

A Transforming World: Green Bonds

As part of our work on [A Transforming World](#), we published an earth-, innovation- and markets-focused equity/credit [Primer](#) on Green Bonds. Here we update our Quarterly report, in which we highlight major developments within the space, and our fundamental credit analyst(s) set out the opportunities offered by Green Bonds.

Climate themed bonds +20% yoy to US\$600bn

The labelled Green Bond market stands at US\$79.43bn as of Aug 31 2015, with 550+ bonds, from 23 countries, augmented by US\$26bn in issuance YTD. While this falls short of US\$70-100bn goal set by various industry experts at the beginning of the year, we are still on track to surpass last year's US\$37bn record issuance. The broader climate-themed bond universe stands at US\$598bn as of June 2015, ballooning by US\$95bn, largely driven by the US\$30.6bn growth in Green Bonds during the same period.

Diversification: Asia, Green ABS, Munis picks up steam

Green Bond issuers now span from quasi-govt and supranationals, to banks, property companies, car makers, food producers, to traditional pure-play cleantech companies. Asia has been active, with China issuing its first corporate Green Bond with Xinjiang Goldwind's US\$300mn note this quarter. We saw continued innovation with the first rupee-denominated Masala Green Bond listed by IFC, with proceeds invested in India's Yes Bank's Green Bond. Green ABS market also picked up steam with issuances from Toyota (US\$1.25bn), SolarCity (US\$124mn), and Renew Financial (US\$13mn) this quarter. Seattle Transit issued the largest US Green Muni bond to date (US\$943mn), signalling growth potential within the US\$3.7tn US muni bond market. There is also progress in SSAs in providing credit enhancements for smaller issuers.

Increased focus on impact reporting

As the market matures, and a number of specialized Green Bond funds emerge, investors are looking for increased transparency on the use of proceeds and the environmental benefits achieved. In March, several multilateral development banks, the largest groups of Green Bonds issuers, published a working paper aimed at standardizing guidelines to measure and report impact, using core metrics including 1) energy savings, 2) GHG emissions reduced or avoided, 3) renewable energy produced. On the heels of this, issuers including World Bank, Region Ile-De-France, KfW, Stockland, have released detailed impact reports.

Green Bond Index maintains fast growth, highest Sharpe

During the last quarter, the BofAML Green Bond Index (GREN) added 14 new issues with a combined face value of \$5.0bn, closing August with market cap of US\$45bn, or 52% growth YoY. Corporate issuers continue to expand their presence in the index. 2015 continues to see a proliferation of small deals, where the US\$0-25mn buckets accounts for 65% of new issuance vs 49% across all years. GREN's annualised return since inception (5.35%) remains ahead of other flagship investment grade indices, with the highest Sharpe ratio vs. IG Govt, Broad Market, IG Corporates, IG Quasi-Govt, and HY Corporates.

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Refer to important disclosures on page 33 to 34. Analyst Certification on page 32.

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A Transforming World: Investment Themes

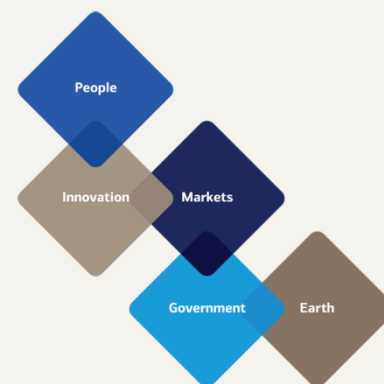
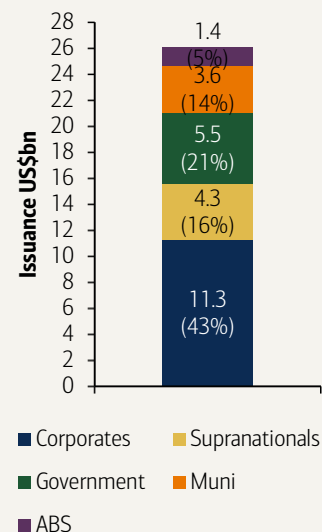


**Chart 1: Issuance by issuer type, 2015
YTD (through August 31)**



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

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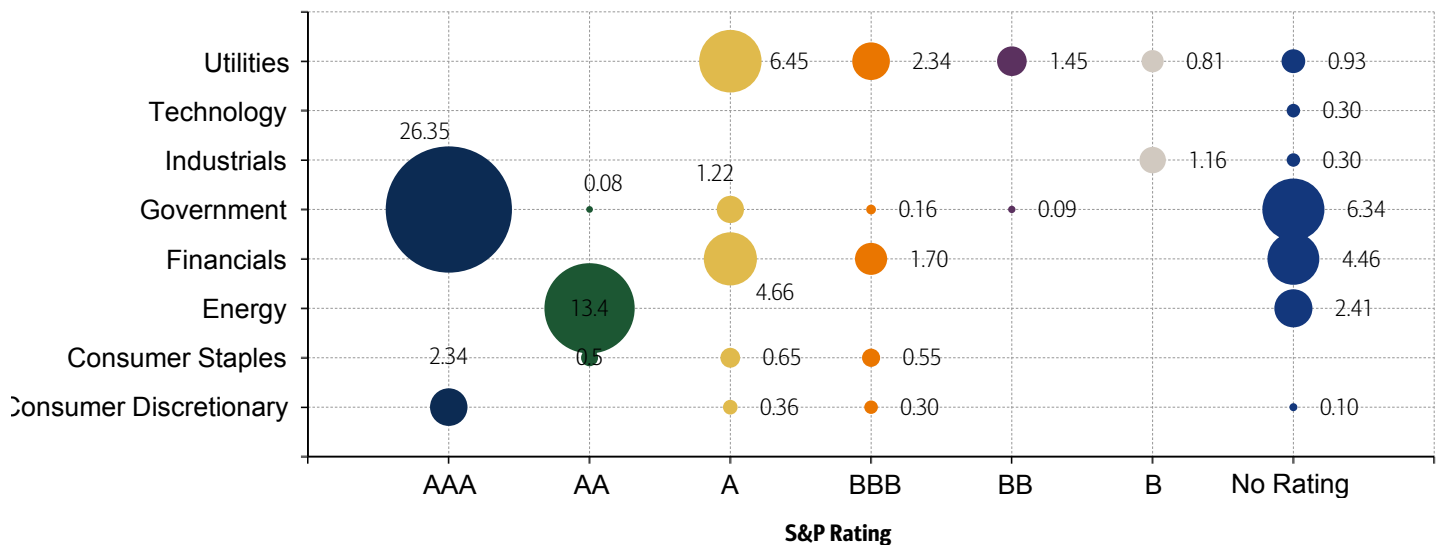
Current state of Green Bonds

The Green Bond market now stands at US\$79.4bn as of August 31 2015, augmented by US\$26bn of issuance YTD. While 2014 had been a pivotal year for growth, with US\$36bn issued versus US\$11bn in 2013, the market is on track to surpass that again this year. The universe is now comprised of 550+ bonds, from 23 countries, in 23 currencies. Issuers span from multilateral banks and supranationals, to banks, property companies, car makers, food producers, conglomerates, to traditional cleantech companies. S&P believes that corporate issuance alone can reach up to \$30bn in 2015. Organizations like the Climate Bonds Initiative (CBI) believes that the overall Green Bonds issuance is likely to hit \$50bn, and a good chance of hitting US\$100bn, while Bloomberg New Energy Finance puts the figure at US\$80bn.

In the last quarter, we've seen tremendous developments from regions like Asia, as well as continued innovation in Green ABS, Masala Green Bonds, and credit enhancements from multilateral development banks. However, further growth would need to be aided by increased standardization, development of second and third party assurance, political support, and overall further maturation and diversification of the Green Bond market.

We need US\$53tn in energy investments from now till 2035 or nearly US\$1tn of additional annual investments, to put the world on a 2°C path and avoid devastating extreme weather and climate change (source: IEA). Our view is that Green Bonds are a game changer in unlocking private capital for environmental needs.

Chart 2: Green Bond Universe by sector and rating, outstanding issues (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings

Increasing diversification, corporates, SSAs, Munis

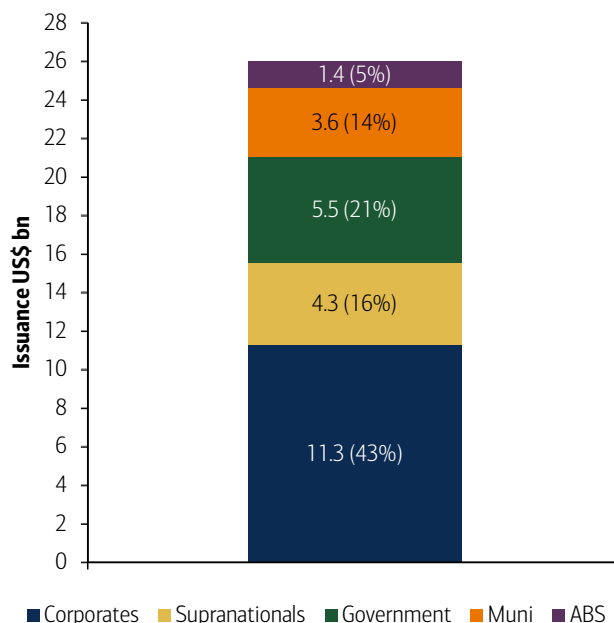
Green Bond issuance has been modest this year, with around US\$26.2bn through August 31 2015. However, issuances by a mix of actors such as Terraform Global, Digital Realty, Toyota, Puget Sound Transit, and the European Investment Bank, indicate that the market continues to grow and diversify. While corporates had overtaken SSAs to become the largest share of issuer this year,

Table 1: Top 20 issuers 2015 YTD (through August 31 2015)

Issuer	US\$ mn
European Investment Bank	2,506
TerraForm Power Operating LLC	1,250
Toyota Auto Receivables 2015-B Owner Trust	1,250
KfW	1,234
TenneT Holding BV	1,124
Nederlandse Waterschapsbank NV	1,098
International Bank for Reconstruction & Development	945
Central Puget Sound Regional Transit Authority	943
TerraForm Global Operating LLC	810
Transport for London	607
Bank of America Corp	600
ABN AMRO Bank NV	564
Berlin Hyp AG	560
BRF S.A.	545
Region of Ile de France	541
Nederlandse Financierings Maatschappij voor Ontwikkelingslanden NV	537
Unibail-Rodamco SE	531
Vestas Wind Systems A/S	527
Paprec Holding	523
Asian Development Bank	502
All other issues in 2015	9,022
Total	26,219

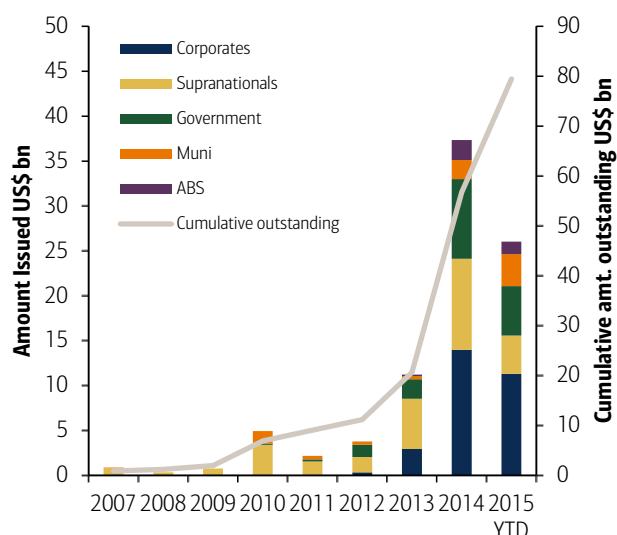
Source: BofAML Global Research, Bloomberg

Chart 3: Issuance by issuer type, 2015 YTD (through August 31)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Chart 4: Corporates leading growth in "Use of Proceeds" green bonds YTD (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Table 2: Top 20 issuers in Q3 2015 (through August 31 2015)

Issuer	US\$ mn
Toyota Auto Receivables 2015-B Owner Trust	1,250
TenneT Holding BV	1,124
Nederlandse Waterschapsbank NV	1,098
Central Puget Sound Regional Transit Authority	943
TerraForm Global Operating LLC	810
KfW	780
European Investment Bank	675
ABN AMRO Bank NV	564
Digital Realty Trust LP	500
Svensk Exportkredit AB	500
Morgan Stanley	500
Australia & New Zealand Banking Group Ltd	463
TerraForm Power Operating LLC	450
Goldwind New Energy	300
City of Los Angeles CA Wastewater System Revenue	290
Telus Corp	225
City of Gothenburg Sweden	127
SolarCity Corp	124
New York State Environmental Facilities Corp	112
Latvenergo AS	85

Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

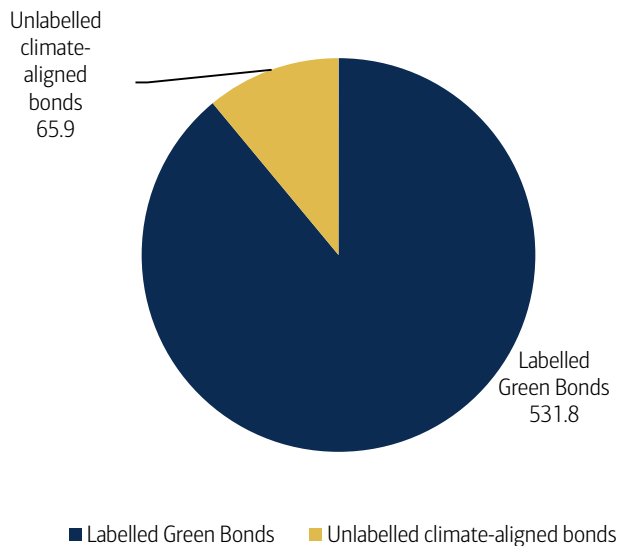
Climate themed bonds balloon to US\$600bn

The latest study from the Climate Change Initiative showed that the universe of climate-themed bonds stood at \$597.7bn as of June 10 2015, representing a 20% increase the previous year. Climate-themed bonds include around 1,400 companies with over 95% of their revenues coming from climate-aligned assets. The universe is comprised of 2,769 bonds from 407 issuers, spanning six climate themes: Transport, Energy, Buildings and Industry, Agriculture and Forestry, Waste and Pollution, and Water.

Green Bonds have been major driver of growth

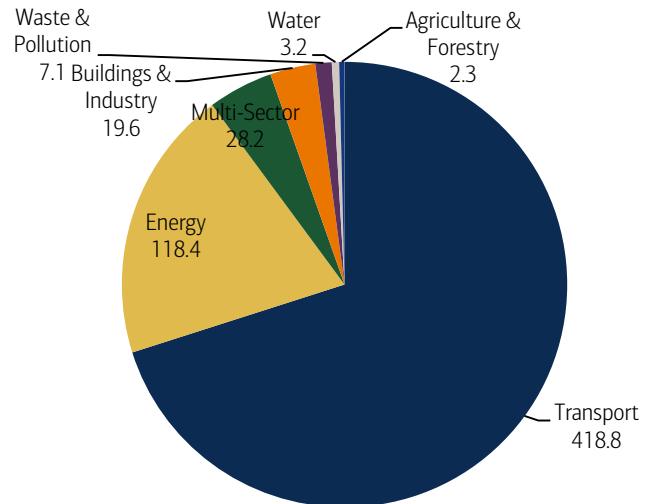
The US\$95bn growth in the climate-aligned bond universe has been driven by the growth of Green Bonds, which grew by an additional US\$30.6bn during the same period, or making up 32% of the growth. At the time of publication, Green Bonds made up US\$65.9bn of the climate-aligned bonds universe, or only 11%.

Chart 5: Climate-aligned bond universe \$ bn



Source: CBI HSBC

Chart 6: Transport continues to be the dominant theme (US\$ bn)

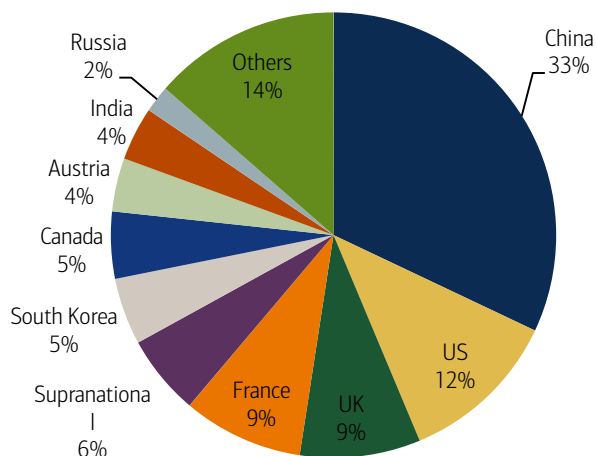


Source: CBI HSBC

Transports and China make up majority of climate bonds

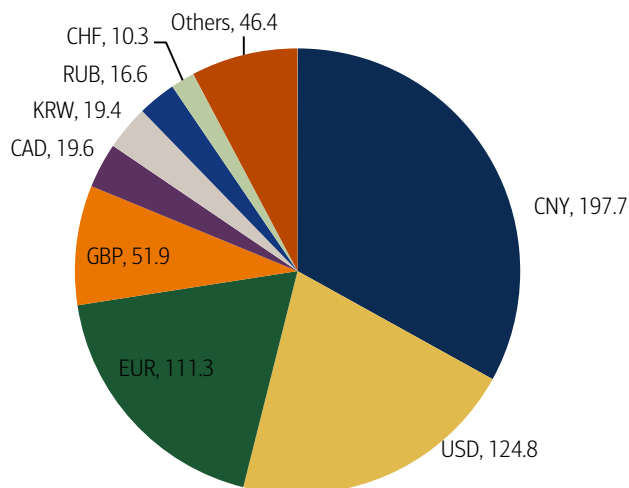
Within the universe, Transport continues to make up the largest proportion of the universe at US\$418.8bn, 95% of which are rail companies that tend to be backed by state entities. Energy is the 2nd largest at US\$118.4bn, including renewable energy such as hydropower, wind, solar, bioenergy, geothermal and nuclear. China (33%) and Chinese Yuan (US\$197.7bn worth) denominated bonds also have a much heavier weighting versus the Green Bonds universe. This is due to the high volume of rail and hydro bonds originating from China.

Chart 7: Top 10 countries for climate aligned bonds



Source: CBI HSBC

Chart 8: Currency breakdown US\$ bn

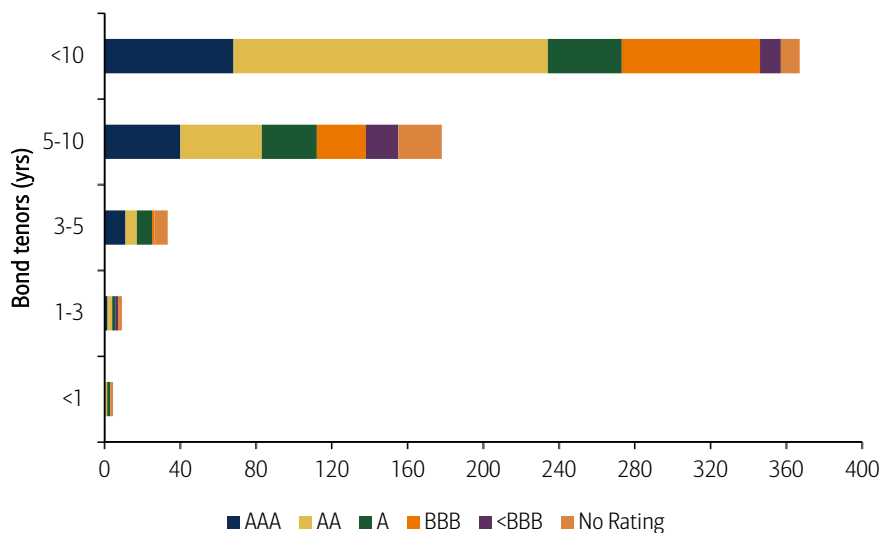


Source: CBI HSBC

Majority are investment grade, and long-dated

Similar to previous years, the great majority of the bonds are investment grade, at US\$523.5bn, or 88% of total. At the same time, most climate bonds fall in the 10Y+ category, which reflects the long-term nature of certain infrastructure projects such as rail. This is significantly higher than for Green Bonds, which are still predominantly in renewable energy and energy efficient buildings that tend to have a shorter time horizon.

Chart 9: Bond tenors of Climate-aligned bonds

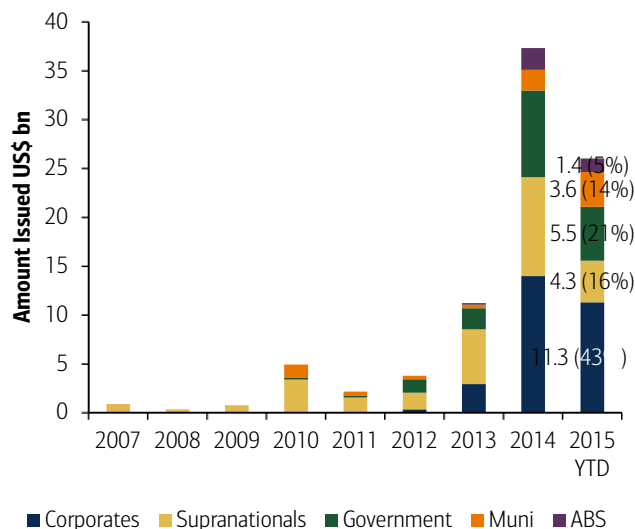


Source: CBI HSBC

In Green Bonds: Corporates continue to dominate

In 2014, we saw corporate issuers lead the way in issuance, jumping from US\$4bn in 2013 to US\$18.4bn in 2014. This has become the first year in time since the birth of the Green Bond market that corporates are the single largest issuer, with nearly US\$12bn of issuance in through August 31 2015. The group continued its momentum this quarter, buoyed by pureplays such as the YieldCo Terraform Global, and Toyota with its 2nd green asset-backed green bond.

Chart 10: Green bond issuance by type, 2007-2015 YTD (US\$bn)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Table 3: Corporate issuers of 2015 YTD (through August 31)

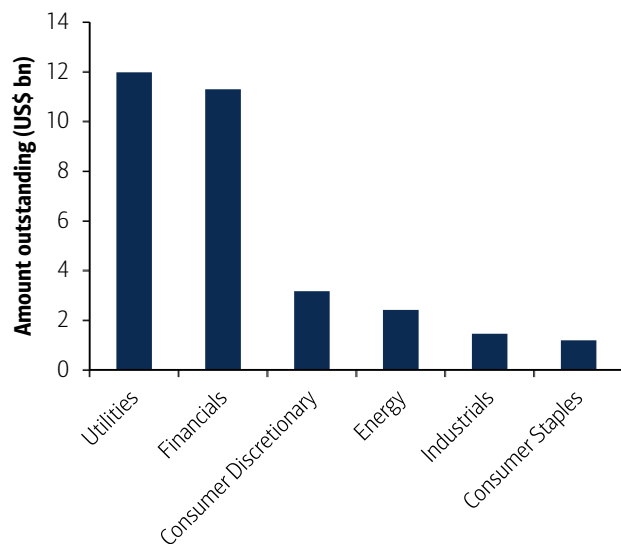
Corporates	2015 US\$ mn
TerraForm Power Operating LLC	1,250
Toyota Auto Receivables 2015-B Owner Trust	1,250
TenneT Holding BV	1,124
TerraForm Global Operating LLC	810
Bank of America Corp	600
ABN AMRO Bank NV	564
Berlin Hyp AG	560
BRF S.A.	545
Unibail-Rodamco SE	531
Vestas Wind Systems A/S	527
Paprec Holding	523
Export-Import Bank of India	500
Morgan Stanley	500
Digital Realty Trust LP	500
Australia & New Zealand Banking Group Ltd	463
Rapid Holding GmbH	446
Fortum Varne Holding samagt med Stockholms stad AB	304
Goldwind New Energy	300
Telus Corp	225
Yes Bank Ltd	210
Others	949
Total	12,681

Source: BofAML Global Research, Bloomberg.

Financials are the #1 corporate issuer

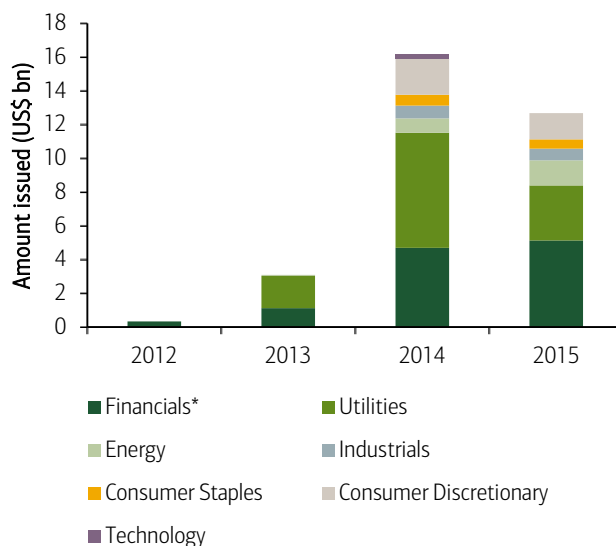
While environmentally focused companies such as power generation and energy utilities previously made up the great majority of corporate issuance, companies in the financial services sectors has overtaken them this quarter as the largest issuer within corporates. Historically, power producers had been the first movers in Green Bonds as they have a large amount of renewables and cleantech assets within their portfolio that easily qualify as green projects. However, 2015 thus has been a busy year in during which non-traditional cleantech companies moved to become largest corporate issuer.

Chart 11: Sectorwise distribution of Green Bonds (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.
* Financials includes Real Estate

Chart 12: Corporate bonds by sector (through August 31 2015)

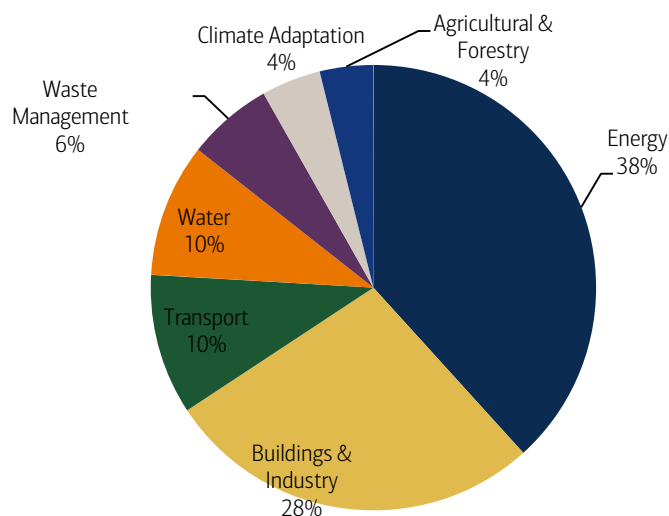


Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.
* Financials includes Real Estate

Renewables and buildings are largest use of proceeds

The majority of Green Bonds are multi-purpose, which means that proceeds go towards various projects that meet the guidelines as specified under the Green Bond Principles. According to the Climate Bond Initiative estimates, around 38% are financing for renewables energy, and 28% for buildings and industry, including low carbon buildings. This compares to 70% of proceeds going towards transport for climate bonds, indicating a huge area for future growth.

Chart 13: Green bonds use of proceeds



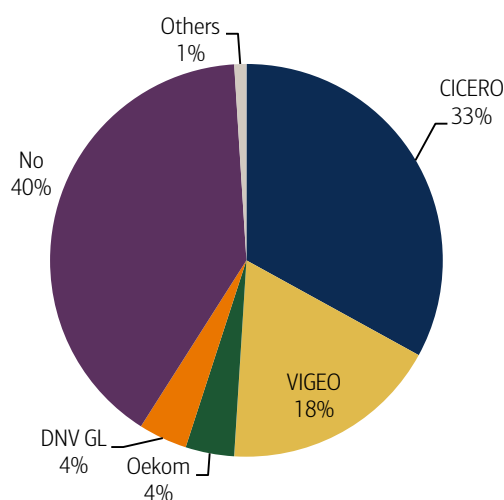
Source: CBI HSBC

Cicero and Vigeo are primary sources of 2nd opinion

Currently, around 60% use a 2nd party review. While there have been new entrants in the space including Oekom, Sustainalytics and KPMG, Cicero (33%) and Vigeo (18%) still take the largest market share. For issuers such as real estate companies that have

reference certified assets such as LEED rated buildings, the ratings will often stand in place of a 2nd party opinion to verify the green credentials of the bond.

Chart 14: Significant providers of second party reviews



Source: CBI HSBC

Banks issuing Green Bonds for climate commitments

The market witnessed several major issues from banks, investment banks, real estate companies, and other financial services institutions. Earlier this year, the Netherlands-based ABN AMRO bank issued paper that will go towards financing mortgages for energy efficient homes, as well as for loans for fitting solar panels. US-based Morgan Stanley's US\$500mn paper went towards wind farms in Texas and installing energy efficient lighting in their New York headquarters. Australia & New Zealand (ANZ) banking group issued a Green Bond in which 40% will go towards property, with the remaining 60% for wind and solar energy loans.

Table 4: Current outstanding amount issued by Financial Services (US\$ mn), through August 31 2015

Issuer	Amt. Issued US\$ mn	# of Bonds	Currency
Bank of America Corp	1100	2	USD
Credit Agricole Corporate & Investment Bank SA	1032	34	Multiple
ABN AMRO Bank NV	564	1	EUR
Berlin Hyp AG	560	1	EUR
Export-Import Bank of India	500	1	USD
Morgan Stanley	500	1	USD
Australia & New Zealand Banking Group Ltd	463	1	AUD
Toronto-Dominion Bank/The	453	1	CAD
Nedbank	338	1	ZAR
National Australia Bank Ltd	247	1	AUD
Rodamco Sverige AB	225	2	SEK
THP Partnership	217	1	CAD
Yes Bank Ltd	210	2	INR
DNB Bank ASA	133	1	NOK
Hannon Armstrong	100	1	USD
Renew Financial	13	1	USD
Total	6,655	52	

Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings

Table 5: Banks YTD issuance (through August 31 2015)

Issuer	Amt. Issued US\$ mn
Bank of America Corp	600
ABN AMRO Bank NV	564
Berlin Hyp AG	560
Export-Import Bank of India	500
Morgan Stanley	500
Australia & New Zealand Banking Group Ltd	463
Yes Bank Ltd	210
DNB Bank ASA	133
Credit Agricole Corporate & Investment Bank SA	23
Total	3,553

Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings

Pureplay companies getting increasingly involved

There has been much discussion on whether cleantech companies would issue Green Bonds because the core of their businesses are naturally green. Earlier in the year, cleantech and environmental companies such as Vestas, Paprec, Shanks, and United Photovoltaics all chose to issue Green Bonds. The trend continued this past quarter when the YieldCo Terraform Global Operating issued an \$810m 7-year green bond, with a 9.75% coupon and ratings of B2 and B+ from Moodys and S&P respectively. Terraform Global owns and operates clean assets in non-US locations including:

- Solar: China, India, South Africa, Honduras, Uruguay, Malaysia and Thailand.
- Hydro: 6 projects in Peru (for 336MW aggregate capacity), as well as 3 small operational hydro projects in Brazil (aggregate capacity of 42MW).
- Wind projects: China, Brazil, South Africa, India, Honduras, Costa Rica and Nicaragua.

The first Chinese corporate Green Bond by Xinjiang Goldwind, China's 2nd largest wind turbine maker, also made headlines with its inaugural US\$300mn which was 5x oversubscribed.

Similarly, French power company AKUO Energy issued a EUR34mn 5-year 5.5% note, through a private placement. This was the first French independent power producer to issue a green bond, with proceeds primarily going towards renewable energy. The overall portfolio of the AKUO is comprised of 79% wind, 19% solar, and 5% biomass assets.

Table 6: Pure-play issuance in 2015 YTD (through August 31) in US\$ mn

Issuer	Amt. Issued
TerraForm Power Operating LLC	1,250
TenneT Holding BV	1,124
TerraForm Global Operating LLC	810
Vestas Wind Systems A/S	527
Paprec Holding	523
Rapid Holding GmbH	446
SolarCity Corp	124
Goldwind New Energy	300
Shanks Group PLC	169
Sunrun Inc	111
Nelja Energia AS	56
AKUO Energy	38

Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings

Green ABS continues

Green asset-backed (ABS) bonds had been a huge area of interest as it is a key tool that could link additional private capital with environmental needs. This quarter, Toyota issued its 2nd green ABS following its inaugural one in 2014. The US\$1.25bn note was also the 3rd largest Green Bond issued this year so far. Proceeds will be used to fund finance and lease contracts for Toyota and Lexus cars that meet certain environmental standards, including 8 models that currently qualify. The specifications include:

- Gas-electric hybrid or alternative fuel powertrain
- Minimum EPA estimated MPG (or MPG equivalent for alternative fuel vehicles) of 35 city / 35 highway
- California Low-Emission Vehicle II (LEV II) certification of super ultra-low emission vehicles (SULEVs) or higher, which would include partial zero emissions vehicles (PZEVs) and zero emissions vehicles (ZEVs)

Table 7: ABS Green bonds issued (through August 31 2015)

Issuer	US\$ mn
2013	
Hannon Armstrong	100
SolarCity Corp	54
Goldman Sachs Japan Co., Ltd	20
2014	
Toyota Auto Receivables 2014-A Owner Trust	1,750
SolarCity Corp	272
Hawaii DBEDT	150
Goldman Sachs Japan Co., Ltd	63
Western Riverside Council of Governments	104
Connecticut Clean Energy and Finance Authority	30
2015	
SolarCity Corp	124
Toyota Auto Receivables 2015-B Owner Trust	1,250
Renew Financial	13
Total	3,929

Source: BofA Merrill Lynch Global Research. Compiled from Bloomberg, CBI, company filings

SolarCity returns with 2nd Green ABS

The largest US-based solar developer SolarCity also followed up 2013 issuance with a 2nd green ABS. The company issued US\$103.5mn in A-rated senior notes with 4.18% interest and US\$20mn in BBB-rated junior notes with 5.58% interest, both maturing on February 21 2022.

On the heels of this, Hannon Armstrong announced that it was also issue a US\$125mn round of 25-year notes. Similar to its first green ABS, it will be backed back renewable energy and energy efficiency assets.

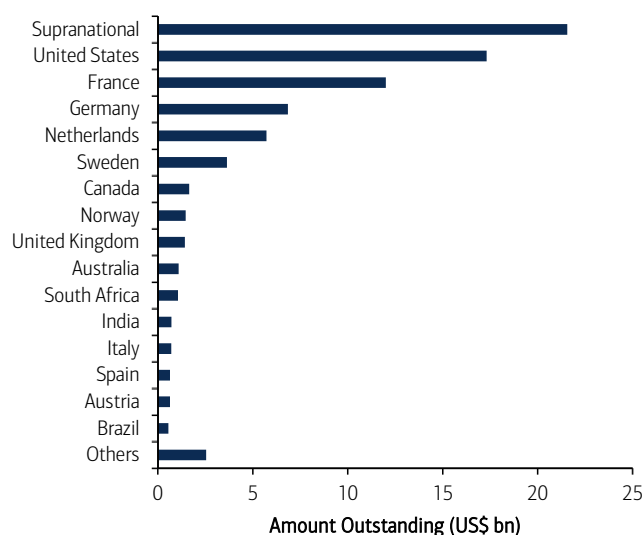
Green muni ABS introduced late 2014

The Hawaii State Department of Business, Economic Development and Tourism (DBEDT) issued a US\$150mn AAA-rated green ABS. The note was backed by a Green Infrastructure Fee, which is applied to electricity bills of Hawaiian state utilities. Proceeds are to go towards loans for customers to fund installations of solar panels, storage, inverters, and monitoring devices.

Europe and US remain largest issuers, but declining

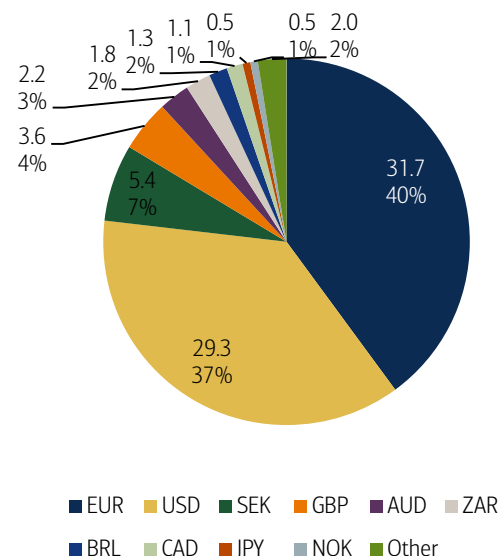
As a region, Europe remains the most developed Green Bond market and has some of the largest issuers. France, Germany, Netherlands, Norway, and Sweden comprise around 36% of the total outstanding market. EUR denominated Green Bonds make up around 42%, down from roughly half the market earlier in 2014. Increase in issuance from the US has driven a rise in USD denominated bonds, which now comprises 38%, tying with EUR.

Chart 15: Countrywise distribution of Green Bonds (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Chart 16: Currency distribution of Green Bonds (outstanding through August 31 2015)

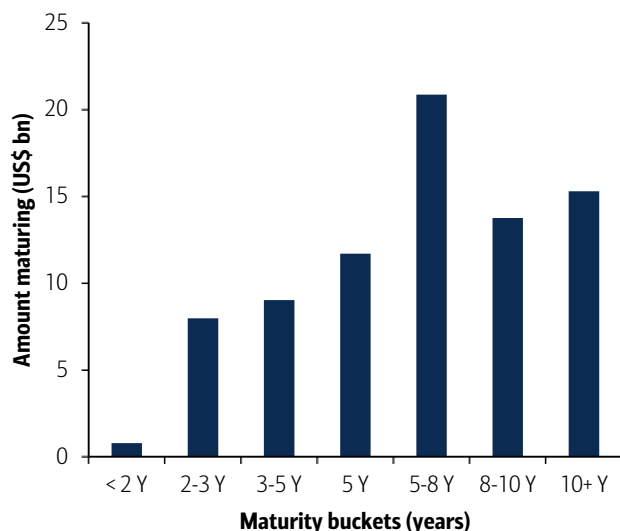


Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Maturity of issuance getting longer

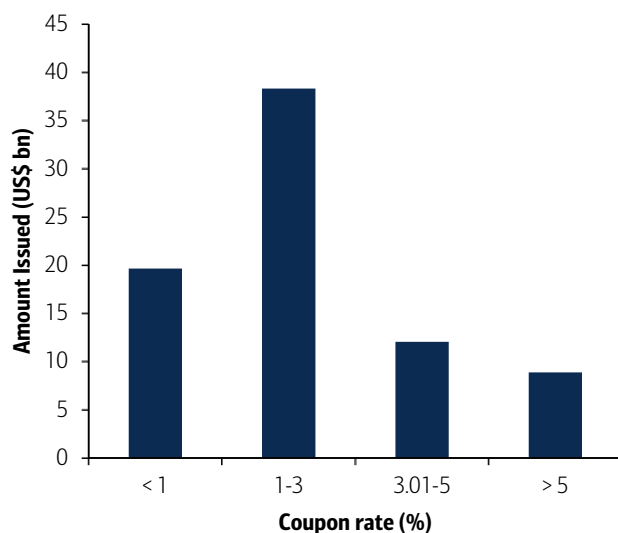
Historically, most Green Bonds span between two to ten years, with the five to eight-year maturity the most popular bucket (source: Bloomberg). However, investors are warming up to the idea of longer-duration projects and the 10-year+ bucket has been growing as a proportion of the market. This is encouraging because many environmental projects have a longer time horizon, and locking in long term financing would alleviate certain funding concerns.

Chart 17: Maturity distribution of Green Bonds (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Chart 18: Coupon distribution of Green Bonds (through August 31 2015)

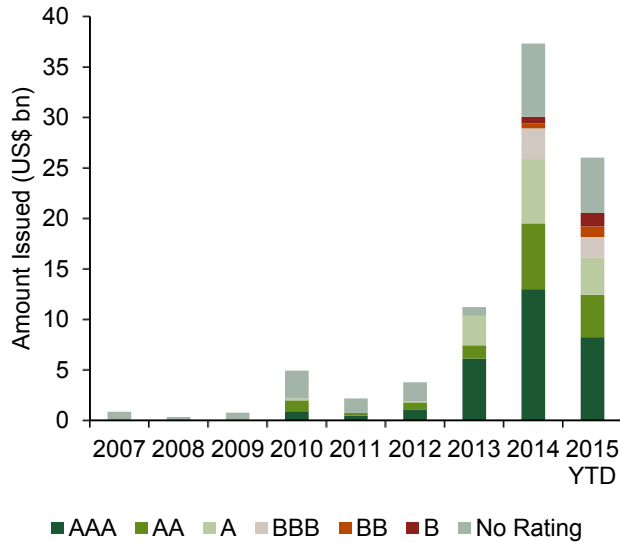


Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Growth of speculative grade continues

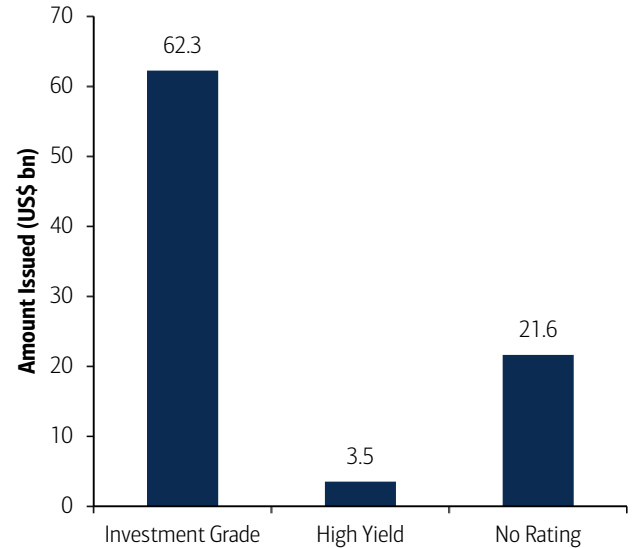
While historically Green Bonds have predominantly investment grade (the BofAML Green Bond Index had an average rating of AAA prior to March 2014), 2014 saw the emergence of high yield issues with NRG Yield. Earlier this year, companies like Paprec, and Abengoa Greenfield had entered the market as well. TerraForm Global, a US YieldCo with renewable power assets in emerging markets, issued a US\$810mn B+-rated bond this quarter, one of the largest of the year.

Chart 19: S&P ratings distribution of Green Bonds (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Chart 20: High Yield vs Investment Grade Issues (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

HY holders more traditional vs SRI

While holders of Green Bonds issued by traditional SSAs has been predominantly the SRI and ESG investor base, there may be evidence that speculative grade Green Bonds remain popular with traditional HY investors. For instance, Global Capital reported in March that Paprec's book was comprised of traditional high yield investors. The paper interviewed someone familiar on the matter, who stated that "the green category is very important for issuers, yet so far has limited impact on the investor base in high yield."

Table 8: Total amount issued by high yield issuers through (August 31 2015)

Issuer	AMT Issued USD mn	Issue Date	Maturity	S&P Rating
TerraForm Global Operating LLC	810	05-Aug-15	05-Aug-22	B+
TerraForm Power Operating LLC	800	28-Jan-15	01-Feb-23	BB-
Abengoa Greenfield SA	635	30-Sep-14	01-Oct-19	B
Paprec Holding	524	27-Mar-15	01-Apr-2022/23	(P)B+/ (P)B-
NRG Yield Operating LLC	500	05-Aug-14	15-Aug-24	BB+
TerraForm Power Operating LLC	150	08-Jun-15	01-Feb-23	BB-
Virginia College Building Authority	67	15-Jul-15	01-Jul-19	BB+
Chicago Board of Education	20	29-Apr-15	01-Dec-32	BB
City of York PA	2.2	28-Dec-11	15-Nov-27	BB+
Total	3,508			

Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

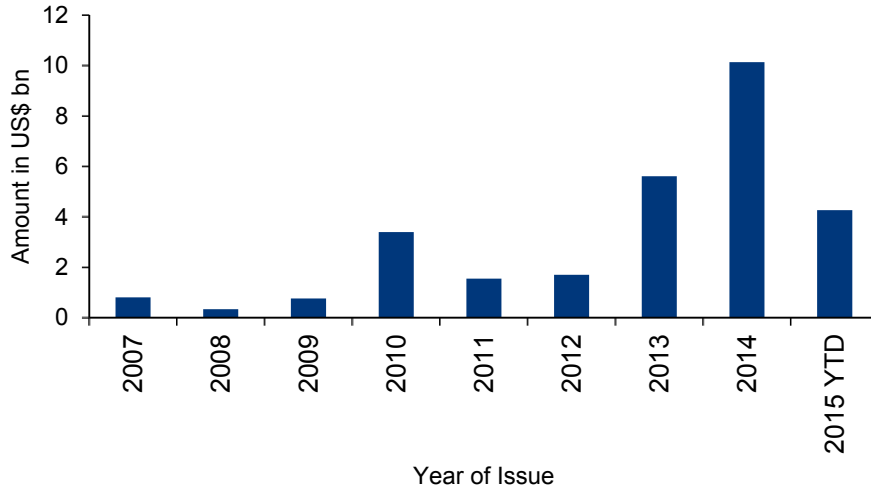
* Paprec holding has two bonds with amounts (322+202)=524

Abengoa has two bonds with amounts issued (335+300) = 635

Supranational issuance less dominant in 2015

In terms of issuers, supranationals, sub-sovereigns, and agencies (SSAs) historically have been the largest group of Green Bond issuers. To date, the largest issuers in the Green Bond market remain multilateral banks such as the World Bank and European Investment bank, their pace of issuance has been only moderate versus last year, at around \$3.5bn YTD.

Chart 21: Supranational Green Bonds (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

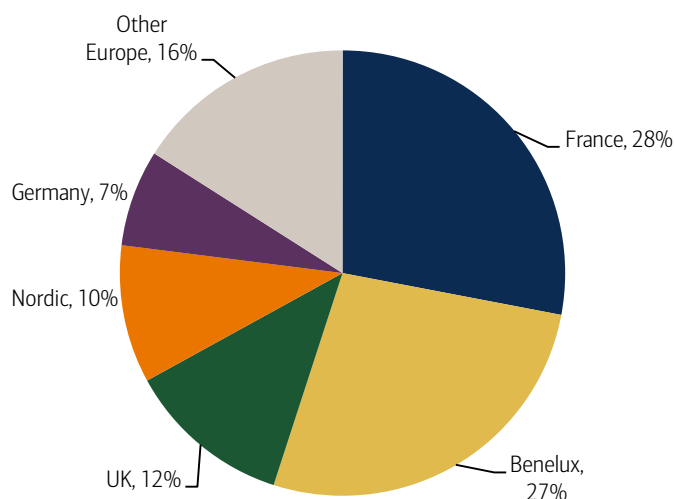
EIB's €600mn bond means they top EUR10bn in issuance

The European Investment Bank (EIB) has been a pioneer in the market, by being the first issuer of Green Bonds back in 2007, and this quarter, they maintained their place as the largest issuer to date with their new €600mn Climate Awareness Bond (CAB) issuance in August. The bond had a 0.5% coupon, maturing in Nov 2023. In aggregate, EIB has issued now issued €10bn in CABs to date. To date, proceeds have been used to fund projects including renewable energy, district heating, building insulation, energy loss reduction in transmission and distribution, and cogeneration. This issue created the 3rd reference point in an intermediate maturity versus their previous issues, which helps to build out EIB's Green Bond curve. This also helps reaffirm the commitment of multilateral banks with their pivotal role in the development and sustained growth of the overall Green Bond market.

Strong SRI interest

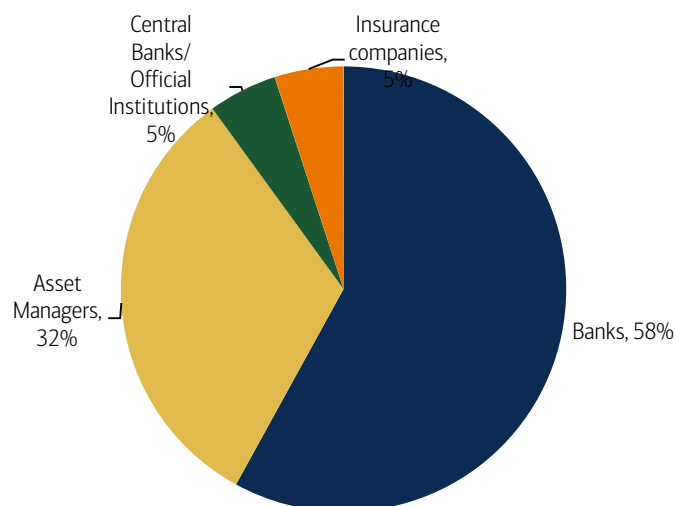
According to the EIB, their latest Green Bond generated strong demand from investors focussed on socially responsible investing. The French and Benelux regions accounted for more than half of all allocations at 55%. Banks (58%) and asset managers (32%) accounted for the great majority of the investor interest.

Chart 22: Interest in latest EIB bond by Geographical Region



Source: EIB

Chart 23: Interest in latest EIB bond by Investor Type

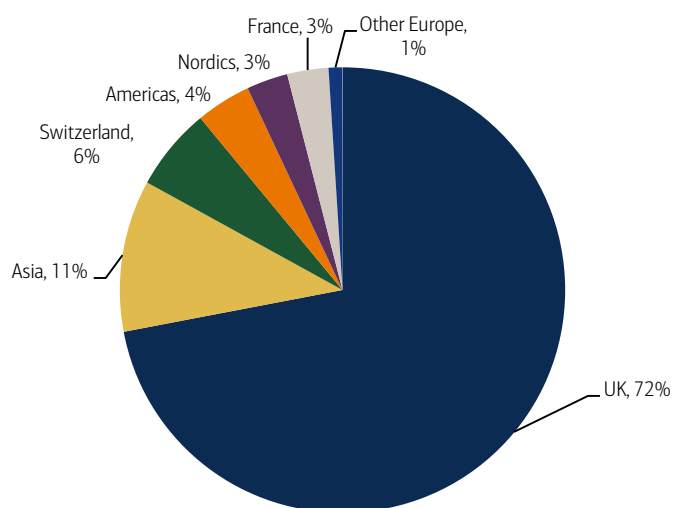


Source: EIB

KfW: development banks continuing on

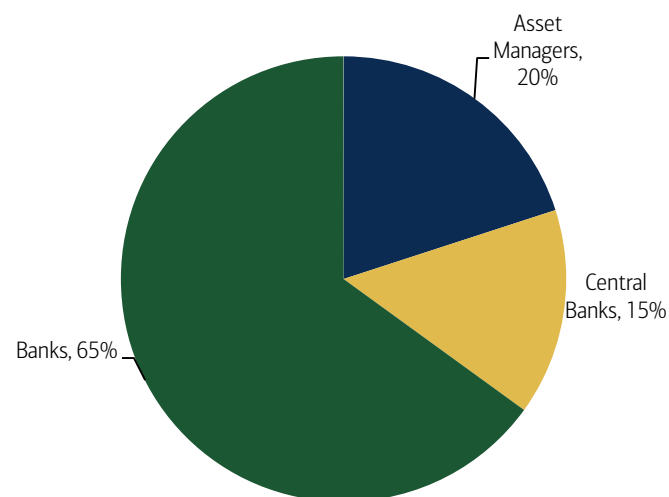
The German development bank KfW has been continuing and is now the 4th largest issuer of Green Bonds YTD. The bank placed a £500mn 15-year 1.625% note in the UK. Proceeds were to go towards on-shore wind and solar projects. UK investors (72%) and banks (65%) accounted for the bulk of the investor base. Similar to other SSAs, the bond was highly rated at AAA, with backing from the German government.

Chart 24: Distribution by region



Source: KfW

Chart 25: Distribution by investor type



Source: KfW

NWB Bank's €1bn bond

The Dutch lender Nederlandse Waterschapsbank (NWB) has issued a €1bn 10-year green bond, a follow-on from the bank's debut issue last year. NWB Bank specializes in financing for Dutch water authorities, and the proceeds will go towards climate mitigation (ex: wastewater), climate adaptations (ex: waterway management), and biodiversity (ex: water treatment).

SEK: first export credit agency issuing

The Swedish Export Credit Corporation (SEK), issued its debut US\$500mn 5-year bond this quarter, a first for an export credit agency. Proceeds will be used to finance exports of Swedish environmental technology, and impact will be measured through carbon dioxide reduction resulting from projects that are financed. ESG investors comprised 65% of the pool, while Europe (53%) and North American (33%) accounted for the great majority of buyers.

SSAs provide backing for smaller Green Bonds

The potential of supranationals, multilateral banks, and other institutions with strong balance sheets and credit ratings to help backstop smaller projects and entities has been a major area of interest. This is another potential area to achieve additional funding for green projects versus relabeling of existing projects that could have been funded without the Green Bond label. There has been progress this past quarter as several SSAs moved to lend their balance sheet to raise cheaper funds from mainstream investors and pass on the proceeds to smaller players that may not have been able to raise the capital or as cheaply otherwise.

Asian Development Bank to provide support for Aboitiz in Philippines

The Asian Development Bank (ADB) has received approval to provide a loan and a partial credit guarantee to support Aboitiz Power Renewables in issuing the first Green Bond in the Philippines. Aboitiz's parent company is one of the largest power generators in the Philippines, with 1/3 of their assets in renewables such as hydro and geothermal power. Aboitiz is aiming at issuing a Ps10.7bn with tenor of up to 10 years, which will be used to refinance and improve operation of their existing renewable power plants. Concurrently, ADB will also provide for an additional loan of up to Ps1.8bn. ADB issued their own inaugural US\$500mn Green Bond in March 2015, with proceeds going towards promoting climate change adaptation.

IFC investment in Yes Bank Green Bonds

Similarly, in August the IFC raised Rs315 to invest in Yes Bank green bonds. The rupee-denominated "masala" bonds were listed on the London Stock Exchange and are part of IFC's US\$3bn masala bond programme where the bank sells a range of tenors in the offshore rupee bond market. The AAA-rated IFC was effectively able to tap into its cheap cost of funding and channel proceeds to emerging markets such as India.

London Stock Exchange launches dedicated segment

In July, the London Stock Exchange launched a new segment dedicated to Green Bonds. The platform provides issuers with a suite of products to support issuance. This includes choice of listed markets – Regulated Market for both retail and wholesale investors, and trading models including on-screen market maker quoting, end-of-day pricing or OTC-style trade reporting. The City of Gothenburg was the first issuer to use the dedicated Green Bond segment with their SEK1bn note, and they migrated their existing Green Bonds onto the same platform.

The Green muni opportunity

Municipalities have tremendous environmental infrastructure needs, where the US alone needs US\$3.6tn of investments through 2020E in such items as transportation systems, waterways, and the power sector. At the same time, cities are also particularly vulnerable to the impacts of climate change. In just the last three years, US metropolitan areas have suffered from more than US\$188bn in damages and lost more than 1000 lives on the back of extreme weather. Investment in low-carbon and environmental solutions is one of the best ways to combat this. (Source: Green City Bonds Coalition)

Table 9: Types of Green Muni Bonds

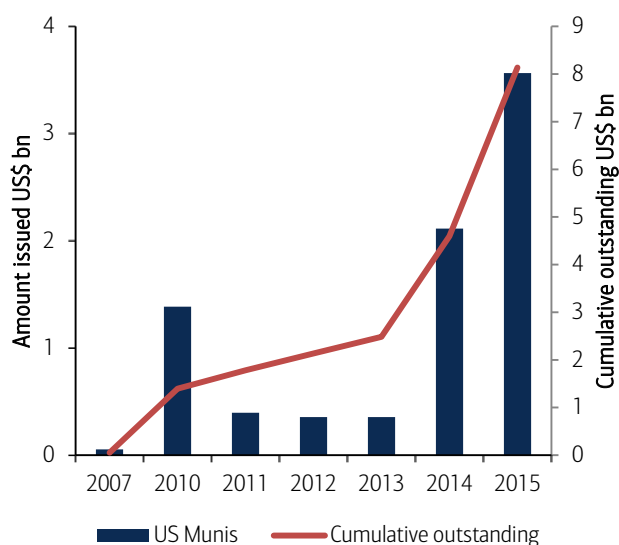
TYPE	PROCEEDS RAISED BY BOND SALE	DEBT RECOURSE	EXAMPLE
General Obligation Bond	Earmarked for green projects	Full recourse to the issuer; therefore, same credit rating applies as to the issuer's other bonds.	State of California issued \$300 million in Aa3/A green bonds with final maturities in 2037. The September 2014 issuance was backed by the State's General Fund, 90 percent of which is derived from personal income tax, sales and use tax, and corporation tax). Proceeds went to fund a variety of projects across several categories, including air pollution, clean water and drinking water, and flood prevention.
Revenue Bond	Earmarked for green projects	Revenue streams from the issuer, such as taxes or user fees, provide repayment for the bond.	Iowa Finance Authority issued \$321.5 million of State Revolving Fund revenue bonds in February 2015, with 1- to 2-year tenors, 1 to 5 percent coupon, rated AAA. The green bonds were backed by water-related fees and taxes. Proceeds were earmarked for water and wastewater projects.
Project Bond	Ring-fenced for the specific underlying green project(s)	Recourse is only to the project's assets and revenue.	No issuance seen in the market yet
Securitized Bond	Either (1) earmarked for green project or (2) go directly into the underlying green projects.	Recourse is to a group of financial assets that have been grouped together as collateral.	Hawaii State Government issued \$150 million, AAA-rated of green asset backed securities in November 2014. The securities were issued in two tranches: \$50 million, 8-year, 1.467 percent coupon and \$100 million, 17-year, 3.242 percent coupon. The bonds were backed by a Green Infrastructure Fee applied to the bills of the State Utility's electricity customers. Proceeds went to loans to install distributed solar panels, connectors, and storage.

Source: Green City Bonds Coalition

US\$3.7tn in US muni opportunity

According to a report released by the Green City Bonds Coalition, the US municipal bond market already stands at US\$3.7tn, with individual retail investors and mutual funds accounting for more than 70% of the market. This is because individuals tend to have significant tax liability, making tax-exempt muni bonds particularly attractive. While the inaugural US\$100mn US Green Muni Bond was issued in 2013, the market ballooned to US\$2.6bn by 2014, and we have already surpassed that this year with US\$3.5bn issued through August 2015. We have been seeing growth of Green Bonds outside the Qualified Energy Conservation Bonds (QECB) and Clean Renewable Energy Bonds (CREB) programs already. Similar to non-muni Green Bonds, demand has been particularly high. We see room for additional growth of Green Bonds within the US\$3.7tn muni market, as well as expanding issuance that would not have occurred previously.

Chart 26: US Muni issuance (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Table 10: Top 10 Green US Muni Bonds 2015 YTD (through August 31)

Governments	2015 YTD Amt Issued US\$ mn
Central Puget Sound Regional Transit Authority	943
Iowa Finance Authority	322
City of Los Angeles CA Wastewater System Revenue	290
State of Connecticut Clean Water Fund - State Revolving Fund	250
Indiana Finance Authority	240
Massachusetts Clean Water Trust/The	228
Metropolitan Water Reclamation District of Greater Chicago	225
Arizona State University	183
Massachusetts Development Finance Agency	158
New York State Environmental Facilities Corp	112
Others	615
Total	3,565

BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Largest Green muni bond from Seattle Transit

In August, the Central Puget Sound Regional Transit authority issued a AAA-rated US\$942mn note, which was the largest US Muni Green Bond to date. The sale includes fixed-rate bonds paying 3.88% interest and around US\$150mn in floating rate bonds. The proceeds will go towards building more than 30 miles of light rail extensions through 2023E, and will go towards refinancing existing bonds to achieve over \$30mn in cost savings. The rail projects are forms of low-carbon mass transit located in and around the Seattle, Tacoma and Puget Sound area, primarily focusing on commuter rail links to the city and airport.

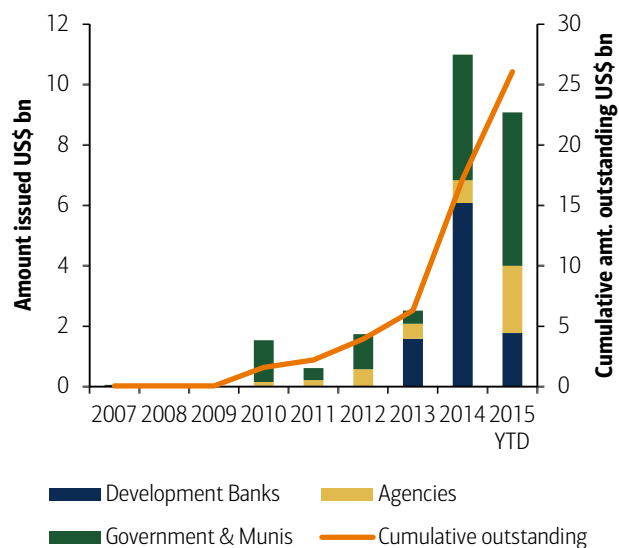
Rare 2nd party opinion used

Sound Transit is one of only two transit agencies to attain the American Public Transportation Association (APTA) platinum level of sustainability commitment. In addition to APTA's annual reviews, they are also using the 2nd opinion from Sustainalytics who will also evaluate the projects in an annual basis. This is only the second US muni besides DC Water from July 2014 to attain a 2nd review.

European munis continue, Gothenburg repeat issuer

In addition to United States, we are seeing continued participation from sovereigns and municipalities in Europe and elsewhere. Earlier this year, Transport for London, a public-private partnership that manages London's public transport network, issued a £400mn 10-year AAA 2.125% Green Bond, which is the 2nd largest government issue this year. The City of Gothenburg, who has been active in Green Bonds since 2013, issued a SEK1bn 6-year 1.455% note. Proceeds will be used to fund green projects including an electric vehicle scheme, energy-from-waste project, sustainable housing, and water project. Majority of the bonds were placed with pension funds (61%), asset managers (17%) and Banks (16%).

Chart 27: Governments, Quasi-Government, and Multilateral Bank issuance YTD (through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Table 11: Top 20 Green Government & Muni Bonds issued 2015 YTD (through August 31)

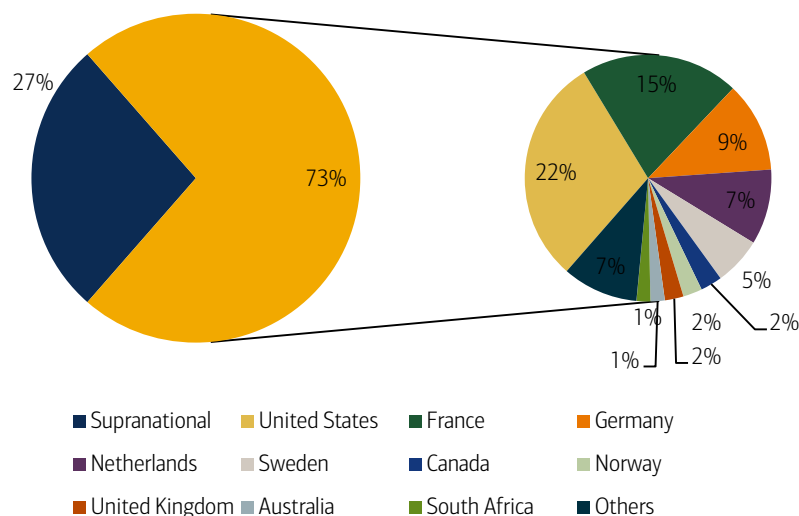
Governments	2015 YTD US\$ mn
Central Puget Sound Regional Transit Authority	943
Transport for London	607
Region of Ile de France	541
Iowa Finance Authority	322
City of Los Angeles CA Wastewater System Revenue	290
State of Connecticut Clean Water Fund - State Revolving Fund	250
Indiana Finance Authority	240
Massachusetts Clean Water Trust/The	228
Metropolitan Water Reclamation District of Greater Chicago	225
Stockholms Lans Landsting	213
Arizona State University	183
Massachusetts Development Finance Agency	158
City of Gothenburg Sweden	127
New York State Environmental Facilities Corp	112
University of Virginia	98
East Bay Municipal Utility District Water System Revenue	74
Virginia College Building Authority	67
Indiana University	59
Rhode Island Clean Water Finance Agency Water Pollution Control	
Revolving Fund	56
Energy Northwest	55
Others	234
Total	5,080

BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Asia to drive future growth, first issuances seen

While issuers from the US and Europe currently accounts for around 60% of the outstanding market, Green Bonds are gaining traction in the rest of the emerging and development world as well. Moody's believes that while the market in US and Europe will become increasingly sophisticated, emerging markets such as China and India are likely to drive growth of issuance as they move towards more eco-friendly economies.

Chart 28: Countrywise distribution of Green Bond (outstanding through August 31 2015)



Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Table 12: All bonds issued in Asian currencies (through August 31)

Issuer	US\$ mn
CNY	
CGN Wind Energy Ltd	160
International Finance Corp	80
IDR	
Credit Agricole Corporate & Investment Bank SA	9
European Bank for Reconstruction & Development	60
INR	
Credit Agricole Corporate & Investment Bank SA	64
European Bank for Reconstruction & Development	40
International Bank for Reconstruction & Development	21
International Finance Corp	49
Kommunalbanken AS	5
Yes Bank Ltd	210
JPY	
Credit Agricole Corporate & Investment Bank SA	499
European Investment Bank	49
International Bank for Reconstruction & Development	1
MYR	
International Bank for Reconstruction & Development	11

Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

Table 13: All bonds issued by Asian countries (through August 31)

Issuer	Amt. Issued US\$ mn	Country
Asian Development Bank	1,711	NA
Export-Import Bank of India	500	India
Export-Import Bank of Korea	500	S. Korea
Development Bank of Japan Inc	316	Japan
ASE*	300	Taiwan
Goldwind New Energy	300	China
Yes Bank Ltd	210	India
CGN Wind Energy Ltd	160	China
Goldman Sachs Japan Co., Ltd	83	Japan

Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings

*Issued through Cayman Islands subsidiary Anstock II Ltd.

China needs RMB2.9tn annual investments

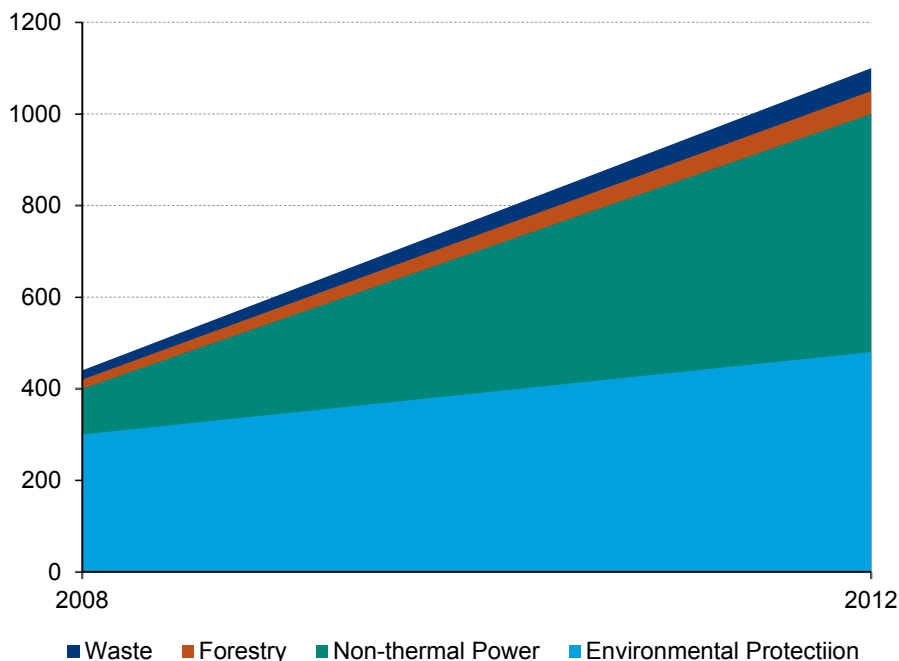
We “resolutely declare war on pollution as we declared war against poverty” – China’s premier Li Keqiang

China is the largest emitter of green house gases, and the cost of pollution is around 3-6% of GDP (source: World Bank). Only 3 out of 74 cities meet air quality minimum standard in 2014, 60% of underground water is polluted, and 19% of arable land is badly polluted. According to the 13th Five-Year Plan, the country needs RMB2.9tn annually from 2015 to 2020, or 3% of GDP. This is equivalent to 14% of the fiscal revenue for the period, which far exceeds the public budget. Hence, Two thirds of this, or RMB2tn will need to come from capital markets, both domestic and international (source: DRC, IISD).

Current mechanisms already market-based

The DRC estimates that green investments in China were RMB1.26tn (US\$200bn) in 2012, or around 2.43% of the GDP and 70% of this had been through market-based channels, predominantly bank loans. While some of the risk would be priced in, many of the banks making loans are state owned enterprises (SOEs), some with implicit backing from the government. Additional growth from the private sphere would be needed to aid additional green growth.

Chart 29: Market based green finance 2008 & 2012



Source: DRC, IISD

Green framework developed, Green Bonds are a tool

Earlier this year, the China’s Development Research Center of the State Council (DRC), and Canada’s International Institute for Sustainable Development (IISD) published an outline for greening China’s financial system. The overarching recommendation was for government’s promotion of green credit, green securities, and green insurance. Green Bonds specifically has been highlighted as a potential solution to link capital markets with the need for environmental investments. (source: DRC, IISD)

CBI and IISD recommendations for framework

Separately, CBI and IISD released a list of Green Bond recommendations to help develop a potential framework the market:

- China Banking Regulatory Commission should develop China-specific definitions for Green Bonds
- A multi-sector “Green Bond Market Development Committee” should be set up to address paper from DRC, IISD, and PBoC.
- Partial credit guarantees to help green municipal revenue bonds and green public-private partnership project bonds.
- Tax credits for interest earned on Green Bonds
- Green Bonds quota for foreign investors (source: CBI).

Final framework to be introduced 3Q or 3Q 2015

The proposed framework is currently being circulated amongst the Ministry of Finance, National Development and Reform Committee (NDRC) and National Association of Financial Market Institutional Investors (NAFMII), as well as Chinese banks and academics. A final version of the regulation has been slated for Q3 or Q4 of this year (Source: Global Capital Asia).

First Chinese corporate Green Bond issued by Goldwind

In July, Xinjiang Goldwind Science and Technology, the 2nd largest wind turbine manufacturer in China, became the first Chinese corporate to issue a Green Bond. The US\$300mn 3-year 2.5% note had credit enhancement from the Bank of China’s Macau branch, which brought it up to an A1/A/A credit rating. While the domestic Chinese market is likely to be governed by its own Green Bond framework, the company attained a 2nd review from DNV GL. While most Green Bond have proceeds earmarked for specific projects, Xinjiang Goldwind did not given it is a pure-play wind turbine maker similar to Vestas’ note earlier this year.

4.6x oversubscribed, primarily Asian investors

The inaugural Chinese corporate Green Bond saw tremendous investor demand, with the order book peaking at US\$1.5bn, although the total issue was capped at US\$300mn due to the credit enhanced from Bank of China. It ultimately sold to yield 2.653% or 160bp over Treasuries to 67 accounts. Asian investors accounted for 97% of the bonds. Banks took the highest allocation at 70%, followed by asset managers (17%), sovereign wealth funds (10%), insurance (2%), and retail (1%).

Green Bonds also a priority for India

Renewable energy and sustainability has been a key focus area for the newly elected Modi government. India is currently the world’s third largest GHG emitters, and needs up to US\$200bn to meet its renewables installation targets alone - 100GW of solar power and 60,000MW of wind power by 2022. This is seven times the country’s current capacity of 25GW. At the same time, India’s renewable energy is 24-32% higher than US or Europe because of higher debt costs according to the US Agency for International Development. Much of the growth can be funded from the debt market.

India issued first two Green Bonds this year

Yes Bank became the first company in India to issue a Green Bond when it sold Rs10bn (US\$161mn) 10-year Green Bond with a 8.85% coupon and AA+ local rating in February (source: IFR, CBI). Export-Import Bank of India followed in March with its US\$500mn 2.75% note issuance. While issuers may be partially capped by the country’s Baa3/BBB-rating, there are measures such as guarantees and liquidity facilities that can provide help for the market. Several SSAs have also already issued in Rupees in recent years. As the Green Bond and overall Indian corporate debt market matures, renewables sector could see price benefits (source: IFR).

Table 14: Indian bonds issued through August 31 2015

Issuer	Issue Amt US\$ mn	Currency of issue
Export-Import Bank of India	500.0	USD
Yes Bank Ltd	209.9	INR
Credit Agricole Corporate & Investment Bank SA	63.6	INR
International Finance Corp	49.2	INR
European Bank for Reconstruction & Development	39.8	INR
International Bank for Reconstruction & Development	21.5	INR

Source: BofAML Global Research. Compiled from Bloomberg, CBI, company filings.

USAID to help deploy Green Bonds

In June 2015, the US Agency for International Development (USAID) signed a memorandum of understanding (MOU) to provide IIFCL Asset Management (IAMCL) to provide technical assistance for increasing environmental investments in the country by US\$655mn. As part of the agreement, USAID will help IAMCL in developing new financing mechanisms including the creation of Green Bonds and infrastructure debt fund-mutual fund worth US\$655mn.

Innovation with Green Masala bond

Even within the Green Bonds market, we are seeing further innovation. In August, IFC raising 3.15bn rupees, issuing the first Green Bond in the offshore rupee market, or a Masala bond, which was listed on the London Stock Exchange's Main Market. The proceeds were in turn fully invested in Green Bonds issued by India's Yes Bank, whose proceeds had gone towards energy efficiency and renewable energy projects across India. The Yes Bank green bond was sold in a private placement, with IFC as the sole investor. Not only was this the first green Masala bond, but it was also the first time the IFC had made an investment in an emerging market Green Bond. The IFC bond was part of a US\$3bn offshore rupee bond program, under which IFC has issued over US\$1.66bn in bonds in a range of tenors.

Growth of Green Bond-specific funds

There have been many public pledges over the past 12 months from underwriters, issuers, and investors to grow the Green Bond market. Several investors have made explicit commitments to buy Green Bonds directly. During 1H 2015, we have also seen significant growth of specialized funds that are focused on Green Bonds. Their success and future growth would also be tied to the maturation of the overall Green Bond market.

Table 15: Green Bond Funds

BBG Ticker	Name	Description
LUXIOEI LX Equity	SEB Green Bond Fund	SEB Green Bond Fund is an open-end investment fund incorporated in Luxembourg. The Fund's objective is to achieve an adequate return while minimizing risk and taking ecological, social and cultural investment criteria into consideration. The Fund invests primarily in green bonds globally, where the proceeds are allocated to projects that have a benefit on the environment.
CGAFX US Equity	Calvert Green Bond Fund	Calvert Green Bond Fund is an open-end fund incorporated in the USA. The Fund's objective is to maximize income. The Fund invests at least 80% of its net assets typically invests in bonds with at least 65% of its net assets in investment grade, U.S. dollar-denominated debt securities, as assessed at the time of purchase.
NRDSDDV FP Equity	Natixis Asset Management Mirova	Mirova Green Bond - Global is an open-end fund registered in France. The Fund's objective is to outperform "green bonds". The Fund will invest 70-100% of its assets in debt instruments favoring energy and ecological transition and labeled green bonds by Mirova.
DBSSDBF SP Equity	Nikko AM Shenton World Bank Gr	Nikko AM Shenton World Bank Green Bond Fund is an open-end unit trust established in Singapore. The Fund seeks to achieve medium to long-term capital growth by tapping opportunities in the global bond market. The Fund invests in bonds issued by governments and blue chip corporations of the G-7 countries and is actively managed to capture swings in interest rate and currency trends.
AVASDBS SP Equity	Aviva Nikko AM Shenton World B	Aviva Nikko AM Shenton World Bank Green Bond Fund is an investment-linked insurance fund established in Singapore. The Fund's objective is to maximize medium to long-term capital growth & to outperform the Citi G7 Government Bond \$. The Fund is a feeder fund to DBS Shenton Dynamic Bond which invests in bonds issued by the government and blue chip corporations of the G7 countries.
NKWGRAU LX Equity	Nikko AM World Bank Green Fund	Nikko AM World Bank Green Fund is an open-end fund incorporated in Luxembourg. The investment objective of the Fund is to achieve income and capital growth over the mid to long term through investing in bonds denominated in different currencies. The Fund will primarily invest in bonds issued in multiple currencies by the World Bank with its main focus on "Green Bonds".

Table 15: Green Bond Funds

BBG Ticker	Name	Description
SSGBIEH LX Equity	State Street Global Advisors S	State Street Global Green Bond Index Fund is an open-end fund incorporated in Luxembourg. The Fund's objective is to seek to track as closely as possible the performance of the Barclays MSCI Green Bond Index. The Fund invests in the Green bonds which are fixed income securities and may include government and government related bonds
MIIX US Equity	Praxis Intermediate Income Fund	Praxis Intermediate Income Fund is an open-end fund incorporated in the USA. The Fund's objective is current income. To a lesser extent, it seeks capital appreciation. The Fund invests primarily in fixed-income securities of all types, consistent with the Fund's social responsibility criteria, including corporate bonds and notes, and U.S. Government agency obligations.
PRFIX US Equity	Parnassus Fixed Income Fund	Parnassus Fixed Income Fund is an open-end fund incorporated in the USA. It is a fundamental, U.S., intermediate, government/credit fixed-income strategy that invests principally in investment-grade debt securities including U.S. government obligations, corporate bonds and convertible bonds.
SPPGOBL SS Equity	SPP	SPP Gron Obligationfond is an open-end fund domiciled in Sweden. The Fund's objective is to reach a value growth over time. The Fund invests in bonds, which have clear effect on the environment and society. The fund invests primarily in fixed income securities denominated in GBP.
NA	Blackrock	ZIB 2US\$bn mandate to Blackrock
NA	Shelton Capital Management	NA

Source: BofAML Global Research. Compiled from Bloomberg

Green Bonds pipeline appears robust

While a tripling in issuance versus 2014 seems optimistic, there are numerous Green Bonds on the horizon as reported that are both diverse in region and by issuer.

Table 16: Examples of Green Bonds in pipeline

Country	Issuer	Amount	Details	Source
Japan	Goldman Sachs	US\$ 1bn	Goldman Sachs is to facilitate the issue of green energy bonds to attract an investment of \$1 billion to renewable energy projects in Japan over the next few years.	Company Press Release
India	HSBC	NA	HSBC India is planning to launch 'green bonds' this year to enable fund raising for investments in projects with environmental benefits.	Press Sources
United States	Hannon Armstrong	US\$ 125mn	Hannon Armstrong announced it will issue another round of green asset-backed securities, that will be backed by renewable energy and energy efficiency assets. The ABS offering will be offered by an indirect subsidiary of Hannon Armstrong.	Hannon Armstrong IR
United States	New York State Environmental Facilities Corporation	US\$ 111.9mn	Proceeds will be used to provide financial assistance to eligible recipients in the State of New York to finance or refinance clean water and drinking water projects.	MSRB, EMMA
Philippines	Aboitiz Power	US\$ 273.2mn	First green bond in the Philippines, with the ADB providing a partial guarantee. Proceeds will be used for geothermal power, specifically Aboitiz Power's Tiwi and Makban geothermal power complexes. The bond will be issued through AP Renewables, a wholly owned subsidiary of Aboitiz Power that operates the complexes.	ADB
China	Agricultural Bank of China	US\$ 1bn	ABC may sell around \$1b green bonds in November.	Press Sources
India	IREDA	US\$ 90mn	INR 6bn issue expected to close next week with a tenor of 10 years and 7.3% coupon. Regulatory approval has been granted by People's Bank of China. China They released a report "Establishing China's Green Financial System", which stresses on developing the green bonds market by issuing industry guidelines, permitting and encouraging banks and enterprises to issue green bonds and providing incentives. (Source: CBI)	Climate Bonds
China	Industrial Bank of China	TBD		
India	Power Finance Corp. Ltd	INR 1000 Cr	Plans to sell tax-free bonds to raise low-cost and long-term funds to help finance India's renewable energy production. Developers may use these funds for projects such as rooftop solar panel installations. (Source: live mint)	Press Sources
India	Rural Electrification Corp. Ltd	INR 1000 Cr	Plans to sell tax-free bonds to raise low-cost and long-term funds to help finance India's renewable energy production. Developers may use these funds for projects such as rooftop solar panel installations. (Source: live mint)	Press Sources
India	Orient Green Power	INR 500 Cr	Company has approved further issue of securities up to Rs 5,000 million (Rs 500 crore) through Domestic international offerings by way of Foreign Currency Convertible Bonds (FCCB) and any other instruments. (Source: The Economic Times)	Press Sources
India	NTPC	US\$ 500 mn	Expected to be used for setting up 10 GW solar power capacity that NTPC has pledged to contribute towards India's target to achieved 100 GW solar power capacity by 2022.	Press Sources

Source: Company Filing, Press sources

Focus on impact reporting

As the Green Bond market matures, investors have been looking for increased transparency regarding where the proceeds are going, and what are the exact environmental benefits being achieved. The Green Bond Principles already recommend annual updates regarding projects and beneficial impact, while 2nd party reviews and opinions have been an additional way to assure green-ness of the bonds.

SSAs at forefront of impact reporting

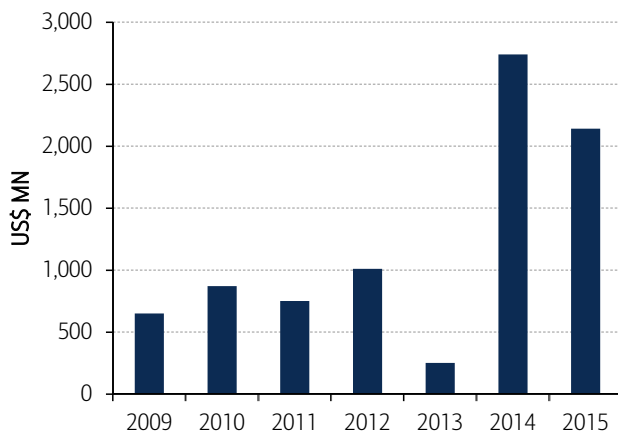
In March of this year, several multilateral development banks, who are the largest single issuer of Green Bonds, issued a working paper called “Working towards a harmonised framework for impact reporting.” Written by the African Development Bank (AfDB), European Investment Bank (EIB), International Finance Corporation (IFC), and the World Bank (IBRD), the white paper aims at creating standardized guidelines to measure and report impact. Issuers are recommended to use a limited number of core predictors including:

- Annual energy savings (EE)
- Annual Greenhouse Gas (GHG) emissions reduced or avoided (EE and RE)
- Annual renewable energy produced (RE)
- Capacity of renewable energy plant(s) constructed or rehabilitated (RE).

World Bank releases impact report

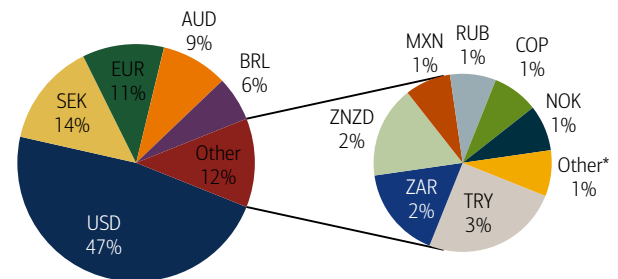
The World Bank, which is one of the largest issuers to date with more than 100 Green Bonds in 18 currencies, adding up to US\$8.4bn, released its latest impact report on the use of proceeds. The report gives details on 77 projects funded by Green Bonds, along with amount allocated, with expected or achieved outcomes. The projects span from renewable energy and energy efficiency, to urban transit financing, to waterways.

Chart 30: World Bank Bond Issuance by Fiscal year



Source: World Bank

Chart 31: World Bank Bond Issuance by Country



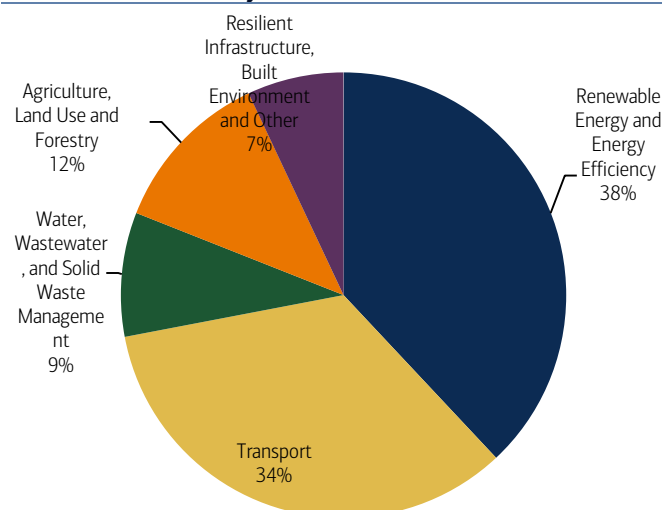
Source: World Bank
* HUF, PLN, MYR, CAD, INR and JPY

The World Bank has 80 Green Bond eligible projects with US\$14bn in commitments, with disbursements commenced for 77 of the projects in 24 countries. US\$5.3bn in Green Bond proceeds are supporting the financing of the disbursements. This leaves the pipeline of undisbursed commitments to eligible projects to be US\$8.3bn.

Table 17: Commitments by Sector

Amounts in Eq. US\$ billion (may not add up due to rounding)	Committed		Total	Allocated & Outstanding
	Mitigation	Adaptation		
Renewable Energy and Energy Efficiency	5.2	0	5.2	2.7
Transport	4.6	0	4.6	1.1
Water, Wastewater, and Solid Waste Management	0.2	1.1	1.3	0.6
Agriculture, Land Use and Forestry	0.4	1.1	1.6	0.4
Resilient Infrastructure, Built Environment and Other	0.3	0.7	1	0.7
Total	10.7	3	13.7	5.4
	78%	22%	100%	

Source: World Bank

Chart 32: Commitments by Sector


Source: World Bank

The world measures and reports beneficial environmental impact on each of the 77 projects, with examples summary impact including:

- US\$1.5bn commitments to 9 renewable energy projects is expected to result in 2,284 MW of renewable energy capacity¹ – equivalent to the total installed capacity of Panama in 2010.
- US\$3.5bn committed to improve public transportation in 30 cities in emerging countries. In China, seven of these projects totaling US\$1.1 billion increase ridership by 680,000 passengers per day.

Table 18: Sample list of World Bank Green Bond by Renewable Energy and Energy Efficiency Projects

Project name (number year/s loans approved) and description	A/M	Project life	Target Results					Other results	Committed US\$ mil	IBRD share	Allocated US\$ mil
			Annual energy savings MWh	Annual energy produced MWh	Renewable capacity added MW	Annual GHG emissions avoided tons of CO2 eq.					
Belarus - Biomass District Heating (P146194 FY14): increase energy efficiency in district heating systems and replace natural gas with wood biomass as a renewable energy source.	M	20	236,000	1,660,000	106	420,000	Cumulative over 5 years: 1,180,000 MWh energy savings from efficiency investments. 2,100,000 tons of CO2 eq. emissions reduced.	90	100%	3.6	
China - Beijing Rooftop Solar Photovoltaic Scale-Up (Sunshine Schools) Project (P125022 FY13): promote renewable energy in 1000 schools and other educational institutions.	M	20	na	100,000	100	89,590	10 to 15 % of the schools annual power use provided by renewable sources. 650,000 students in 1,000 schools benefit.	120	50%	7.6	
China - Eco-Farming Project (P096556 FY09): promote sustainable farming systems and reduce greenhouse gas emissions (from methane and burning coal and firewood) benefiting rural communities with biogas systems.	M	20	na	~	~	900,000	400,000 - 500,000 rural households benefit with cleaner biogas-based cooking and heating systems.	119.8	27%	119.8	
China - Energy Efficiency Financing (P084874 FY08, FY12): promote energy conservation in China's industrial sector supporting intermediary loans for energy efficiency projects in medium and large-sized manufacturing companies.	M	20	21,807,900	na	na	6,490,000	2,666,000 tons of coal eq. (tce) annual energy savings (assuming 150 subprojects)	300	45%	253.8	

Table 18: Sample list of World Bank Green Bond by Renewable Energy and Energy Efficiency Projects

Project name (number year/s loans approved) and description	A/M	Project life	Target Results				Other results	Committed US\$ mil	IBRD share	Allocated US\$ mil
			Annual energy savings MWh	Annual energy produced MWh	Renewable capacity added MW	Annual GHG emissions avoided tons of CO2 eq.				
India - Power System Development Project IV (P101653 FY09): expand transmission infrastructure resulting in decreased CO2 emissions through efficiency gains and transferring surplus hydro energy to power deficit regions.	M	20	8,699,000	na	na	~	Reduced transmission losses equivalent to between 526-993 MW. 107,000 circuit kilometers of increased transmission capacity. 68,000 GWh power exchange growth between regions.	400	16%	400
India - Rampur Hydropower Project (P095114 FY08): scale-up access to renewable energy through construction of a run-of-the-river hydroelectric scheme.	M	30	na	1,770,000	412	1,407,700	-	400	60%	400

Source: World Bank

Table 19: Sample list of World Bank Green Bond by Other Resilient Infrastructure projects

Project name (number year/s loans approved) and description	A/M	Other results	Committed US\$ mil	IBRD share	Allocated US\$ mil
India - Eastern Dedicated Freight Corridor - II (P131765 FY14): increase the capacity and quality of freight rail service.	M	1,133 kms of new freight-only rail. Axle-load limit raised from 23 to 25 tons increasing speeds. 12.8 million tons of CO2 eq. emissions reduced over a 30 year period.	1100	67%	0.3
Brazil - Greening Rio de Janeiro Urban Rail Transit – Additional Financing (P111996 FY12): provide a more efficient and cleaner suburban rail transportation system.	M	60 new trains and upgraded infrastructure to shorten travel times. Bicycle and parking facilities in select stations. 70,200 additional passengers served per day. 34,000 tons of CO2 eq. reduced annually by project end.	600	73%	205.4
Morocco - Solid Waste Sector DPL (P104937 FY09): enhance the governance of the solid waste sector.	M	Regulatory reforms leading to solid waste management programs in 11 municipalities. 735,000 tons of CO2 eq. emissions reduced annually (methane gas capture). 30% of waste disposed in sanitary landfills and 21 dumpsites closed or rehabilitated.	111.8	100%	111.8
Philippines - Rural Development (P132317 FY15): improve the resilience of small-scale farmers and fishermen to climate change by helping them recover and increase income-generating activities and strengthening the conservation of coastal and marine resources.	M	Increase incomes of about 1.9 million farmers and fishermen and the value of their products.	501.3	75%	45.1
Mexico - Climate Change Development Policy Loan (P110849 FY08): mainstream climate change considerations into public policy.	Both	Climate-informed public policies, including: 642,000 hectares reforested. 6,000,000 tons of CO2 eq. emissions reduced annually due to reforestation. Domestic carbon pricing strategy developed. City and state climate action plans developed.	501.3	100%	501.3

Source: World Bank

Evolution of the Green Bond Index

Section pertaining to BofAML Green Bond Index is written by Phil Galdi, Bond Index Research Analyst

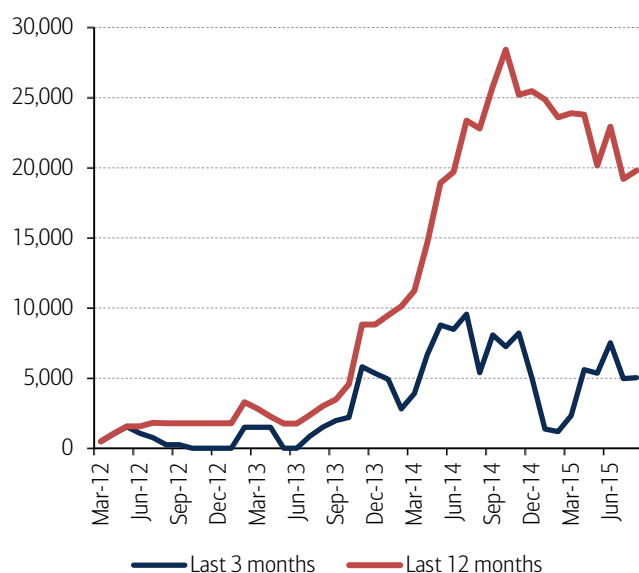
[Bond Index Introductory Guide: Introducing the Green Bond Index 30 October 2014](#)

The pace of net additions to the Green Bond Index over the last months was roughly on a par with the March-May period (\$5.0bn vs \$5.4bn) as the index added 14 new issues, up from nine in the prior period. The Index closed August with a market cap just over \$45bn – up 12% versus 3 months ago and 52% YOY. The 12-month growth rate has steadily declined from its peak last October but remains in line with levels back in mid-2014 (Chart 33). Most of the decline is attributed to the sharp slowdown in 1Q but lately the three month growth rate has remained above the \$5bn mark.

The Green Bond Index growth rate remains strong, but is still below peak levels.

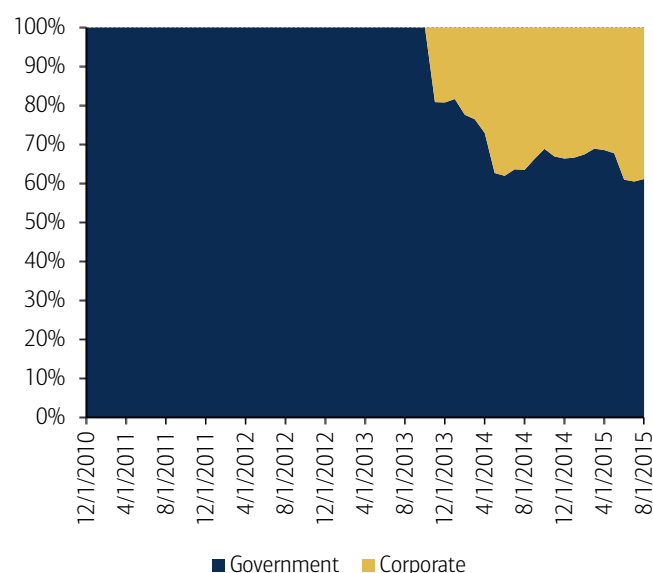
Corporate issuers continue to expand their presence in the green use of proceeds market. Of the 14 issues to enter the index over the last three months, ten were corporates that accounted for over two-thirds of the incoming face value. That boosted the corporate allocation to 39%, just eclipsing its prior high back in June 2014 (Chart 34). It is also noteworthy that 12 of the 14 new additions were from ten issuers who made their debut in the index, comprising: ABNANV, ANZ, BRFSBZ (2 bonds), DLR, FVHSAM, GWNDLN, MS, SEK, STOCKL, TENN (2 bonds).

Chart 33: Face value of net additions (USD MM)



Source: BofA Merrill Lynch Bond Indices

Chart 34: Index distribution between corporate and government issuers

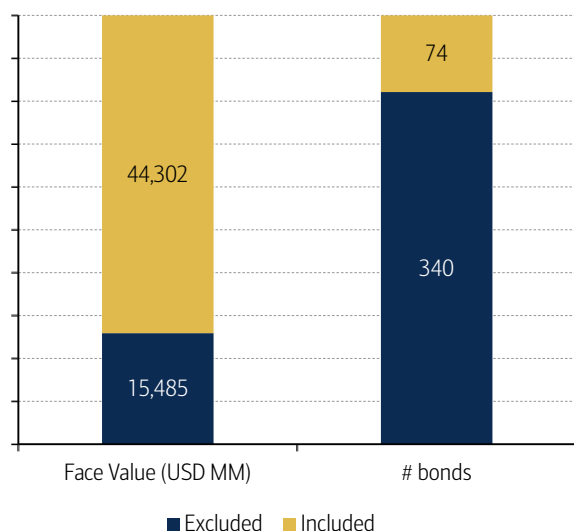


Source: BofA Merrill Lynch Bond Indices

2015 continues to see a proliferation of very small deals coming to market.

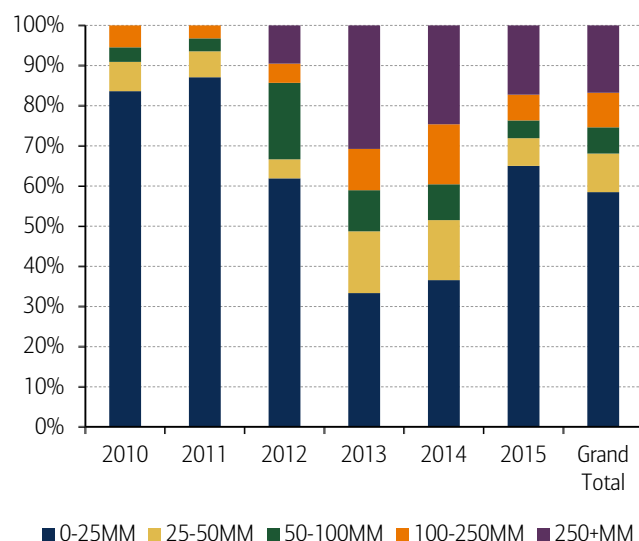
Looking beyond the scope of index-qualifying issues, the overall corporate and government green use of proceeds market saw a similar expansion over the last three months with the total face value of securities up \$7.8bn to \$59.8bn, leaving the index share of the overall market unchanged at 74%. Of the 93 bonds issued over the last three months only 14 entered the index. Most of those that did not enter the index failed to meet the minimum size requirements, including 60 bonds with a face value of only \$25mn or less. So far in 2015 the \$0-25mn bucket accounts for 65% of new issuance. That is down a little from three months ago (67%) but well above the average share across all years (49%). In addition to the recent issuance that did not meet the index minimum size requirements, there were three issues that did not join the index due to lack of ratings and another three that have below investment grade ratings.

Chart 35: Green Bond Index coverage of the green use of proceeds universe (Aug 31, 2015)



Source: BofA Merrill Lynch Bond Indices

Chart 36: Distribution of green issuance by issue size



Source: BofA Merrill Lynch Bond Indices

Green Bond Index performance

The Green Bond Index did not escape the recent bond market downturn as it slipped to a break-even return for the year.

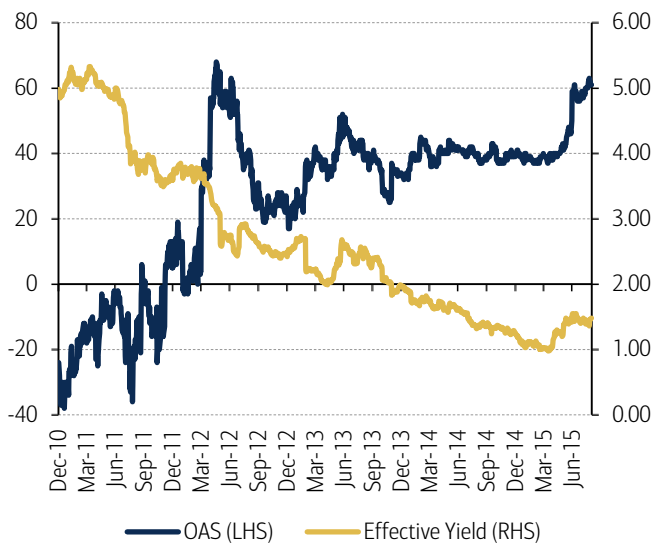
The global bond markets have run into hard times of late and the Green Bond Index did not escape the downturn. The Index lost 0.77% (in local currency terms) over the last three months, which essentially wiped out all of its gains over the first five months of the year leaving the index with a 0.03% YTD total return. The sell-off increased the index yield a little more than a quarter percent versus the end of May to 1.48%, returning it to levels of about a year ago. About two-thirds of March-May yield increase was attributed to underlying benchmark yield curves, but for the last three months spread widening was the primary cause (+18bp) of the 0.27% yield increase. That does

not sound like much but it represents a 42% increase in the credit risk premium (61bp spread currently vs 43bp at the end of May).

All of the spread-widening in the last three months took place in the corporate sector of the index.

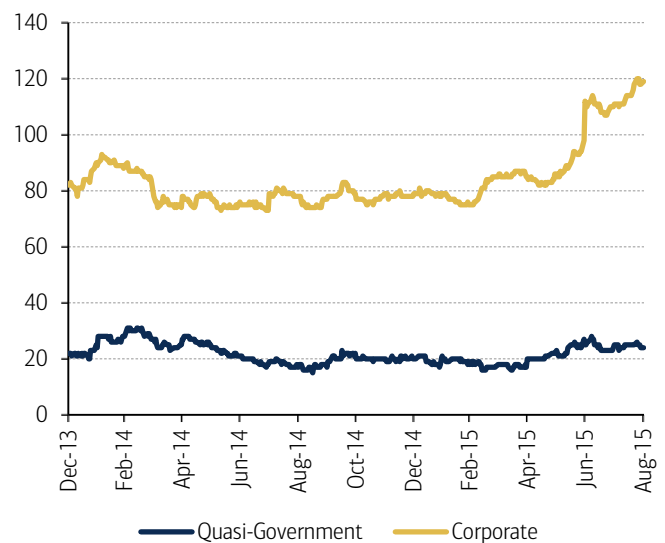
All of the spread widening took place in the corporate sector. Quasi-governments spreads were virtually unchanged versus three months ago (24bp vs 23bp), while Corporates jumped from 86bp to 119bp, touching a new record high during the last week of August. With the Corporate allocation also on the rise (up 6.6% over the last three months), that has exacerbated the negative impact on the index return. The larger Global Single-A Corporate Index, inclusive of non-green bonds, is a good comparison point for the green corporate segment as it has a very similar duration (6.17yrs currently vs 6.22yrs for green corporates) and average rating (both A2). The Global Single-A Index only widened 20bp over the last three months (versus 33bp for the Green Index). But those changes are inclusive of the impact of rebalancing changes. If the rebalancing impact is stripped out, then the Green and Global Single-A Indices widened by an identical 19bp.

Chart 37: Green Bond Index yield and spread through Aug 31, 2015



Source: BofA Merrill Lynch Bond Indices

Chart 38: Green Bond Index spread by sector through Aug 31, 2015



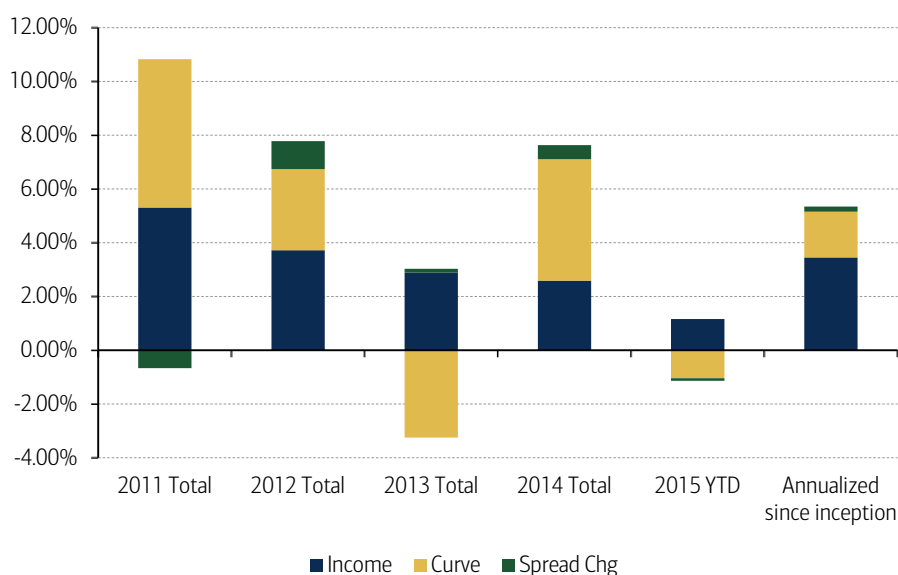
Source: BofA Merrill Lynch Bond Indices

Spread movement played an important role in index performance over the last three months but for the year it remains a negligible return factor

Spread movement played an important role in index performance over the last three months but for the year it remains a negligible return factor, costing the index just 0.10% or a little over a basis point a month. As has been the case in four of the last five years, almost all of this year's performance is attributed to interest income and yield curve movement (Chart 39). 2012 was the only exception to that rule, and even then spread gains totaling a little over 1% amounted to less than a third of the contributions of the income and curve factors. While spread performance has been a minimal factor

all along, the curve factor has been anything but. In absolute terms the curve factor has been as large as, or larger than, the income factor every year. The problem is that curve movement is just as prone to wiping out the index income (2013, 2015) as it is to making a positive contribution. And with the index duration extending about a year and a half over the last two years, the curve is like to remain an important factor going forward.

Chart 39: Green Bond Index return factors



Source: BofA Merrill Lynch Bond Indices

Compared to other flagship global indices, the Green Index has the highest Sharpe ratio but ranks next to last in terms of Information ratio .

The Green Bond Index cumulative annualized return since inception (5.35%) is down half a percent versus the end of May but it remains ahead of other flagship investment grade indices (Table 20). For the current year it ranks right in between the global high grade corporate and quasi-government indices, both in terms of total return and excess return (Table 21). Adjusted for risk, the Green Index Sharpe ratio continues to rank first though its lead over second place Global Quasi-Governments declined from 0.06 at the end of May to 0.04 at the end of August (Table 22). And it now ranks next to last in the Information ratio rankings ahead of only Global IG Corporates.

Table 20: Green Bond Index total return (in local currency terms) vs other global IG indices

	2011	2012	2013	2014	2015 YTD	Cumulative annualized
Green Bond Index (GREN)	10.16	7.78	-0.22	7.62	0.03	5.35
Global IG Govt (WOG1)	6.09	4.36	-0.36	8.37	0.41	3.99
Global Broad Mkt (GBMI)	5.90	5.70	-0.31	7.81	0.37	4.12
Global IG Corp (GOBC)	5.16	10.79	0.05	7.80	-0.44	4.92
Global IG Quasi-Govt (GOBQ)	6.17	5.89	-0.65	7.47	0.75	4.16

Source: BofA Merrill Lynch Bond Indices

Table 21: Comparative YTD return attributions 2015

Index	Interest income	Yield curve	Spread Change	Total Return	Excess Return
Green Bond Index (GREN)	1.16%	-1.04%	-0.10%	0.03%	-0.41%
Global IG Govt (WOG1)	0.99%	-2.09%	1.52%	0.41%	0.12%
Global Broad Mkt (GBMI)	1.41%	-1.56%	0.49%	0.36%	-0.18%
Global IG Corp (GOBC)	2.00%	-1.39%	-1.05%	-0.44%	-1.10%
Global IG Quasi-Govt (GOBQ)	1.25%	-0.54%	0.04%	0.75%	-0.07%

Source: BofA Merrill Lynch Bond Indices

Table 22: Comparative Sharpe and Information Ratios (Jan-2011 – Aug 2015)

	Avg monthly total return	Total return volatility	Sharpe Ratio	Rank	Avg monthly excess return	Excess return volatility	Information Ratio	Rank
Green Bond Index (GREN)	0.44	0.83	0.53	1	0.04	0.25	0.15	5
Global IG Govt (WOG1)	0.33	0.82	0.40	4	0.04	0.22	0.17	4
Global Broad Mkt (GBMI)	0.34	0.75	0.45	3	0.06	0.31	0.19	2
Global IG Corp (GOBC)	0.41	1.03	0.39	5	0.11	0.90	0.13	6
Global IG Quasi-Govt (GOBQ)	0.34	0.70	0.49	2	0.07	0.31	0.22	1
Global HY Corp (HW00)	0.57	1.79	0.32	6	0.35	1.99	0.17	3

Source: BofA Merrill Lynch Bond Indices

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