

Greening Financial Markets: Country Experiences, Challenges and Opportunities

SANA MOID

Assistant Professor

Amity Business School, Amity University, Lucknow

Abstract

The 2008 global financial crisis not only resulted in a turning point for regulation and practices of capital market participants, but also changed the behaviour of financial players. Investors and financial institutions are currently more concerned about allocation of funds. This paper discusses green project bonds as an alternative way of financing projects along with presenting its scope and challenges on a global level. As compared to mainstream bonds, green bonds require the issuer to provide a guarantee of repayment of capital over the tenure of the bond and investors receive either fixed or variable coupon rate of interest. Green bonds can be categorized as asset-backed securities tied to specific green infrastructure projects.

Keywords: *Green Bonds, Green Finance, Bonds, Coupon rate, Global, Challenges and Opportunities*

Introduction

The International Capital Market Association defines a green bond as: “any type of bond instrument where proceeds are exclusively applied to finance or re-finance partially or completely on new and/or existing eligible Green Projects.” Green bonds are debt instruments that are used to finance green projects that deliver environmental benefits. They can be categorised as asset-backed securities tied to specific green infrastructure projects, but have most commonly been issued in the form of “use-of-proceeds” bonds that raise capital to be allocated across a portfolio of green projects. The momentum of continued issuance and market demand has led to growing consensus on what constitutes a green bond and progress has been made on standards and criteria for what constitutes a green project or activity. The narrow definition includes only “labelled” green bonds, including self-labelled and those labelled by independent reviewers. The broader definition also includes unlabelled “pure play” bonds in sectors that are considered as “green” without controversies. The broadest definition is “climate-aligned bonds” as defined by CBI (Climate Bond Initiative) which includes many unlabelled bonds that are assessed by CBI to be “green”. The GBP (Green Bond Principles) suggests that the term “green bonds” be used only for GBP-aligned bonds while the wider universe should be referred to as climate or environmental themed bonds. For the statistics cited in this report, the definition used for “green bond” is cited as well.

Green bonds are becoming an increasingly popular financial instrument used by a number of development banks, state and municipal entities, as well as private companies to raise capital for green investments that alleviate climate change thereby accelerating the global transformation towards resource-efficient and low-carbon sustainable economies. Since the first issue of a green bond in 2007, its market has grown rapidly in OECD countries. Facing a particularly high exposure to climate and environmental risks as well as limited public funds, emerging market economies in the Americas and Asia are increasingly turning towards green bonds as well, viewing them as a promising instrument to mobilize private capital for the green investments urgently needed.

Green Bonds come in six categories:

1. **Corporate bond:** A “use of proceeds” bond issued by corporate entities with an option to the issuer applicable in case of default on interest payments or on return of principal. This category includes bonds issued by “Yield Co” to finance asset acquisitions.
2. **Project bond:** A bond backed by a single or multiple projects for which the investor has direct exposure to risk inherent in the project, with or without recourse to the bond issuer.
3. **Asset-backed security:** A bond collateralized by one or more specific projects, providing recourse only to the assets, except in the case of covered bonds (included in this category). For covered bonds, the primary recourse is to the issuing entity,

with secondary recourse to an underlying cover pool of assets, in the event of default by the issuer.

4. **Supranational, sub-sovereign and agency bond:** These are bonds issued by international financial institutions (IFIs) like World Bank and European Investment Bank (i.e. “supranational issuers”). SSA bonds have features similar to a corporate bond relating to “use of proceeds” and recourse to the issuer. Agency bonds are included in this category, as are sub-sovereign national development banks.
5. **Municipal bond:** These are bonds issued by a local government or territory or one of their agencies, regions or cities. The central/national government could theoretically also issue a “sovereign” bond; no green sovereign bonds have been issued to date.
6. **Financial sector bond:** This is a type of corporate bond issued by a financial institution specifically for raising capital to finance “on-balance sheet lending” (i.e. to provide loans) for green activities (e.g. ABN AMRO or Agricultural Bank of China). This type of bond is considered separately for the purpose of OECD scenarios modelling for retaining a distinction between financial sector bond issuances which finance lending and those which directly finance green investments.

Objectives:

- To understand the concept of Green Bonds and to study the evaluation of the Green Bond market in the Indian and Global contexts.
- To discuss country experiences, challenges and opportunities with respect to Green Bonds.
- To suggest policy recommendations for improvements of flow of green bonds in India.

History of Green Bonds

The green bond market was initiated in 2007 when the EIB (European Investment Bank) issued its first climate awareness bonds followed by a \$400mn green bond issue by the World Bank in 2008. It was initially characterized as a niche product pioneered by a handful of development banks. This was followed by the World Bank issuing a “Green Bond” in 2008. The corporate sector took some time to enter this market; in 2013, the first sizable “green” (classified as 'use of proceeds') bond was issued.

Between 2007 and 2012, governments started joining international organizations to issue their own green bonds and the market reached \$10 billion by mid-2012. With a growing demand for green bonds, there are increasingly diverse issuers and investors across more currencies, beyond the early investments by the United States and Europe. New investors including Credit Agricole and HSBC made first time pledges, and various consortia of banks formed to issue guidance on impact reporting, aimed at bringing companies to market.

To identify what can be called “green”, the Climate Bond Initiative, 2009, came out with “green bond principles”, which have since been adopted by a consortium of banks and financial institutions as the definition of “green”. They are voluntary process guidelines recommending transparency and disclosure, and promote integrity in the development of the green bond market by clarifying the approach for issuance of a green bond.

The Green Bond Principles, updated most recently in June 2016, have attained broad market acceptance as well as growing recognition by policy makers and regulators. As of June 2016, over 117 Green Bond issuers, underwriters and investors have become members of the GBP and about 73 organizations are observers. The GBP outlines voluntary guidelines for issuing green bonds, focusing on disclosure and transparency. It also provides guidance on eligible green project types through major areas of concern and high level project categories.

While green bonds can facilitate the flow of capital to low carbon infrastructure investments, demand for such investments is driven by other factors like low-carbon policy mandates, clean energy standards or deployment targets. An enabling policy context, therefore, is important for actual use of debt capital available through bond markets.

Understanding Green Financing

Green financing differs from conventional financing in some of the key areas including:

Information Sharing: The company raising funds by issuing green bonds, needs to share information beyond financials, specifying the assets and projects that will use green funding and indicating how its operations will have environmental benefits. Green Bond Principles (GBP) are a set of standards agreed among issuers, investors and banks for strengthening the integrity of the emerging green bond market. The focus is to ensure adequate transparency so that investors can decide if bonds fit their requirements or not.

Tracking the use of funds: It is important to track the use of funds until – and after – they have been utilized; this involves quantification of positive impacts. For example, a company may be able to quantify how much carbon emissions were saved by producing energy from renewable sources.

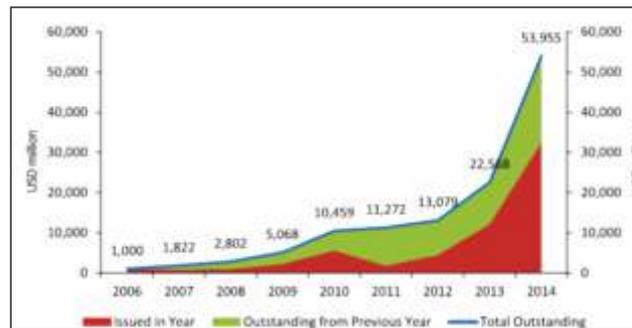
Outside opinion: In practice, investors like to seek an outside opinion for verifying compliance with GBP. Establishing these working and reporting streams does entail some work and cost – but it is not as taxing as people unfamiliar with green financing space might think. The quantity of work also depends on the information already available elsewhere in the company.

Ratings: Where ratings are concerned, the credit credentials of green bonds are the same as other bonds, as green bonds are repaid from the same cash flow as conventional bonds. However, some individual investors may give additional weight for good green issuers.

Global Market Trends – Green Bonds

The Green Bond market has been expanding since 2013, with fresh issue of stocks in the last two years resulting in over 80 percent of the total outstanding. As shown in Figure 1 below, the total outstanding investments in Green Bonds as on October 2014 was USD 54 billion, including USD 32.5 billion of fresh issuances, more than the cumulative issuance of Green Bonds over the last eight years. In the third quarter of 2014, the total number of Green Bonds issued was 28 with total value at USD 9.2 billion.

Figure 1: Historical Issuance of Green Bonds



Source: USAID

The size of bond issuances has been steadily increasing – with over 31 bonds issued in the last two years grossing over USD 500 million each, as compared to seven such issues over the period 2006-2011, indicating an increased market base for Green Bonds.

The significant growth of the Green Bond market 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. Currently, over USD 45 trillion of Global “Assets under Management (AUM)” incorporate ESG issues into investment decisions and are participants to Principles of Responsible Investments.

Figure: PRI Signatories in Various Geographies



Source: USAID

It is important to analyze international market trends while exploring Green Bonds for the Indian market. The key learnings from the international market are as mentioned below:

Interest arbitraging against normal bonds does not exist: Currently, the Green Bonds market is at its initial stage but is rapidly expanding to reach a critical mass with larger investor participation. The current market trends indicate that while the demand and supply gap exists, it is still not reflected in a pricing advantage for Green Bonds.

Green Bond investments are not social funds: All issuers should view Green Bond issuances as competing with other normal bonds. In fact, investors prefer Green Bonds over normal bonds falling in a similar risk/reward equation.

Green Bond tenures are shorter than the requirement: The recently issued Green Bonds have short tenures of between 3-10 years; however, there are some bonds with tenures exceeding 15 years. For the Indian market, shorter tenure Green Bonds issuances are suggested at the initial stage with longer tenure issuances after the country's international reputation in the bond market develops.

Perspectives of Green Bond Stakeholders

Issuer Perspective

Issuing a green bond requires a number of parties working together for generation of a marketable product: issuers for issuing the bond and directing the proceeds toward borrowers with appropriate “green” projects, underwriters for marketing and selling of the bond to investors, and investors for purchasing the bonds. In some cases, the issuer and the borrower can be the same party.

Investor Perspective

Green bonds are still viewed by investors and asset managers as a strong product because of a relatively small level of issuances compared to broader markets for traditional bonds. However, several large asset managers have launched green bond funds for serving interested investors. There are some perceived benefits of green bonds for particular investor types. For example, green bonds can help foundations, pensions and family offices conduct “mission-related investments,” aligning investment of their main assets with their broader social and environmental objectives. Additionally, investors interested in geography-specific investments may be drawn to green bond issuances for supporting projects in specific geographic areas or communities. Nonetheless, such advantages are currently not adequate for inducing investors to accept a lower rate of interest on green bonds versus a comparable conventional government bond. Investors are primarily interested in investing in green bonds whose characteristics match their overall investment objectives (e.g., risk-return profile, duration). Family offices and small foundations have been first movers in buying green bonds, which asset managers interviewed attribute to a stronger willingness to take risks on a part of their portfolio, or for accepting a lower level of return in exchange for a green bond that is “mission-aligned” with their organization's social or environmental goals.

Overview of Green Bonds in India

India has set ambitious renewable energy goals for improving energy access and energy security while taking action on climate change. To procure the necessary finance for achieving the national targets, the Government of India is interested in green bonds and has approached at least eight domestic lenders to raise low cost, long-tenure funds through green bond energy plans. Encouraging national players like the Rural Electrification Corporation (REC), Power Finance Corporation (PFC), Industrial Development Bank of India (IDBI), Indian Renewable Energy Development Agency (IREDA), and private sector entities like India Infrastructure Finance Corporation Limited (IIFCL), ICICI Bank and Yes Bank has entered the market helping scale up green bonds in India. With an increasing number of financial entities entering the Indian green bond market for providing capital for renewable energy projects of all sizes, the cost of financing projects in the market will become more favourable.

In 2015, the green bond market in India kick-started with smaller issues of \$100 million to \$200 million with a huge potential of scaling-up. Green bonds are also varied in terms of credit ratings (AAA to BBB) with most green bonds rated AAA to A, providing stability and higher quality of bonds. However, challenges that exist for green bond issuances include high currency hedging cost, poor sovereign rating (BBB-) and lower tenures causing obstacles in its growth. Several entities have issued green bonds in India and raised more than Rs.120 billion (\$1.85 billion) so far:

Yes Bank: Yes Bank issued its first green infrastructure bond in February 2015 - Euro denominated Rs.10 billion (\$161 million)

10-year issue - and received a AA+ rating. It was oversubscribed by nearly over two times, demonstrating huge demand. The issue proceeds were to fund renewable energy infrastructure projects.

Export-Import Bank of India (Exim Bank): Exim Bank issued India's first ever and Asia's second dollar-denominated green bond in March 2015. The BBB- rated issue was oversubscribed by more than three times with majority of investors being asset managers, banks, sovereign wealth funds and insurance companies. The Exim Bank did not get an external green certification, but provided a series of detailed investor updates and assured audit certification for the use of proceeds.

CLP Wind Farms: CLP Wind Farms became the first Indian corporate to issue green bonds in September 2015 and managed to raise Rs.6 billion (\$90.3 million), receiving an AA- rating and attracting primarily Indian mutual funds as investors with a coupon of 9.15% per annum, in three equal tranches of Rs.200 crore (\$30 million) with maturity in three stages - every April in 2018, 2019 and 2020.

Hero Future Energies: Hero Future Energies issued the country's first certified climate bond in February 2016 and raised Rs.3 billion (\$44 million) by issuing non-convertible debentures – certified by Climate Bonds Standard – for financing the development of wind energy projects in the states of Madhya Pradesh, Telangana and Andhra Pradesh.

IDBI Bank: India's state-owned IDBI Bank raised \$350 million in BBB-rated 5-year green bonds for renewable energy projects in November 2015, becoming India's first public-sector bank to raise funds through green bonds. The issue, certified through the Climate Bond Standard, was oversubscribed by over three times, with prospective investors offering a total of \$1.1 billion.

IREDA: In January 2016, IREDA issued tax-free Rs.10 billion (\$150 million) green bonds which were oversubscribed by over five times on the opening day and offered retail investors up to 7.68 percent interest rate for tenures ranging between 10 and 20 years. Factoring in tax savings, the effective interest rate for investors is substantially higher than bank fixed deposits, which attract income tax on interest income. The IREDA green bonds successfully reached a broad base of investors including retail individual investors, high net-worth individuals and institutional buyers.

A list of issuances of Green Bonds in India has been provided below.

Date	Issuer	Amount	Purpose
February 2015	Yes Bank	INR 10 billion	Renewable energy
March 2015	EXIM Bank	USD 500 million	Eligible green projects in Bangladesh and Sri Lanka
August 2015	Yes Bank	INR 3.1 billion	Renewable energy
September 2015	CLP India	INR 6 billion	Renewable energy
November 2015	IDBI Bank	USE 350 million	Renewable energy
January 2016	IREDA	INR 10 billion	Renewable energy
February 2016	Hero Future Energies	INR 3 billion	Renewable energy

Source: Author's own research

The Regulatory Rhymes

The SEBI (Issue and Listing of Debt Securities) Regulations, 2008 (“SEBI Debt Regulations”) governs public issue of debt securities and listing of debt securities issued through either public or private placement route, on a recognized stock exchange in India. While, on-shore Green Bonds have been issued and listed under SEBI Debt Regulations, however, in the absence of clear directions or provisions in the SEBI Debt Regulations, it was not clear as to what would constitute a Green Bond and the process required to be followed. With the objective of bringing uniformity related to Green Bonds and for removing future confusion around the subject matter, SEBI, in its meeting held on January 11, 2016, approved the new norms for issuing and listing of 'Green Bonds'.

Even though the process of issuing Green Bonds is the same as issuing other corporate bonds, there are a few additional disclosures required related to periodic reporting of fund allocation. The issuer would have to make disclosures including use of proceeds, listing of projects to which Green Bond proceeds have been allocated in the annual report and periodical filings made to stock exchanges. The other salient features are as under:

- i. The issuance and listing of Green Bonds shall be governed by the existing SEBI regulations for issuance of Corporate

Bonds i.e. SEBI (Issue and Listing of Debt Securities) Regulations, 2008. However, the issuers of the Green Bonds will have to make additional disclosures/ follow procedures.

- ii. The definition of Green Bonds should be prescribed by SEBI from time to time. However, care must be exercised in defining the green label for such bonds and should be aligned with the international guidelines and investors' expectations.
- iii. Requirement of independent third party reviewer/ certifier/ validator for reviewing/ certifying/ validating the pre-issuance and post-issuance process including project evaluation and selection criteria, for lending credibility to the issue of Green Bonds. However, given the fact that availability of such third party reviewer/ certifier/ validator in India is not sufficient and globally such review is not compulsory, the same has been kept optional by SEBI.
- iv. Escrow account for tracking the proceeds of Green Bonds is not made compulsory by SEBI. However, the issuer is required to present details of the systems/ procedures to be used for tracking the proceeds of the issue, including the investments made and/or investments earmarked for eligible projects and the same shall be verified by the external auditors.

Benefits:

The green bond market can offer several important advantages for green investment:

Providing an additional source of green financing. Given massive green investment needs, bonds offer a holistic financing instrument for addressing such projects. As traditional sources of debt financing are not sufficient in light of immense green investment needs, there is a need for introducing new means of financing that can influence a wider investor base including institutional investors (such as pension funds, insurance companies and sovereign wealth funds) managing over USD 100 trillion in assets globally. The development of the green bond market can provide an additional source of funding to green lending by banks and green equity financing by investors.

Enabling more long-term green financing by addressing maturity mismatch. In many countries, the ability of banks to provide long-term green loans is constrained due to the short maturity of their liabilities and a lack of instruments for hedging duration risks. The corporate sector accessing short-term bank credit also face refinancing risks for long-term green projects. If banks and the corporate sector can issue medium- and long-term green bonds for green projects, these constraints on long-term green financing can be mitigated.

Enhancing issuers' reputation and clarifying environmental strategy. Issuing a green bond is an effective way for developing and implementing a credible sustainability strategy for investors and the general public by clarifying how proceeds raised will contribute towards the pipeline of tangible environmental projects. Green bonds can thus help enhance an issuer's reputation along with internal sustainable development policies, as this is an effective way for the issuer to display its commitment towards improving environmental sustainability. These enhancements may result in benefits for product marketing as well as potential government policy incentives for business operations. Setting up a green bond framework can also serve to upgrade issuers' environmental risk management processes due to their commitment to "green" disclosures.

Offering potential cost advantages. While the cost advantage is not yet clear in the current nascent green bond market, it is possible that, once the market attracts a wider investor base, both domestically and internationally, better pricing for green bonds versus regular bonds may emerge, provided demand is sustained. According to CBI, a number of issuers also report having benefitted due to the increased speed of "book building" translating into reduced costs for marketing and road shows. In some countries, government incentives like tax reduction, interest subsidies and credit guarantees are also being discussed as options for further reducing the funding costs for green bonds with US having already experimented in this area with green property bonds and municipal bonds.

Facilitating the "greening" of traditionally brown sectors. The aforementioned benefits of the green bond market can function as a transition mechanism that encourages issuers in less environmental-friendly sectors for taking part in the green bond market (provided they ring-fence proceeds for green projects) and also to reduce the environmental footprint by engaging in green investment activities that can be funded via a green bond. This complements mandatory 'real economy' policies that lead to changes in business models.

Making new green financial products available to responsible and long-term investors. Pension funds, insurance companies, sovereign wealth funds and other institutional investors having special preference for sustainable (responsible) and long-term investment are looking for new financial instruments to achieve their investment targets. Green bonds provide these investors with access to such products and the way for many other investors to diversify their portfolios. The green label is a discovery mechanism that lowers the "search costs" for investors looking for green opportunities in a vast ocean of bonds.

Disclosure Requirements for Issuance and Listing of Green Bonds:

A green bond is like any other bond where a debt instrument is issued by an issuer to raise funds from investors. However, what differentiates a Green Bond from other bonds is that the proceeds of a Green Bond are earmarked for use towards financing 'green' projects.

SEBI (Issue and Listing of Debt Securities) Regulations, 2008 (hereinafter "ILDS Regulations") govern the public issue of debt securities and listing of debt securities issued through public issue or on private placement basis, on a recognized stock exchange.

Thus, an issuance of Green Bonds in India shall be governed under ILDS Regulations requiring the issuer to make disclosures as required under ILDS Regulations. However, given the nature of such bonds, there is a requirement for defining what issues are categorized as Green Bonds and the specific disclosure requirements with regards to management of proceeds, reporting requirements, etc.

While even today Green Bonds can be issued under ILDS Regulations, the proposal under consideration removes uncertainty about what constitutes a Green Bond and what is the process required to be followed. This is intended to benefit those funds/investors which have a mandate to invest only in green initiatives. These funds/investors will no longer need to apply their separate test for eligibility and as such, it will facilitate quicker decision making.

Green Bond Indices

An overview of the green bond indices in the market and their inclusion criteria is set out in the table below.

	Minimum size	Investment grade only	Bond types	Coupon	Maturity	Green criteria
Solactive	\$100m	Mixed (non-investment grade and unrated included)	Corporate, Bank, Development Bank	Fixed only	>6 months	Complies with Climate Bonds taxonomy
S&P Dow Jones	n/a	Mixed (non-investment grade and unrated included)	Corporate, Bank, Development Bank, Municipal (ex US), ABS	Fixed, zero step up, fixed to float, floaters	>1 year	Complies with Climate Bonds taxonomy. Separate unlabelled climate project bond index
Barclays & MSCI	\$250m	Yes	Corporate, Bank, Development Bank, Municipal (ex US), ABS	Fixed only	Maturity in index	Complies with Climate Bonds taxonomy. MSCI environmental assessment unlabelled climate bonds are eligible
Bank of America Merrill Lynch	\$250m	Yes	Corporate, Bank, Development Bank, Municipal (ex US), ABS	n/a	>1 month	Complies with Bloomberg Green Bond definition

Source: Author's own research

As the bulk of assets under management globally are passive investments tracking indices, Green Bond indices are an important measure to ensure accessibility of Green Bond investments to the mainstream, passive funds. This facilitates the Green Bond market to be scalable and not remaining a niche market. Development of a range of Green Bond indices allows a range of Green Bond funds to be launched tracking different indices. Another important role for Green Bond indices is building a performance history for the financial performance of Green Bonds.

Why Green Bonds Are a Necessary Tool for leveraging and supporting broad clean energy deployment in India:

Green bonds expand the quantity of clean energy finance and broaden the investor base: To meet India's clean energy targets, a variety of mechanisms and instruments are required for mobilizing adequate finance in a timely manner. Infrastructure financing in India has traditionally been supported by institutions such as banks, non-banking financial companies (NBFCs) and financial institutions. Given the huge investment required for scaling renewable energy, existing traditional financing sources like domestic bank loans are not sufficient for supporting capacity addition. Thus, new innovative financial instruments – like Green Bonds – that tap into international resources for leveraging a wider investor base like pension funds, sovereign wealth funds and insurance companies are needed for achieving India's climate and clean energy goals.

Green bonds provide access to low cost, long term capital: Green Bonds are cost-competitive in comparison to other bonds and can provide capital at a lower cost than commercial bank loans. The cost of capital through Green Bonds can be lowered even further with strategies of forex hedging and standards and certifications. Banks are usually unable to invest in long-term projects due to maturity mismatch between traditional bank loans and longer payback periods typical for most renewable energy and sustainable development projects. In India, interest rates are high, increasing the intensive upfront capital investment for most green projects. Green Bonds address both these challenges. Offering a competitive risk return profile as compared to traditional bonds, Green Bonds can provide lower cost and stable funding for renewable energy projects regardless of an individual government's policy support for clean energy.

Global Experiences:

Japan: The Environment Ministry of Japan stipulated "Green Bond Guidelines, 2017" on March 28, 2017 with the purpose of spurring issuances of Green Bonds and investments in them in Japan. To maintain credibility of the green characteristics of Green Bonds, the Guidelines seek to prevent "green-wash" bonds from being issued and invested in.

As the International Capital Market Association continues to update its recommended Green Bond Principles with the objective of improving integrity and transparency of the Green Bond market internationally, developments in Japan also continue to move toward this goal. One of the developments is a growing practice among some issuers for arranging of second opinions on compliance of product with ICMA's Green Bond Principles. This goes toward one of the important areas with respect to Green Bonds – the credibility of the bond as a "green product" in terms of the use of its proceeds.

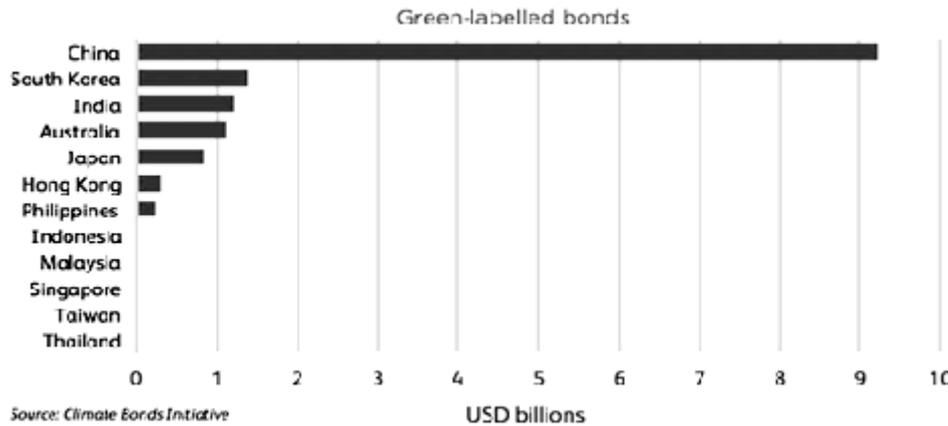
A key area of concern for investors interested in Green Bonds is the level of certainty of "greenness" of the bonds, which can be addressed by obtaining a second opinion with respect to compliance with Green Bond Principles. Moving towards a credible definition of "Green Bonds" with some level of certainty for the Japanese market will require constant monitoring of international trends as well as a consideration of practical factors.

Singapore: Sustainable investments have gone mainstream and Singapore is taking steps to match the demand by growing a Green Bond market. The global Green Bond market has grown rapidly over the years, reaching more than US\$80 billion (S\$112 billion) in 2016. Under the Green Bond grant scheme, issuers can offset up to \$100,000 of costs incurred from obtaining an independent review based on international Green Bond standards. For qualifying, bonds can be denominated in any currency but must be issued in Singapore with a minimum size of \$200 million and tenure of at least three years.

From June 2017, the government of Singapore introduced a scheme for Green Bonds which it hopes will increase the use of Green Bonds as an asset class in the country, following global acceleration and growth of the climate bond market in the last four years. To qualify for Singapore's grant scheme, bonds should have a minimum value of S\$200 million with a lifespan of at least three years. The bond can be denominated in any currency, but must be issued in Singapore. Once confirmed, recipients of the grant scheme will be able to offset the cost of obtaining an external review for Green Bonds for qualifying issuances up to either S\$100,000 or 100% of the cost – whichever is cheaper – per issuance. However, issuers will be able to apply for and receive the grant multiple times.

Other Asian Economies: In a region dealing with excessive pollution and greenhouse gas emissions, climate change-induced droughts and floods, exacerbated by high coal-fuelled energy consumption, countries in Asia are exploring innovative clean and green financing products like Green Bonds to move towards a sustainable, low carbon economy.

The Asian market for Green Bonds is dominated by China, South Korea, India and Japan.



Asian markets, including China, India, Japan, South Korea and the Philippines, have witnessed a rapid increase in Green Bond transactions in recent years. Green Bonds are going mainstream in the overall bond market, mainly because of the growing global awareness about the pressing need for environmental protection.

In the second half of 2016, BlackRock, the world's largest asset manager, issued a climate change warning stating that investors could no longer ignore the phenomenon and that they should contribute towards solving of environmental problems. In the global Green Bond market that more than doubled in size to over \$85 billion in 2016 (versus 2015's levels), Asia's collective market share grew to more than 40% of issuances (from 10% in 2015). China's individual increase in market share (from about 7% to more than 35%) at a time of such accelerating overall market growth reflects the galvanizing impact of a 'regulatory-push' factor. In Europe and some other developed markets, growth has been led more by 'investor-pull' factors.

Such rapid expansion only comes from a broad-based shift: existing green issuers, largely developmental organisations, have been joined by an increasingly diverse range of entities, including developed-market corporates like Apple, Toyota, Hyundai and Iberdrola, as well as issuers from emerging economies, mainly in Asia, including Bank of China, China's Industrial Bank, Bank of Qingdao and Xinjiang Goldwind from China, and India's Hero Future Energies and Axis Bank. Moreover, 2016 saw diversification of structure as well as issuer with Bank of China launching China's first green covered bond in November; India's first green 'masala' bond was issued in August by National Thermal Power Corporation, just a month after the offshore rupee market had opened.

USA: In 2008, The World Bank issued the first fixed-rate bond carrying a green label. In less than a decade, the market has grown to \$118 billion in outstanding bonds labelled green. In addition, another \$576 billion in unlabeled bonds fund climate-friendly projects. Investors around the world are increasingly familiar with the challenges of climate change and energy conversion. More and more of them are clamouring for investment tools taking environmental criteria into account. They are showing interest in the bonds and "100% green" investing. And while green bonds remain a relatively small phenomenon, the market is expanding rapidly. In September 2016, the Luxembourg Stock Exchange announced the opening of the "Luxembourg Green Exchange (LGX)", the world's first platform dedicated for green financial instruments. It aims at capturing a significant chunk of a market that is expected to become enormous. When the platform was opened, 114 Green Bonds were already listed, amounting to over \$45 billion. The bonds meet strict requirements, remarkably concerning invested funds, which must be "used exclusively for financing or refinancing 100% green projects."

Despite this impressive progress, Green Bonds still represent less than 1% of the worldwide bond market. The United States is the world's leading issuer with more than \$24 billion in Green Bonds outstanding in mid-2016, according to the Climate Bonds Initiative. The U.S. bond market, with \$40 trillion outstanding, dwarfs those of other countries. The relatively slow pace of U.S. Green Bond issuance is a major obstacle to the country's efforts to address climate change. Many market participants believe that the problem in the United States is lack of supply and not of demand. Green Bond issues are typically oversubscribed. The

reason behind weak U.S. Green Bond activity is still not clear. Part of the answer lies in the market's lack of maturity. A combination of irregular deal flow, small offering size, index ineligibility, illiquidity and lack of standardization limits market activity. But these factors are becoming less constraining as the market grows. The more fundamental explanation for Green Bonds' slow takeoff in the United States lies not in the bond market itself, but in the broader cultural, political, and legal environment that holds back action on climate change.

UK: The UK has become a global hub for green finance initiatives. A wide range of pioneering green finance initiatives and organizations are based in London. The London Stock Exchange is attracting international Green Bond issuances in different currencies. In July 2015, the stock exchange established a range of dedicated 'Green Bond' segments to increase the visibility of Green Bonds for investors. As of January 2016, 10 Green Bonds were listed on the London Stock Exchange. In January 2016, the Green Finance Initiative (GFI) was launched aiming to mobilise the capital required for implementing the Paris climate change agreement and the UN's Sustainable Development Goals.

Issues with “Green” Bonds:

1. Green Bond Standards: The International Capital Markets Association (ICMA) has issued Green Bond principles; the Climate Bonds Initiative has resulted in climate bond standards. There are also Green Bond indices being developed by various banks or rating agencies. These indices and principles spell out standards and practices defining what are considered “green”. The definitions in both are quite broad and guidelines are voluntary; so they do not hamper innovation in green financing. However, the definitions also led to a great deal of confusion over what is considered green. CICERO, a second-party reviewer of Green Bonds offered the “shades of green” methodology through which Green Bonds are graded “dark, medium or light” green depending on the underlying project's contribution to “implementing a 2050 climate solution”. There is no fixed definition or binding standards. This has kept some mandated green investors, preferring to do their own due diligence, away, thus raising the cost of investing and monitoring. Issuers face reputational risk and potential accusations of “green washing” if proceeds are not used for their intended purposes or if issuers are unable to prove that proceeds have funded projects with a positive impact.

A second problem faced by green investors is their limited capacity to analyse green projects, in which case the role of third party guarantors like CICERO and audit firms like KPMG and EY becomes vital.

Investors: So far, all Indian green bond issues have seen 15-20 per cent investment by dedicated green funds including supra-nationals like International Finance Corporation, KfW, European Investment Bank, Asian Development Bank and other funds, which have a compulsion clause to invest in green projects. For any pricing advantage over conventional bonds, this proportion needs to go up to 50 per cent.

Funding: Banks are the major source of direct green infrastructure financing. However, the scale of investment along with the “maturity mismatch” significantly exceeds the capabilities of the post-financial crisis banking sector with inhibited balance sheets. Indian PSU banks are already grappling with huge NPAs and are credit inhibited. Bond markets, which provide both an alternative and complement to bank financing of debt, will be required to play a crucial role. Bonds with long tenures are potentially a good fit with institutional investors' long-term liabilities allowing for asset-liability matching.

Low Credit Rating of Potential Green Bond Issuers: Infrastructure companies in India do not have a very good credit rating history. In addition, apart from biggest names in the power generation sector, viz., NTPC and Tata Power, no other company has a credit rating good enough to issue bonds in the capital markets. Because of the nature of business, power generation is capital intensive and relies mainly on debt for funding, which further hampers new companies from being able to raise debt in the capital markets.

Cost: The issue of “Green Bonds” entails an additional monitoring and certification cost. Although this is completely voluntary, it does tend to increase the cost of a “green” issue.

Issues with Indian energy markets:

1. Repayment Risks: Indian distribution companies are not in the best financial state right now. They are burdened by heavy losses and the Ujwal DISCOM Assurance Yojana (UDAY) scheme is a temporary analgesic. The incentives that allowed discoms to accumulate such huge losses by supplying power cheaply still remain. Renewable energy Power Purchase

Agreements are more expensive for discoms, and they supply only a miniscule amount of power as compared to conventional energy. In such a situation, discoms will first default on renewable PPAs in case of financial difficulties.

2. **Energy Reforms:** Most states have corporatized state electricity boards but some still have to unbundle them, separating generation from distribution and, in essence, implementing all the changes suggested in the Electricity Act of 2003.
3. **Enforcement of Renewable Purchase Obligation:** Considering the financial condition of discoms in the country, RPOs have not been enforced firmly; this has negatively affected the demand for renewable energy, which is more expensive than thermal power and RPOs increase the cost for discoms.

Issues with Indian financial markets:

1. **Seed Financing:** Financing of green field renewable projects in the initial stages is a problem unless the promoter company is highly rated because of the risk-averse nature of financiers who hesitate in taking risks on project implementation.
2. **Duration Mismatch:** Indian banks lend money for project finance up to a maximum duration of 15 years. Power projects usually have a lifecycle of 20-25 years and they face a refinancing risk. This can be avoided if projects are financed by NBFCs or investors with a longer duration horizon like insurance or pension funds.
3. **Insurance and Pension Regulations:** Certain insurance and pension regulations restrict these funds from participating in infrastructure projects.

Key Challenges for Indian Entities

The following challenges are considered to be the key risk elements for issuance of Green Bonds for Indian entities.

Hedging costs: Currently, hedging costs are very high (estimated at 8 percent and above for 10-year tenure) and hence, take away the cost advantage for foreign currency financing in India. There is a need for exploring instruments/methods that can enable reduction of such costs.

Credit ratings: India's current sovereign rating of BBB- is not attractive for risk-averse investors. Thus credit enhancement offered by multiple agencies like IFC, AFD and USAID-DCA, can help enhance credit rating. However, there are costs associated with such credit enhancement services and hence, cost benefit analysis needs to be done.

Regulations: The external commercial borrowing (ECB) guidelines pose certain challenges for the usage of proceeds from Green Bonds. Viable solutions include: Refinancing special purpose vehicle by integrated performance primitive issuing corporate bonds in foreign currency, On-lending possibility for SPV of Infrastructure Finance Company created for issuance of Green Bonds, Issuances of Green Bonds by an overseas SPV of a domestic FI, etc. Only 25 percent of ECBs are allowed to refinance existing loans; the remaining 75 percent should be used for development of new constructions, which poses a challenge for launching Green Bonds for operational assets.

Policy Recommendations

In order to develop a Green Bond market, the government essentially needs to increase the funds available for investment in green projects. This can be done through specific tax incentives and development of long-term finance markets in general. The following measures are recommended:

Regulatory changes in IRDA: Regressive regulations are one of the major reasons the market for corporate debt is under-developed. A couple of regulatory changes by PFRDA and IRDA will go a long way in creating a market for debt in India. Regulations to some extent are hampering the growth of the bond market in India and need to be relaxed. But, it is not recommended that IRDA mandates insurance companies to invest in areas if they choose not to. Companies handling public money should choose the risk they are willing to take and should not be burdened with additional risks.

- a. The Insurance Act does not permit insurance companies to invest in private limited companies preventing them from investing in many infrastructure projects and renewable projects, specifically because renewable power developers are usually smaller companies that are privately held.
- b. IRDA requires 15 per cent investment in infrastructure and housing for life insurers (10 per cent in infrastructure by non-life insurers).

Revisiting PSL Norms for Green Investing (RBI): The RBI's priority sector lending requirements allow bank loans up to INR 15

crore for purposes like solar power generators, biomass power generators, wind mills, micro-hydel plants and non-conventional energy based public utilities to be eligible to be classified as priority sector loans under “Renewable Energy”. The RBI probably wants banks to lend to newer borrowers and not classify their existing renewable loans to large players as PSL.

Clear Specifications and Monitoring for Green Bonds (SEBI): The SEBI, in December 2015, came out with a concept paper for issuance of Green Bonds in India, which stated that no additional regulations are required for issuing Green Bonds in India. However, government incentives cannot operate in grey areas where the definition of green is “voluntary”. If it is decided to provide incentive for green bonds, the definition of “green” must be standardized.

Retail Tax Incentive for Green Bonds: For mobilising retail savings, the government can include or create a new category for Green Bonds on the lines of infrastructure bonds which receive an exemption under Sec 80CCF, which will help Indians save more while directing money towards renewable energy.

To increase investments and investor confidence, a robust Certification and Standardization (C&S) scheme is an essential component of green bond-supported projects that can verify the transparency, quality and “greenness” of projects and enable reporting through a standard mechanism. Standards increase the long-term credibility of Indian Green Bonds market by providing evidence to issuers and investors that the selected green projects are achieving environmental benefits and no “green washing” has occurred.

Transactional costs attached with Green Bonds can be brought down even further by employing the following strategies: Reducing forex-hedging costs; Credit enhancement products and Certification and standardization.

Ministry of Finance and RBI can lead efforts to develop rupee denominated Green Bonds that open access to new sets of international investors for India's clean energy projects. To limit the effect of perceived creditworthiness issues in reaching the broad segment of investors, international development finance institutes such as International Finance Corporation (IFC) and Asian Development Bank (ADB) can act as a bridge linking Indian Rural Development Bank to international investors and providing credit enhancement.

Establishing green investment guidelines and setting portfolio-level mandates – such as sub-categories within the priority sector lending targets for banks and social and infrastructure investments by insurers – can result in a robust demand for clean energy assets.

The Ministry should also consider providing future allocations of tax-free bonds with a larger share for clean energy for diversifying and deepening the debt markets in India. Industry experts in collaboration with clean energy knowledge leaders and ratings institutions like CRISIL, ICRA etc. can support several measures for making the Green Bond market more inclusive and diverse in India beyond large, creditworthy investors.

Conclusion

Green Bonds have a high potential to mobilize international finance for renewable energy project developers by enabling access to scalable, long-term and low cost debt capital from institutional investors. Green Bonds can provide low cost financing by providing lower interest rates than typical domestic clean energy project financing.

The “Green” Bond market is a relatively new aspect of global capital markets and has been pioneered by multinational institutions. Although it comes under the fixed income umbrella, the number of dedicated investors with compulsion for socially responsible investing is increasing every year. Considering that fossil fuels have enjoyed huge subsidies throughout their history and have led to environmental degradation and contributed to global warming, it is appropriate that renewable energy and technologies that reduce the carbon footprint get the same advantage. There are subsidies in place for environmentally friendly projects in many countries of the world and technological advancement is driving costs down for them to become competitive with conventional energy.

Green Bonds are just another way of classifying and channelizing investments in “green” projects. Although the market is burgeoning, broad guidelines are coming to the front. As the market matures, investors will require that Green Bond issuers report on the status of deployment and environmental outcomes of the investments. For the Green Bond market to have long-term credibility, investors and governments would need evidence that the projects funded have delivered the intended

environmental benefits. Issuers should design monitoring and evaluation processes in advance, and implement key performance indicators and data collection systems to monitor the environmental outcomes of projects over time.

In general, global leaders need to take three steps for reducing the carbon footprint. First, governments around the world would do well to promote the development and standardization of “Green” Bonds as a way to finance environmentally sustainable projects. Second, there should be incentives for investing in sustainable projects funded by a carbon tax on polluting sources of energy and finally, more funds to be dedicated for investment in environmentally sustainable projects.

Green bonds are changing the scenario of available investment products, helping to address solutions for meeting the global environmental challenges. It is believed that this will continue to grow in the future as investors, in particular millennials, look to make a positive impact in their communities and worldwide via their investment portfolios.

Future Research

The present study is a review paper focusing on the descriptive analysis of the literature present for Green Bonds without empirically analyzing the specific performance of Green Bonds. Further research could be conducted to empirically test the performance of these bonds and a comparative analysis could also be done presenting the performance economy-wise. For the purpose of such analysis, the Green Bond market indices could be used as the base.

Lastly, Green Bonds lack unified guidelines that may help mitigate the liquidity and credit risk in the green bonds market. Future research may focus on possible improvements on liquidity regulations and liquidity risk management in the Green Bonds market.

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Sana Moid is Assistant Professor at Amity Business School, Amity University, Lucknow. She has over 8 years of teaching and research experience. Her teaching interest includes accounts and finance. She has cleared NET in 2012 and has been awarded PhD degree in the year 2016. Her research interest include Taxation aspects of E- Retailing transactions, new aspects of Accounting including Creative Accounting, Forensic Accounting and Spiritual aspects of accounting, Women Entrepreneurship and its financing. She is a permanent member of professional bodies like Indian Accounting Association and Indian Commerce Association. She has also edited a book on Online taxation of E- Retailing transactions to be published by a renowned American publisher. She can be reached at smoid@lko.amity.edu

