

GREEN FINANCE: GREEN BOND DIRECTIONS COP22

Highlights

- Climate finance through the green bond market has grown substantially in 2016, funding both climate mitigation and adaptation efforts. Issuance in 2016 is on track to be more than double that of 2015.
- Growth in 2016 has been driven by government action and demonstration issuance in China - soon to be the world's largest green bond market - with other emerging markets growing, including India, Brazil and Mexico.
- Green bonds are now being seen as a tool for raising capital to meet mitigation and adaptation targets set out in Nationally Determined Contributions (NDCs).

The green bond market facilitates capital flows for low carbon and climate resilient development

Green bonds are regular bonds with one distinguishing feature: proceeds are earmarked for projects with environmental benefits, primarily climate change mitigation and adaptation.

A key characteristic is that green bonds are used to fund green assets and projects, not green entities.

Green bonds have been issued by municipalities, corporations, multilateral development banks and cities. They can finance a range of projects including clean energy and water projects, sustainable land-use, low carbon transport and energy-efficient buildings.

The market is growing quickly

Annual issuance of green bonds has quadrupled between 2013 and 2015. As of October 31st, total 2016 issuance is already 50% greater than the 2015 total. Moody's has estimated that 2016 issuance will be USD 80bn¹.

As appetite has grown, the market has become increasingly diverse with growing issuance from new issuer types, in various currencies and countries.

"To investors green bonds offer a stable, rated and liquid investment with long duration. To issuers, they could tap the USD100 trillion global institutional fixed income investor base."

Mark Carney, Governor of the Bank of England and FSB Chair

International governance for green bond markets

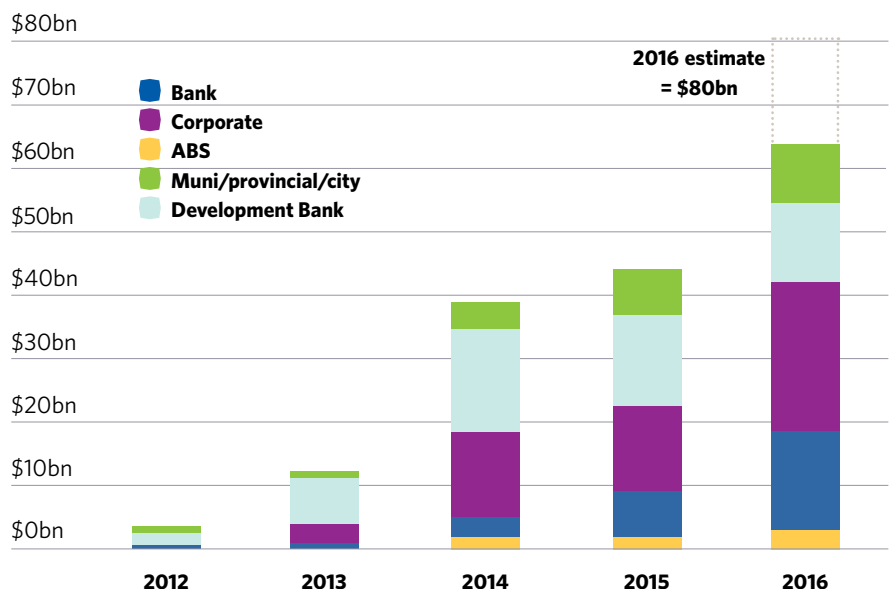
More consistent standards can support market development, reduce market frictions, address the risk of 'greenwashing' and ensure that green investments are contributing to tackling climate change. Market governance is largely in place:

The Green Bond Principles (GBP) are voluntary process guidelines around disclosure, reporting and monitoring of the bond's use of proceeds. While not mandatory, the GBP have become widely used across the market, with most issuers noting compliance with the Principles.

The Climate Bonds Standard is a framework that incorporates the Green Bond Principles and then adds science-based sector-specific criteria for eligible projects, providing green definitions within an industry certification model.

National schemes have arisen in China and India, referencing and broadly consistent with the Green Bond Principles and the Climate Bonds Standard approach to definitions.

Oversubscription of green bonds is the norm; we expect growth to continue



1 Climate Bonds Initiative - COP22 Green Bond Directions report

Energy and efficiency projects receive most of the capital flows

Approximately 75% of the proceeds raised are spent on mitigation through clean energy, energy efficiency and low carbon transport.

Within clean energy, the majority of spending is for wind and solar projects while the energy efficiency space is dominated by low carbon buildings, both commercial and residential.

Adaptation financing is growing

While mitigation remains the core of the green bonds market, there is increasing spending on adaptation. This has risen from almost zero in 2011 to make up 5% of total issuance.

The increase in spending on adaptation-related projects has primarily come from municipalities in the US and elsewhere. These have financed upgrades to water systems, improvements to storm water systems and capacity to deal with fluctuating water supply.

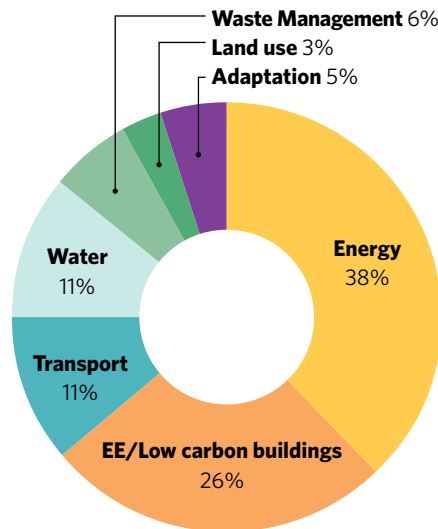
The Climate Bonds Water Criteria was approved in 2016 providing guidance on how water infrastructure assets can qualify as climate bonds.

The private sector now accounts for the majority of issuance

Issuance from corporations and banks has increased from zero in 2010 to 66% of issuance in 2016. This is an important development given the role that the private sector will need to have in financing the low carbon economy transition.

Having established the market, multilateral development banks (MDBs) continue to play an important role by encouraging longer tenors, for example EIB's 21 year green bond

Driven by the urbanisation agenda, we expect buildings, water and transport to grow their share



issued in 2016. They have also broadened the currency range issuing in over 20 different currencies since 2010.

Investors have been pushing market growth

Despite the rapid market growth, demand continues to outstrip supply.

Many leading investors have made public commitments to large green bond portfolios, including Barclays (GBP 2bn), Zurich (USD 2bn) and KfW (EUR 1bn), while others have continued to build up portfolios without making explicit commitments.

MDBs have also played a valuable investor role by acting as cornerstone investors for issuers in new markets such as the Philippines and India.

International momentum around green finance is growing

China was the first emerging market to issue green bond requirements, followed by India.

Green finance is rising on the international economic agenda and increasingly recognised as critical to support sustainable global growth.

G20 leaders have established a Green Finance Study Group, chaired by the Central Banks of China and the UK. In the latest G20 'Hangzhou communique' they declared it necessary to scale up green financing and that efforts should be made to support the development of green bond markets.

In China, the seven major regulators jointly released new *Guidelines for Establishing the Green Financial System* outlining steps for capital markets to allocate resources to serve the transition to a green economy.

Green bonds are well-suited for low carbon and climate-resilient investments to access low cost capital.

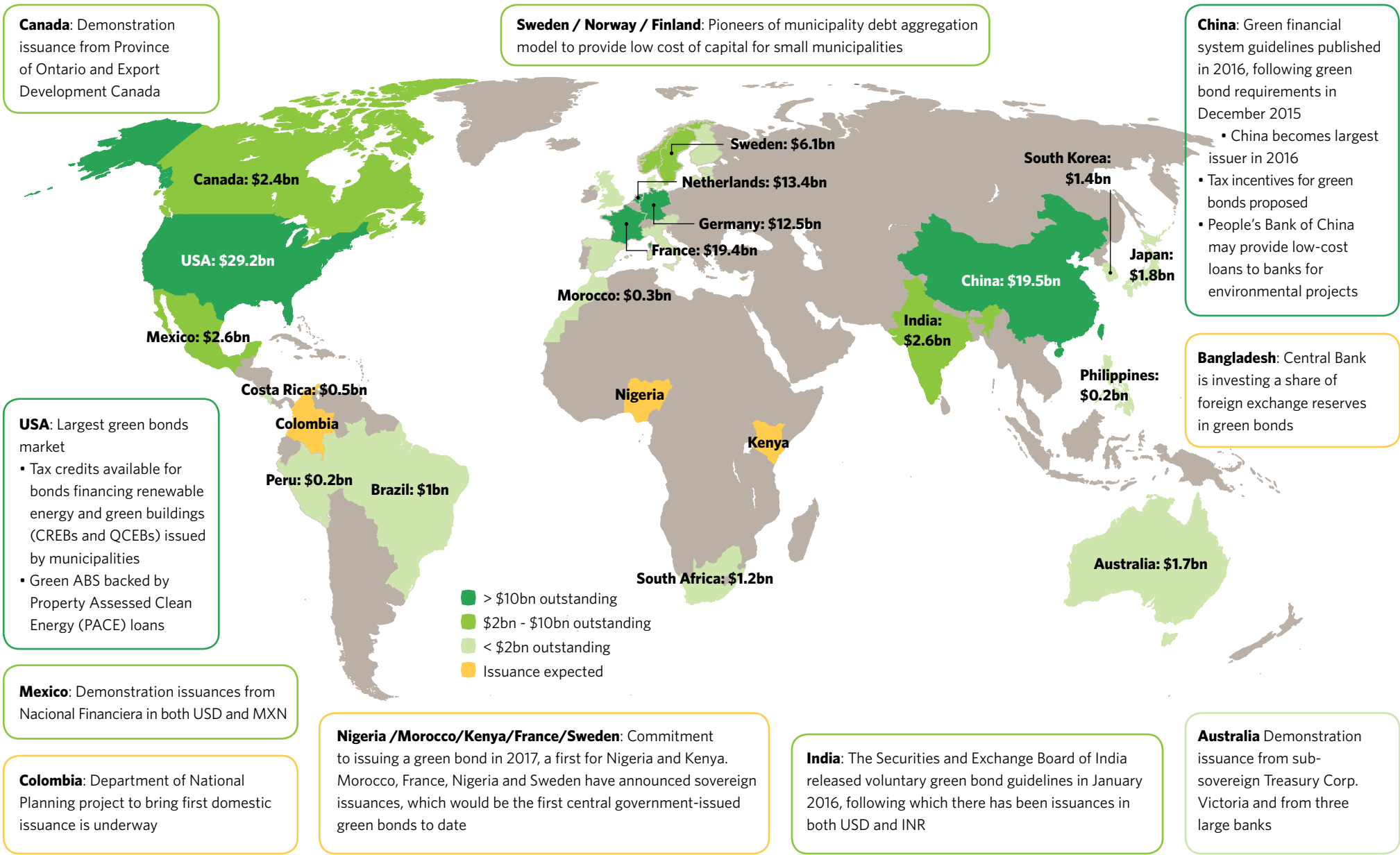
This is particularly important in high interest rate emerging markets, where the cost of capital has a significant impact on the economic viability of projects. These are generally more capital intensive than their higher carbon equivalents in the early phases, but usually have low and stable operating expenditure over the medium term. For example, a renewable energy project does not require fuel inputs over its life time and operating costs are not linked to volatile resource prices.

Largest 10 Green Bond issuers 2016*

| Issuer | 2016 issuance | Use of Proceeds |
|----------------------------------|---|--|
| Shanghai Pudong Development Bank | RMB 50bn (USD 7.6bn) | Renewable energy, energy efficiency, low carbon transport, water and waste management, adaptation |
| European Investment Bank | USD 4.1bn <small>(in CAD, EUR, GBP, SEK and USD)</small> | Renewable energy, energy efficiency |
| Bank of China | USD 3bn <small>(in RMB, EUR and USD)</small> | Renewable energy, pollution prevention |
| Mexico City Airport Trust | USD 2 bn | Renewable energy, energy efficiency, low carbon buildings, water and wastewater management, pollution prevention, adaptation |
| Électricité de France | EUR 1.75bn (USD 1.9 bn) | Renewable energy |
| Iberdrola | EUR 1.7bn (USD 1.9 bn) | Renewable energy |
| TenneT Holdings | EUR 1.5bn (USD 1.8 bn) | Renewable energy transmission infrastructure |
| Toyota | USD 1.6 bn | Low emissions vehicles, hybrid vehicles, electric vehicles |
| Apple Inc. | USD 1.5 bn | Renewable energy, low carbon buildings, energy, waste, water |
| New York MTA | USD 1.4 bn | Low carbon transport |

*only includes green bonds that align with the Climate Bonds taxonomy

Leaders in the green bond market



Post Paris: National capital raising plans to meet NDCs

As the Paris Agreement enters into force, countries now face the challenge of implementing the commitments set out in NDCs. National capital raising plans to meet the targets' financing need to be developed. With public budgets under strain and banks having restricted lending capabilities, private sector sources of capital need to be engaged.

Tapping green bond markets will be an important strategy to raise capital for low carbon and climate resilient infrastructure that can support meeting NDC targets.

The world has deep capital resources, much of which is sitting in historically low or near-zero interest bonds in developed economies.

A large portion of that capital – representing assets of some USD 60 trillion – has made public statements about the need to address climate change and that it stands ready to invest in climate solutions – subject to meeting risk/yield requirements. The challenge is the lack of *investible* opportunities that address climate change priorities.

Green bonds are a tool to help meet climate targets by closing the gap between funding needs and investor demand; they are a 'friction reduction' instrument.

There are a number of actions governments can take to promote the development of domestic green bond markets as part of national capital raising plans.

First, as the G20 Green Finance Study Group recommends, they need to²:

1. Issue demonstration green bonds:

Demonstration issuance from development banks, national or sub-

national governments can raise awareness of green bond benefits and lead the way for corporate issuers.

2. Apply green standards: Green asset definitions, taxonomies and disclosure guidelines are necessary tools to facilitate local market development. The Green Bond Principles and Climate Bonds Standard are international tools that can be leveraged by governments and regulators to standardise domestic markets in line with international best practice.

3. Enable domestic verifiers: External assurance processes are important elements for the development of a trusted green bonds market. Developing a domestic network of assurers and providing training on disclosure and reporting against third-party assurance frameworks can reduce costs for issuance.

4. Provide supporting market infrastructure:

Green bond segments in stock exchanges (such as the ones in London, Luxembourg, Oslo and Mexico), green bond indices and rating tools from credit rating agencies can promote green bond trading by facilitating the flow of information for investors.

5. Promote international collaboration:

Cross-border investment in green bonds through international collaboration enhances market harmonisation and helps to develop capability. Collaboration not only allows laggards to leverage frameworks developed internationally, but also connects projects in developing and emerging countries with investors in developed ones.

Second, and most importantly, governments need to develop ambitious green investment pipelines that will meet the objectives of their climate change plans, especially green infrastructure.

Low carbon transport plans – rail and bus rapid transport systems – need to be brought forward; waste and wastewater treatment (with methane capture) developed; and clean energy generation and grids prioritised. With cities accounting for 80% of energy emissions, the rapid rates of urbanization we can expect to see in the coming 15 years need to be directed to become green urbanization.

Incentives and support tools will also be necessary to achieve the scale of investments required. These could include regulatory measures, incentive structures, pricing support mechanisms and aggregation platforms for smaller scale projects; many can and should be provided by wealthier countries to support green choices in developing nations.

The Green Infrastructure Investment

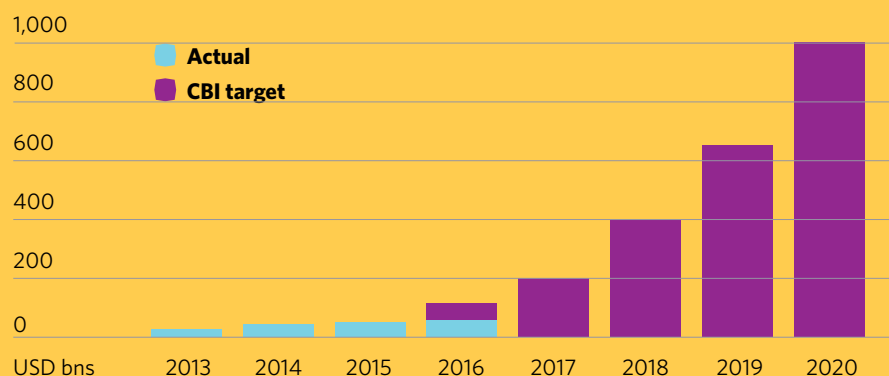
Coalition (GIIC) launched at COP21, is an example of a cross border collaborative framework. It is a platform to bring together investors, governments, green infrastructure developers and development banks to help increase the flow of capital to green infrastructure investments around the world. The Coalition has held its first Forum linking India-based projects with international investors. Further fora are planned for Brazil, China, India and the US.

Beyond Paris: \$1 trn a year of green bonds by 2020

The Paris Agreement marked the first step towards achieving a 2-degree global warming target by the end of the century. After a global stocktake of the aggregate impact of NDCs in 2018, nations will need to update their NDCs or submit new ones by COP 2020; these will need greater ambition if we are to meet the agreed goals of holding emissions to no more than 2°C, and ideally 1.5°C.

Action needs to focus on shifting investments towards green solutions and facilitating large-scale project pipelines to ensure capital is reallocated and committed to sustainable growth based on NDC targets.

To make a substantive contribution to addressing climate change, we need one trillion dollars a year of issuance by 2020



A large and liquid green bonds market will help. Our view is that green bonds will be playing a pivotal role in shifting capital when

the market reaches USD 1 trn of issuance per year by 2020 - given the rapid rate of growth to date, this is possible.

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1. <https://www.investmentbank.barclays.com/our-insights/Barclays-reaches-green-bond-target.html>
 2. The steps are drawn from the Green Finance Study Group Synthesis report to the G20
 3. The estimation is an order of magnitude based on top-down analysis of current and projected infrastructure investment and financed by bonds rather than a detailed projection of expected green bond issuance.