Green Bonds : An Instrument for Financing a sustainable Future

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Abstract:

The green bond market is attracting new issuers and a more diversified base of investors. However, the size of the green bond market remains small compared to the challenges it is meant to address and to the overall traditional bond market. This paper is based on an extensive literature review, market data analysis tostudy the concept, genesis, evolution, development and trends towards funds raised through green bonds globally and study the potential of green bonds as a catalyst to enhancing India's capacity to cope with climate change in the country. This paper makes several recommendations to unlock and leverage the full potential of green bonds to finance efforts and initiatives towards sustainable development Goals.

Keywords: Green bonds, climate change, low carbon transition, Green Bond, Sustainable development

INTRODUCTION

Despite the positive renewable energy investment trends over the past decade, annual investments in renewable energy power alone need to double until 2050 to meet climate goals. To allocate enough capital to drive the world's transition to a low-carbon economy, a set of financial solutions need to be developed and taken advantage of by policymakers, investors and financial institutions. The International Renewable Energy Agency (IRENA) has recently published a series of renewable energy finance briefs looking at tools to scale up renewables. *Renewable energy finance: Green bonds* highlights green bonds as an innovative instrument that can help channel substantial global capital into renewable energy and other green assets. According to the Climate Bond Initiative (CBI), a non-profit organization, "the green bonds era has begun—mobilizing bond markets as a low-cost financing tool will be essential for the realization of a low-carbon and climate-resilient economy. In order to combat the threat of *climate change, there is an urgent need to adopt mitigation and adaptation efforts at various levels and finance such initiatives. Green bonds are a relatively new funding instrument for green projects that have been identified as the potential financial instrument for financing a sustainable future. India, in particular, has immense scope to diversify the green bond market beyond renewable energy*.

Green bonds were created to fund projects that have positive environmental and/or climate benefits. The majority of the green bonds issued are green "use of proceeds" or asset-linked bonds. Proceeds from these bonds are earmarked for green projects but are backed by the issuer's entire balance sheet. A bond is a debt

instrument with which an entity raises money from investors. Green bonds are like any other debt instrument but the funds raised from such bond sale are used exclusively for renewable energy projects. The general idea is that the proceeds from the issue of these types of debt instruments will be used either to fund projects which have a clear, positive environmental impact, often in the renewable energy sector, or be used to invest in generally environmentally desirable business models or assets.

OBJECTIVES OF THE STUDY

a) To study the concept, genesis, evolution and trends towards funds raised through green bonds globally

b) To study the potential of green bonds as a catalyst to enhancing India's capacity to cope with climate change in the country.

RESEARCH METHODOLOGY

The study uses secondary data sourced / sifted from Research reports, Research articles, relevant information available of the internet to study the concept, genesis, evolution and trends towards funds raised through green bonds globally and to study the potential of green bonds as a catalyst to enhancing India's capacity to cope with climate change in the country. The data has been purposely selected to summarize and highlight key data points to facilitate and support the objectives of the study.

CONCEPTUAL FRAMEWORK

1. The essence of greenbonds.

Like any other bond, a green bond is a fixed-income financial instrument for raising capital from investors through the debt capital market. Typically, the bond issuer raises a fixed amount of capital from investors over a set period of time (the "maturity"), repaying the capital (the "principal") when the bond matures and paying an agreed amount of interest ("coupons") along the way. Green bonds are fixed-income instruments, the proceeds of which the issuer uses to finance specific projects that deliver environmental or climate benefits. They are particularly well suited to financing sustainable infrastructure investments. As financial instruments, they can offer investors stable long-term returns. Perhaps this is why the appetite of institutional investors for green bonds has grown substantially in

recent years.The green bond market, as it stands today, is a "self-labeled" market with voluntary issuer disclosure standards that vary in scope and quality. Unlike plain vanilla corporate bonds, which generally provide a company's management the flexibility to decide how to use bond proceeds, green bonds are required to direct their proceeds only into projects that generate environmental benefits

In a world where there is ever-increasing awareness on climate concerns, the Green Bond is a tool that raises industry engagement by encouraging investments in sustainable projects, processes and technologies with a transparency that allows investors to understand the challenges and thus diversify risk. At the same time, the Green Bond provides issuers with an opportunity to have a closer dialogue with investors and adapt issuance. Capital market investors are increasingly integrating environmental, social and governance criteria in their investment decisions, and looking for ways to make a positive impact. Green bonds often serve as an entry point for issuers and investors interested in using their investments to overcome global challenges as highlighted by the 17 UN Sustainable Development Goals. Over the past decade, green finance has moved from a niche market to one that is increasingly mainstream. Investment in green bonds is at record highs as investors align their strategies with environmental considerations.

2. Types of green bonds

Green Bonds are standard bonds with a green as a bonus feature. The green credentials of green bonds can be broadly structured and categorized as follows:

- **Green use of proceed bonds:** This is a standard recourse to the issuer debt obligation for which the proceeds shall be held in a sub-portfolio or otherwise tracked by the issuer and attested to by a formal internal process that will be linked to the issuer's lending and investment operations for projects.
- **Green use of proceeds revenue bonds:** This is a non-recourse-to-the-issuer debt obligation in which the credit exposure in the bond is to the pledged cash flows of the revenue streams, fees, taxes, etc., and the use of proceeds of the bond goes to related or unrelated green projects. Notably, the underlying collateral need not always be "green" as demonstrated by the green bonds issued by Toyota in March 2014. The structure involved the securitization of auto loans to collateralize its green bonds, the issuance proceeds of which were allocated to fund the development of environmentally-friendly automobiles.

- **Green project bond:** This is a project bond for a single or multiple green project(s) for which the investor has direct exposure to the risk of the project(s) with or without potential recourse to the issuer.
- **Green securitized bond:** This is a bond collateralized by one or more specific projects, including but not limited to covered bonds, asset-backed securities and other structures. The first source of repayment is generally the cash flows of the assets securing the bonds.

Green bonds can also be categorized as:

- **Asset Backed Securities (ABS):** Asset Backed Securities (ABS) are a help to benefit related or unrelated green projects which are fuelled by the proceeds of these bonds as also the profit earned out of these bonds is used as issuer debt obligation. It is so because the credit flows of the revenue streams, fees, taxes, etc. in the bond is pledged to the credit exposure of the bond. As established in a case study of Toyota (March 2014), it is not essential that the related investment need may not necessarily be 'green'. As for example green bonds which have a direct or indirect relation with auto loans would mean allocating the proceeds for the development of environmentally-friendly automobiles (IREDA, 2016).
- **High-Yield Green Bonds:** These robust reporting non-investment grade bonds were first issued by 'NRG Yield' in August 2014 for $500 million.
- **Corporate Green Bonds:** Corporate “earmarked” bonds, which hold a relatively smaller market share between $1 and $3 billion, helped in creation of a vast and strong green market.
- **The US initiated the Municipal Green Bonds in 2014.** These were earmarked to promote green properties and finance sustainable hydro projects for the universities. Subsequently, European cities and municipalities followed suit which led to setting of an enhanced trend wherein several more joining the stream with numerous green bonds (Climate Bonds Initiative, 2014).
- **Commercial Bank Green Bonds:** Help to financially support a variety of projects covering renewable energy. Some of these are related to wind, water and solar energies which are turned highly efficient in their respective fields of contribution to environment

The specific structure for a green bond can be determined based on the circumstances of the issuer and the applicable green projects.

3. Stakeholders

- **Green Bonds issuer(s):** Any company, government agency or financial institution that develops, registers and sells a bond.
- **Green Bonds investor(s):** Individuals, companies or institutional investors who buy green bonds with the expectation of a financial return. They include individuals, companies and institutional investors (e.g. endowment funds, hedge funds, insurance companies, asset managers, investment companies, investment trusts, mutual funds, pension funds, sovereign wealth funds, etc.).
- **Green Bonds partner(s):** A broad spectrum of organizations interested in developing a commercially viable green bonds' market, including financial institutions, development banks, NGOs, credit rating agencies, etc.
- **Credit rating agencies and auditors:** institutions responsible for verifying compliance with the standards for green bonds or established credit standards.
- **Regulators:** Financial authorities responsible for regulating capital markets; they examine the qualifications of underwriters as well as the securitization of credit assets and bonds' custodial arrangements; and regulate the issuance, clearing and settlement provisions. Regulators include securities commissions and other regulatory bodies, including stock exchanges and central banks.

4. Benefits of Green Bonds

'Green bonds' are an attractive mechanism for organizations to raise capital for sustainable projects. These bonds can be raised by not only financial institutions, but also by any private sector or public sector organization. The global green bond market is growing rapidly which is a result of the interest from varied debt investors.

4.1 Benefits to Issuers

- Helping issuers to articulate and communicate the sustainability strategy.
- Improving relationships with debt providers and broadening the 'investor base'.

- Creating internal synergies between financial and sustainability departments.
- Improving diversification of bond issuer investor base, potentially reducing exposure to bond demand fluctuations.
- Reputational benefits (e.g. marketing can highlight issuer's green credentials and support for green investment).
- Tracking of proceeds use and reporting leads to improved internal governance structures and communication.

4.2 Benefits to investors

- Helping investors to develop better-informed investment strategies through improved risk assessment in an otherwise opaque fixed income market through use of proceeds reporting.
- Facilitating the smooth implementation of long-term climate strategies.
- Helping responsible investors broaden their restricted investment portfolios.

4.3Benefits to Policymakers

Indirectly supporting the implementation of sustainable development strategies by better matching of green issuers and investor

LITERATURE REVIEW

Green bonds are an important development because they are a financial innovation designed to facilitate sustainable investing for institutional investors such a pension funds, insurance companies, mutual funds, and sovereign wealth funds. For example, green bonds are sometimes highlighted as an innovation that can help increase sustainable infrastructure investments from institutional investors by improving the liquidity of infrastructure assets (Merk et al. 2012; Della Croce and Yermo 2013; Bhattacharya, Oppenheim, and Stern 2015; OECD 2016).

With the exceptions of green bonds issued in China and India, what makes a bond green has to date not tended to be regulated. Instead, a common practice for establishing the 'greenness' of a bond has been alignment of the bond's use of proceeds clause with the Green Bond Principles (GBPs), or other similar voluntary standards. The GBPs have been developed and endorsed by financial actors through the International Capital Markets Association (ICMA). The GBPs list renewable energy, energy and resource efficiency, pollution reduction, water and

waste management, conservation, and climate adaptation as the types of projects that can be financed with a green bond (ICMA 2018).

Over 90% of green bonds are investment grade issuances (Tiftik, Mahmood, and Nozema 2019), meaning that they have high to medium credit quality ratings (i.e. AAA & AA or A & BBB ratings). A recent study of green bonds issued between 2013 and 2017 finds that the yields of green bonds are on average two basis points (bps) lower than those of comparable conventional bonds (Zerbib 2019). One common explanation for this yield difference is the high demand for and limited supply of green bonds. However, the presence of any pricing difference and its level is still debated in empirical studies (e.g. Larcker and Watts 2019).Irrespective of this debate, what is clear is that the vast majority of green bonds could have been issued as conventional bonds with little difference to the issuers' ability to raise capital at favorable rates.

The surge in interest in green bonds also reflects a revolution in socially responsible approaches to investment and finance [Chesney et al., 2016; Dziawgo, 2010]. Issuers may be governments (including municipal, state and national governments and export-import banks), intergovernmental organizations (e.g. World Bank or regional development banks), financial institutions, and other corporations. Market actors are increasingly enthusiastic about green bonds [Shishlov et al., 2018, p. 8].Since green bonds are an instrument to shift capital for green investments, the question is whether green bonds really can increase and accelerate green investments. And what does “green” really mean? The problem is that many market participants have their own definitions of “being green” or “environmentally beneficial”, which may or may not overlap.

The structure of the green bond market today raises several questions. If green bonds are nearly identical to regular investment grade bonds in terms of financial performance why are issuers making the extra effort to go through the green bond labelling, verification, and reporting process? Similarly, if the financial characteristics of green bonds do not differ significantly from conventional bonds, what explains the high demand for green bonds among investors? What value are green bonds delivering to issuers and investors, and what difference do they make to the way issuers and investors interact with each other? Understanding the motivations of actors participating in the green bond market is central to understanding what role green bonds can play in directing investment towards sustainable development and how we should understand green bonds as a new financial innovation.

BUSINESS CASE FOR GREEN BONDS

The business case for investing or issuing green bonds refers to incentives related to the economic performance of the investor or issuer that is not directly related to the financial performance of the green bond for the respective parties. Hockerts (2015) highlighted four types of non-financial business case incentives; branding, operational efficiency, creating new markets, and reducing risk.

The business case for the branding benefits of engaging in sustainable finance could be to attract and retain customers and clients or to charge premium prices for products and services (Menon and Menon 1997; Du, Bhattacharya, and Sen 2007; Belz and Schmidt-Riediger 2010; Dangelico and Vocalelli 2017). Operational efficiency may be enhanced by, for example, attracting high quality employees, impacting the productivity of employees motivated by sustainability commitments of the organisation, or identifying new operational efficiency gains (Branco and Rodrigues 2006; Morsing 2006; Sen, Bhattacharya, and Korschun 2006; Grolleau, Mzoughi, and Thomas 2007; Henriques and Sadorsky 2007; Ali et al. 2010).

Creating new markets could entail developing new investment products for customers interested in sustainable investing and/or attracting new classes of customers to existing and new product offerings (Renneboog, Horst, and Zhang 2011; Jansson and Biel 2014; Riedl and Smeets 2017). There could also be incentives associate with reducing risk that are not directly related to financial risks. For example, reputational risks and risks associate with potential future regulation related to sustainability (Davis 1973; Banerjee 2008; Barnett and Hoffman 2008; Gond and Piani 2013; Haufler 2013).

EMERGENCE OF GREEN BONDS

In order to protect the environment, the first green bond was issued in 2007 and was initially1characterized as a niche product pioneered by a handful of development banks. The “Climate Awareness Bond” was issued by the European Investment Bank (EIB) in 2007, followed by the World Bank issuing a “Green Bond” in 2008. Between 2007 and 2012, governments began to join international organizations and issue their own green bonds. Although several factors are driving rapid growth in demand for green bonds today, the initial rise of the market is often attributed to the work carried out by the United Nations (UN) since the 1990s to combat the climate-change problem. The market began to gain traction by 2013, when corporate green bonds were issued by Electricité de France and Bank of America. Later in 2015 the Paris Climate Change Conference was able to bring close around

200 countries who all agreed to work together to arrest global warming issue to less that 2° Celsius. It is assumed that to achieve the agreed targets on environment issues an amount of more that 100 trillion dollars would be required in the next 14 years. That is the reason that green bonds now are looked upon as one of the most fruitful instruments to raise funds (Gupta and Aggarwal, 2019).

The Paris Agreement, clearly defines that all the governments should take steps to avoid environment pollution. The pace must be accelerated which is further boasted by the technology innovation in the country. The Green bonds are issued to achieve the objectives of the Paris climate change accord(Lisa, 2017). The Paris agreement made it mandatory for the government to submit "Intended Nationally Determined Contributions" (INDCs) towards this social cause. It wanted the countries to make commitment towards submitting their reports on the amount of emission and their progress reports towards executing and achieving their Intended Nationally Determined Contributions (INDC).

The Paris Climate Change Conference resulted in nearly 200 countries coming together in an attempt to limit global warming to less than 2° Celsius—was effectively a culmination of the UN's work, and is now providing fresh impetus for the world to explore the possible financial solutions available. Some now estimate that upwards of $100 trillion of investment will be required over the next 14 years if the agreement's targets are to be met. With substantially more investment funds required to be generated, therefore, green bonds are now increasingly considered to be among the most useful instruments to help countries achieve those target. This market is a crucial source of financing for projects, with positive environmental impacts in both developed and emerging countries. Investor appetite for green bonds continues to grow, and emerging market issuers are likely to benefit from increasing demand. This second edition of the "Emerging Market Green Bonds Report" highlights where there has been growth and where there is potential.

DATA ANALYSIS : THE DEVELOPMENT AND TRENDS OF THE MARKET FOR GREEN BONDS

The origins of green bonds date back to 2007 when the EIB launched its first Climate Awareness Bond. The World Bank issued its inaugural green bond in 2008. These were followed by a small but growing stream of issues from government-related entities and local authorities. The market really started in earnest after the launch of the Green Bond Principles in 2014. The establishment of these principles

helped create more transparency for investors and clarified requirements for issuers. This gave a strong impulse to both the volume and diversity of issuers.

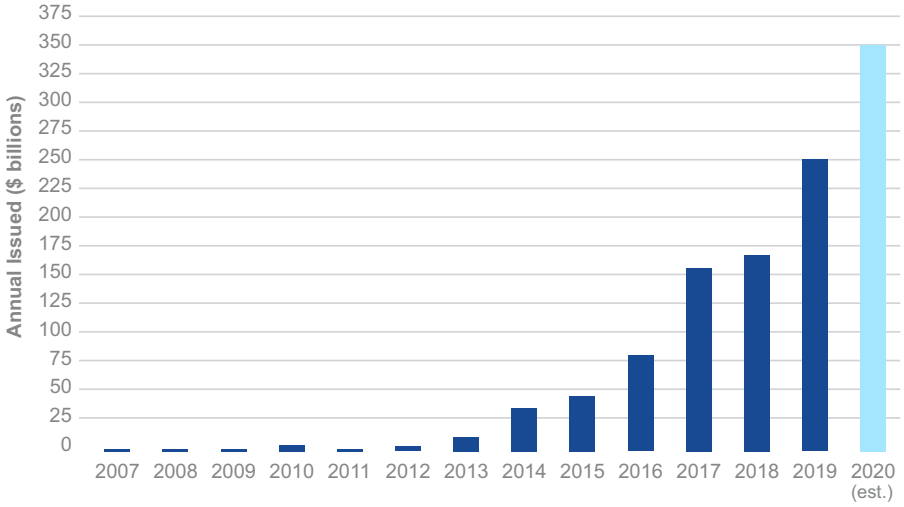
The green bond market experienced rapid growth between 2015 and 2017, with a tilt towards specific segments. Institutions such as the EIB, IBRD and KfW, which by that stage had become relatively established green bond names, expanded issuance, but a substantial part of the growth – particularly in 2016 and early 2017 – came from Chinese names, such as the Shanghai Pudong Development Bank and ICBC. US issuers took over the lead in 2017, with sizeable green bond issuance by US municipalities to finance local transportation and water projects, and by Fannie Mae to finance sustainable housing.

The significant growth of the Green Bond markets over the last few years can partly be attributed to an overarching trend towards including environmental, social and governance (ESG) issues into the decision process for investments by institutional investors. The lively primary market in green bonds – which has seen strong growth particularly in recent years – now has issuance from a diversified set of institutions, across the corporate, government, government-related and multi-lateral sectors. The secondary market has been functioning well, with green bonds priced close to their non-green peers. Globally, Momentum is rapidly building for the global green bond market. The green bond market outperformed expectations in 2019, with record issuance of $240 billion with a growth of over 51% over 2018.

2019 green bond market highlights:

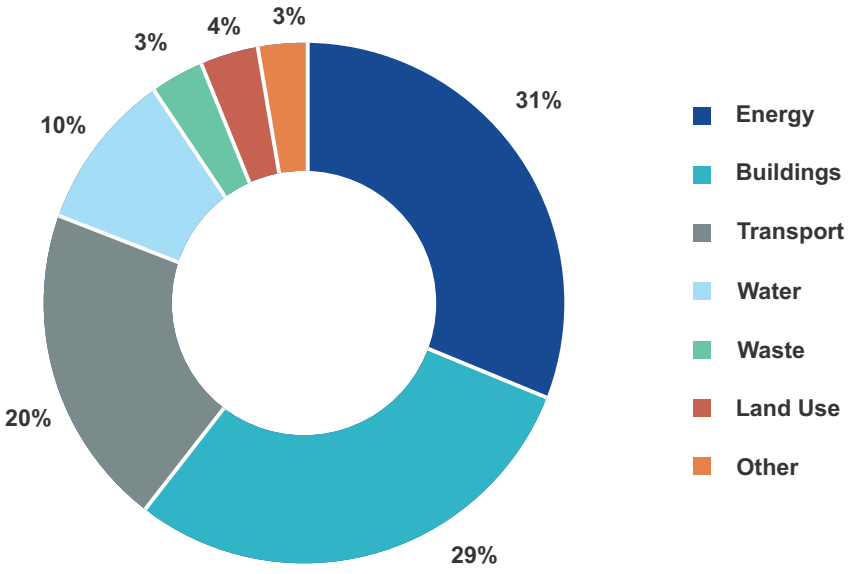
- USD258.9bn in issuance (2018: USD171.2bn)
- 1,802 deals (2018: 1,591)
- 506 issuers (2018: 347)
- 291 new issuers: (2018: 204)
- 8 new countries: Russia, Saudi Arabia, Ukraine, Ecuador, Greece, Kenya, Panama, Barbados
- USA top with USD51.3bn, followed by China (USD31.3bn) and France (USD30.1bn)
- Certified Climate Bonds passed the USD100bn milestone

Figure 1 -Green Bond Issuance: The Hot Streak



Source : Climate Bonds Initiative

Figure 2 -Green Bond Issued by Use of Proceeds



Source : Climate Bonds Initiative

Globally, Momentum is rapidly building for the global green bond market. The green bond market outperformed expectations in 2019, with record issuance of $240 billion with a growth of over 51% over 2018. In the first four months of 2020, green bond issuance increased compared with 2019, and the market is expected to grow further after the COVID-19 pandemic. The fact that green bond issuance increased when most countries around the world were already in lockdown due to the COVID-19 crisis implies that we can expect to see continued growth over time. Estimates for 2020 forecast point to a healthy year ahead, of USD300bn to USD350bn.

Green bonds are issued to finance environmentally friendly projects but are generally backed by the full balance sheet of the issuer and rank pari-passu with other debt of the same seniority. In terms of the types of projects financed by green bonds issued in 2019, renewable energy and green buildings continued to have the largest share of total issuance, at 31% and 29%, respectively. Clean transport projects have steadily increased over the years as a percentage of issuance, and that trend continued in 2019. Adaptation projects still represent only a very small portion of overall projects at 1% of total issuance, as do projects related to land use at 4%.

Figure 3 - Green Bond supply - Geographic overview

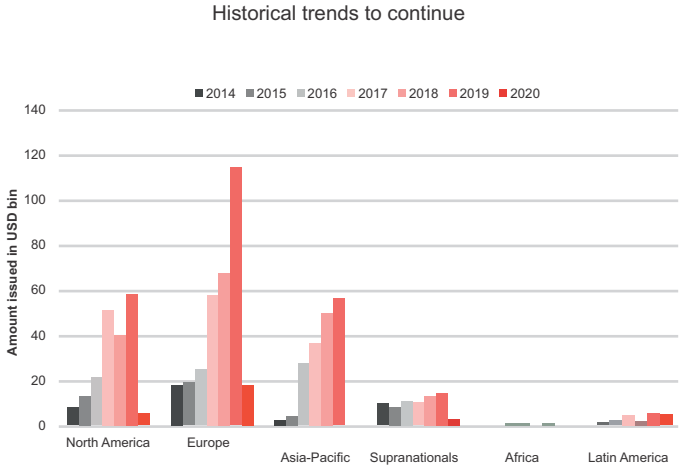
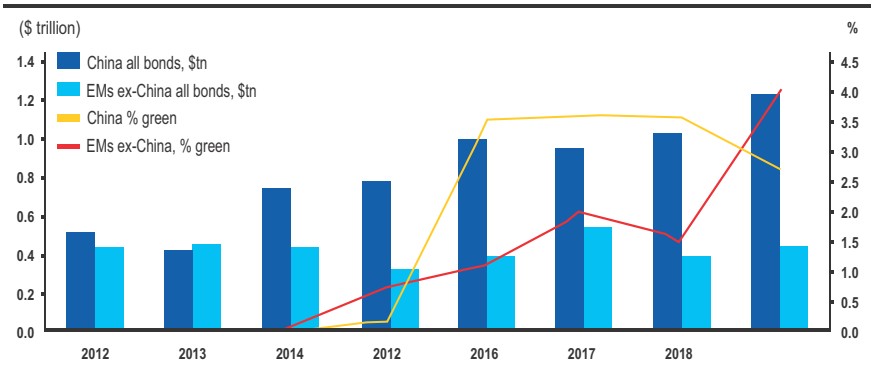


Figure 4 - Emerging Market Green Bond Issurance, 2019



Source : Climate Bonds Initiative- UniCredit Research

Although the market is still dominated by few countries, predominantly by the USA, there is fast increase in geographic diversity. Green bonds have been issued in 23 jurisdictions, including 14 markets of the G20, and in 23 currencies. Emerging markets are the most vulnerable countries to climate change-related impacts. This has placed a high demand on these countries to urgently scale up climate change adaptation and resilience measures. The green bond market is nascent in emerging countries, with the potential for promising growth. Emerging markets have been issuing green bonds since 2012, when South Africa made two debut issuances, followed by issuances from Brazil, China, and Peru in 2014. After the People's Bank of China announced guidelines for green bond issuances in late 2015, China's green bond market quickly grew to $108.6 billion in cumulative issuances between 2012 and 2019.

Outlook for 2020 – 2021

- Green bond growth expected from financial institutions, sovereigns, Certified Climate Bonds, and climate aligned issuers
- Greater use of other labels (e.g. sustainability and social bonds), especially in light of COVID-19, as well as performance-linked instruments (e.g. KPI-linked credit facilities) to facilitate transition

- Increased focus on transitioning "brown" sectors, such as aviation, steel, and cement
- Harmonization of taxonomies (esp. EU Taxonomy), green bond guidelines and disclosure

Over the past few years the green bond market has grown from a small niche market to a liquid and diversified market. Although many buy-and-hold investors are active in the green bond market, the secondary market has been functioning well, with green bonds priced close to their non-green peers. The increase in issuance volumes has made it possible to build sizeable portfolios in this market. With many new green initiatives on the agenda and a growing environmental awareness within society, we expect continued strong growth for the green bond market in the years to come.

GREENING INDIA'S FINANCIAL MARKET

India's Nationally Determined Contribution (NDC) includes pledges to reduce the emissions intensity of GDP by 33 percent – 35 percent by 2030 below 2005 levels and to increase the share of non-fossil-based energy resources to 40 percent of installed electric power capacity by 2030, with help of transfer of technology and low-cost international finance. These are ambitious promises and are recognized by commentators as being broadly consistent with the sustainable development goals. In order to achieve them, India is setting out on a huge program of investing in solar PV and wind with targets to have 175 GW of installed Renewable Energy (RE) capacity by 2022; this represents a 50-percent increase in India's current electricity generation capacity of 345 GW. India is also seeking to electrify its mass transportation system through completing the electrification of its broad gauge rail (16,500 km), electrifying its vehicle stock. The Government of India has estimated that US$ 4.5 trillion is needed to meet India's ambitious targets for renewable energy and urban sustainability over the next ten years – around US$ 450 million per year.

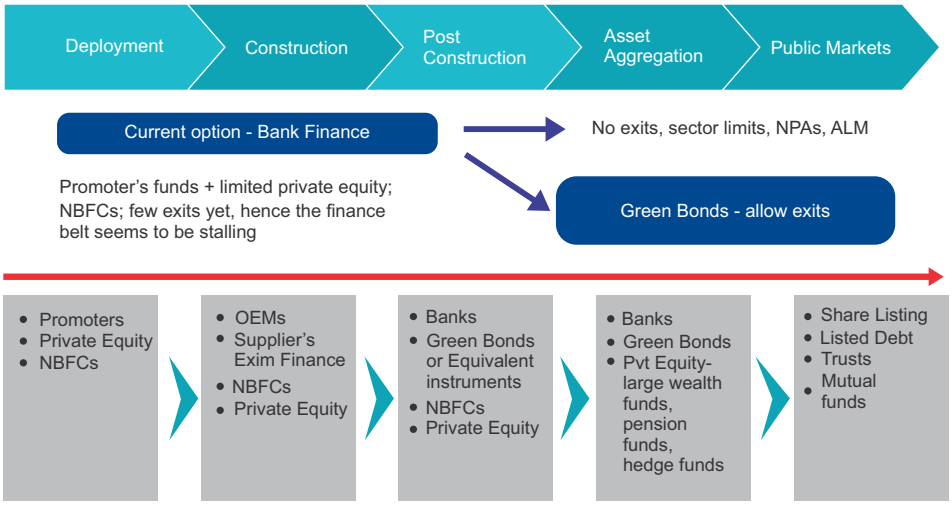
This ambitious target needs ambitious investments. It is estimated that this leap towards renewable energy will require funding of US$200 billionAssuming a debt-equity ratio of 3:1, the sector will require close to US$150 billion by way of debt. Some studies indicate that paucity of funds for the sector and the consequent higher interest rates in India drive up the cost of RE by 24 – 32% in the country as compared to costs in US and Europe. Similarly, the overall size of the EE market in India is estimated to be around US$ 11 billion. Green bond funding is crucial for

India to achieve its green goals. Green bonds are becoming an increasingly attractive mechanism for both private and public sector organizations to raise capital for projects, assets or other activities that benefit the economy, environment and society. With the Indian government and private sector increasingly focusing on renewable energy projects, the demand for such funds is expected to rise over time.

Currently, most renewable projects are financed by bank commercial loans. The Indian banking sector is currently going through a tough phase and carrying out balance sheet adjustment; banks are unlikely to be able to expand their balance sheets to be able to finance the additional requirements of the renewable sector. Green bonds may be able to fill this gap. Current funding mechanisms for RE and EE projects include equity, government subsidy/incentive schemes, specific funds set up by government agencies or donors, trade credit, and commercial finance. However, there are some critical factors inhibiting the flow of credit from financial institutions. There is a limited understanding of the different kinds of risks affecting RE and EE projects. Loans in this sector often have to be custom designed, owing to considerable differences in business models and heterogeneity in project design. This increases the transaction costs for financial institutions. Further, there is the issue of asset-liability mismatch for commercial banks, since RE and EE projects typically have longer gestation periods.

The green bonds appeal to regular investors as well as other investors such as bilateral or multilateral agencies, other institutional agencies, high net worth individual (HNI) investors etc. who focus on use of proceeds and their friendliness to the environment, in addition to the yield offered. Green bonds, therefore, have considerable potential to provide large quantum of long-term debt capital for RE and EE projects.

Exhibit : Financing Conveyer Belt – Access to Capital and various development stages.



Source: Issue Paper Green Bonds in India

STATE OF THE INDIAN GREEN BONDS MARKET AND OPPORTUNITIES TO SCALE UP

The Indian green bond market had its first green issuance three and a half years ago. Issuing institutions have included non-financial corporates like Greenko, private banks like Yes Bank and also public sector backed entities like IREDA, and the Indian Railway Finance Corporation. All green bonds have been oversubscribed and have attracted a wider pool of investors than vanilla equivalents by the same issuer. Additionally, greater investor diversification has also led to a pricing advantage - albeit a mathematically conclusive result establishing this assessment is not available mainly due to limited availability of data. However, anecdotal estimates suggest that pricing advantage for Indian issuers has been between 7 to 14 basis points. The experience of the first issuer of Green Bonds, the European Investment Bank shows that its green bonds trade much tighter than an equivalent non-green bond, giving support to the argument about a pricing advantage on green bonds.

Activating the drivers for scaling up green issuances in India Green Bonds are fundamentally oriented towards large volume deals (greater than US$ 100 million

in international issuance and US$ 50 million in domestic issuance). The greening of India's economy, however, needs to be assessed through both high-volume individual deals (utility scale RE, Rail or metro transport etc) as well as aggregating large number of smaller assets and making them attractive for market investments. In combination with other sources of capital like lending by banks and Financial institutions green bonds can provide the much needed access to long term cheap capital for green projects. The issuance size in India varies from small size bonds of below $100 Million to large sized going upto $1billion. Of all the green bonds issues, 40% were of amount less than $100 Million, 56% were of amount between $100 Million to $500 Million and 4% were of size more than $500 Million. Energy research firm Bridge to India noted that with the combined issuance of $4 billion, India has put itself among the top ten green bond markets in the world. The listing of Green Bonds issued in India is as under:

- In 2015, YES Bank, India's Private Sector Bank successfully issued India's first ever green infrastructure bonds raising an amount of INR 1,000 crores. The amount raised is being used by YES Bank to finance green infrastructure projects in renewable energy including solar power, wind power, biomass, and small hydropower projects.
- Another leading banking institution, the Exim Bank of India, in March 2015, issued a five-year $500 million green bond, which is India's first dollar-denominated green bond to fund eligible green projects in countries including Bangladesh and Sri Lanka.
- Axis Bank has launched India's first internationally-listed and certified green bond and raised $500 million to finance climate change projects and solutions around the world. The bond certified by the Climate Bonds Standards Board (CBSB) has been listed in London Stock Exchange (LSE).The Axis Bank will utilise the bond proceeds to promote green energy in urban and rural areas, transportation and what is called 'green-blue infrastructure' projects in India and abroad.
- IDBI Bank raised $350 million in BBB-rated 5-year green bonds for renewable energy projects in November 2015.
- In January 2016, IREDA issued a tax-free Rs.10 billion green bond
- CLP Wind Farms, the largest wind power developer in India with 1,000 MW of wind energy assets in the pipeline across 6 states, became the first

Indian corporate (non-bank) issuer of green bonds in September 2015. CLP Wind Farms raised Rs.6 billion.

- Re New Power Ventures, a leading Indian clean energy company, issued the second corporate green bond in the country in September 2015.The proceeds of the Rs.4.51 billion green bond is intended to refinance bank loans for the company's 85 megawatts (MW) wind power plant in Maharashtra.
- Hero Future Energies, the green energy arm of the Hero Group, one of India's leading industrial conglomerates, issued the country's first certified climate bond in February 2016. Hero Future Energies raised Rs.3 billion ($44 million) by issuing nonconvertible debentures – certified by the Climate Bonds Standard – to finance the development of wind energy projects in the states of Madhya Pradesh, Telangana, and Andhra Pradesh
- India's state-owned energy major NTPC has become first Indian corporate to raise $300 million through Green Masala Bond listed at the London Stock Exchange (LSE) as part of its efforts to promote renewable energy projects in the country.
- In July, 2017, L&T issued country's first SEBI approved green bond. IFC Bought $103 Million of L&T Green Bonds.
- In Sep, 2017 IREDA issued first Green Masala Bond and In Dec 2017, IRFC issued India's first listed Green Bond on INX
- India's biggest lender State Bank of India (SBI) listed Green Bonds of $100 million under its $10 billion Global Medium Term Note Programme on India INX's Global Securities Market Green Platform (GSM)
- Adani Green and Azure Power raised $362 million and $350 million respectively, while ReNew Power has picked up $90 million in 2019

SEBI GUIDELINES ON ISSUANCE OF GREEN BOND

In January 2016, the Securities and Exchange Board of India published its official green bonds requirements for Indian issuers making India the second country (after China) to provide national level guidelines. As per the guidelines of the *Securities and Exchange Board of India (SEBI)*, a debt security shall be considered as 'Green' or 'Green Debt Securities', if the funds raised through issuance of the debt

securities are to be utilized for project(s) and/or asset(s) falling under any of the following broad categories:

1. Renewable and sustainable energy including wind, solar, bio-energy, other sources of energy which use clean technology, etc.

2. Clean transportation including mass/public transportation, etc.

3. Sustainable water management including clean and/or drinking water, water recycling, etc. There are different

types of definitions and indexes that can be leveraged:

4. Climate change adaptation

5. Energy efficiency including efficient and green buildings, etc.

6. Sustainable waste management including recycling, waste-to-energy, efficient disposal of wastage, etc.

7. Sustainable land use including sustainable forestry and agriculture, afforestation, etc.

8. Biodiversity conservation

SEBI issued circular on disclosure norms in May 2017

In addition to the above, SEBI issued a circular on May 30, 2017, setting out disclosure norms which would govern the issuance and listing of 'green bonds' in India (Green Bond Guidelines), in addition to the existing SEBI (Issue and Listing of Debt Securities) Regulations, 2008 (ILDS Regulations). Within the guidelines, the scope of definition of green bonds has been kept wide to include most types of green projects and SEBI has been empowered to include any other category of projects from time to time. As part of the guidelines, the issuer would have to make disclosures including use of proceeds, list of projects to which green bond proceeds have been allocated in the annual report, and periodic filings made to the stock exchanges.

THE RESERVE BANK OF INDIA (RBI) INTRODUCED CORPORATE BOND MEASURES

In this context, the Reserve Bank of India has also introduced a number of measures in August 2016 to develop the corporate bond market in India:

a) It raised the ceiling limit for partial credit enhancement to 50% of issue size from the earlier limit of 20%

b) It allowed banks to issue rupee denominated bonds overseas under the extant framework of incentivizing issuance of long-term bonds by banks for financing infrastructure and affordable housing

c) In order to encourage activity in the corporate bond market, the RBI allowed brokers to participate in corporate bond repo market

d) To facilitate direct trading in corporate bonds, RBI in consultation with SEBI, decided to allow foreign portfolio investments (FPIs) to transact in corporate bonds directly without involving brokers.

BARRIERS TO GREEN BOND MARKET GROWTH MAY INCLUDE:

Market participants the world over are excited and encouraged by signs of future potential of green bonds as a means of financing a sustainable future. It is expected that a greater diversity of issuers will come to market as understanding grows that green bonds can help to meet funding needs for sustainable development.

The following key challenges need to be addressed to enable more rapid expansion of the market

- Lack of commonly accepted green definitions;
- Quality and availability of information to identify, measure, and track green investment
- Supply constraints, including the limited availability of labeled green assets and a pipeline of green projects
- Lack of awareness and know-how about issuing and investing in green products
- Overall macroeconomic and policy instability as well as challenges related to regulatory frameworks, including harmonized standards, green definitions, and green taxonomies
- Underdeveloped capital markets with insufficient liquidity and high transaction costs
- Investors with limited capacity to analyze green investments;
- Scale and mismatch among projects, bonds and institutional investors;

- A lack of suitable aggregation mechanisms; non standardized projects and cash flow instability;
- Low credit ratings for potential green bond issuers and green projects, especially in emerging economies.

Guarding against the risk of 'green washing'

The lack of standard definition for a 'green bond' has led to avoidable confusion and uncertainty over whether all green bonds really are 'green'. Issuers face reputational risk and potential accusations of 'green wash'. Green washing occurs when a bond's proceeds are used to fund projects with little or no positive environmental impact. To prevent the risk of green washing, companies are advised to be guided by the two sets of currently available standards which define and regulate green bonds (1) The Green Bond Principles are voluntary guidelines issued by the International Capital Market Association which states the procedure for certifying a green bond, which have been adopted by 50 large issuers, underwriters and investors. They set disclosure criteria and where the money can go. An external consultant can provide a second opinion and assurance on the bond structure and on the projects financed (2) The Climate Bond Standards have been put forward by the Climate Bond Standards Board, an organization of funds that have among them around $35 trillion.

FINDINGS AND RECOMMENDATIONS FOR FURTHERING USE OF GREEN BONDS AS A SUSTAINABLE DEVELOPMENT FINANCING INSTRUMENT

Green bonds raise money for climate and environmental projects, and are issued by governments, corporations, and financial institutions. The green bond market is now, even though it's a decade or so old, the market is still very much in its infancy but Green bonds are grabbing headlines given the solid growth of that bond market over the past few years. The green bond market is likely to continue to grow over the next decade. It promises to be an important source of capital for much-needed climate initiatives and a source of investment opportunities for SRI investors and funds. As the green-bond market matures, it is developing offshoots. In the last five years, we have seen shifts in the types of projects financed, as well as the emergence of innovative types of bonds and loans linked to environmental, social and governance (ESG) targets. The growth of the green corporate bond market is impressive, more than three-quarters of the market comes from the US or Europe,

with the latter making up nearly 60% alone. China makes up just 5%. Currency-wise, 95% of these bonds are denominated in either USD or EUR. At a sector level, utilities (39%) and banking (33%) dominate. The variety of purposes funded by green bonds has expanded beyond alternative energy to green building and sustainable-transport projects. The unprecedented coronavirus pandemic and its consequent economic repercussions may be occupying a great deal of investor attention at the moment, but climate change and sustainability remain high on many investors' – and companies' – agendas. Green bonds and their offshoots could potentially open up new opportunities to help make the pandemic recovery greener as well.

Green bonds are increasingly being applied to finance emissions reductions, sustainable development, and other cleaner production investments conducive to reaching the 2 °C temperature target of the Paris Agreement. As their markets are relatively nascent, there is a gap in the empirical literature on the drivers of green bond market growth. The scalability of the green bond market depends on a paradigm shift. Stakeholders today perceive the green bond market mostly as a communication tool, with a relatively limited or unclear economic benefit. However with a clear focus and sustained efforts the green bond market can acquire a data-driven legitimacy both in terms of sustainability and financial returns. That shift will reduce transaction costs and crowd in more issuers, especially smaller ones, and give comfort to a wider investor base, expanding the scope of green bonds to more corporate sectors and geographies.

Green bonds are an attractive mechanism for organizations to raise capital for sustainable projects. These bonds can be raised by not only financial institutions, but also by any private sector or public sector organizations. Indian companies are beginning to embrace green finance to fund environmentally friendly projects, as they heed calls from Prime Minister Narendra Modi to boost renewable energy in one of the world's worst polluting nations and tap rising investor demand. A healthy capital market will be critical to achieving India's ambitious climate mitigation targets, and green bonds can act as an effective instrument in channelizing the much-needed private capital. This paper argues that India could effectively leverage the potential of green bonds as a financing instrument to solve its carbon emissions, and climate impacts challenges. It is important to make policy changes to incentivize investment in green technologies.

The recommendations below should set the direction.

· Policy makers can help increase both the supply of green bonds (through the adoption of leading climate-aligned green bond standards) and the provision of enabling policies that grow the renewable energy sector.

- Public capital providers can do their part to help de-risk renewable assets and can support green bonds through provision of the seed capital, demonstration issuances and capacity building.
- Institutional investors can assist by aligning their internal capacities and investment targets with long-term sustainability mandates.
- Other stakeholders, such as rating agencies, financial institutions and retail investors, also play a role in strengthening the green bond market and advancing the global energy transformation.
- Establish a "green" taxonomy: The SEBI disclosure requirements for green bonds and securities is a valuable first step in helping India define long-term sustainable investments and mobilizing green finance, but it does not go far enough. The next step must be to establish a comprehensive set of criteria for defining "green" assets in sync with international frameworks
- Formulate a national green investment strategy: The government should set out a "green" investment program in consultation with the states and the private sector defining its vision, direction and priorities for investment in both mitigation and adaptation efforts.
- Review and redesign Priority Sector Lending to introduce green sub sectors with targets: Banks have a special role to play in primary lending to households and businesses. Priority Sector Lending sub-targets should be set on the basis of green taxonomy.
- Use the Assets Backed Securities to broaden the green bond market: Green bonds have typically been used to fund large companies, backed by the companies' balance sheets. Asset Backed Securitization allows funding for assets secured on the strength of the cash flows earned by the assets themselves, and independent of the credit scores of the borrower
- Adopt High Standards of Disclosure and Reporting : Policymakers must facilitate how companies disclose and report information on which part of their revenue comes from green activities and green assets, and on the use

of proceeds of all green bonds issued. In terms of increasing the credibility and validity of reporting, external entities should be involved in the disclosure verification process.

- Regulators must get actively involved in supervising environmental aspects of green financial products. Regulations focus exclusively on financial risks and disclosure. It is recommended that regulators should engage in supervising the environmental performance of green financial products.
- Broader dialogue between policymakers and market stakeholders: Such dialogue should aim to strengthen the green bond market by aligning it with long-term sustainable development priorities and unlocking its full potential to deliver tangible impact.

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