Climate Bonds INITIATIVE

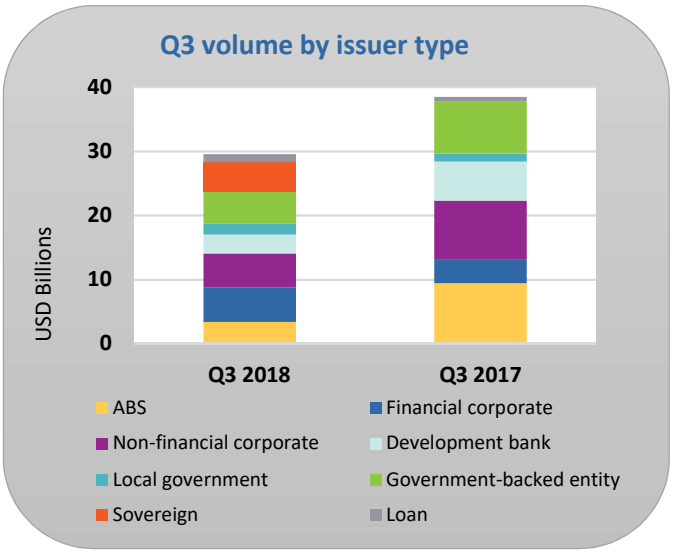
Green Bonds Market Summary

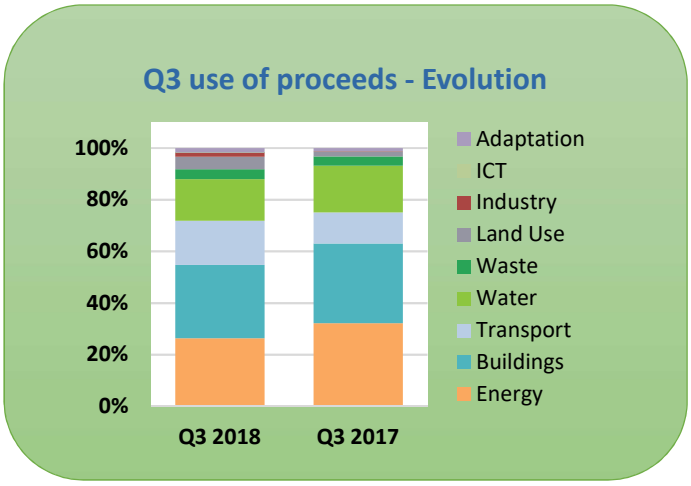
Q3 2018

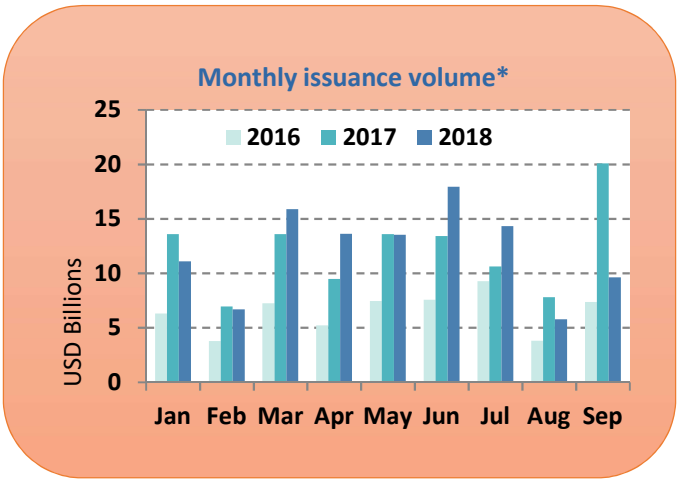
October 2018

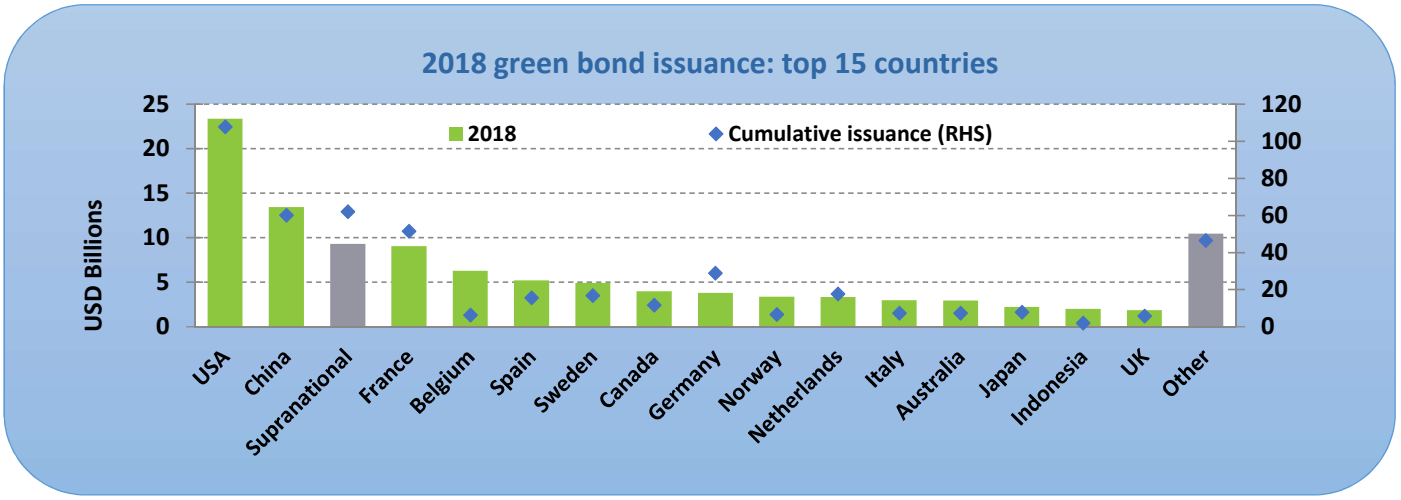
Q3 at a glance

- USD29.7bn of issuance*
- 293 green bond issues* with 212 from the USA, 18 from China and 13 from Sweden
- 79 issuers* from 27 countries
- 46 market entrants from 18 countries bring the total number of green bond issuers to 553
- 52 green bond markets reached, with the first issuer from Uruguay debuting in Q3
- 4th tap of the Republic of France's sovereign Green OAT, taking the total to EUR14.8bn (USD16.7bn)









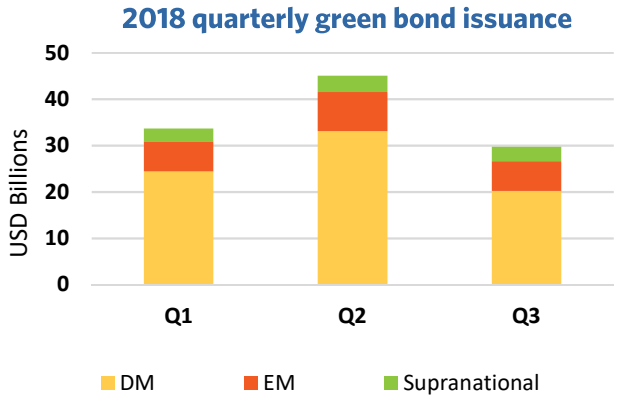
** All charts and analysis are based on preliminary figures for Q3 2018 issuance volume and number of deals, pending the inclusion of Fannie Mae Green MBS September deals and 32 deals still under assessment for inclusion in the CBI green bond database.*

Q3 2018 green bond issuance highlights

Green bonds in Q3 2018 totalled USD29.7bn, a 23% drop compared to Q3 2017. Looking at issuance since the beginning of the year reveals a more reassuring trend, with USD108.3bn falling short of 2017 figures for the first three quarters by less than 1%.

Issuance of sustainability bonds – which allow proceeds to be allocated to both green and social projects – has increased more than two-fold compared to 2017 volumes as of Q3. Social bonds also went up 35%. Including sustainability and social bonds would take total issuance to USD35.1bn – a 9% increase year-on-year.

Q3 volumes were driven by both financial and non-financial corporates, which accounted for 18% each. Government-backed entities were also active in the market representing 16% of the total, with issuance equally split between developed and emerging markets. The Republic of France's fourth tap of its sovereign Green OAT accounted for another 16%.



The rise of Impact/ESG-linked loans

During the course of 2018, Climate Bonds started tracking the issuance of impact/ESG-linked loans, which link the loan's financial structure to the borrower's Corporate and Social Responsibility (CSR) or ESG performance.

These instruments do not directly promote investments in green or social projects and hence are classified as excluded in the CBI database. However, the loans have the potential to incentivise companies to achieve their CSR/ESG objectives, as this can lead to lower rates.

Impact/ESG-linked loans totalled USD9.1bn between 2017 and 2018. The most recent borrowers to come to market in 2018 include cereal manufacturer Grupo Siro, hospitality company AccorHotels and multiutility company Hera Group.

In the future, borrowers could start allocating proceeds to climate aligned assets, as well as linking the loan's rates to sustainability objectives to provide an even clearer demonstration of their commitments to supporting the transition to a green economy.

Spotlight on secured green bonds

There are different types of debt instruments that can provide bondholders with security over specific assets or project revenue streams. The main benefit of these structures for investors is that the assets are known from day 1 and investors benefit from due diligence provided on these specific assets. Some structures (e.g. ABS) rely solely on the assets to generate ongoing cash flow for debt service and for debt repayment. Other structures (e.g. covered bonds) rely both on the asset and the issuer.

The green bond market has seen four main types of secured structures: secured bonds (including secured MTN programmes), asset-backed securities (ABS), covered bonds (including dual recourse bonds) and debentures.

As of Q3 2018, USD66bn worth of green ABS have been recorded in the CBI Green Bond Database, and that represents 14% of cumulative green bond issuance. Covered bonds account for just under 2% of the market with USD7bn, while other secured bonds (including debentures) represent a 1% share of cumulative issuance at USD3.8bn.

Secured green bond issuance is dominated by ABS

Region	ABS	Covered bond	Secured & Debentures
Asia-Pacific	3,795 m	500 m	240 m
Europe	4,948 m	6,508 m	2,122 m
Latin America	295 m		89 m
North America	56,973 m		1,395 m
Total	**66.0bn**	**7.0bn**	**3.8bn**

All figures are in USD

Securitisations are dominant in the US and China for green secured debt, but in Europe the highest volume is in covered bonds. An in-depth analysis of the diverse bond structures to which the 'green' label has been applied to date is available on pages 22-27 of the State of the Market 2018 report.

State of the Market 2018: The scale is there in DM, but where are the green bonds?

Climate Bonds' recently launched Bonds and Climate Change: the State of the Market 2018 report identified a climate-aligned bond universe of USD1.45tn, made up of USD1.2tn from fully-aligned, strongly-aligned and green bond issuers, plus USD250bn outstanding bonds from US Muni fully-aligned issuers. Green bonds account for a third of the USD1.2bn total – or USD389bn – pointing to a large pool of issuers financing green infrastructure through unlabelled bonds. This highlights the extensive opportunities for growing and diversifying the green bond market.

The IPCC's special report published in October 2018 stresses that emission reductions are still far from being sufficient to meet the targets set by the Paris Agreement. The report estimates that global temperatures could surpass 1.5 degrees of warming between 2030 and 2052 if the current rate of human-caused annual average temperature increase continues. Upscaling investment flows directed towards financing the low-carbon transition is an urgent imperative if we are to achieve net-zero CO2 emissions by mid-century.

Developed markets account for 62% of aligned outstanding figures in the climate aligned universe. Over 50% come from fully-aligned issuers, 15% from strongly-aligned issuers and 35% from green bonds.

The top 10 developed countries represent the vast majority of DM volumes (87%). If scale is what we are looking for, then this seems like a good place to start. We picked the three countries with the largest bond markets among the top 10 DM ranking to highlight opportunities for catalysing green debt issuance.

Top 10 developed markets: Composition of climate aligned universe (in USD bn)

Country	Fully-aligned (>95% green revenue)	Strongly-aligned (75-95% green revenues)	Green bonds	Grand Total
USA	77.0	21.5	93.3	191.8
France	73.5	58.1	43.6	175.3
UK	91.2	1.2	4.0	96.3
Germany	24.8	0.8	26.2	51.8
Canada	29.9	4.4	8.2	42.6
Austria	19.7	1.3	1.1	22.1
Sweden	0.2	5.4	13.9	19.5
Spain	5.0	0.0	14.1	19.1
Japan	2.8	9.1	6.5	18.4
Norway	12.1	0.1	5.6	17.8

US figures exclude fully-aligned US Muni bonds outstanding, unless they are labelled green bonds

USA

The US totals USD192bn of aligned outstanding volumes, second only to China (USD279bn). Green bonds represent around half of outstanding volumes. Fully aligned US Muni debt (USD250bn) come extra!

The transport sector has the biggest potential for scaling green bond issuance. It accounts for over a third of total country volumes, with 63% of that coming from fully-aligned issuers. Railroad operating company Union Pacific Corp is the largest fully-aligned issuer with almost USD20bn outstanding.

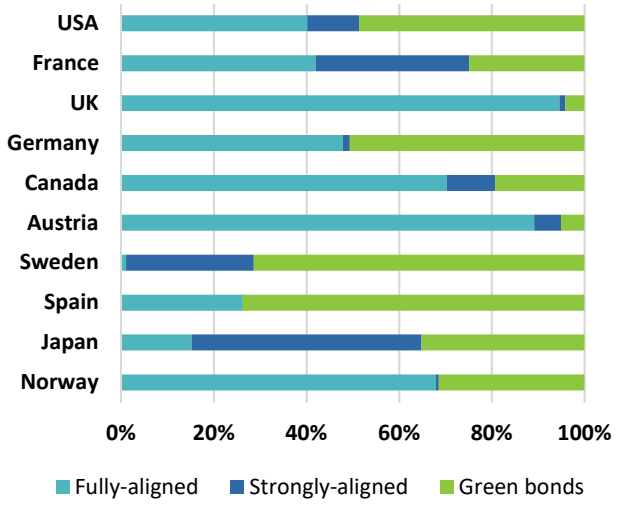
Burlington Northern Santa Fe LLC, a wholly owned rail subsidiary of Berkshire Hathaway, is the second largest issuer accounting for over 7% of the sector's volume. Another Berkshire Hathaway subsidiary, solar power developer company Solar Star Funding LLC, is also a fully-aligned company and is included under the energy sector. This points to how multinational conglomerates with highly diversified business streams can capitalise on their subsidiaries' green assets to participate in the green bond market.

Apple Inc is a good example of a corporate that does not have big enough green revenues to be considered fully- or strongly-aligned but has taken advantage of the green bond label to finance renewable energy projects aligned with a 2-degree transition.

Fully-aligned solar companies such as SunPower Corp and Solar Star Funding LLC could follow the lead of Solar ABS issuers like Solar Mosaic and Vivint Solar and issue securitisations to recycle capital.

NextEra Energy Capital Holdings Inc and Pattern Energy Group Inc also have the potential to switch from vanilla to green bond issuance. Large container and packaging companies such as International Paper Co and WestRock Co and forestry company Weyerhaeuser Co having the opportunity to finance their FSC/PEFC certified assets through green bond issuance.

Composition of climate-aligned bond universe in the Top 10 DM countries



UK

The UK's climate-aligned volume is almost exclusively driven by fully-aligned issuers at 95%. At USD91.2bn, fully aligned issuers take the UK to the top of country rankings for the fully aligned universe. Globally! What is remarkable is that UK issuers have not been particularly active in the green bond market so far (albeit there is now a bit more issuance), and the UK ranks 16th in cumulative issuance volumes as of Q3.

The largest fully-aligned issuers come from the transport sector, including government owned Network Rail Infrastructure Finance PLC (USD33bn outstanding) and Channel Link Enterprises Finance PLC (USD6bn). Transport for London is the third largest issuer of the sector and the only one to have issued a green bond: it's GBP400m (USD608m) green bond from May 2015 financed rail, metro, hybrid buses and cycling infrastructure.

Water sector issuers account for 44% of the country's outstanding volumes, mostly driven by fully-aligned water utilities. Thames Water Utilities Cayman Finance, a subsidiary of Thames Water Utilities, has the largest amount of outstanding debt at USD8bn. United Utilities Water Ltd, Anglian Water Services Financing PLC and Severn Trent Utilities Finance PLC account for 4% each of the UK's total volume.

Anglian Water made its debut in the green bond market with a GBP250m (USD326m) secured green bond in August 2017 to finance water management and water recycling projects under a wider MTN programme. Bazalgette Finance is also both a fully-aligned company and a repeat green bond issuer with a total of USD600m raised under its MTN programme to finance the Thames Tideway Tunnel. Could their peers follow suit?

Energy company SSE plc is flying the flag for energy utilities in the green bond market: it is a repeat issuer with USD716m green bonds issued to finance onshore and offshore windfarms and transmission network infrastructure. SSE is also the only UK corporate to have issued a benchmark deal (USD500m or more).

In a global first for the green finance sector, Vodafone recently became the first telco company to publish a green bond framework. The company is now well positioned to add diversity and scale to the corporate green bond market, as well as spearheading issuance from the ICT sector.

Japan

Japan is 9th in the DM country ranking, with USD18.4bn aligned outstanding. The country has significantly increased its presence in the green bond market since the Development Bank of Japan's first green bond in 2014, with 2017 and 2018 issuance to date representing almost 70% of cumulative figures.

50% of outstanding volumes come from strongly-aligned companies. Transport sector issuer Central Japan Railway Co accounts for a third of the total, while passenger transport service company Tokyo Metro Co has the second largest outstanding amount at USD2.2bn. The company could follow Japan Railway Construction Transport and Technology Agency's example, which joined the green bond market in November 2017 with a JPY20bn (USD176m) green bond to finance an urban railway project.

Scaling opportunities also exist for forestry & paper companies. Sumitomo Forestry Co issued its first green bond in October 2018. Containers and packaging company Oji Holdings Corp and paper manufacturer Daio Paper Corp are well positioned to capitalise on their sustainability commitments through the issuance of green labelled debt.

Green bond second party opinion league tables

From Q3 2018, Climate Bonds Initiative will issue a quarterly league table for Second Party Opinion (SPO) providers. The ranking is based on deal volume.

As of Q3 2018, CICERO has the highest market share at 45% of issued bond. Fannie Mae is by far the largest contributor to CICERO's Second Party Opinion volumes at USD45bn (33%). The issuer obtained a CICERO Second Party Opinion on its green bond framework in June 2018 and included both previously issued bonds and future ones under the same framework.

Sustainalytics comes second for cumulative volumes with 21%. Mexico City Airport's green bonds account for 10% of the Sustainalytics total reviewed volume.

Vigeo Eiris closely follows in third place with 20%. The Republic of France Green OAT was the main driver of volumes, representing 28% of cumulative volumes.

In 2018 to date, 71% of deals by volume have obtained a Second Party Opinion. Top rankings remain mostly unvaried between cumulative and 2018 figures. In Q3, Vigeo Eiris leaped in front of Sustainalytics taking the second spot with over a third of volumes.

Second Party Opinions represent just one of the four available forms of external reviews, which also include:

- verification reports for Certified Climate Bonds
- assurance reports
- green bond assessments ratings

Accounting for all external review types takes the share of green bonds by volume that have obtained an external review to around 85% for both cumulative and 2018 figures.

CICERO is largest Second Party Opinion provider with Vigeo EIRIS ranking second for Q3 2018 volume

SPO provider	Cumulative (USD, issued amount)	Cumulative (%)	2018 (USD, issued amount)	2018 (%)	Q3 2018 (USD, issued amount)	Q3 2018 (%)
CICERO	133,895 m	45%	31,780 m	42%	8,780 m	43%
Sustainalytics	60,785 m	21%	20,590 m	27%	2,757 m	13%
Vigeo EIRIS	59,937 m	20%	14,552 m	19%	6,908 m	34%
ISS-Oekom	20,573 m	7%	4,966 m	6%	1,171 m	6%
DNV GL	14,778 m	5%	3,479 m	5%	797 m	4%
Zhongcai Green Financing	1,420 m	0%	348 m	0%	146 m	1%
Syntao Green Finance	1,368 m	0%	-	0%	-	0%
Carbon Trust	580 m	0%	580 m	1%	-	0%
SITAWI	563 m	0%	179 m	0%	-	0%
Turner & Townsend	313 m	0%	-	0%	-	0%
CH2M Hill	181 m	0%	-	0%	-	0%
GIB	151 m	0%	-	0%	-	0%
RUF	3 m	0%	-	0%	-	0%
Total	**294,548 m**	**100%**	**76,475 m**	**100%**	**20,559 m**	**100%**

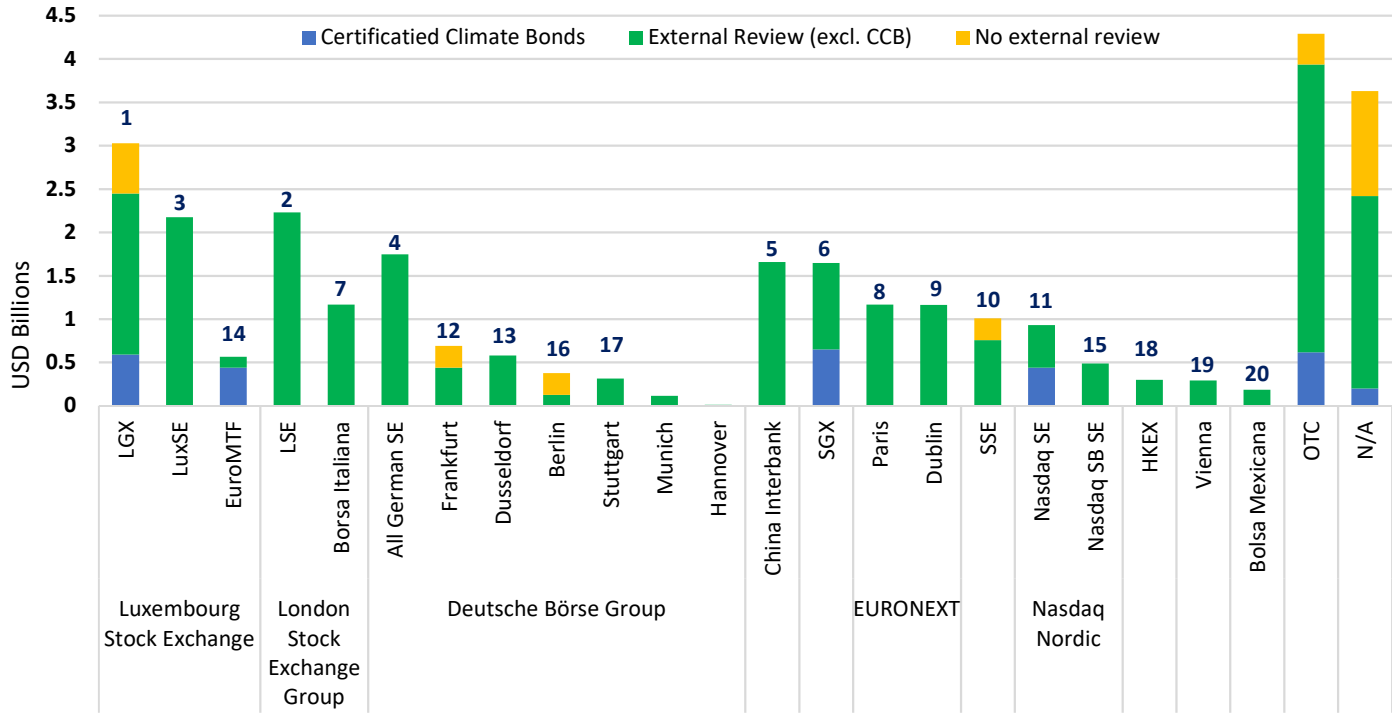
Methodology note: The ranking is only for external reviews which are second party opinions. In addition, external reviews can be provided in the form of verification for Certified Climate Bonds, assurance reports and rating agency green bond assessments/evaluations.

Trading venue league table

In Q3 2018, USD20.5bn worth of green bonds has been listed on a variety of trading venues, accounting for 69% of the total green bonds issued in the same period. In the trading venue league table below, we have grouped those venues under the same stock exchange group. The numbers on top of the bars indicate the ranking of each venue in the top 20.

Luxembourg Green Exchange tops Q3 venue rankings, followed by London Stock Exchange.

LGX at No. 1 in Top 20 green bond trading venues in Q3



Listing venue league table: Methodology

For a green bond to be eligible for the league table, deals must meet our Methodology criteria. For example, ESG bonds with significant social project allocations, or bonds that finance clean coal are excluded.

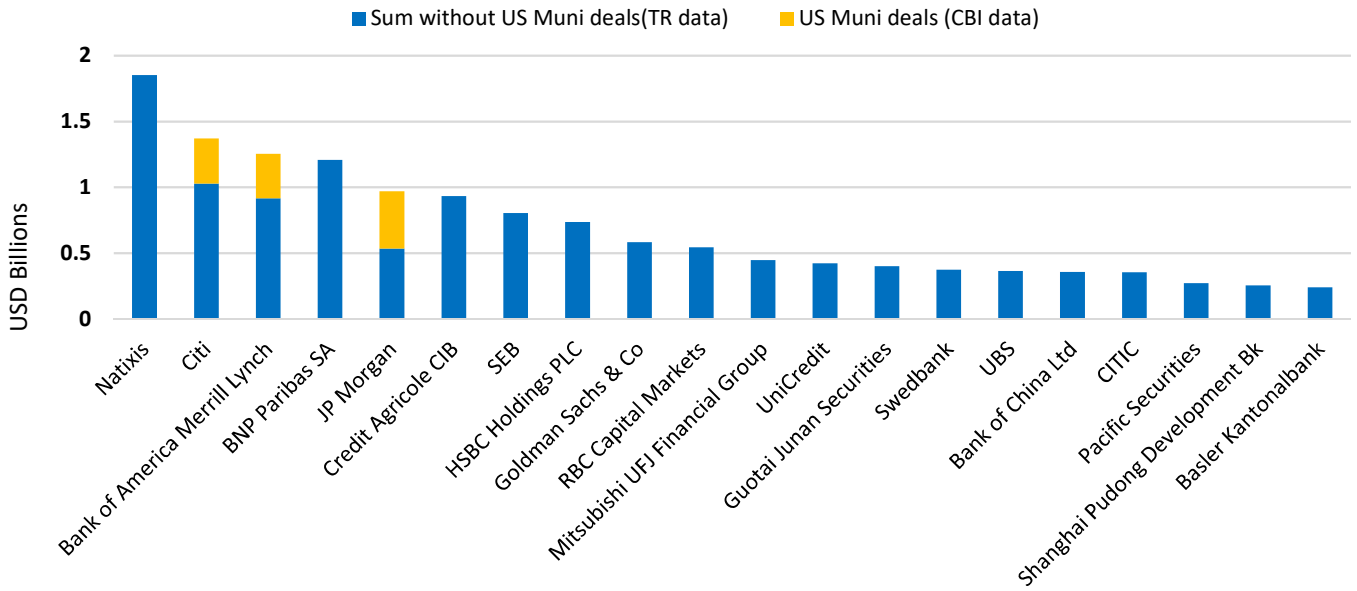
- Primary data sources for listing venues include Thomson Reuter EIKON, Bloomberg Terminal and Wind Financial Terminal. They are further supplemented by information collected from stock exchanges with a dedicated green bond segment, such as Luxembourg Green Exchange, London Stock Exchange, Borsa Italiana, Shanghai Stock Exchange and Taipei Exchange.
- At most four listing venues are recorded for calculation purposes. If a bond is listed on multiple exchanges, primary vs. secondary listing venues are not differentiated.
- When a green bond is listed on more than one venue, the issued amount is divided by the number of venues and each venue is allocated an equal share.
- We have not allocated bonds listed on All German SE, EURONEXT and Nasdaq Nordic to the constituent stock exchanges.
- A bond listing venue is treated as "Not listed" when the bond is not listed or relevant information is not available from the sources identified in this methodology.
- Bond volumes allocated to each listing venue are categorised into Certified Climate Bonds, bonds with external reviews (other than Certified Climate Bonds) and bonds with no external reviews. Commentary:
- Bonds issued before the Green Bond Principles were first published in 2014 generally do not have external reviews. Many of the early issues have now matured.
- Some external reviews may not be available until an assurance audit is completed. For instance, KPMG provides an annual independent review of EIB's Climate Awareness Bonds. The 2016 assurance report was published in mid-2017. The 2017 report is expect by year end 2018.
    - All LGX deals without a review relate to older EIB CAB bonds or ones from 2017/2018, for which an assurance report has not been published yet.

Green bond underwriter league table

Q3 2018 league table shows Natixis steadily climbing to the top from 7th place in Q2 and 15th in Q1. Citi climbed to second place, while BAML dropped from the top spot in Q2 to third in Q3.

Citi and BAML saw US Muni deals in the mix, similar to last quarter, though JP Morgan deal volume shows a significantly higher US Muni share compared to Q2.

Natixis, Citi and BAML in top 3 of Green Bond Underwriters League Table Q3 2018



Underwriter league tables: Methodology

Since Q3 2016, the underwriters league tables are collated using data from Thomson Reuters except for US municipal bonds which are calculated by the Climate Bonds Initiative. As such, ranking volumes differ from Thomson Reuters tables. Volumes may differ from other league tables as they include ABS deals and US Muni bonds and only include bonds which have 95% or more of proceeds going to assets or projects, aligned to the Climate Bonds Taxonomy.

- Thomson Reuters data methodology:
- Primary Issuance only
- Underwritten transactions only
- Thomson Reuters data excludes tax exempt US Municipal bonds
- The global table includes transactions that mature at least 360 days after settlement
- Transactions that mature or are callable/puttable less than 360 days after settlement are excluded
- Self-funded straight debt transactions are excluded (excluding mortgage and asset securitizations) unless two or more managers/ underwriters unrelated to the issuer are present.
- Transactions with an issue size of less than USD 1m (equivalent) are included; sole led MTN take downs with a minimum size of USD50m for core currencies are included, USD10m for non-core
- Deals must be received within five business days of pricing to be eligible
- For a transaction to be green league table eligible, deals must have 100% of proceeds formally earmarked for green projects
- Issuances where there is a mixed use of proceeds designated across different projects, are not eligible: e.g. ESG bonds that combine social and green projects
- Securitisation deals and private placement will be included provided they meet the standard criteria