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SEB Green Bonds Website

Letter to the Reader

Having just returned from the One Planet Summit in Paris, I find myself coming away with a taste that is a difficult to identify. President Macron highlighted that "we are losing the battle against climate change". At the same time, over 50 heads of state (from China to Sweden – and from the cities and states of the U.S.) along with 3,000 other leaders in the room from the corporate and investor communities provided unprecedented climate action pledges.

However one thing was very clear - there is an inescapable momentum which is now being institutionalized across the world.

Facing a global challenge from a local spot can be hard. At SEB, we combine our own experience with insights gained through JVs, collaborations and initiatives that enable us to reach out and make reflections globally. In this edition of The Green Bond we have invited a number of our partners, which represent various parts of our One Planet - to reflect on their own regions. As stated in Paris – "there is no Plan B because there is no Planet B". However linking efforts together and sharing intelligence will secure better solutions.

Enjoy your reading,

Christopher Flensborg
Head of Climate & Sustainable Financial Solutions, SEB

Climate & Sustainable Finance

Executive Summary

The green bond market once again achieved an impressive result in 2017 with issuance rising by **61%** Year-over-Year (YoY) to **USD 156 bn**.

The outcome of SEB's annual **regional** and **sector-by-sector analyses** suggest that 2018 will be a year of consolidation with more modest growth. This is reflected in our base-case scenario constructed **country-by-country** showing the market with potential to grow +12% YoY to **USD 175 bn in 2018**, with possibility to surprise to the upside again and cross to **USD 210 bn**.

October matched September's record-setting **USD 20 bn** of issuance; November rose by 7% YoY and December finished in line with last year. Total cumulative issuance stood at **USD 384 bn** and a **robust pipeline** of announced deals remained.

Three regions account for over half of issuance. The **U.S.** has the potential to retain its top spot in 2018 growing from **USD 37.8 bn** to **USD 45 bn**, followed by **China** (**USD 30.7 bn**) which could see growth once again to **USD 34 bn**. **France** came third with **USD 19.4 bn**.

Germany leap-frogged to fourth place and has the potential to build further and grow by **50% in 2018** to USD 15 bn. In **Sweden** (USD 4.6 bn) green bonds accounted for **5.1%** of all **SEK** issuance in 2017, compared to the green share of **2%** out of all **Euro** bonds issued this year. We see the potential for issuance to rise to **USD 6 bn** in Sweden in 2018.

Securitizations surged to **USD 26 bn**, largely due to Fannie Mae's Green MBS. In 2018, we see the potential for **USD 34-46 bn** of new securitizations. The **corporate** green bond sector turned in a magnificent performance with **USD 77 bn**, driven by a doubling in **corporate non-financial** issuance, standing at **USD 42.3 bn**. Nine of Europe's largest corporate issuers of green bonds publicly announced **their pledge** to double down on their green financing. **USD 49.5-63 bn** is possible for 2018 and **financial sector issuers,** flat at USD 34bn could grow to **USD 44 bn** under certain scenarios**.**

Issuance from **government agencies** jumped 57% YoY to USD 18.4 bn. We expect USD 17.5-22 bn in 2018. **Green Sovereigns:** France was joined by Fiji and Nigeria. With 10 further states reported to be considering or planning sovereigns**,** we see 2018 potential at **USD 11-14 bn.** Strong growth in 2018 is possible for **Munis** and **Regions** to **USD 17-19 bn**. **New analysis** on the emerging market universe of opportunities and by currency is provided. New Green Bond **Relative Value and Pricing Analysis** is available via SEB Research Portal.

SEB Climate & Sustainable Finance Review

Guest contributors welcomed in this edition:

- **KfW**: Prospects for the German green bond market;
- **Inter-American Development Bank**: LAC green bond market development;
- **CUFE**: Green bonds in China: International prospects for participation:
- **Ontario Financing Authority**: The Canadian green bond market in 2017;
- **EIB**: On the need for a common language in green finance;
- Plus reflections from **SEB's inaugural green bond**.

1. Green Bond Market Review and 2018 Outlook

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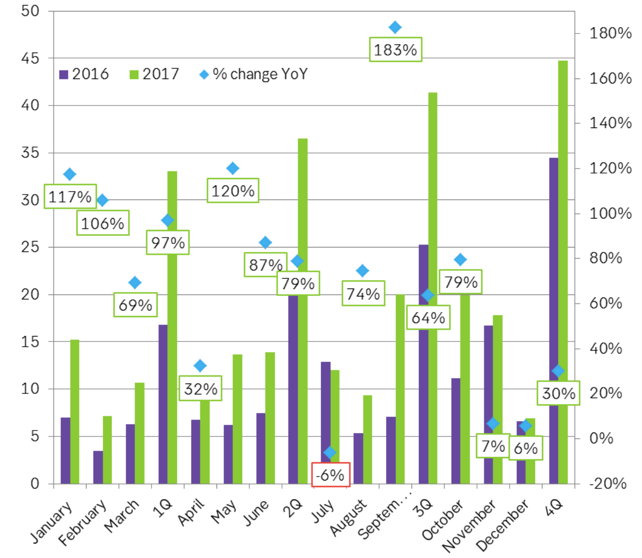
The green bond market once again achieved an impressive result in 2017 with issuance rising by a vigorous **61%** Year-over-Year (YoY) to **USD 156 billion**. This year-end figure may still be revised up as work to inventory all of the securitizations and municipal issuances continues into January; however it already exceeded SEB's upper range of the USD 125-150 billion seen as possible in 2017, and was in line with our hawkish scenarios modelled in all of our seven reports this past year.

A healthy constitution of enablers and drivers stands ready to continue to support the momentum from 2017 and further elevate green bond issuance in 2018. Growth prospects can concurrently be expected to be balanced by issuers and investors taking time to absorb the impressive acceleration that has occurred in the market to date, while calibrating their strategies.

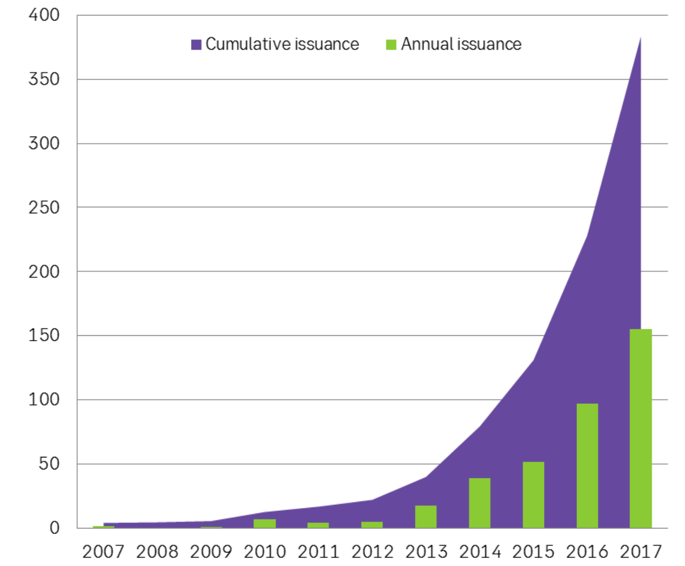
As such, SEB's annual sector-by-sector and regional analysis (described in the sections below) suggests that 2018 will be a year of consolidation with more modest growth. This is reflected in our base-case scenario showing the market having the potential to grow by 12% YoY to **USD 175 billion in 2018**, with the possibility to surprise to the upside once again and cross to **USD 210 billion** (+35%).

Figure 1. Periodic issuance (USD Bn) and % change YoY



Source: SEB analysis based on Bloomberg and SEB data

Figure 2. Annual and total cumulative issuance (USD Bn)



Source: SEB analysis based on Bloomberg and SEB data

Figure 1 captures the market's vitality well, by illustrating how issuance managed to beat nearly every single calendar period on a YoY basis (except for July). When reading solely by the numbers, it may appear that the market's outperformance lost momentum over the course of the year (falling on a tidy quarterly basis: 1Q+97% → 2Q+79% → 3Q+64% → 4Q+30%).

However, this may mask the fact that the market had a daunting task to surmount, given the second half of 2016 was exceptionally busy and characterized by a fusillade of Chinese financial sector issuance. Market activity was smoother in 2017, compared to the serrated issuance patterns that characterized 2016 stemming from stop and start Chinese issuance. Chinese activity which had lagged at points during the year finished approaching 95% of 2016 levels (see Figures 7 and 8).

This potent progress in 2H17 and the full year result was achieved thanks to October almost precisely matching September's record-setting **USD 20 billion** of issuance, November rising by 7% over last November (which had set the record for 2016 issuance) and December finishing in line with last year, up 6%. Total cumulative green bond issuance stood at USD 384 billion[1] (Figure 2) and a robust pipeline of announced deals remained for January, or later in 2018 (see Section 2).

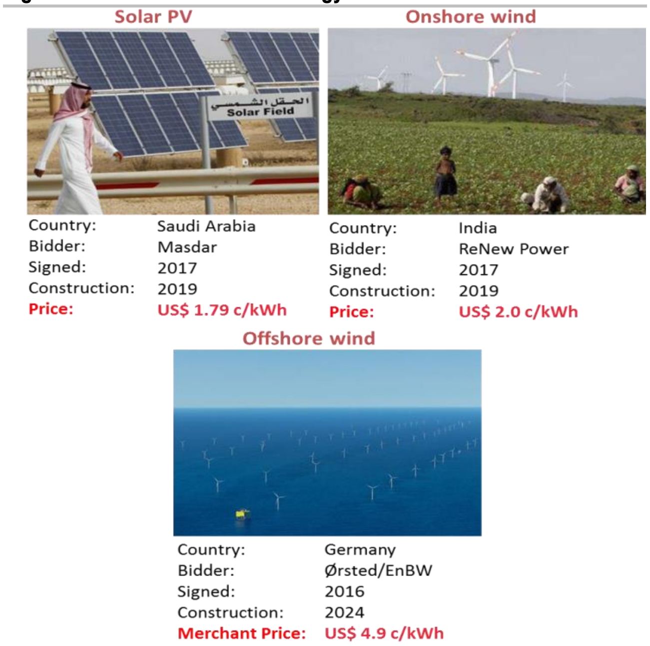
[1] Bloomberg/BNEF methodologies (see Guide to Green Bonds on the Bloomberg Terminal) used to qualify green bonds. Note that Bloomberg is actively "tagging" different types of bonds as green on the Terminal back to 1992 including 'asset level' municipal, ABS and project bonds deemed in line with the Green Bond Principles, and also Corporate-level 'use of proceeds' and 'pure-play' bonds. Methodologies to better distinguish these bonds are also being developed by BNEF and have been used in the SEB database to screen 'pure-play' corporate bonds which are not in line with the GBPs.

Market Drivers

At a higher level, the drivers of this activity and geographic dispersion described below (and throughout our publications this year) can be attributed to sustained green infrastructure investment demand and green bond financing. This is a sincere megatrend that is a function of an extensive array of complementary enabling factors including economic, technological, security, policy, social and sector-specific forces, alongside persistently increasing appetite from institutional investors.

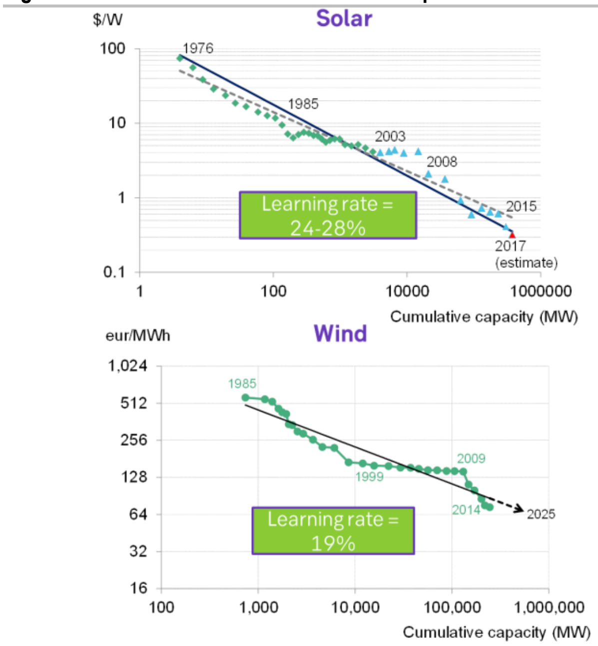
According to Bloomberg New Energy Finance (BNEF), 2017 looks certain to be the 8th successive year in which global clean energy investment has been in range of USD 250 billion - USD 350 billion. Powerful "cost down" curves for clean energy and batteries continue, with the emergence of unsubsidized solar PV, onshore and offshore wind setting new record lows throughout the year and becoming significantly cheaper than any other sources of electricity in their jurisdictions. Therefore, despite fairly stable investment levels 2017 looks set to achieve another milestone for new clean energy capacity installations.

Figure 3. Unsubsidized clean energy records set in 2017



Source: BNEF; Images Siemens; Wikimedia Commons; Masdar *Headline figure only - may include elements of subsidy, price support or price escalation; not final. Previous unsubsidized world record US$ 2.42 c/kWh in UAE (Marubeni/Jinko)

Figure 4. Wind and Solar PV "Cost Down" Experience Curves



Source: BNEF Database

The One Planet Summit, held two years to the day after the historic Paris Agreement was concluded, provided a backdrop for a number of notable announcements (summarised here by the UN). For instance, a group of 225 global investors (including SEB Investment Management) with more than USD 26 trillion AuM pledged to engage with the 100 most polluting corporates (linked to about two-thirds of all emissions from industry worldwide) and to step up their ambition on climate action. The coalition asks corporations to improve governance on climate change, curb emissions and strengthen climate-related financial disclosures, in line with the final recommendations of the Task Force on Climate-related Financial Disclosure (TCFD).

Mike Bloomberg and Mark Carney announced that the number of companies supporting the TCFD recommendations has more than doubled over the six months since the publication in June, with 237 companies (USD 6.3 trillion by market cap) having publicly committed to support the TCFD recommendations. This includes over 150 financial firms (over USD 80 trillion of AuM) and corporates from a broad range of industries, including construction, consumer goods, energy, metals & mining and transport, headquartered in 29 countries. Separately, it was announced that by 2020 every listed company in China must disclose information on environmental impacts.

Just ahead of the Summit, the European Commission launched a public consultation on institutional investors and asset managers' duties regarding sustainability, which will run until January 2018 as part of the High Level Expert Group (HLEG) work on sustainable finance.[2] In its interim report, published in July 2017, the HLEG recommended the Commission to clarify

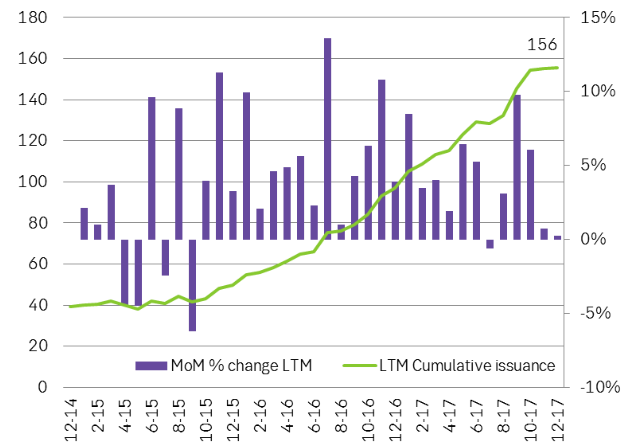
[2] https://ec.europa.eu/info/consultations/finance-2017-investors-duties-sustainability_en

that the fiduciary duties (duties of loyalty and prudence) of institutional investors and asset managers explicitly integrate material environmental, social and governance (ESG) factors and long term sustainability.

Geographic Green Bond Issuance Trends and Potentials

As shown in Figure 4 (and 8), in previous editions SEB introduced analysis of moving Last Twelve Months (LTM) of green bond issuance. These metrics show that cumulative LTM figures surpassed USD 100 billion in January 2017, and continued to grow relatively steadily (taking a short summer break) and plateauing at around USD 155 billion for the last three months. A 2-month moving average of percentage change in LTM showed a downward trend for most of 2017 that was suddenly reversed in September.

Figure 4. Last Twelve Months Analysis / % change (USD Bn)



Source: SEB analysis based on Bloomberg and SEB data

Figure 5. Top 10 countries in 2017, incl. Supranational (USD Bn)

Rank	Region	Issuance	2017 Trajectory YTD
1	UNITED STATES	37.8	
2	CHINA	30.7	
3	FRANCE	19.4	
4	GERMANY	9.8	
5	SNAT	9.6	
6	SPAIN	5.3	
7	SWEDEN	4.8	
8	MEXICO	4.0	
9	NETHERLANDS	3.8	
10	INDIA	3.7	

Source: SEB analysis based on Bloomberg and SEB data

Three regions account for over half (56%) of issuance (compare Figure 6 with Figure 7), with the United States retaining its top spot in the ranking for most of the year (USD 37.8 billion of issuance), followed by China (USD 30.7 billion), which boosted its performance over France (USD 19.4 billion) during 4Q.

France had amongst the most diverse and granular participation across sectors. Buoyed by the French Green OAT Sovereign tapped twice throughout the year (taking its total to USD 10.5 billion), there was widespread participation from corporates and government agencies. **We see activity in France as consolidating in 2018 and dipping somewhat to USD 16 billion.**

Germany leap-frogged to fourth place (USD 6.7 billion) and is the focus of an outlook contribution in this edition provided by **KfW**, the largest issuer in Germany. **We see Germany as having the potential to build further and grow by 50% in 2018 to USD 15 billion.**

Supranational institutions such as Multilateral and Regional Development Banks rounded out the top five with USD 9.6 billion. Supranationals have issued almost USD 55 billion since 2007 (as seen in Figure 7), led in volume by EUR 19.5 billion (USD 23.4 billion) from **the European Investment Bank**, which also contributes an article on the need for a common language in green finance to this edition.

Spain and Sweden had been climbing the rankings all year and jumped over Mexico, which was closely grouped with the Netherlands and India. **Spain could see 50% growth in 2018.**

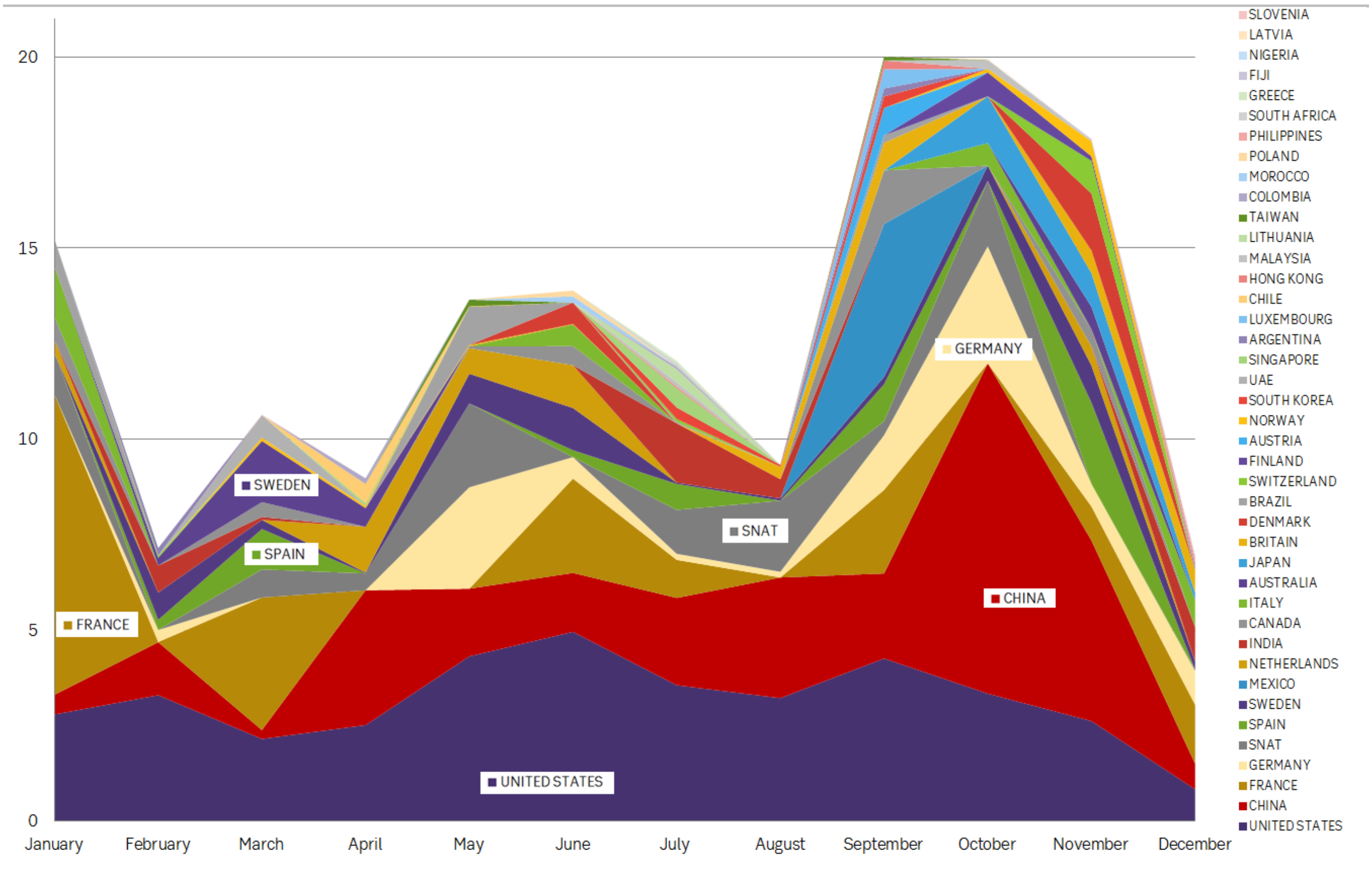
Activity in India continued to heat up after the Securities and Exchange Board (SEBI) released its final green bond guidelines in June and then cooled somewhat. India provided a fascinating case study in cost competiveness of clean energy in 2017, as solar PV became cheaper than coal, and then was promptly overtaken by wind energy in December, which became the cheapest source of electricity domestically.[3] We see **India as having the potential to more than double its issuance in 2018 to USD 8 billion.**

Figure 6 showcases how the market continues its trend of geographic and sectoral diversification, with a record 40 jurisdictions featuring green bond issuance in 2017. Europe became the first region to surpass USD 100 billion of cumulative green bond issuance, and is clearly the dominant green bond market globally as can be seen in Figure 7.

[3] See: https://www.bloombergquint.com/business/2017/12/21/wind-power-is-now-the-cheapest-energy-in-india

This is even the case when excluding the fifth-ranked Nordic region, which is interesting to examine separately from Europe as it was closing in on USD 20 billion of cumulative green bond issuance on its own. Promisingly, the green share doubled over the last year for Euro bonds, but taking the result to only 2% in 2017. **In Sweden for instance, green bonds accounted for 5.1% of all Swedish Krona (SEK) issuance in 2017. We see the potential for issuance to rise to USD 6 billion in Sweden in 2018.**

Figure 6. Geographic distribution of green bond issuance in 2017 (USD Bn)



Note: Country of Domicile classifications and terminology from Bloomberg used. SUPRANAT = Supranational; Taiwan = Chinese Taipei. Top issuers labelled in chart for illustration.

Source: SEB analysis based on Bloomberg and SEB data

The American green bond market surprised many with its first place country rank in 2017, expanding by over 140% YoY. Its composition of highly consistent activity is geographically unique; dominated by green securitizations and municipal bonds, which account for 91% of issuance. Two thirds of U.S. issuance (USD 24.8 billion) comes in the form of Green Asset Backed and Mortgage Backed Securities, led by Fannie Mae (the Federal National Mortgage Association) which printed USD 22.3 billion of green MBS in 2017[4] - more than all the green bonds issued in third-placed France. A further 26% (USD 9.7 billion) is in the form of green muni bonds issued by 39 individual municipal entities. Provided Fannie Mae continues with its impressive program, we see the **U.S. as having the potential to grow even further to USD 45 billion in 2018.**

Canada is also making an increasingly significant contribution to the North American green bond market, sitting just outside the top 10 in 2017 with USD 3.4 billion, but with clear prospects for 2018, as discussed in a **review article** contributed to this edition from the Province of Ontario. **We see the potential for over USD 5 billion of issuance in 2018 from Canada.**

As discussed above, the Asian green bond market has been led by China, and is the focus of an in depth commentary in this edition provided by the **Central University of Finance and Economics**. As we expected, China returned in 2017 with similar issuance magnitude, while also making important domestic strides. In a move that campaigners hailed as a "monumental" step in the global fight against climate change, the Chinese government confirmed the long-

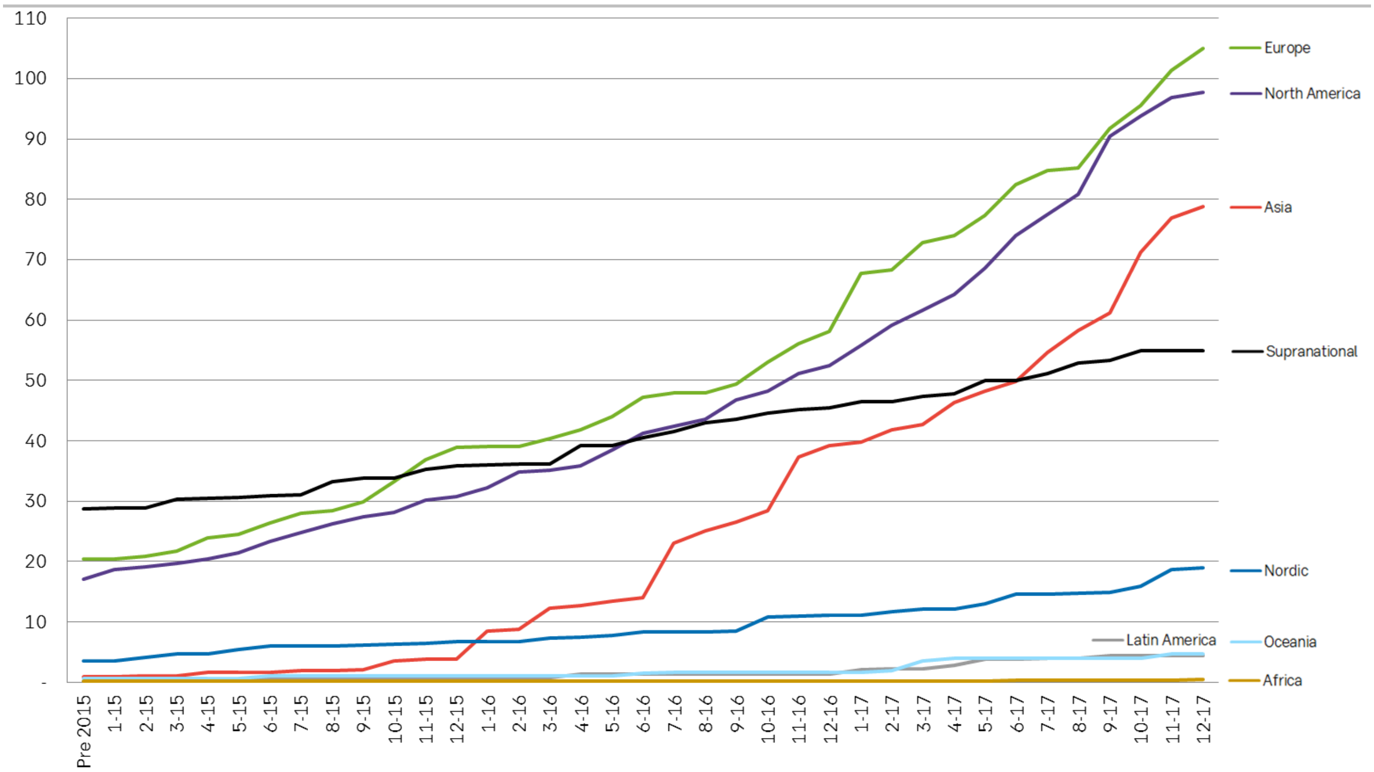
[4] The full list of green bonds issued by Fannie Mae is available at: https://www.fanniemae.com/multifamily/green-initiative-green-mbs

awaited national emissions trading scheme (ETS) which will create the world's largest carbon market once it comes into operation, dwarfing Europe's ETS in size and scope.

However, other parts of Asia also experienced a spike in activity in 2017. Japanese banks and corporates began to enter the market with USD 2.3 billion of issuance following green bond guidelines being launched domestically. **We see the potential for Japanese issuance to increase by up to 200% in 2017.** Following the launch of the ASEAN Green Bond Standards, and the Monetary Authority of Singapore's incentives, issuance began to pick up throughout South East Asia as well, with different types of structures emerging such as green sukuk in Malaysia. **Issuance in Singapore could grow by 75% in 2018.**

Other geographies where we expect growth in 2018 include Australia, with potential for USD 4 billion; Brazil and the United Kingdom (USD 3 billion possible for each); Denmark (USD 2.5 billion); Argentina, Austria, Finland, Hong Kong, Norway South Korea, and Switzerland each could achieve USD 2 billion; and a further 10 jurisdictions could potentially reach the USD 1 billion mark.

Figure 7. Regional evolution of green bond markets 2015-2017 (USD Bn)



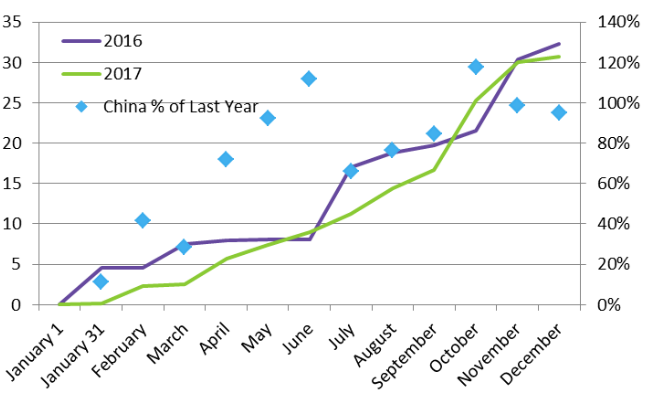
Source: SEB analysis based on Bloomberg and SEB data

As shown in Figures 8 and 9, the Chinese market appeared healthy and characterized by smaller but more numerous and diverse issues. LTM figures have held up most of the year in the USD 30 billion range. LTM figures for number of individual bonds issued out of China had been steadily increasing all year before resting in December.

The pipeline of announced Chinese deals also continued to appear solid, complementing signaling from Chinese authorities that green bond issuance in 2017 potential is "strong" and harmonization efforts being developed to attract foreign investment into the domestic green bond market, while providing domestic policy incentives. At the time of writing, the PBoC and CSRC had just jointly issued the *Green Bond Appraisal and Certification Guidelines (Provisional) Guidelines)*, announcing improvements to its national green bond certification system geared at boosting its green bond market.

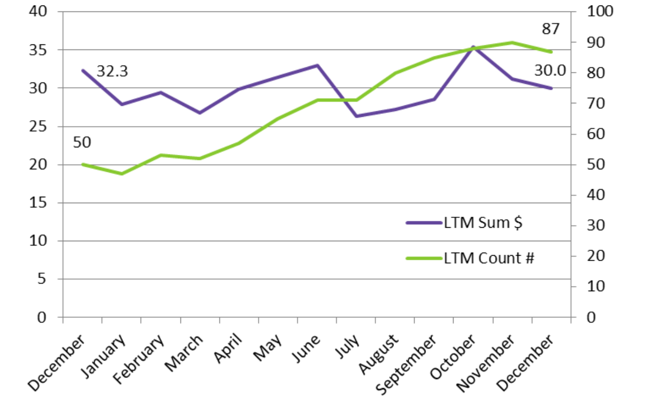
We see the potential for Chinese issuance rising once again to USD 34 billion in 2018.

Figure 8. Steady Chinese issuance catches up YoY (USD Bn)



Source: SEB analysis based on Bloomberg/BNEF and SEB data.

Figure 9. China: LTM Volume (USD Bn - L) and issue count (R)



Source: SEB analysis based on Bloomberg/BNEF and SEB data

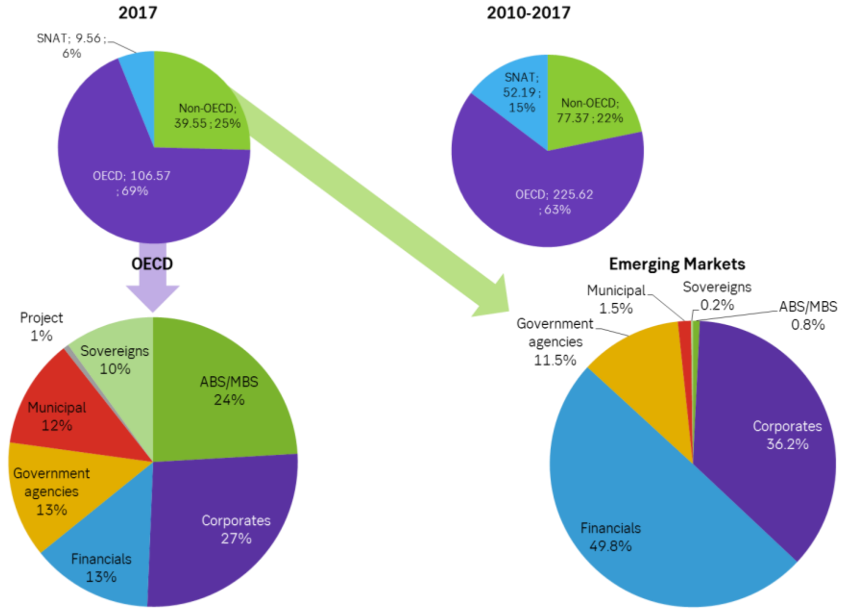
Expanding Emerging Market Opportunity and Currency Distribution

Consistent with the geographic trends described above, 75% of green bond issuance has occurred in OECD markets (USD 107 billion) and from supranational institutions (USD 9.6 billion). As illustrated in Figure 10, in the OECD, issuance is relatively evenly distributed across types of green bonds and sectors.

Issuance out of Emerging Markets and Developing Economies (EMDEs) continued its increasingly important growth trend. The shift in the overall composition of the market since the beginning of the year is noticeable with 25% of issuance now occurring in EMDEs, leading to a larger universe of higher yielding EM opportunities becoming available. The sectoral distribution in EMDEs looks completely different, and is heavily weighted towards corporate bonds; split between financials (50%), where the CNY presence is obvious, and non-financial corporates (36%).

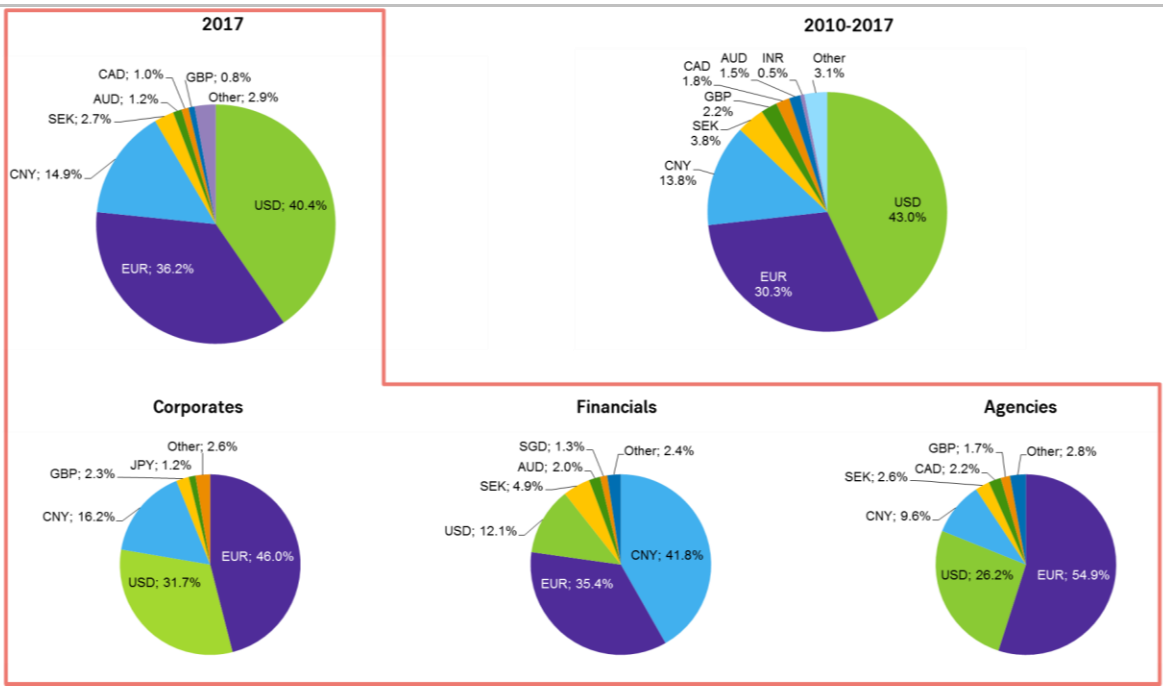
In terms of currencies (Figure 11), the key takeaway from 2017 was that the market shifted towards Euros, driven by a very active corporate EUR market (with non-financial corporates favoring EUR). The magnitude of the French Green Sovereign OAT definitely helped to push the EUR trend as well.

Figure 10. Regional evolution of green bond markets 2015-2017 (USD Bn)



Source: SEB analysis based on Bloomberg and SEB data

Figure 11. Currency distribution of green bond issuance in 2017 and market outstanding since 2010 (USD Bn)

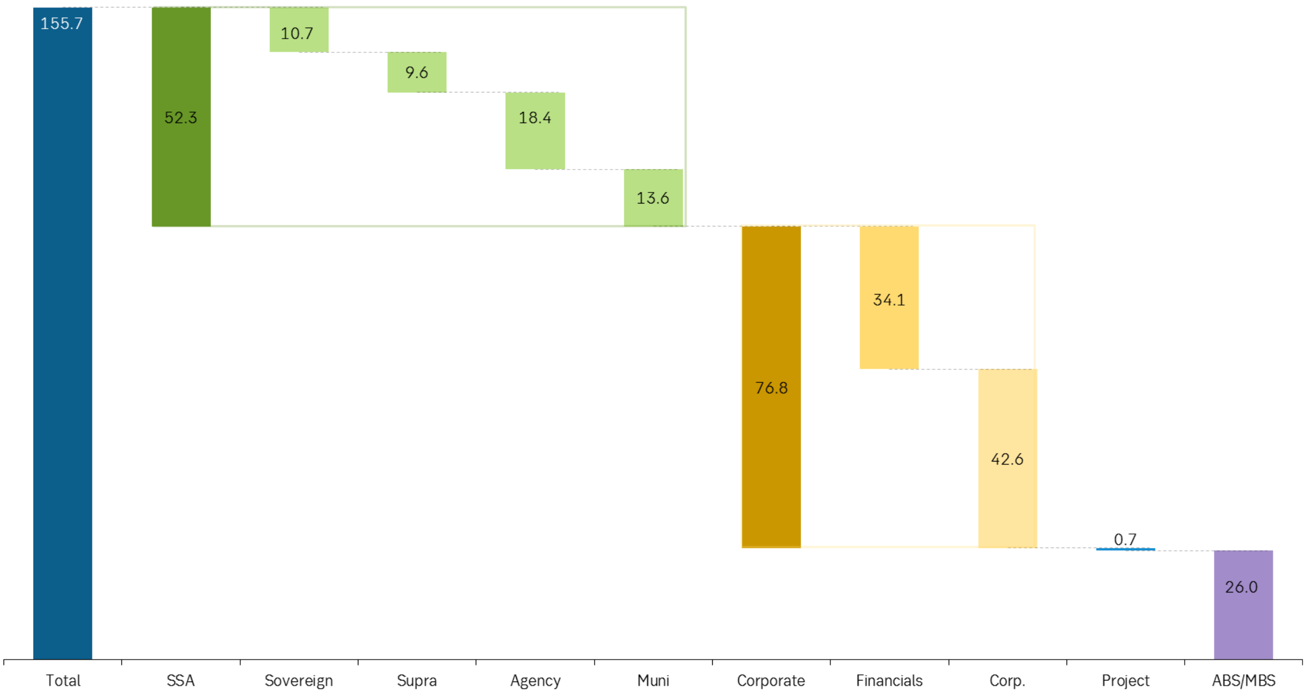


Source: SEB analysis based on Bloomberg and SEB data

Analysis by green bond issuer sector

SEB maintained its 2017 year-end green bond market potential issuance figures across all sectors unchanged since the beginning of the year with the exception of securitizations, where we put the sector on watch and then raised its potential to USD 20 billion.

Figure 12. Green bond issuance in 2017 by sector and sub-sector (USD Billion)



Notes: ABS/MBS = Asset Backed Securities/Mortgage Backed Securities; SSA = Sovereign, Supranational, Agency and Municipal, Regional and other sub-sovereign; Financials include Real Estate and Insurance; N-F Corp. = Non-Financial Corporates. SEB uses the BICS sector classification system with some adjustments using Bloomberg/MSCI green bond sector classifications. Bloomberg (see Guide to Green Bonds on the Bloomberg Terminal) methodologies used to qualify green bonds excluding pure plays.

Source: SEB analysis based on Bloomberg/BNEF and SEB data.

As discussed above, the market for ABS/MBS exceeded even that and finished the year with USD 26 billion, largely due to Fannie Mae's activity. In 2018, with the caveats discussed above, **we see the potential for USD 34-46 billion of new green securitizations.** The upper end of

our range would be in line with the OECD's conservative analysis for the potential for securitizations in 2015-2020.[5]

The emergence of the green sovereign market, which was described in previous editions, was in line with the quantum of issuance we had expected; however the much-awaited entrance of countries other than Poland and France materialized only right at the end of the year with small green sovereigns issued by Fiji and Nigeria.

With another three new countries reported as announcing their intentions for 2018 issuance (Belgium, Indonesia and Russia), and Poland and Nigeria confirming their intention to tap their sovereigns, the pipeline looks robust. Additionally, seven further countries are the topic of press reports and conjecture suggesting they are evaluating or planning a sovereign green bond.

As such, we see the potential for USD 11-14 billion of green sovereign issuance in 2018.

Issuance from **government agencies** jumped 57% YoY to USD 18.4 billion, with new large transactions from KfW adding to other national public financial institutions or development banks earlier in the year. We expect a gentler year in 2018 with USD 17.5 of issuance, with the potential for upside growth to 22 billion depending on certain regional activity.

Sub-sovereign issuance including from **municipalities and regions** rose continually to end the year up 54% YoY to USD 13.6 billion with the U.S. featuring prominently (as discussed above). We see strong growth potential in 2018 with USD 17-19 billion possible, depending on whether an infrastructure investment plan is passed in the U.S. Congress.

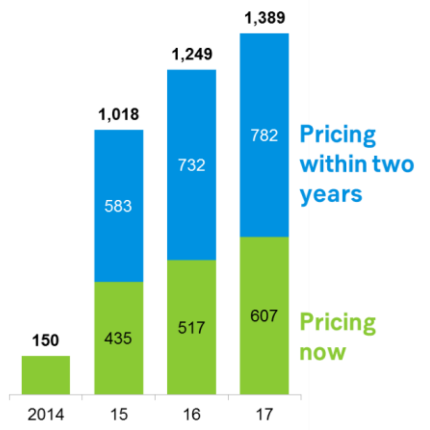
Non-financials drive an expanding and diversifying corporate bond market

On the whole, the **corporate** green bond sector turned in a magnificent performance with USD 77 billion, driven by a doubling in **corporate non-financial** issuance, standing at USD 42.3 billion. This rise can largely be attributed to large-scale participation by the European electric/utility sector but also with diversifying participation from technology, engineering, water, medical/healthcare and forestry, pulp and paper sectors.

In the margins of the One Planet Summit, nine of Europe's largest corporate non-financial issuers of green bonds (responsible for EUR 26 billion of issuance) publicly announced their pledge to double down on their green financing The pledge also calls upon other industrial corporates to consider issuing green bonds, with the companies joining forces to voice their commitment to the green bond market as part of their strategy, financing policy and their active engagement in the reporting debate and dialogue with investors.

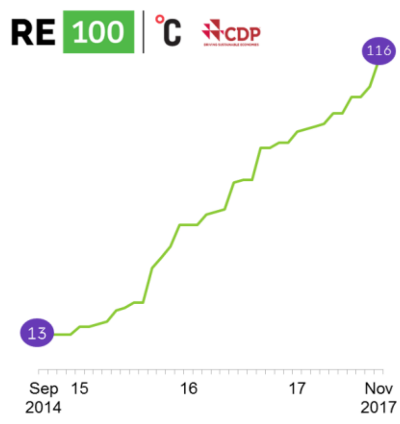
The year also observed a continuous increase in the number of multinational companies using shadow (internal) carbon pricing (Figure 13) and the number of companies committed to powering themselves 100% with renewable energy procurement surging to 116 (Figure 14), driving a market for corporate PPAs in the 4-5 GW range for the fourth year in a row. Non-financial corporates could add **USD 49.5-63 billion** to the market in 2018.

Figure 13. Multinational companies pricing carbon



Source: BNEF and CDP

Figure 14. Companies committed to 100% renewable power



Source: BNEF and http://there100.org/

The **corporate financial sector (including real estate)**, had lagged 2016 issuance earlier in the year caught up briefly over the summer, but just missed last year's extraordinary total by -3% to a still impressive USD 34 billion. In 2018 we expect in our baseline scenario another

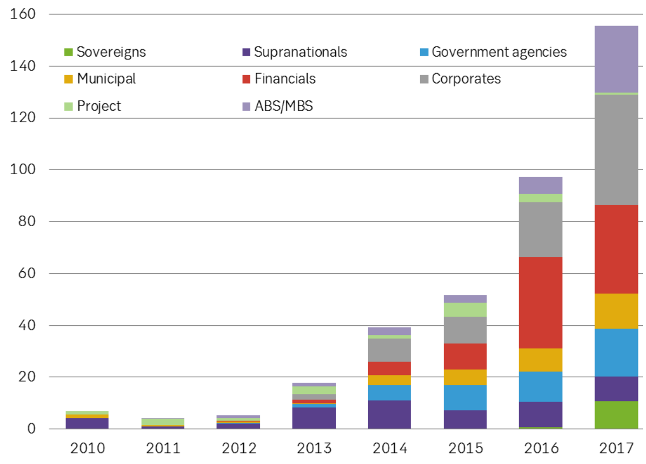
[5] In sustainable energy, energy efficiency and electric vehicles, in a 2 degree scenario, in four regions: See http://www.oecd.org/cgfi/quantitative-framework-bond-contributions-in-a-low-carbon-transition.pdf

strong but flat year as large financial institutions (including real estate in the West and large banks in China) return to service their balance sheet needs.

However much depends on whether green loans and mortgages take off, smaller financial institutions start to join the green bond market (especially in emerging economies) and if the insurance sector opens up further in 2018, following dipping its toes into the market this year. As such, we see s**trong upside potential for the market to hit USD 44 billion under these more optimistic assumptions.**[6]

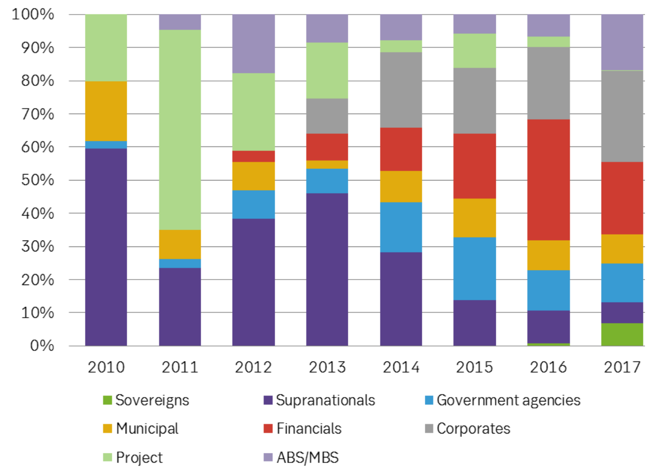
Supranational institution (Multilateral and Regional Development Banks) activity had been up and down throughout the year and ended flat YoY with USD 9.6 billion, just shy of what we had expected. We expect a similar result next year with between USD 9-10 billion of issuance, as supranationals explore other innovations including social and sustainability bonds.

Figure 15. Issuance evolution by sector 2010-2017 (USD Bn)



Source: SEB analysis based on Bloomberg/BNEF and SEB data. YTD through December 19.

Figure 16. Sector shares, issuance 2010-2017



Source: SEB analysis based on Bloomberg/BNEF and SEB data. YTD through December 19.

[6] Which exclude the possibility of any regulatory preferencing, should that occur.

2. Green Bond Announced Pipeline

- Banco Nacion Argentina
- Bank of Russia / Russia Green Sovereign
- Belgium Green Sovereign
- City of Barcelona Sustainable Bond
- Henang Yuguang RMB
- Indonesia Green Sovereign Sukuk
- IREDA green masala
- Jacinta Solar Farm
- KfW Benchmark USD and EUR
- Mexico City MXN
- Midpeninsula ROSD
- New Development Bank Green Panda
- Nigeria Green Sovereign Tap
- Poland Sovereign tap
- Sindicatum
- State Bank of India USD

Climate & Sustainable Finance SEB

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KfW Bankengruppe
Asset Management

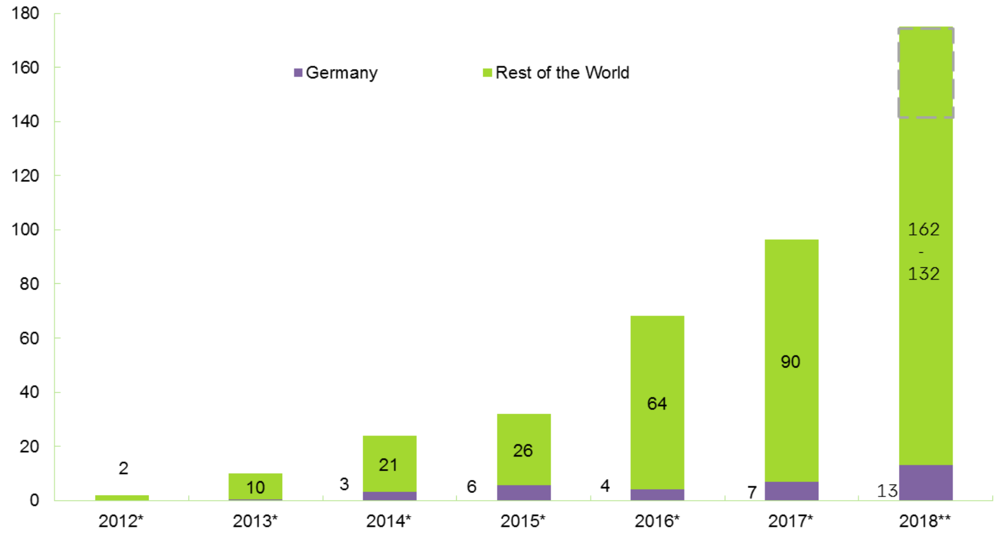
3. The prospects for the green bond market in Germany in 2018

In 2017, the German green bond market has developed substantially in line with the dynamic evolution of the global green bond market. On a year-on-year basis, the new issuance volume nearly doubled from EUR 3.5 billion to EUR 6.8 billion, making up 7% of this year's new issuance volume worldwide and positioning Germany as the 3rd largest market in terms of new issuance (source: Bloomberg data).

New German green bond issuers entered the market (e.g., Deutsche Hypothekenbank and LBBW) while regular issuers (e.g., NRW.Bank, DKB, Berlin Hyp and KfW) pursued their green bond activities. NRW.Bank and DKB followed KfW's role model adopting a dual approach as a green bond issuer and investor. As of today, KfW has issued Green Bonds - Made by KfW amounting to around EUR 13 billion, thereby being the second largest issuer of green bonds globally, and is building up a green bond portfolio with a target volume of EUR 2 billion. In 2017, KfW invested approx. EUR 350 million in green bonds. The total portfolio currently amounts to approx. EUR 920 million.

Diversification in terms of products was brought forward with German issuers introducing innovative green finance instruments over the years. The first green bond index was launched by a German index provider in 2014. In 2016, the first green Pfandbrief was issued by Berlin Hyp and the first green Schuldscheindarlehen (SSD) was brought to the market by the wind turbine provider Nordex. Other green covered bonds and SSDs followed in and outside Germany in 2017.

Global Green Bond Issues (in EUR billion)



Note: * Excl. asset-backed securities and US municipal bonds** SEB estimate (incl. asset-backed securities and US municipal bonds)

Source: Bloomberg

With regard to the profile of green bonds issuers, the German market is largely dominated by issuers from the banking and agency sector. KfW itself plays a prominent role holding a share of more than 65% of all green bonds outstanding. German corporates are still reluctant to enter the market. Innogy presented its debut issuance, even though formally issued out of the Netherlands. This is all the more worth noting given that in 2017, the global green bond market has been characterized by large corporate issuances and a further diversification in terms of industry sector. In addition, green bond issuance from public sector entities is lagging behind in the German market with Land North Rhine-Westphalia being currently the only German public sector sustainability bond issuer.

One of the reasons for the limited volume of green bonds issuance by German corporates and public sector entities is owing to the fact that capital market funding is not that common in Germany compared to many other countries. Given the easy access to funding via traditional loans from German financial institutions and the lack of clear funding advantage, incentive for potential issuers is low to undergo the process of setting up the structures required for green bond issuance and to assume the related efforts and costs.

Globally, it is positive to note that the exchange between the public sector, market participants, scientists and other stakeholders on sustainability, climate risk management and a corresponding financial infrastructure has intensified considerably.

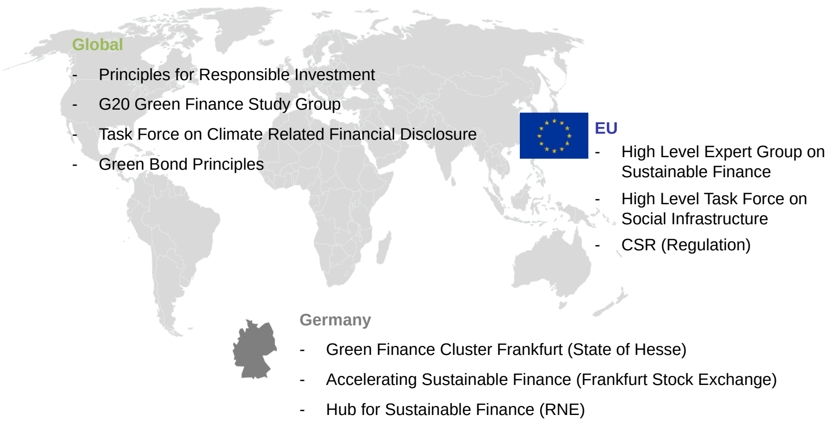
While Germany was relatively late in taking the journey to sustainable finance, it is has been catching up recently. In January 2017, the State of Hesse announced its intention to create a Green Finance Cluster Frankfurt which was officially launched in October 2017. The objective is to create a competence center for sustainable and green finance in order to play an active role in the current national and international discussions about a sustainable financial system. In May 2017, Deutsche Börse AG co-launched with major stakeholders from the Frankfurt financial center the Acceleration Sustainable Finance Initiative. By signing the so-called 'Frankfurt Declaration', the signatories committed themselves to join forces in order to develop sustainable solutions and new structures for a sustainable capital market. Working groups with dedicated tasks have been set-up with focus on Sustainable Products & Services, Impact Investing & Financial Inclusion and ESG data.

With the view to consolidating and coordinating these current and already existing initiatives in a sensible way, Deutsche Börse AG and the German Council for Sustainable Development (*Rat für Nachhaltige Entwicklung*) decided in summer 2017 to start a strategic cooperation. The main tasks of the newly created Hub for Sustainable Finance are to coordinate joint activities and identify potential areas and measures to promote sustainable finance in Germany. Based on these findings the German Council for Sustainable Development will advise the German Federal Government. KfW is active in all these initiatives.

Sustainable finance is also gaining relevance in the German public sector asset management. The investment guidelines for the EUR 24 billion German Fund for the Financing of Nuclear Waste Disposal (*Fonds zur Finanzierung der kerntechnischen Entsorgung*), created in 2017, specifies that investments have to follow sustainability criteria. Deutsche Bundesbank recently organized a portfolio day with public sector representatives from the German government and federal states in order to discuss the incorporation of **E**nvironmental, **S**ocial and **G**overnance aspects in the public sector asset management.

The German activities form part of a broader development. In various financial centers similar initiatives have been organized. At European level, a milestone was set with the creation of the European High-Level Expert Group on Sustainable Finance, in 2017 an interim report with recommendations was published, the final report is scheduled for January 2018. The report inter alia refers to the recommendations of the Task Force on Climate-related Disclosure and it is getting increasingly obvious that the TCFD recommendations will have significant impact on the "real economy" as well as on the financial sector.

Green Finance – Sustainable Finance



Source: KfW

While it is difficult to exactly quantify the influence of all these initiatives and developments on the German green bond market and its prospect for 2018, it is clear that they definitely contribute to raising awareness amongst German investors and bond issuers about green and sustainable finance thereby broadening the scope of potential green bond issuers and investors, including the public sector.

KfW will continue its green bond activities. It plans to issue at least one large-scale green bond in both euros and US dollars in 2018. It will also carry on building up its green bond portfolio and taking an active role in initiatives like the Green Bond Principles with a view to further promote the green bond market, both globally and in Germany.

Climate & Sustainable Finance

SEB

IDB Inter-American Development Bank

IDB Invest

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4. The Latin America and the Caribbean (LAC) green bond market in 2017

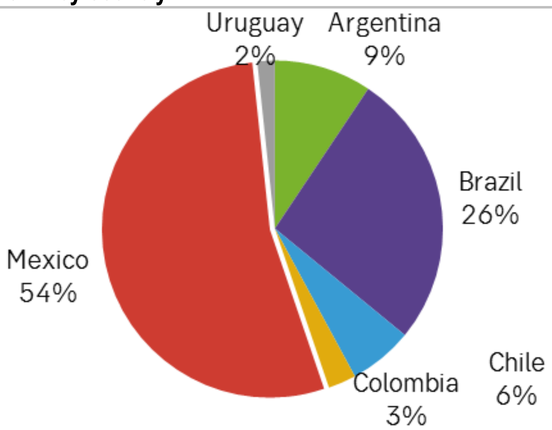
Green bond issuance in Latin America and the Caribbean (LAC) continues to grow, albeit the region remains one of the smaller markets compared to the US, Europe and especially Asia. Total issuance to date in LAC for 2017 has reached an overall market value of US$8.1 billion for 18 transactions from 15 issuers. The 2017 market value is more than twice the US$3.7 billion in 2016, and US$1 billion in 2015.

With almost 80% of the total regional market, Mexico and Brazil dominated 2017 issuance. However, it is worth noting the issuance that occurred in Argentina with two mid-sized bonds from two provinces to finance wind farms within the national renewable energy program RENOVAR.

In terms of issuers, state-owned vehicles and subnational entities accounted for more than 50% of the market value, this also because of the outsized issuance for the Mexico City Airport. Corporates and financial institutions followed with 25% and 20% of the total market respectively. National Development Banks in Brazil, Colombia, and Mexico were the most active issuers among the financial institutions,

Finally, the majority of the bonds were issued with 10-year maturity; however the average tenor of the new issued paper increased from 9 to 11 years, with two 30-year bonds and one 20-year bond contributing to such increase.

Total 2017 green bond issuance in LAC broken down by country



Source: Cepal (2017), Climate Bonds Initiative (2017)

Notable issuance from 2017 by type of issuer and the role of Multilateral Development Banks

Notable Public Sector Issuance:

Public Sector Issuance represented the majority of green bonds for 2017, with issuance from the Mexican Government, 3 National Development Banks and 2 Provinces in Argentina.

The Mexican Government completion of the US$6 billion green bond program issued across 2016 and 2017 to finance the development and construction of the new Mexico City Airport, expected to become the largest hub in Latin America, is the most notable issuance. The bonds, the largest green bond program so far in LAC, have been rated at the lower level of investment grade (Baa1 / BBB+), and are backed by a collateral structure based on a securitization of passenger charges to be collected by the Mexican government from airlines operating at the existing airport and the new airport. The bond program received excellent green rating scores by both S&P (E1) and Moody's (GA1) thanks to a strong commitment to sustainable construction of the airport based on a program of certified green buildings, renewable energy (mainly photovoltaic solar), and water treatment investments.

Three National Development Banks issued a total of US$ 1.292 billion, with one large issuance in US Dollars (BNDES), and two issuance in local currency for the domestic markets market (Banobras in Mexico and Bancoldex in Colombia). Worth mentioning that the bond from Banobras, combines a green dimension (Sustainable transport; Renewable energy; Energy efficiency; Water efficiency and wastewater management; Pollution prevention and control, Disaster recovery) with a social dimension (Affordable basic infrastructure to vulnerable segments of the population; Public services infrastructure) signaling the beginning of a strong

interest in the region for a wider offering of instruments for sustainable investments that would encompass concerns around climate change and social development.

Notable Private Sector Issuance

In Brazil, it is worth noting that all private issuers have been corporates from the pulp and paper (Klabin, Suzano and Fibria), food (BRF) and energy industries (Omega and Rio) (Green Bond Database, 2017). The sharp increase in bonds labelled "green" observed in Brazil in 2017 is partly due to the development and release of green bond guidelines in 2016 by the Brazilian Business Council on Sustainable Development (CEBDS) an the Brazilian Bank Federation (FEBRABAN).

In Colombia, it is worth highlighting the 433 billion peso deal issued by Davivienda, which the Bogotá-based bank said was the largest green bond issued by a private financial institution in Latin America. Davivienda's issuance follows the one of Bancolombia, who with a US$ 116 million (350 billion peso) green bond was the first to set foot in the market in December 2016.

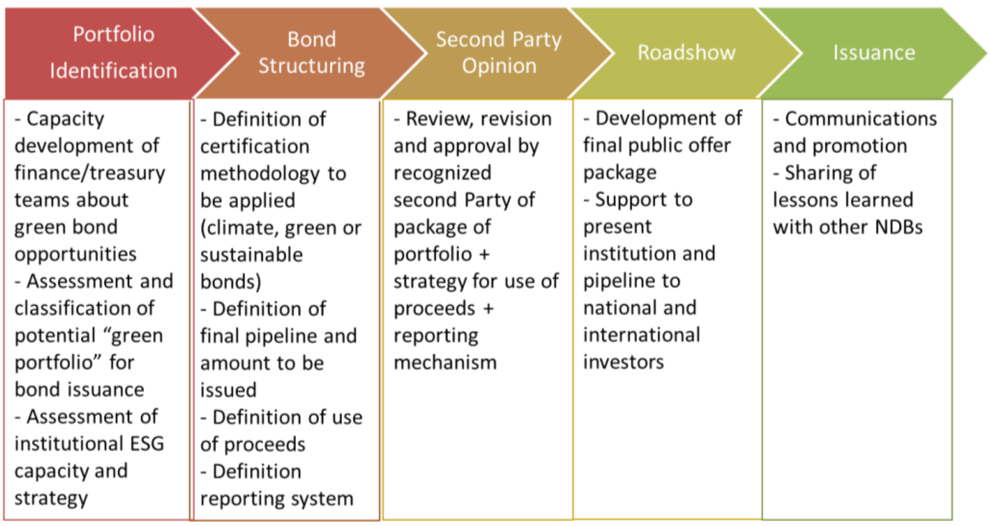
The role of Multilateral Development Banks in promoting a green bond market in LAC

Multilateral Development Banks are encouraging and supporting the issuance of green bonds in the region through financial and non-financial products as well as dialogue with relevant government-related entities and authorities.

The Inter-American Development Bank Group (IDB) – a Multilateral Development Bank operating in LAC – for instance, has been promoting the development of the market by working with both public and private sector entities. The public sector arm of the Group, IDB, in 2016 launched a technical cooperation program to support nine NDBs in their efforts to raise private funds at adequate maturities in both local and international capital markets, through the issuance of green bonds or sustainable bonds.[7] By offering credit enhancement instruments to some of these NDBs, IDB can help attract national and international institutional and impact investors and, hence, support the ability of these issuers to diversify sources of funding while promoting investments with high positive social and climate impacts.

As shown in the figure below, the IDB's support provides for institutional capacity building at all preparatory stages for issuance.

IDB Group's holistic technical support to issuers



Bancoldex was the first beneficiary of the program to complete the assessment by issuing green bonds in August 2017 for COL 200 billion. The issuance was the first one made through local stock markets in Colombia (other 2 previous issuances made by private banks were made through private placements), and had an oversubscription of 2.5 times.

[7] The program is financed by the Switzerland's State Secretariat for Economic Affairs (SECO) for Colombia, Peru and Ecuador – and of the International Climate Initiative (IKI) of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) via the LGI program for other countries in the region (Mexico, Brazil and potentially Argentina for instance).

BDMG, Findeter and Fira are in advanced stages of support. In many cases, with the common objective to promote transparency and standardization in green bonds markets globally, the IDB is working closely with the Climate Bond Initiative in supporting its clients to develop detailed reporting methodologies of positive environmental impacts for sectors that are not yet covered by the existing green bond metrics and standards, or to work as pilot projects for new standards – i.e. potential small hydro power (for Findeter) and GHG emissions reductions from greenhouses (for FIRA).

IDB Invest – the private sector arm of the IDB Group – has so far supported issuance in Mexico and Uruguay, and is seeking to expand its efforts across the region. In Mexico, IDB Invest with the support of donors' resources is structuring the first small scale "green" asset aggregation and securitization platform to unlock funds from institutional investors for small scale energy efficiency projects developed by Energy Service Companies (ESCOs).[8]

In Uruguay, IDB Invest has closed two landmark green bond certified private placement transactions namely,

- Campo Palomas, a 19.5-year amortizing B-bond for US$ 135.8 million used to finance the operation of a 70 MW wind farm. This was the first green-certified bond issued in Uruguay. U.S. and Canadian institutional investors invested in the bond, many of them invested in Uruguay for the first time as a result of this innovative structure.
- La Jacinta, a 65 million B-bond issuance for a US$81 million 50 MW solar power project. At a 24.5-year tenor, it is the longest non-sovereign bond issued in Uruguay.

New Instruments: Intermediate Access, Bonds bundling and Credit Enhancement

"Bundling" of pipelines is a strategy that can be pursued to attract international investors. This is because few issuers in LAC have the necessary portfolio and/or capacity to go for international public bond (international investment banks usually recommend a USD300 million minimum threshold for an international issuance). Those international issuances seem accessible only to a NDBs with large mono sector portfolios such as big renewable energy portfolios (BNDES, Nafin) or for larger infrastructure projects with either large public sponsors (as in the case of Mexico City Airport) or private ones (as for Genneia SA in Argentina). In most of the cases, the potential issuers in LAC, mainly financial institutions, need to work on less 'low hanging fruit' type of green bond issuance projects with smaller and multi-sector portfolios.

BNDES' Fundo de Energia Sustentavel was launched in March 2017 and aims to support infrastructure projects, primarily in assets supporting the transition a low carbon economy. The target size of the sustainable energy fund is BR$500 million (US$ 162.9 million /EUR 150.9 million).[9,10] The aim was to create an innovative financing vehicle that meets the needs of Brazilian investors, as Brazilian pension funds need a vehicle that provides diversification in infrastructure investments, but also the expertise on infrastructure projects. The structure of the sustainable energy fund is based on the Infrastructure bonds law 12,431 and CVM instruction 476. Managed by a 3rd party fund manager – Vinci - the new fund will have 15 years tenor, guarantee from BNDES, and will be tradeable and so will help foster a secondary market (which is currently very limited). The Fund will allow diversification to investors and provide project developers access to long term financing.

Multilateral Development Banks are also developing new instruments and strategies to improve the credit profile of the bond to meet institutional investors' risk appetite. IDB Invest, for instance, can provide a construction guarantee product to help partially mitigate construction risk for institutional investors and to improve ratings for the underlying transactions.

IDB Invest B-Bond structure provides political risk coverage for institutional investors looking to invest in new countries in Latin America. Under this structure, institutional investors purchase notes from a special purpose vehicle that purchases a participation in the IDB Invest loan. The structure allows investors to benefit from IDB Invest's privileges and immunities in its member countries and its in-depth knowledge of the Latin American market. In the Brazilian market, IDB Invest has developed a Real-denominated Total Credit Guarantee to de-risk long-dated infrastructure debentures for renewable energy projects. The structure is designed to increase

[8] For more information, please see IDB Invest web site here.
[9] http://www.bndes.gov.br/wps/portal/site/home/imprensa/noticias/conteudo/bndes-seleciona-vinci-como-gestor-do-fundo-de-energia-sustent-vel/ | https://renewablesnow.com/news/vinci-partners-to-manage-sustainable-energy-fund-in-brazil-562355/
[10] http://www.madronalaw.com.br/english/artigo/energy-securitization-fund/

the participation of risk-averse investors in the local market and to extend the tenors available to green projects.

For international and local investors, IDB Invest also provides a partial credit guarantee structure whereby IDB Invest would guarantee the timely payment of principal and interest to investors. The product can be used to provide a ratings uplift to enable non-investment grade products to achieve an investment grade rating.

Liquidity Credit Line – Prompted by the aversion towards construction risks in capital markets, this liquidity credit line (or *stand-by letter of credit*) would provide financial support if there is a shortfall in construction financing or debt servicing due to timing mismatch of cash flows. This could be used for infrastructure primarily, but could prove key in mitigating the highest risk perceived with more innovative technologies (e.g. renewable energy) or with traditional infrastructure constructed in a more sustainable manner (e.g. including climate resilient components).

Green Bond Market Development

Investors' enthusiasm is expected to grow further in LAC. This is highlighted by for instance, by the interest signaled by domestic institutional investors in supporting the growth of the market. This is in particular demonstrated by the 'Green Bonds Statement' signed in 2016 by Brazilian investors with over US$ 575 billion (BRL 1.80 trillion) of assets under management and, in 2017, the signature of a similar statement by 57 Mexican investors with US$ 225 billion (MXN4 trillion) under management.

Overall, the pipeline of infrastructure investments expected for the region in the next decade is significant and estimated by IFC at around US$2.6bl (IFC, 2016), as several countries in the region are launching large scale investment plans in renewable energy, transport and urban infrastructure (eg Brazil's multisector Projeto Crescer, Argentina's renewable energy program RENOVAR, and Mexico's large scale renewable energy auction program).

Further, with the recent upgrades to Argentina and several recent successful climate-related issuances for the Province of La Rioja and Jujuy, there may be opportunities in the near future for more green bonds as investors look to re-finance projects developed under the Renovar program, that so far has awarded 59 projects for a total of 2.4GW of power and US$4bl of investment value (Latin Finance, 2017).

Following on the success of the Mexico City Airport's green bond issuance, Mexico's energy reforms are expected to open up green bond issuances for renewables and energy efficiency projects as the first wave of investments under the new reforms reach project completion and are re-financed.

Many governments in the region are starting to think about the role they should play in the development of domestic green bonds markets. In Colombia for example, after the Bancoldex issue, the Bolsa de Valores de Bogota is starting a strategic project to look at the potential of a Colombian green bond market and the regulation framework that could foster its success.

In November 2017, the Mexican Stock Exchange (BVM) and the Exchange of Buenos Aires (BCBA) signed a joint agreement to support the development of green bonds and sustainable financing in the two countries, relaunching the efforts of the Sustainable Finance Division of the BCBA in a partnership with Mexico2, the green market platform of BMV, for a coordinated development and dissemination of best practices in green financing and green bonds.[11]

The IDB Group is working with different players such as Government Agencies, Financial Sector regulatory bodies or domestic Stock and Bond Exchanges to support the design of national strategies to incentivize domestic green and sustainable bonds markets. Pilot projects are currently being developed in Brazil, Mexico and Ecuador. In particular, in Brazil, an innovation finance laboratory was recently launched together with the local capital market regulator (CVM) and ABDE. The Laboratory has a working group bringing together regulatory bodies (CVM, Central Bank, insurance regulator), development banks (Caixa, BNDES, Banco do Brasil), lines ministries (planning, finance), investor associations and stock markets to discuss and identify specific solutions to promote the local green bond markets, in particular, with regards to:

- Potential regulatory incentives for green bonds (fiscal, pension funds regulations, asset management regulations, etc.)

[11] http://www.mexico2.com.mx/noticia-ma-contenido.php?id=172

- Potential for green sovereign bond issuance
- Mechanisms to stimulate securitization and insurance participation in markets
- Mechanisms to stimulate market transparency and participation

Finally, the IDB Group has launched in 2017 a series of investor meetings (the *"LAC Sustainable Infrastructure Investment Network*") to be held during 2017/18 with the objective of bringing together investors active in the region, project developers, lenders and regulators, as well as line ministries and public-private partnerships agencies in charge of developing pipeline of projects, to facilitate discussions on the barriers and solutions to mobilize domestic capital markets towards sustainable infrastructure investment in LAC, and to capture and disseminate success stories and lessons learned. During 2018, the IDB Group is planning to host further four events in partnership with local institutions (such as stock exchanges and market regulators) to continue the development of this Sustainable Infrastructure Investment Network.

Details on LATAM green bonds

Country	Name	Amount (million)	Issue Date	Term	Rating	Market	Sector	Type of issuer
Brazil	Fibria	USD 700	Jan-17	10	Ba1/BBB-/BBB-	International	Agriculture & Forestry	Corporate
Argentina	Genneia S.A.	USD 350	Jan-17	5	B3/B+	International	Energy (wind)	Corporate
Argentina	Province of La Rioja	USD 200	Feb-17	8	B/B-	International	Energy (wind)	Sub-sovereign (Municipal)
Chile	Inversiones CMPC	USD 500	Mar-17	10	Baa3	International	Multi-sector	Corporate
Colombia	Davivienda	COP 433,000	Apr-17	10	AAA	Local	Multi-sector	Commercial Bank
Brazil	BNDES	USD 1,000	May-17	7	Ba2/BB	International	Energy (wind & solar)	Development bank
Brazil	Itarema Geração de Energia S.A.	BRL 112	May-17	11	AA	Local	Energy (wind)	Corporate
Brazil	Potami Energia S.A. (Omega Geração)	BRL 42	May-17	9	AA	Local	Energy (wind)	Corporate
Mexico	Grupo Rotoplas SAB	MXN 1,400	Jun-17	10	AA-/AA	Local	Water and sanitation	Corporate
Mexico	Grupo Rotoplas SAB	MXN 600	Jun-17	3	AA-/AA	Local	Water and sanitation	Corporate
Uruguay	IIC (Invenergy Wind)-Campo Palomas Finance Ltda.	USD 136	Aug-17	19	Baa3	B-bond	Energy (wind)	Dev. bank/debt issuing vehicle
Colombia	Bancóldex	COP 200,000	Aug-17	5	AAA/AAA	Local	Multi-sector	Development bank
Mexico	Banobras	MXN 4,000	Aug-17	7	AAA/AAA	Local	Multi-sector	Development bank
Brazil	Suzano Papel e Celulose	USD 200`	Sep-17	30		International	Multi-sector	Corporate
Brazil	Suzano Papel e Celulose	USD 200`	Sep-17	9		International	Multi-sector	Corporate
Mexico	Mexico City Airport	USD 3000	Sep-17	30	Baa1/BBB+/BBB+	International	Transport	State-owned/debt issuing vehicle
Mexico	Mexico City Airport	USD 1000	Sep-17	11	Baa1/BBB+/BBB+	International	Transport	State-owned/debt issuing vehicle
Argentina	Province of Jujuy	USD 210	Sep-17	5	B/B-	International	Energy (wind)	Sub-sovereign (Municipal)

Source: Cepal (2017), Climate Bonds Initiative (2017)

Prospects for international participation in China's green bond market: The potential for international integration

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When discussing green bonds in China in the past, the question was *why* this was important. Today, the question is *how* green bonds can be scaled up. While becoming the world's largest bond market, based largely on domestic organizations issuing and investing, China is gradually opening up to foreign investors. China has a clear interest in promoting this process, as the country needs an estimated minimum of RMB 3-4 trillion each year in green investments from 2015 to 2020, of which at least 85% needs to come from the private sector[12]. To meet this financing need, it is further estimated that 20% of all financing in China must be within green categories. Today, foreign investment in China's green bond market has a great scope for expansion since foreign holding today only constitutes a meagre 2% of the general bond market.

Simultaneously, international investors have shown clear signs of interest in green assets. Surveys show that more than 50% of European investors are interested in sustainable investing. Another survey by the Official Monetary and Financial Institutions Forum shows that 38% Chief Investment Officers in public sector institutions are interested in buying more green bonds[13]. Scaling up foreign investment in Chinese green bonds therefore has both of the underlying prerequisite circumstances, namely Chinese interest in attracting capital and foreign interest in investing. These mutual interests can be realized either by foreign investors buying bonds on the Chinese on-shore market, or Chinese bonds being listed off-shore on international markets.

Current status of foreign investment and international issuance

China has recently launched a number of initiatives to increase access to Chinese financial markets for international investors. These include the Bond Connect Program, allowing international investors to invest into the Chinese bond market, within a daily limit, through Hong Kong based trustees. This initiative simplifies the process and allows for investors of smaller scale to get involved. Furthermore, the China Interbank Bond Market Direct, as launched by the PBoC in February 2016, facilitates access for a wide range of investors. Rules are relaxed for banks, securities companies, fund management companies, insurance, pensions, and other long-term investors to enter the Chinese bond market, which had previously been largely restricted to central banks, sovereign wealth funds, and few other approved financial institutions. These initiatives allow for increased access by foreign investors compared with the existing QFII/RQFII schemes, and provide a sense of the strategic direction of improving access in the future.

Alternatively, Chinese green bond issuers can reach international investors by issuing off-shore. Recent examples include the Bank of China on the Euronext Exchange, ICBC on the Luxembourg Exchange, and China Three Gorges Corporation on the Irish Stock Exchange. Most offshore issuance are in both RMB, Euro and USD. Another way is for foreign investors to invest in Chinese green bonds through indexes listed on international exchanges. An example of this is the CUFE-CNI Green Bond Index Series launched on the Luxembourg Green Exchange, allowing investments in a wide range of Chinese green bonds. The purpose of such an index is to provide greater transparency and facilitate access to green securities for investors in Europe.

Overcoming challenges on both sides to scale up integration

Realizing greater foreign participation in the Chinese green bond market faces a number of fundamental perception and practical challenges. On one side of the equation, the Chinese green bond market has to continue to grow. Therefore, a challenge is to make issuers understand the numerous real advantages of green bonds. This includes a green premium in the primary market. Despite the limited size and history of the green bond market, the evidence suggests that a green premium does indeed exist, according the Bank of International Settlements[14], HSBC[15], and Natixis[16]. It further entails the advantage of being on included on

[12] Ma, J. (2017). *Establishing China's Green Financial System.* GFC, Green Finance Series
[13] Reuters (2017). *Public sector investors favor real estate, renewables – survey.* Retreived from: https://www.reuters.com/article/us-global-cenbank-assets/public-sector-investors-favor-real-estate-renewables-survey-idUSKBN1930CU
[14] Ehlers, T. & Packer, T. (2017. Green Bond Finance & Certification. *BIS Quarterly Review, September 2017*
[15] HSBC (2017). *Global Green Bonds*. HSBC Research: Global Fixed Income

green indexes and top 100 lists, as often used in China. In China, having a green profile also allows companies in some areas to access cheaper financing from banks through subsidized interest rates, guarantees, and transaction costs compensation. Issuing green bonds also provides a positive reputation and market signal in the eyes of many investors, while banks have the opportunity to refinance green credit extended previously through new green bonds with a longer maturity. This process is directly encouraged by the China Banking Regulatory Commission. Lastly, not all bonds that meet the criteria of green bonds, are necessarily labelled and issued as green. The ChinaBond-China Green Bond Index includes 759 bonds at a total value of RMB 2.45 trillion[17], compared to labelled green bonds approaching RMB 1 trillion. It is further estimate that before green bonds were introduced, about 30% of corporate bond issuance would have qualified as green[18]. As issuers become increasingly aware of the advantages of green bonds, labelling bonds as green will increase.

As another challenge, international investors also have to comprehend the arguments for investing in green bonds, in China and in general. Compared to conventional bonds, green bonds have a higher degree of transparency and information disclosure, allowing investors to make better informed decisions. Furthermore, green bonds have a lower volatility than conventional bonds and trade slightly higher in the secondary market. While liquidity is lower for green bonds, the level remains adequate for most investors. Lastly, investing in green bonds provides a positive reputational and market signal.

In addition to these overarching issues, foreign investment in Chinese green bonds faces specific challenges when it comes to on-shore and off-shore bonds respectively. For investments into China, foreign investors lack understanding of the Chinese green bond market. This includes aspects such as green bond categories, management of proceeds regulations, pre-issue verification and audits, as well as understanding how to find information on these areas. Another issue is that a two-part verification by a Chinese and an international organization, while dealing with some of the above issuance, increases the transaction costs. In regards to green bond categories, the Chinese standards of the Green Finance Committee and the NDRC will be revised and harmonized in 2018. Moreover, the Green Finance Committee is working with the European Investment Bank on harmonizing green bond standards between Europe and China. The first step of this work-stream has been completed as of November 2017, providing a framework for compatibility between the standards, allowing investors to make a direct comparison[19]. Lastly, as mentioned above, China is opening and expanding a number of methods allowing for large and small scale international investors to enter the Chinese mainland green bond market.

Chinese green bonds outside of China have been well received by international investors, suggesting a large potential for further issuance. The challenge is to incite further issuance by Chinese organizations abroad. This is carried out by improving the knowledge of issuers on the possibility and procedures for foreign issuance. As the process is different than for domestic issuance and as only 10 cases exist today, the practice is yet to be institutionalized in the financial industry. For example, foreign issuance has to undergo a different approval procedure by the NDRC based on quotas. In addition to the above-mentioned general advantages of green bond issuances, doing so in international markets allow Chinese organizations to use both USD and Euro. To meet the great potential of foreign issuance, the success stories of the 10 existing cases is expected to incite a substantial increase looking forward.

Ultimately, the rapid expansion of green bonds in China shows the pace at which Chinese capital markets can develop toward strategic political priorities. As the domestic market continues its expansion, the next step is to internationalize the market. This internationalization process has the potential to developed as rapidly as the domestic process. Yet, it depends on overcoming a number of issues in regards to Chinese regulations, Chinese issuers, and foreign investors. As serious efforts are underway on each of these, we can expect the internationalization of Chinese green bonds to expand substantially in 2018.

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[16] Natixis (2017). *Is the EIB paving the way for a "Green Premium"?*
[17] China Central Depository and Clearing Co., Ltd (2017). *ChinaBond China Green Bond Index, ChinaBond China Green Bond Select Index, Factsheet*
[18] China Green Finance Committee (2015). *China's Green Bond market is promising.* Retrieved from: http://greenfinance.org.cn/displaynews.php?id=462
[19] China Green Finance Committee & the European Investment Bank (2017). *The Need for a Common Language in Green Finance*

Climate & Sustainable Finance SEB

Ontario

Ontario Financing Authority

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The Canadian Green Bond Market

Over the past three years, Ontario's economy has outpaced all G-7 countries. For 2017, the most recent private-sector real GDP forecast is about 3.0% for Ontario and roughly the same for Canada. Canadian interest rates and oil prices are expected to rise over the next three years which should provide support for the Canadian dollar.

The Canadian dollar green bond market made substantial progress in 2017. Activity picked up in the market in terms of both the volume of issuance and the breadth of borrowers. This was a very positive development as the market welcomed a number of new entrants.

The Province of Ontario issued its third Canadian dollar green bond in January of 2017. This 6-year issue further demonstrated Ontario's commitment to the green bond market and was notable for its size of C$800 million. As a re-opening of its previous green bond it increased the overall issue size to C$1.55 billion and provided even greater secondary market liquidity. Ontario is the largest borrower in the Canadian green bond market and is planning its fourth Canadian dollar green bond issue in early 2018.

The Province of Quebec entered the green bond market with an inaugural 5-year C$500 million offering in February which by all accounts was a very successful issue and more than met the borrower's expectations. Quebec is the second Canadian province to move into the Canadian green bond market and, like Ontario, expects to be a frequent issuer in this market in future.

In August, Export Development Canada, Canada's export credit agency which is wholly owned by the Government of Canada, did its first Canadian dollar green bond (C$500 million 5-year issue), which was a departure from its U.S. dollar green bond program. Again, it was a very successful issue which was substantially oversubscribed with broad investor and geographic distribution.

In early November, the City of Ottawa did an inaugural green bond issue which was also the first green bond from a Canadian municipality. Although a somewhat smaller transaction of C$102 million, it was a 30-year issue and was also heavily oversubscribed.

By the end of the year, overall issuance in the Canadian dollar green bond market increased from C$1.25 billion in 2016 to C$1.902 billion in 2017. Demand for green bonds in 2017 has more than kept up with increased supply and new investors, both domestic and international, continue to come into the market. In general, Canadian green bonds have been anchored by Canadian investors, with domestic investors accounting for in excess of 60% of total distribution. Issues have been oversubscribed and have traded in line with non-green bonds.

Building on the momentum established in 2017, the outlook for the Canadian dollar green bond market in terms of total issuance looks positive for 2018. Canadian provinces are expected to continue to access the market and there may be more opportunities for Canadian government borrowers and municipalities. As the market becomes more established it also becomes easier for other borrowers to enter the market which may lead to even greater credit diversification in 2018.

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The need for a common language in Green Finance - Towards a standard-neutral taxonomy for the environmental use of proceeds

China's Green Bond Endorsed Project Catalogue and The Common Principles for Climate Mitigation Finance Tracking mapped and compared

Phase I Report of Joint Research by European Investment Bank Green Finance Committee of China Society for Finance and Banking

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In June this year, EIB celebrated the tenth anniversary of its first green bond with a new reference green bond of 30 year tenor, the longest green benchmark ever issued until then. It was a strong statement that highlighted both the healthy dynamic of the segment and the EU Bank's commitment to its further development.

The roots of EIB's strategic approach to green bonds lie in the Berlin Declaration of 2007, which put energy and climate protection at the heart of European integration, as well as in the concomitant EU Energy Action Plan, which set ambitious GHG-emission targets and engaged the European Investment Bank in their implementation on the ground.

While upscaling climate action lending, to renewable energy and energy efficiency in the first place, the Bank decided to actively involve stakeholders in its endeavours, putting accountability and precise definition of the eligible projects at the core of its dialogue with capital markets.

New issuance is only one part of this dialogue, which is also supported by ongoing engagement in the area of best practice. In the past years, EIB's contributions have ranged from the upgrade of its own allocation and reporting to the promotion of impact reporting harmonization and the start of ex-post reporting as well as the provision of "reasonable assurance" to investors through independent external audit.

Widespread recognition and credibility, sealed by chairmanship of the executive committee of the Green Bond Principles (GBP), have helped the Bank continue extending the range of its initiatives. One important area is the classification of the activities underlying green bonds, and, more in general, green finance. Lack of clarity in this area questions comparability, increases the uncertainty associated with investment decisions, prevents clear policy signals.

Our approach is pragmatic and result-oriented: together, Chinese issuers, EIB and its peers raised the largest amounts of green bonds in 2016. It is therefore legitimate for China Green Finance Committee (CGFC) and EIB to map and compare the use-of-proceeds classifications of these two constituencies in a coherent manner. A consistent logical framework, rather than the "right" use-of-proceeds, is therefore what we are striving for in this exercise.

Simultaneously, we aim to establish a reference for further discussions in multiple fora (e.g. GBP, IFI working groups, the European Commission's High Level Expert Group on sustainable finance, external reviewers). The goal is to explore the feasibility of mapping and comparing in a coherent manner the classification of activities established for the use of proceeds of any green bond. At the same time, we are pursuing consistency between green lending and green funding, a condition for material impact investment.

This study is the result of close cooperation between EIB's Projects and Finance Directorates, and combines appraisal and capital markets expertise, framing the relevant issues without fear of complexity, still with a concrete objective in mind. This is helped by an innovative approach to the classification of the activities underlying any financial product.

This White Paper thus sets the scene for a broader debate that should ultimately lead to the establishment of a common language in green finance. The objective is to help practitioners clarify and compare their preferences with precision, so that demand can meet supply more efficiently within and across jurisdictions, spurring market support to global public policies.

In pursuing these goals, the White Paper directly serves the China-EU strategic partnership in climate finance and clean energy, which has the potential to develop synergies of core relevance for the planet. Two-way capital market flows are an important component of this partnership and should benefit from the work presently underway.

On the global scene, China and the EU are actively advocating for green finance to be included as a central pillar of sustainable development. Under China's presidency of the G20, green finance became a key theme at the G20 agenda for the first time. The G20 Green Finance

Study Group was launched as part of this effort to support the G20's goal of strong, sustainable, and balanced growth.

This initiative has been continued this year through the latest G20 summit in Hamburg and may advance further towards 2018 under the G20 framework. This white paper, co-authored by China's Green Finance Committee (CGFC, launched by the People's Bank of China in 2015) and the European Investment Bank, is focused on the case of green bonds, since this market has achieved a scale and frequency of cross-border flows to make harmonization critical.

Internationally a number of green bond standards exist without a clear method for comparison. As a basis for developing greater harmony, this paper aims to provide a scheme on the basis of which the Chinese Green Bond Endorsed Project Catalogue, the project eligibility criteria of EIB's Climate Awareness Bonds (a sub-set of EIB's lending criteria), and the MDB-IDFC Common Principles for Climate Mitigation Finance Tracking become conceptually compatible, as these represent core applied standards for the classification of activities underlying green bonds globally.

The present white paper serves this end by initiating a study on how to enhance comparability of green bond standards in China and the EU. Announced in March 2017, the CGFC/EIB initiative aims to provide a logical framework for initiatives that could create momentum for harmonizing green finance standards, including proposals for a "translation device" or "Rosetta Stone" using a universal taxonomy of environmental activities for the comparison of classifications and standards, starting with climate change mitigation. Furthermore, a few ad hoc working groups of EU-China technical specialists may be established to take this work forward in the other areas of green development (e.g. pollution prevention and control, climate change adaptation, biodiversity loss, and natural resource depletion).

Regarding specifically the comparison of standards, the technical conclusions of the paper are:

1. The Chinese, MDB-IDFC, and EIB standards use different categories for the classification of the underlying assets. While the Chinese green bond catalogue, which is largely consistent with the Green Bond Principles, has a broader scope of green, covering "environmental protection" among others, the MDB-IDFC and EIB standards are focused on climate change. However, both standards include areas not included in the other. Therefore, direct comparison at the first stage of this study is taking place in the area of climate mitigation.

2. Regarding the Chinese standard, within climate change mitigation, four categories are not included in the MDB-IDFC standard, namely energy saving on greenfield facility construction for industries with national energy consumption allowance, clean utilization of coal, ultra-high voltage grid infrastructure, as well as urban underground pipeline projects. On the other hand, within the broader scope of the Chinese standard, some items outside the MDB-IDFC standard are included namely environmental restoration projects, coal washing and processing for the purpose of clean utilization of coal, cleaner gasoline and diesel, and a few aspects of ecological protection and climate change adaptation. These differences are similar between the Chinese and the EIB standard.

3. When it comes to the EIB standard, as climate change mitigation, i.e. "low carbon", is the scope of both the MDB-IDFC and the EIB standard, the difference between the two lies in what specific categories to cover within such scope. Here the analysis finds that the EIB lending standard is different from the MDB-IDFC standard in its inclusion of nuclear energy[20]. This difference also exists towards the Chinese standard, which does not include nuclear energy either.

4. The MDB-IDFC standard further includes a number of categories not included in the Chinese or EIB standard. As opposed to the Chinese standard, the MDB-IDFC standard specifically includes renewable energy power plant retrofits, wind-driven pumping systems, energy audits to end-users, carbon capture and storage, non-motorized transport, projects producing low carbon components, as well as a number of aspects of technical assistance. Lastly, the MDB-IDFC standard also includes categories not included in the EIB standard, namely energy efficiency in thermal power stations (coal[21]).

This white paper recommends that a broader working group of China-EU technical specialists works further on compatibility between the Chinese and MDB-IDFC standards. This includes

[20] Nuclear energy is however not eligible for CAB-allocation

[21] 2 Energy efficiency in conventional coal-fired power plants is ineligible for EIB unless it meets EPS and is in all cases not counted as Climate Mitigation.

potentially splitting and rephrasing categories to enhance direct compatibility, extending the analysis beyond climate change mitigation toward broader areas of “environmental protection”, and exploring ways to identify a “common ground” that could serve as the basis for green bonds issued and/or sold by China in the overseas market as well as by international issuers in the Chinese domestic market. This effort can also feed into the work of the Green Bond Principles, and could create momentum for enhancing the consistency of green bond standards globally.

Reflections following SEB's inaugural Green Bond

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As you may know, SEB has been one of the pioneers in developing the Green Bond market. The development has been exponential, just like growth experienced in technology sectors, with the global market increasing to USD 156 billion of issuance in 2017. The main focus of green bonds has been to raise awareness around the transition towards a more sustainable world, including the financing part of the value chain.

Over the last year we at SEB have cross-fertilized all our experiences from this journey to our internal processes. SEB aspires to be a role model in sustainability within the financial industry and this work has honed SEB's own sustainability strategy to also include increased awareness and a toolbox to transforming our own balance sheet. SEB's Green Bond Framework received the Dark Green shading according to CICERO's Shade of Green methodology.

In February 2017, SEB successfully issued its inaugural EUR 500 million 5 year Green Bond. The order book was in excess of EUR 2.1 billion and included a very granular and broad participation across Europe. Our underlying green bond portfolio was worth SEK 11.8 billion at the time. One important feature of this transaction was that we as an issuer could broaden and diversify the investor base at the same time as we could deepen the relationships with existing investors. The dialogue around climate intelligence has really encouraged all of us to identify related financial risk and return issues.

Issuing a green bond definitely contributes to an increased awareness within the company and narrows the gap between capital and sustainability. The framework we have used is based on a five step process: Define, select, verify, monitor and report.

Following the inaugural transaction, discussions within our bank have really taken off. We are convinced that the most important step to get traction towards a more sustainable world is to go from an undefined balance sheet to a defined balance sheet. This might sound like common sense to many of you, but it is in this process you will increase awareness and competence within an organization. For us this has opened up many new discussions around both our existing assets, processes as well as the underwriting criteria for new assets.

Banks are by default facilitators for private individuals, companies and institutions to access funding either directly from the bank itself or through the bank's network in the capital market. The apparent risk with this from a sustainability perspective is that the largest and most sustainable assets will never touch the bank's balance sheet, since it will be distributed directly to the capital market. It is therefore of utmost importance that the sustainable financing products and services within a bank will open up avenues for smaller enterprises and private individuals to access sustainable investment money. This can be done through multiple ways, and increased awareness in the banking sector is a key first step.

At SEB, this awareness has been created across the organization and now also developed into tangible actions. The natural first step is to ensure a process on how to define the existing assets on the balance sheet and then engage in a dialogue with the respective customers on how to increase the awareness at their end and vis-à-vis their stakeholders. Simultaneously, the product development departments need to embrace the sustainable financing alternatives and find simple and transparent new products. This journey is not something that we as a single bank can do on our own. Therefore we continue encouraging more banks to open up the dialogue around this, and we also see a need to develop and agree on common standards for how to for example conduct impact reporting and define the asset base.

Ecosystems may be a new buzzword, however in this context; I really find it as a fair description of a key ingredient in the success for developing the sustainable financing market further.

In 2018, we aim for higher than what we have achieved in 2017. This is both in terms of origination of other issuers, and to increase the number of different solutions we can advise our clients and partners to use in their own transformational journey towards a more sustainable world. Our own issuance plan is a function of both the customer demand and the deposit base, but we have an ambition to be a frequent issuer in the market so we will do our utmost to be back in the Green Bond market with a second transaction during 2018.

If you also join us to raise your own ambition and add more activity, we will all benefit both in the short and long term.

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