

BONDS AND CLIMATE CHANGE

THE STATE OF THE MARKET IN

2014

PLUS:
Green Bonds
Market Update



A \$503 BILLION CLIMATE-THEMED BONDS UNIVERSE

Climate Bonds INITIATIVE

HSBC 

Prepared by Climate Bonds Initiative.

Commissioned by HSBC.

Introduction

This focus of our third annual update and 2014 edition of Bonds and Climate Change: the State of the Market is to identify bonds linked to climate change that are both labelled and unlabelled. Since our first edition in 2012, the green and climate bonds landscape is unrecognisable.

Three years ago, labelled green bonds were a niche market pioneered by a handful of development banks.

In the past year, however, labelled green bonds have entered the spotlight with \$11bn issued in 2013 (over three times the issuance of any year previous) and \$18.35bn issued up to 10 June in 2014. The issuer base has also expanded beyond development banks to include corporates and municipalities.

The Green Bonds era has begun. And yet, while the market has come a long way, there is still a way to go to meet International Energy Agency (IEA) projections of the capital flows needed to address dangerous climate change. The IEA estimates the finance requirement to be around \$1 trillion per year above business as usual.

With over \$100trn outstanding¹, the bond market is significantly larger than the \$63trn equity market².

Mobilizing bond markets as a low cost financing tool will be essential for the realization of a low carbon and climate resilient economy.

Bonds can also enable investors to

invest more directly in low carbon solutions, if proceeds are designated accordingly (as in the labelled green bond market). Bonds and Climate Change 2014 answers key questions around the size of both the labelled green bond market and the broader climate-themed bonds universe.

Methodology

The climate-themed bonds universe is an estimate of the size of the bond market where proceeds are directed towards areas aligned with a low carbon and climate resilient economy. The 'snapshot' methodology employed screens issuers and, where available, use of proceeds documentation available on market databases.

Only bonds issued after 1 January 2005 and which remain outstanding on 10 June 2014 are included.

This represents a different time frame from our previous reports which went up to Q1. The extended time frame has allowed us to capture some rapid developments in the labelled Green Bonds market, although it renders year-by-year comparisons difficult as bonds are naturally redeemed.

Key climate change solutions across seven themes are screened: Transport, Energy, Climate Finance, Buildings & Industry, Agriculture & Forestry, Waste & Pollution Control and Water. See www.climatebonds.net/taxonomy for more details.

Note: All \$ figures are in USD unless otherwise stated

1. Bank of International Settlements Quarterly Review, March 2014 - International banking and financial market developments
2. <http://www.bloomberg.com/news/2014-02-18/global-stocks-erase-2014-losses-as-3-trillion-of-value-restored.html>
3. World Energy Investment Outlook Special Report, International Energy Agency, 2014
4. Climate Solutions 2, by Climate Risk Ltd, WWF, 2009.
5. https://ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf

Three features of the climate finance challenge

1. Scale

The IEA says³ that to avoid "catastrophic" global warming and get the world on a 2°C emissions trajectory requires \$53trn in cumulative investment in energy supply and energy efficiency up to 2035. Action has been left so late that even with increased mitigation action, warming of 2°C can be expected. Trillions in additional finance will be needed to address adaptation.

Niche financing solutions will not be sufficient, and neither will public sector funds alone. Capital markets are essential.

2. Urgency

A key risk is that global warming reaches "climate tipping points"⁴, processes such as mass leakage of frozen methane gas under the warming Arctic Sea that cause spikes in greenhouse gas concentrations. If tipping points are reached we lose the chance to control climate change.

We have 5-10 years to decrease the likelihood of reaching climate change tipping points⁵. To do that, low-carbon industries must grow, on average, 25-30% per annum globally⁵ — an indicator of success for the Climate Bonds Initiative.

3. Opportunity

The good news is that much of what is required can be constructed as investment:

- The capital is available;
- Interest rates - and so financing costs - are at an historic low, ideal for big infrastructure investments;
- The solutions are understood. E.g. large scale deployment of existing renewable energy technology; a modal shift to low carbon transport; energy efficiency investments.

Labelled or unlabelled?

Throughout this report, the term 'Green Bonds Market' is used to refer to bonds where the use of proceeds is for climate or environmental projects and they are labelled as 'Green'. The term 'climate-themed bonds universe' in this report refers to labelled as well as unlabelled bonds (bonds whose proceeds are directed to climate projects but are not labelled green). The unlabelled universe indicates where future bonds can be labelled.

An Updated \$502.6bn climate-themed bond Universe

We estimate the universe of climate-themed bonds outstanding to be \$502.6bn. This is a significant expansion on the March 2013 estimate of \$346bn.

The universe is made up of over 1,900 bonds from approximately 280 issuers and remains dominated by Transport (\$358.4bn), Energy (\$74.7bn) and Finance (\$50.1bn) themes.

The transport theme, largely rail, continues to make up the majority of the universe of bonds. This is due to the inclusion of a number of large rail issuers that have long history of using bonds to raise finance.

Climate-themed bond issuance continues to grow (Fig. 2) with 2013 being the largest year to date at \$95bn, a 12% increase on 2012.

75% of the climate-themed bond universe is made up of bonds which have an implicit or explicit backing from a government entity. This is due to the presence of large state-backed rail entities within the Transport theme, as well as multilateral development bank issuers in the Climate Finance theme. These entities largely fall into the AAA- A ratings band, making the universe approximately 90% investment grade (BBB- and higher). An analysis of the proportion of the universe that meets this and other index requirements is on Page 5.

China remains the largest single issuing country due to the inclusion of China Railway Corp. which is one of the largest builders of new rail infrastructure in the world (see more on Page 8). Large issuance also comes from the UK, US and France.

- China = \$164bn**
- UK = \$58.5bn**
- US = \$51bn**
- France = \$49bn**
- Canada = \$25bn**
- South Korea = \$24bn**
- Supra-nationals = \$31.7bn**
- Rest of the World = \$99bn**

Figure 1. Thematic breakdown of climate-themed bond universe

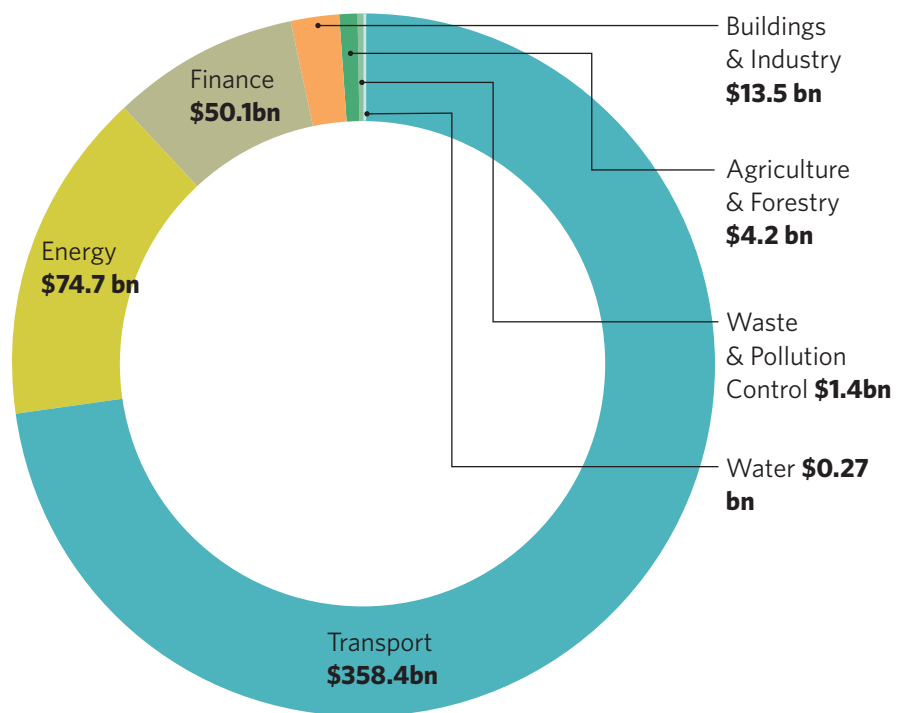


Figure 2. Climate-themed bond issuance per year

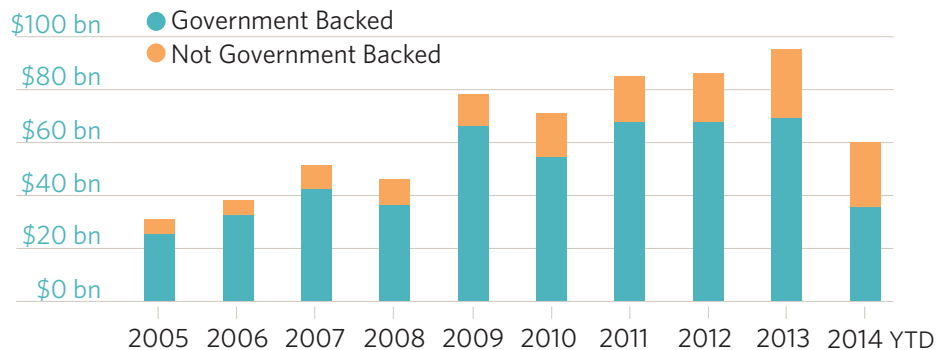
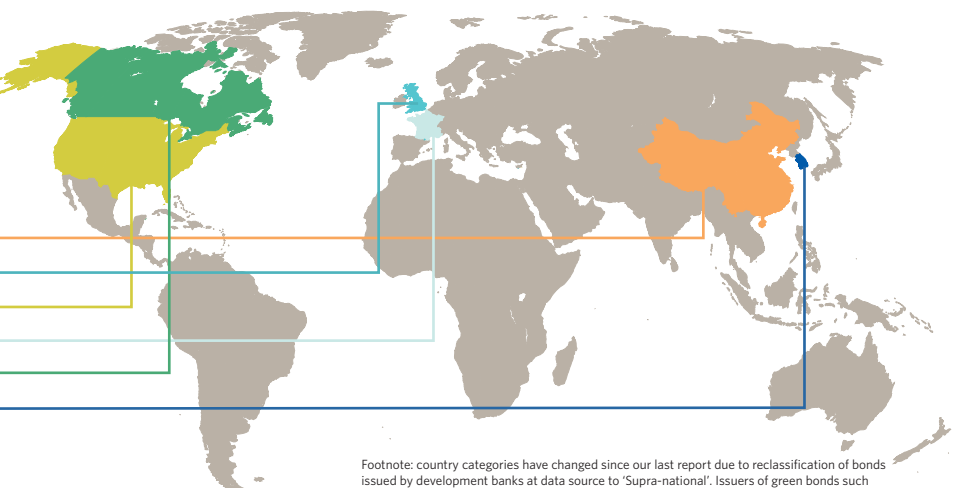


Figure 3. Geographic breakdown of issuer origin



Footnote: country categories have changed since our last report due to reclassification of bonds issued by development banks at data source to 'Supra-national'. Issuers of green bonds such as the World Bank, the European Investment Bank and the European Rail funder Eurofima are included in this category rather than their country of registration.

Many Dimensions

Climate-themed bonds universe

The universe of climate-themed bonds amounts to \$502.6bn and includes bonds whose proceeds are used primarily for financing the transition to a low carbon economy.

This includes all the groups of bonds detailed below.

\$502.6bn

Core Investable universe \$236.6bn

(see page 5)

The core investable universe provides an analysis of the proportion of the broad universe that could be eligible for inclusion on mainstream indices. This is calculated by screening the full universe using the following filters:

- Investment grade ratings (BBB- and higher).
- Currencies eligible on benchmark indices¹.
- Issuance sizes over \$200m.

Using these filters identifies a universe of \$236.6bn, approximately 47% of the full climate-themed bonds universe.

Project bonds \$7.8bn

Project bonds finance specific projects where the debt is paid back from the cashflow generated by the projects rather than an issuers balance sheet.

Project bonds have been used to finance renewable energy projects around the world and play an important role in raising the profile of bonds for climate solutions; we anticipate further issuance in 2014-15.

However, we expect project bonds to finance construction to remain a small proportion of the market partly due to institutional investor reluctance to taking on construction risk.

Debt finance for project development is, and we expect will remain, dominated by bank lending. There is, we believe significant potential to grow a post-completion project bond market, where lenders and equity investors use bonds to re-finance assets, recycling their capital into new projects.

Of the project bonds identified in this report (Figure 4), 67% (by value)

achieve a BBB rating. 18% achieved an AAA rating due to loan guarantees from the US Department of Energy (DoE)².

Geographically, the majority (71%) of the project bonds were for renewable projects in the US - the largest being the 2013 \$1bn Solar Star bond and two Topaz Solar bonds totalling \$1.1bn in 2012 & 13. The remaining 30% comes from Canada, UK, Italy, Mexico, South Africa and Germany.

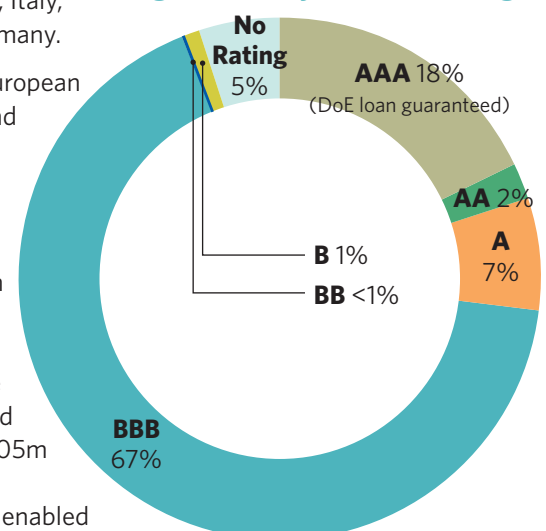
Last year we noted that the European Investment Bank's Project Bond Initiative (PBI) could support increased EU issuance. While renewable energy generation assets are not eligible in the PBI's pilot phase, transmission infrastructure is. 2013 saw the first use of this facility for a climate-related project - the Greater Gabbard offshore wind transmission bond. The GBP305m bond was supported by a 15% guarantee from the PBI which enabled a rating of A3 from Moodys, one notch above what it otherwise would have achieved³.

Green Bonds Market \$35.83bn

(see page 6&7)

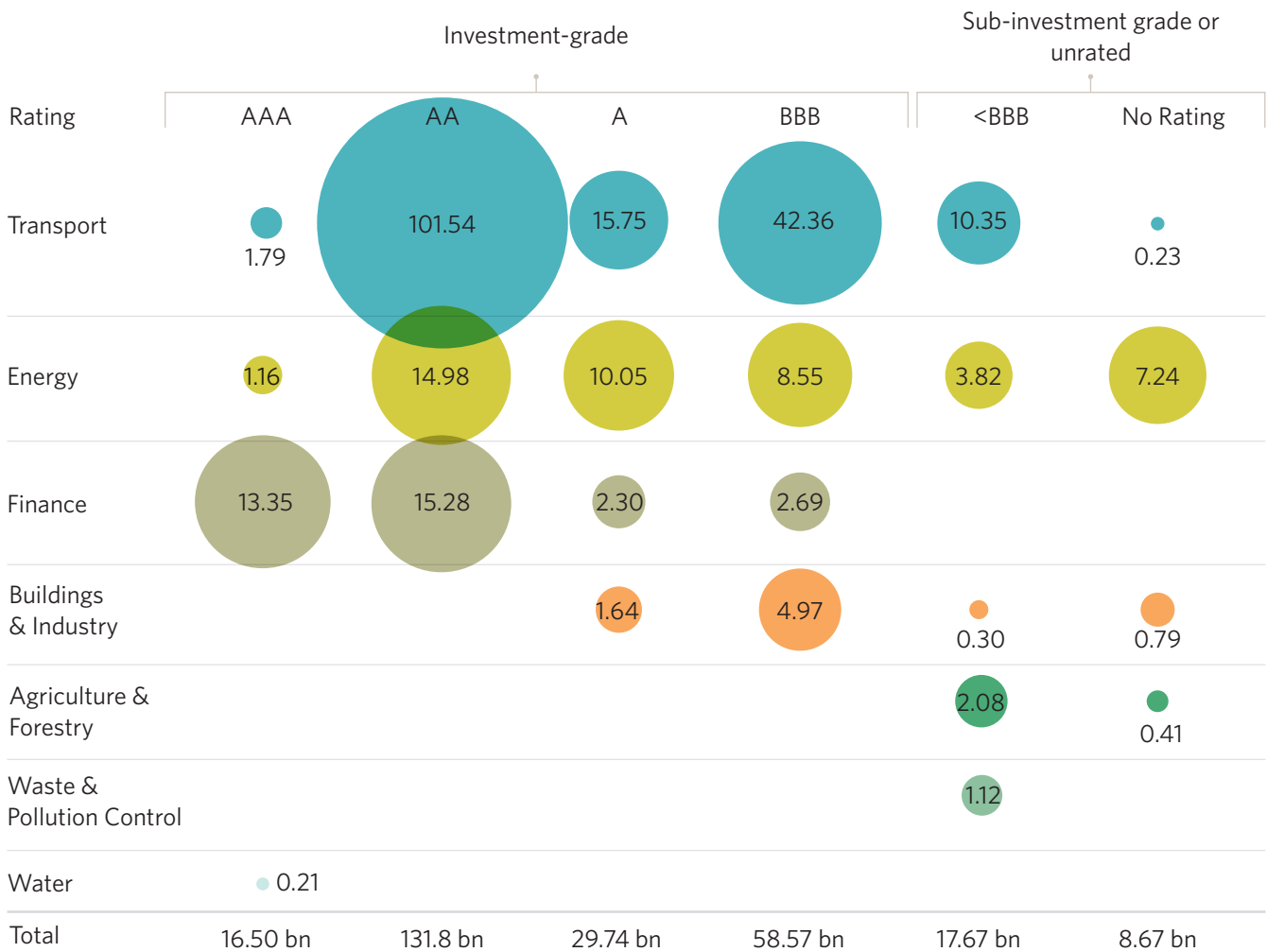
The green labelled bonds market grew rapidly in 2013 and 2014 and on 10 June 2014 stood at \$35.8bn.

Figure 4. Project bond ratings



1. These are: USD, CAD, CLP, MXN, EUR, GBP, CHF, CZK, DKK, ILS, NOK, PLN, RUB, SEK, TRY, ZAR, JPY, AUD, HKD, KRW, NZD, SGD, MYR, THB. [Note that these have changed since our last report: <http://www.newsroom.barclays.com/Press-releases/Barclays-announces-changes-to-its-benchmark-fixed-income-indices-ac9.aspx>]
 2. <http://energy.gov/lpo/services/section-1703-loan-program>
 3. http://europa.eu/rapid/press-release_BEI-13-204_en.htm

● Core Investable Universe is \$236.6bn



The core investable universe of climate-themed bonds amounts to approximately \$236.6bn, 47% of the full climate-themed bonds universe.

This sub-set of climate-themed bonds represents the proportion of the climate-themed bond market that could be permissible investments for the majority of mainstream investment grade portfolios.

This is relevant for investors given that not all bonds within the \$502.6bn climate-themed bond universe are suitable investments for mainstream portfolios. Sub-investment grade bonds, bonds under size thresholds and bonds issued in restricted currencies, such as China's Renminbi (CNY), are generally excluded.

The transport theme remains dominant, making up 71% of the total followed by energy at 14%.

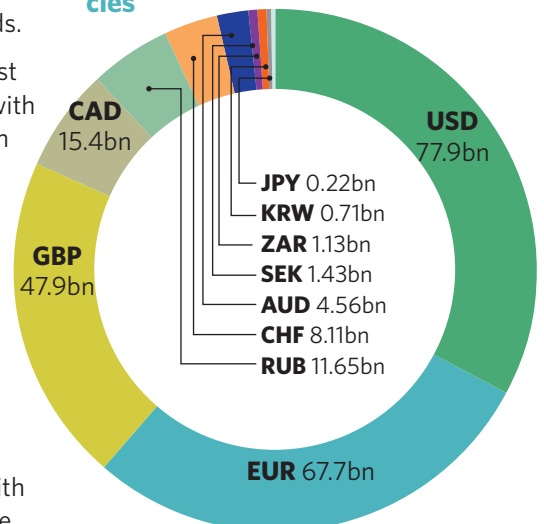
There is a broad availability of climate-themed bonds across ratings bands with the majority in the AA-rating band. The list of eligible currencies we used has been revised to include Russian Roubles (RUB)⁴, so there is now a significant number of BBB-rated Russian Railways bonds.

The energy theme shows the most even distribution across ratings with small renewable manufacturers in the junk category, project bonds falling within investment grade at BBB and large utilities in the A and AA ratings bands (e.g EDF and Hydro-Québec).

In line with global markets, the main issuing currency (Fig 5) is USD followed by EUR and GBP. Less than half of USD issuance comes from US-based issuers, with USD bonds coming from a diverse geography of issuers.

The majority of bonds have tenors greater than 10 years, providing opportunities for pension and insurance funds to match assets with liabilities.

Figure 5. Investable universe currencies



⁴ <http://www.newsroom.barclays.com/Press-releases/Barclays-announces-changes-to-its-benchmark-fixed-income-indices-ac9.aspx>

The Green Bonds Market lifts off in 2013 and 2014

The Green Bonds market stood at \$35.8bn outstanding on 10 June 2014, with issuance in 2013 (\$11bn) and 2014 (\$18.3bn) accounting for over 80% of the total outstanding.

The strong growth of the Green Bonds market in late 2013 and early 2014 has catapulted the market from niche to mainstream in the year since our last report.

Growth was driven by landmark issuances by the IFC (\$1bn) and EIB (EUR650m) in the first half of 2013. This piqued the interest of issuers, underwriters and investors interested in benchmark size product.

An important feature of the market's growth in late 2013 was the entrance of the first corporate issuers.

Three corporate bonds were issued in one week in November 2013: Bank of America Merrill Lynch (BoAML), Électricité de France (EDF), and Vasakronan (Swedish property group). The EDF bond was the largest issued until that point, underscoring the important role corporates will play in leveraging their balance sheets for meeting climate finance targets.

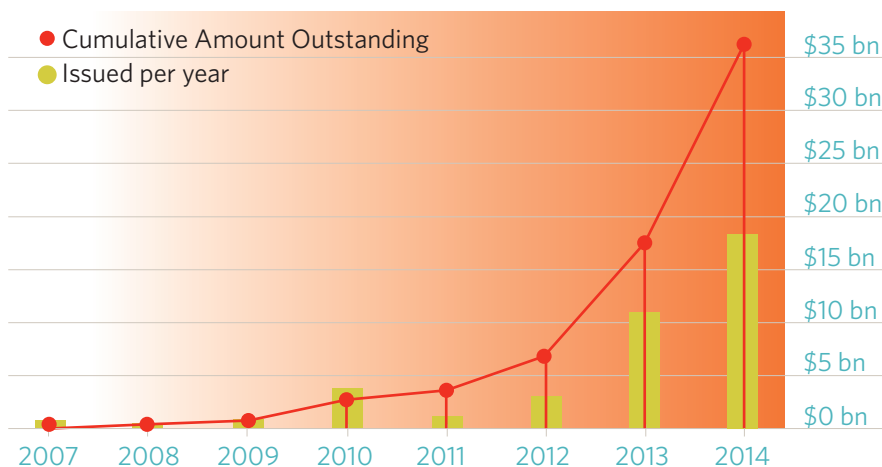
Supply has remained strong in H1 2014 with over \$18bn issued in the first half of the year.

While the EIB is still the largest single issuer in 2014 (\$3.53bn), the majority of issuance is now coming from corporations rather than development banks. The largest corporate bond to date was issued by GDF Suez at EUR2.5bn (\$3.44bn).

New corporate issuers in 2013 & 2014

Arise	Skanska
BoAML	Svenska Cellulosa
Électricité de France	TD Bank
GDF Suez	Toyota
Hannon Armstrong	Unilever
Iberdrola	Unibail-Rodamco
Regency Centres	Vornado Realty
Rikshem	Vasakronan

Figure 6. Green labelled bond issuance grew in 2013 and 2014



Currencies

Currency denomination has been diverse across a range of currencies (21 in total) with USD and EUR dominant.

Interestingly, the other common currencies for green bonds are SEK, ZAR and BRL which are generally less dominant across the bond markets.¹

Despite being common currencies within global bond markets, no GBP or CHF denominated green bonds were issued until January 2014.

Demand

Demand has remained strong in the green labelled market with bonds significantly oversubscribed. Popular issuances included GDF Suez (3x), EDF (2x), Unibail-Rodamco (3.4x) and Korea Export Import Bank (3x).

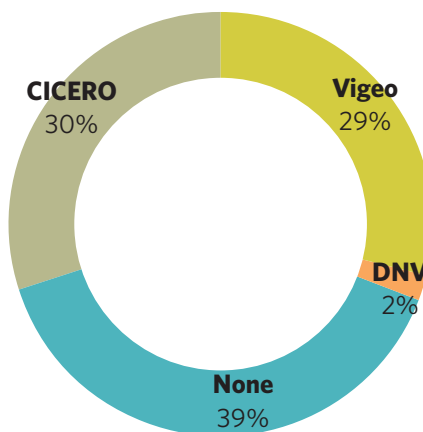
Investors have shown strong demand for new types of issuers and bonds including asset-backed securities (ABS) such as that from Toyota which was linked to hybrid and electric vehicle loans, and corporate bonds linked to internal water and energy targets (Unilever) and green building portfolios (e.g. Unibail-Rodamco, Vasakronan, Regency Centres).

Demand is not just originating from investors with ESG mandates but remains high with mainstream investors interested in the green theme. However, demand has not yet translated into pricing differences - pricing remains largely in line with similar bonds from the same issuers.

Standards and certification

Among Green Bonds issued in 2013 and 2014, 39% (by value) were issued without an independent review, while 61% were reviewed by CICERO (Oslo University's climate change research centre), Paris-based Vigeo or DNV GL.

Figure 7: 3rd party reviews (2013-14)



A third of issuance from corporations and financial institutions in 2013 and 2014, mainly in the US, lacked independent review, indicating that there needs to be a clearer value for issuers in validating their use of proceeds for investors. A number of issuers adhered to green property standards (e.g. LEED and BREEAM), although 3rd party review on the bond was not undertaken. As the corporate green bond market grows, simple due diligence by competent 3rd parties will be important to ensure investor trust.

● Outlook for the Green Bonds Market

The \$502.6bn climate-themed universe analysed in this report provides an estimate of the potential size of the future labelled Green Bonds market. These bonds originate from pure play corporates i.e. where their activities are fully aligned with our climate themes. These types of pure-play corporates are common in some themes such as transport, but not in others such as energy, and buildings & industry. However, the big growth area in Green Bonds issuance in the past year has come from non-pure play companies issuing bonds with proceeds "ring-fenced" for green or climate related investments.

In this section we provide an outlook for future issuers of such bonds.



Electricity utilities

As builders of renewable energy infrastructure, electricity utilities are an essential part of the transition to a low carbon economy. The IEA expects total global renewable capacity to grow from 1,580 gigawatts (GW) in 2012 to 2,350 GW in 2018. Much of this will be built by utilities and could be financed by Green Bonds.

Electricity utilities are frequent bond issuers - total debt issued by electric utilities globally amounted to over \$75bn in 2013¹. Recent, large corporate green bonds from EDF, Iberdrola and GDF Suez have financed renewable energy projects. We expect to see this model copied by utilities around the world.



Auto manufacturers \$250bn potential annual EV loans by 2020

Toyota was the first auto manufacturer to issue a Green Bond with an ABS linked to electric vehicle (EV) and hybrid car loans in early 2014.

There is potential for Green Bonds from other large EV manufacturers such as Nissan and Chevrolet. Global sales of EVs reached approximately 113,000 in 2013² which, using average vehicle prices, translates to annual loans of c\$4bn. Including hybrid vehicles in this figure would put the total loan volume at over c\$7bn per annum. According to the IEA, EV sales will reach 7.2m units globally per year by 2020³ which could result in annual EV loan volumes of over \$252bn.



Bank lending/asset finance \$150bn in 2013

The \$500m Bank of America Merrill Lynch Green Bond in 2013 showed the potential for commercial banks to issue bonds linked to 'green' lending. Lending to clean energy in 2013

amounted to over \$150bn⁴ with top 10 lenders including commercial banks Sumitomo Mitsui Banking Corp, Deutsche Bank and Crédit Agricole⁵.

Lending will continue to increase as governments expand renewables in both developed and emerging markets. For example, in 2013 the South African government signed ZAR47bn (\$5.4 bn) of contracts under their renewable energy program⁶. South African commercial banks provided the majority of debt financing and could issue Green Bonds to finance loans.



Water utility bonds \$25bn in 2013

Water infrastructure is a huge sector internationally. The use of water will be one of the areas most dramatically affected by rainfall changes as a result of climate change: from clean water provision to waterways management.

Limited information on how utility/municipality planning takes account of climate adaptation means that there are only two water bonds identified in our report. However, we expect this will change as adaptation becomes recognized as essential to water infrastructure planning.

In 2013 over \$25bn was issued in water bonds by utilities and municipalities (where data is available). While none of these can currently be classified as 'climate ready', adaptation to climate change will be a key challenge in the future and one which bonds could play a role in addressing.

1. Sourced from Bloomberg bond data
2. http://www.iea.org/publications/globaleveoutlook_2013.pdf
3. http://www.iea.org/publications/globaleveoutlook_2013.pdf
4. http://www.cleanenergypipeline.com/Resources/CE/PressReleases/Clean_Energy_IQ14_Analytics_and_Graphs.pdf
5. http://www.cleanenergypipeline.com/Resources/CE/PressReleases/Clean_EnergyPipeline_LeagueTables_2013.pdf
6. http://www.cleanenergypipeline.com/Resources/CE/DataReports/CEpData-Insight_SouthAfricaWindowOne_2012.pdf

Behind the Themes

Low Carbon Transport



- As with previous years, transport remains the dominant theme with \$358.4bn in bonds outstanding.
- \$59bn was issued in 2013, mostly rail bonds in China, the UK, France and the USA.
- Auto manufacturers featured for the first time:
 - EV manufacturer Tesla issued a \$600m bond in May 2013.
 - In Q1 2014, Toyota issued an ABS to finance EV and hybrid vehicle motor loans. It will likely precipitate further issuance.
- China Railways is the largest single issuer accounting for \$140.6bn of the universe. China Railways was previously named the Ministry of Railways, but this was dissolved in 2013. Its debt has been transferred to a new state-owned railway corporation which continues to issue debt for specific rail projects across China.
- For 2014, China Railways have been given approval to issue CNY150bn (\$24bn). This is less than in previous years – CNY190bn was issued in 2013 and CNY200bn in 2012.

The importance of rail

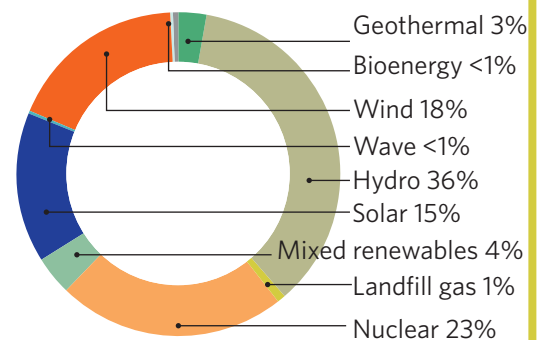
- The IEA stresses the importance of rail investment to reduce transport sector emissions. Annual rail travel has to increase by more than 6.1 trillion passenger-kilometres, nearly 30% over current trajectories.
- China is an important part of this growth. Despite declining rates of rail investment in the rest of the world, China added 7,000km of track in 2000-2010 and by 2011 had 6,000km of high speed rail track – double the rest of the world.
- In the IEA's 2 degrees scenario, rail infrastructure is expected to increase globally to 1.5 million track-kms by 2050 of which China will account for roughly 10%. In high speed rail, the IEA expects China to account for 60% of additional track up to 2030¹.
- Chinese rail bonds are essential in financing this additional infrastructure.

Low Carbon Energy



- The Energy theme accounts for \$74.7bn of bonds outstanding & 15% of the total universe.
- Renewable energy makes up over two thirds of the theme, with hydropower the largest proportion at 36%.
- 84% of issuance was from corporates with 11% in project bonds.
- EDF's EUR1.4bn green bond for its renewables division was the first time a large utility has been included. This was followed by GDF Suez's EUR2.5bn bond, the largest corporate to date.
- Notable project bonds include the \$1bn MidAmerican "Solar Star" June 2013 bond and the Greater Gabbard Offshore Wind Transmission Grid project bond – a GBP305m bond supported by a 15% guarantee from the EIB Project Bond Initiative.
- Nuclear is included because it's *low-carbon*, although it is a highly controversial energy source for many investors.

Energy theme sub-categories

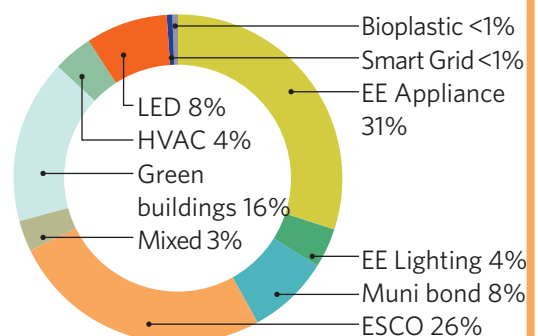


Buildings and Industry



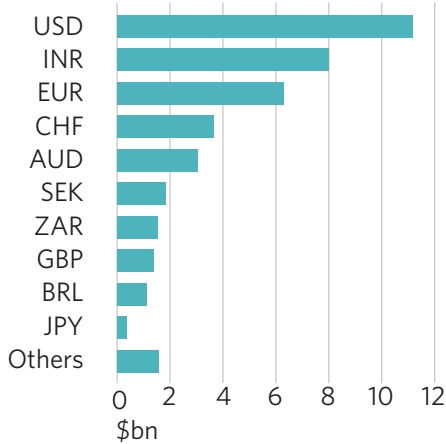
- At \$13.5bn the theme is more than double last year's figure and 2% of climate-themed bonds.
- The largest segment comes from energy efficient appliance/product manufacturers. LG Electronics has been included because 93% of its product range is certified with the Energy Star label. This compares with other major manufacturers assessed, none of which has more than 76% of products with 'eco-product' labels.
- Irish-based ESCO Ingersoll-Rand issued \$2.3bn in 2013.
- The first green property bonds have been included: Swedish developer Vasakronan and a number of Australian REITs with high energy performance ratings across their portfolios.

Buildings & Industry sub-categories



¹ IEA. Global Land Transport Infrastructure Requirements, 2013. https://www.iea.org/publications/freepublications/publication/TransportInfrastructureInsights_FINAL_WEB.pdf

Finance theme currency breakdown



Climate Finance



- The Finance theme amounts to \$50bn outstanding, with \$11.5bn issued during 2013, the majority of which are Green Bonds issued by development banks.
- The theme is comprised 39% of labelled green bonds (only those issued by financial institutions are included), 60% from rail lending institutions, and 1% from renewable energy lending institutions.
- Notable green bonds from Bank of America (\$500m) and Crédit Agricole (\$350m in retail bonds) signalled the first large commercial banks to enter the green bond market.

Water



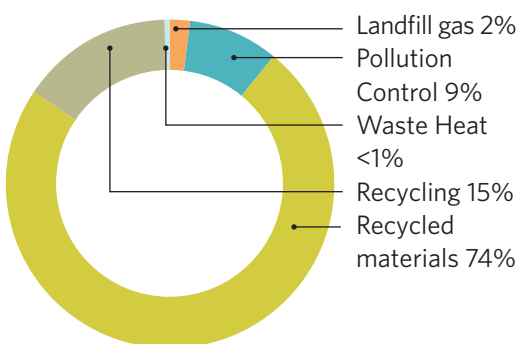
- Two water bonds identified: 1) \$53.5m California groundwater recovery and storage project. 2) \$213m Green Bond from the New York State Environmental Facilities Corp.
- Disclosure on readiness for climate risks from water utilities remains limited. In the UK, it is expected that companies will report to DEFRA through the Adaptation Reporting Power framework in 2015.

Agriculture & Forestry



- \$4.2bn in bonds outstanding representing 1% of the total universe.
- 95% are from sustainable paper and pulp manufacturers and sustainable forest management.
- A recent bond by Swedish forest products company SCA is the first labelled bond linked to certified forests, and includes a commitment to increase forest cover by 1% each year.
- The small size of the theme is partly due to the fact that bonds are rarely used to raise finance in this sector – of the 1522 companies in the global forestry & paper plantations or fishing farming sectors, only 139 have bonds outstanding (the vast majority of which do not meet our criteria).

Waste & Pollution Control sub-categories



Waste & Pollution Control



- \$1.4bn in the theme, largely due to pure play companies in recycling or recycled products.
- No labelled bonds feature in this space, but both SCA (Agriculture & Forestry) and Unilever (Buildings & Industry) bonds incorporate waste reduction projects into their Green Bonds.
- Potential future issuance may originate from municipalities and cities with waste reduction plans and landfill gas capture projects.

	Transport \$358.4bn	Energy \$74.7bn	Finance \$50.1bn	Buildings & Industry \$13.5bn	Agriculture & Forestry \$4.2bn	Waste & Pollution \$1.4bn	Water \$266m
Number of bonds	1,000	736	430	130	42	29	2
Number of issuers	89	160	33	40	11	13	2
Average bond size	\$466m	\$122m	\$146m	\$117m	\$106m	\$60m	\$133.5m
Largest issuer	China Railway	Hydro-Québec	Eurofima	LG Electronic	Sveaskog	Darling International	Cadiz Inc.

Behind the growth in the Green Bonds market

The growth in the Green Bonds market is part of an overarching trend towards increasing interest in environmental, social and governance (ESG) issues across all asset classes.

This trend is gaining pace: over \$13trn of global assets under management currently incorporate ESG issues into investment decisions¹; investors managing \$45trn of assets have joined the Principles for Responsible Investment² (which now has a working group on ESG in fixed income); and in climate, investors representing \$22.5 trn in 2012 called on governments to take urgent action on climate change³.

It is not only investors who are interested - in January 2014 a sell-side collaboration launched the Green Bond Principles.⁴ The collaboration was formed when bankers, seeing the IFC's \$1bn Green Bond that sold out in one hour, realised the "ring-fenced" green bond model could be applied to the corporate sector.

The Green Bonds Principles were designed to provide guidance for the development of the market (although they do not detail "what is green"). Originally formed by Citi Group, Bank of America Merrill Lynch, JP Morgan and Crédit Agricole, by May 2014

it had 49 underwriters, issuers and investors as signatories.

Despite this groundswell of support, there is some concern that the Green Bonds market is mostly a re-packaging exercise, contributing only modest new investment. However, the market serves a vital role in exposing green investments, building a liquid market and engaging investors with the nascent sector.

Here are four reasons we think a thematic Green Bonds market is needed to help meet climate finance requirements:

1. Improved discoverability

A thematic market aids discoverability of climate or environmental investments. Green bonds provide a simple means to allocate funds in that direction. Bonds of equal yield and risk, a feature of the Green Bonds market in the past year, make that choice even easier.

2. Achieve scale and liquidity

A broader thematic approach allows for the pooling of multiple assets into portfolios and opens up opportunities for larger scale issuance that institutional investors prefer. Proceeds from EIB Climate Awareness Bonds

are allocated to renewable energy, energy efficiency and other climate related projects; similarly, Hannon Armstrong's Sustainable Yield Bond is backed by a mixture of energy efficiency and solar energy leases.

3. Re-packaging kickstarts a market and leads to additionality

Bond markets generally start with high-grade issuance and expand to lower ratings levels. Labelling and re-packaging existing assets that already meet scale, rating and liquidity requirements is an important way to get investor buy-in.

As investors gain confidence in the market, bonds can be issued at lower ratings and against future assets thus enabling additionality. This is what we are seeing in the Green Bonds market.

4. Positive investment narrative

The Green Bonds market represents a change in the climate finance narrative towards emphasising climate solutions as positive investment opportunities.

With evidence now clear that there is significant demand for climate-related investments, governments can be pressed to fast-track planning and regulatory measures that will deliver low carbon investment opportunities.

Trends identified in 2013 report	What has happened to date
Labelled green/climate bond issuance growth	<ul style="list-style-type: none"> 2013 year of most labelled issuance at \$11bn, 2014 YTD reached \$18bn. Majority of issuance (\$7.7bn) from multilateral and development banks
Increasing issuance from municipalities and local government	<ul style="list-style-type: none"> Massachusetts issues first labelled green bond by municipality (\$100m) City of Gothenburg follows with a SEK500mn (\$79m) bond City of Johannesburg (South Africa) issues ZAR1.45bn (\$136m) bond
EE in buildings and solar PV securitisations to feature	<ul style="list-style-type: none"> SolarCity issues 2 solar rooftop securitisations in 2013 and 2014 First bonds linked to energy efficient buildings: Vasakronan, Unibail-Rodamco, Skanska, Regency Centers and Vornado Realty.
Utility-scale renewable energy project bonds	<ul style="list-style-type: none"> Solar Star and Greater Gabbard utility-scale project bonds Electricity utilities issue bonds linked to renewables businesses: 2013: EDF, (EUR1.4bn); 2014: Iberdrola (EUR750m), GDF Suez (EUR2.5bn)
Industrials and commercial banks issuing climate-linked corporate bonds	<ul style="list-style-type: none"> Toyota issues \$1.75bn ABS against auto loans linked to electric and hybrid vehicles. Commercial banks bonds from Bank of America Merrill Lynch and TD Bank linked to lending to environmental and climate projects. Unilever issues GBP250m Sustainability Bond linked to internal energy and water consumption improvements

Outlook: rapid growth, validation, green city bonds

1. Green bond market to grow by \$40bn in 2014, \$100bn in 2015

After a record breaking year of labelled issuance in 2013 (\$11bn), we estimated in February that this would double in 2014 to pass \$20bn in a year. By our analysis cut-off date of 10 June 2014, issuance for the year had reached \$18.35bn; as this report went to print it had passed \$20bn.

We expect 2015 issuance to reach \$100bn. Significant growth from a very low base will occur in new markets such as

Germany, catalysed by a recently-announced KfW bond, and China, where the Government has called for the growth of a corporate green bonds market.

2. Improved steps to validate green

In the absence of clear and widely accepted guidelines around what is green there is a risk of "greenwashing", where bond proceeds are allocated to assets that have little or doubtful environmental value. This would shake confidence in the nascent market. The Green Bonds Principles address this issue by proposing that reporting on the use of proceeds and independent review of environmental credentials should be required. These aspects of the Principles should become effectively mandatory rather than optional.

A common, science-referenced classification of what is green will be important to the next stage of growth as we see lower-rated issuers enter the market. At present there is no standardised approach for the issuance of a Green Bond.

The Climate Bonds Standard⁴ involves a wide coalition of academic and industry experts preparing open access guidelines for which climate-related investments can be associated with green bonds.

As issuance broadens from more obvious "green" areas such as renewable energy, we expect investors to push for more clarity and better standards on what types of projects can be defined as green. This is especially important given the fast-moving and commoditized nature of bond markets, where, even if an investor has in-house due diligence capability, a proxy for judging credibility is needed when decision-making windows are very short.

NGOs and academics as well as ESG ratings agencies will play a role in defining green. At the same time, investors will be looking for stronger legal recourse in the event of a misuse of proceeds and so tracking of proceeds as well as verification from auditors will become important.

3. The role of the public sector

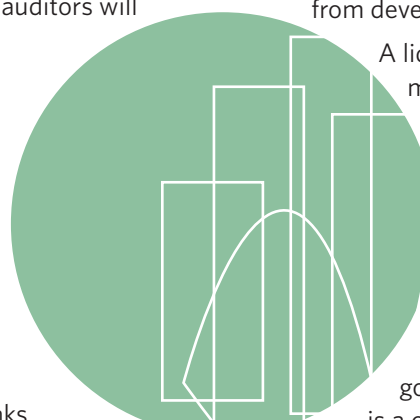
The public sector has three key roles:

- Kickstarting markets with cornerstone issuance, for example through development banks.
- Risk-bridging activities. Given the novelty, scale and policy risk involved in growing low-carbon solutions, public sector support is needed to lift investment ratings to levels that are attractive to investors. This will include guarantees, credit enhancement, subsidies and tax incentives.
- Planning and regulatory steps are required to support the generation of investment opportunities. Most investment will depend on enabling and supportive policy and regulation ranging from energy market management to financial regulation.

4. Growth of Green Securitization.

One of the contributions a Green Bonds market can make is to support post-construction recycling of capital to free up bank lending allocations and equity capital. That gives lenders and investors an exit strategy, allowing them to more rapidly recycle their limited capital into new projects. Project lending and investment requires due diligence capabilities that most bond buyers lack; and recapitalisation pressures on banks have reduced their allocations to such lending, and equity remains scarce in policy-vulnerable sectors.

Developing a loan securitization pipeline would allow equity investors and bank lenders to do more with less. Securitization of green operating assets will help aggregate fragmented renewable energy and energy efficiency markets to meet the needs of investors. This will involve regulatory measures and support from development banks.



A liquid green bonds market that reduces re-financing risk for project lending will contribute to lower lifetime financing costs and will embolden project investors - knowing they have a good exit strategy. This is a critical benefit Green Bonds market can provide.

5. Sovereign/city green bonds

2013 and 2014 saw the issuance of green city and muni bonds, with bonds from Ile de France (Paris), Massachusetts, Gothenburg, Stockholm and Johannesburg. This is an important area for future growth as cities and sub-sovereign entities (especially in emerging markets) raise finance to meet climate infrastructure requirements.

1. htt 2012 Global Sustainability Investment Review, GSIA. <http://gsiareview2012.gsi-alliance.org/#/6/>
2. <http://www.unpri.org/news/pri-fact-sheet/>
3. <http://globalinvestorcoalition.org/investor-statements-on-climate-change/>
4. <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/>
5. <http://standards.climatebonds.net>

Summary

The annual Bonds and Climate Change report aims to estimate the size of the existing universe of bonds whose proceeds are used primarily for financing the transition to a low carbon and climate resilient economy. The 2014 edition is the third iteration of this report. It includes a thorough analysis of all climate-themed bonds as well as detail on the current and future state of the rapidly-growing labelled Green Bonds market.

Key Findings

\$502.6 bn
TOTAL
UNIVERSE

See page 3

\$35.83BN

LABELLED GREEN BONDS

See page 6&7

\$236.6 bn
MEETS INDEX
REQUIREMENTS

See page 5

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July 2014 in association with HSBC Climate Change Centre
of Excellence.

The Climate Bonds Initiative is an investor focused not-for-profit, mobilizing debt capital markets for a rapid transition to a low-carbon and climate resilient economy.

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All source data derived from Bloomberg.
All figures are rounded.

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