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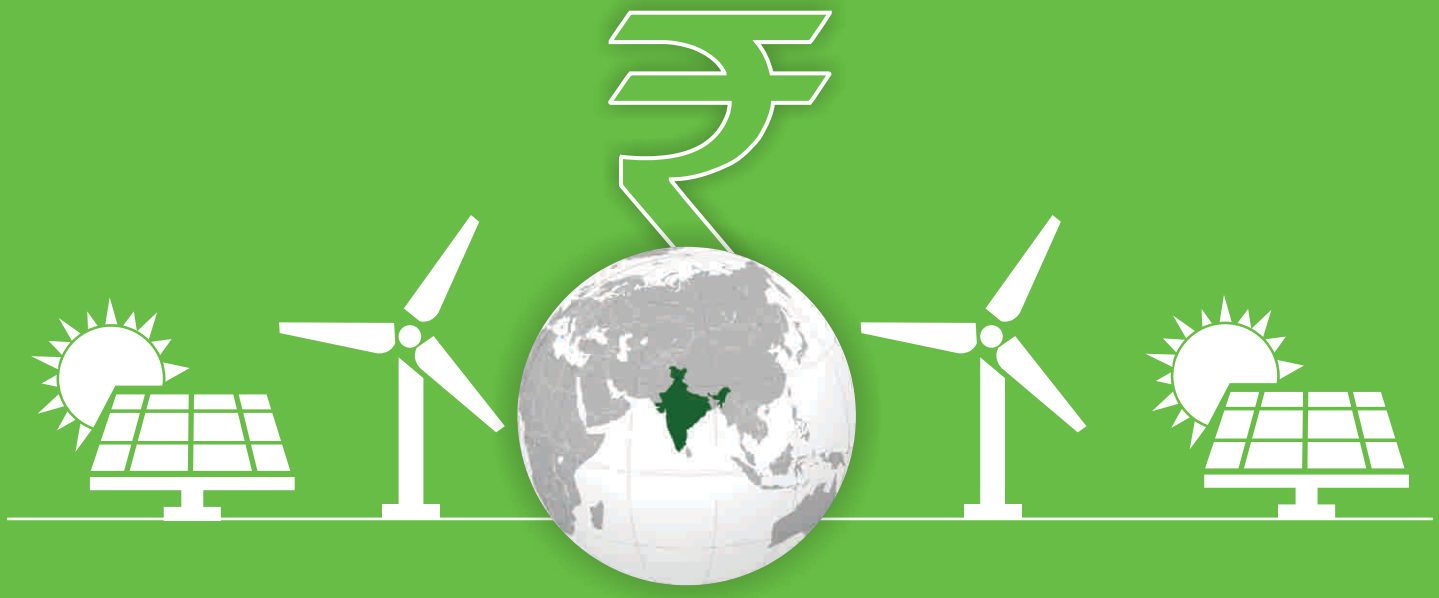
Partnership to Advance Clean Energy-Deployment (PACE-D)
Technical Assistance Program

Issue Paper: Green Bonds in India



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ACRONYMS

Acronyms	Definition
ABS	asset-backed securities
ADB	Asian Development Bank
AFD	African Development Bank
AUM	assets under management
BAML	Bank of America Merrill Lynch
CBI	Climate Bond Initiative
CBSB	Climate Bond Standards Board
CSR	corporate social responsibility
DBS	Development Bank of Singapore
DISCOMs	Distribution Companies
ECB	external commercial borrowing
EIB	European Investment Bank
ESG	environmental, social and governance
EUR	Euro
EVI	Emergent Ventures India
FI	financial institution
FiT	feed-in tariff
GOI	Government of India
GW	gigawatt
IFC	International Finance Corporation
INR	Indian Rupee
IPP	independent power producer
KfW	Kreditanstalt Für Wiederaufbau
MIGA	Multilateral Investment Guarantee Agency
NAPCC	National Action Plan On Climate Change
NBFC	Non-Banking Financial Company
NIB	Nordic Investment Bank
NY	New York
OPIC	Overseas Private Investment Corporation
PACE-D	Partnership to Advance Clean Energy – Deployment
PPA	power purchase agreement
PV	photovoltaic
RBI	Reserve Bank of India
RE	renewable energy
SAI	Statement of Additional Information
SCA	Svenska Cellulosa AB
SEB	Skandinaviska Enskilda Banken
SPV	special purpose vehicles
USAID	United States Agency for International Development
USAID-DCA	USAID Development Credit Authority

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USAID Program Managers
Anurag Mishra
Apurva Chaturvedi

Principal Authors
Vinod Kala
Vivek Garg

Technical Team
Nithyanandam Yuvaraj Dinesh Babu
Ronnie Khanna
Aalok Awalikar

Editorial Team
Kavita Kaur
Rahul Kumar

EXECUTIVE SUMMARY

The Need for RE Investment

India's renewable energy (RE) potential is estimated to exceed 3,000 GW, yet currently only a fraction of this amount—32.8 GW, equating to little over 1 percent—has been harnessed. The government aims to dramatically increase the amount of installed RE, and has set a target of 165 GW of additional RE capacity installation by 2022. The government focus is currently on methods of arranging and facilitating the needed capital investment to achieve this target, which is estimated at USD 200 billion.

However, even with the variety of project financing mechanisms for RE that are prevalent in India, there are some fundamental challenges for RE developers in the financial marketplace:

1. **Asset-liability mismatch:** This limits project financing tenure to 5-7 years except in cases of institutions such as Indian Renewable Energy Development Agency (IREDA), PTC Financial Services, etc., which have access to lines of credit from multi-lateral and bi-lateral agencies with longer tenures[1].
2. **High interest rates:** It is estimated that higher interest rates and inferior terms of debt in India raise the cost of renewable energy by 24-32 percent[2] compared to similar projects financed in the U.S. or Europe.
3. **Sector limits:** With renewable energy categorized under the power sector by the banks, there is an increased competition for RE projects to access capital vis-à-vis thermal power projects.

In this context, innovative financing mechanisms are required for the development of the RE sector in India. To address these challenges, the USAID Partnership to Advance Clean Energy – Deployment (PACE-D) Technical Assistance (TA) Program prepared comprehensive reviews of financing mechanisms for renewable energy and energy efficiency [3] in 2013. Green Bonds were identified as one of the key financial instruments that can provide Indian RE project developers with access to scalable, long-term, low-cost debt capital from institutional investors.

The Promise of Green Bonds

Green Bonds are standard, fixed-income financial instruments (bonds) where the proceeds are exclusively utilized for financing climate change mitigation or adaptation related projects or programs. Currently, there is no standard international definition for what projects/programs qualifies for Green Bonds. They are commonly issued as either self-labeled corporate bonds, asset-backed securities, green project bonds, supranational/international bonds, government and municipal bonds, etc. for climate change related programs/projects. Some of the key benefits of Green Bonds for various stakeholders associated with renewable energy are shown in Figure 1.

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[1] Currently, IREDA provides project financing of tenures up to 12 years based on long term capital it obtains from DFIs

[2] Climate Policy Initiative: Meeting India's Renewable Energy Targets: The Financing Challenge

[3] The reports, Financing Renewable Energy in India and Financing Energy Efficiency in India, were published in October 2013 and can be accessed at www.pace-d.com

Lenders/Banks	Developers	State	Green Bonds Investors
• Releases capital for re-financing new projects - Asset liability mismatch can be corrected - Economic value from sponsoring IDF/sale of loan portfolio	• Long-term, low cost debt - will improve equity returns - Potential exit for part/full equity, investors; thus, can scale up faster - Encourage emergence of development and construction finance options and risk mitigation products	• Help scale-up RE investments - meet NAPCC targets - Tap long term foreign investors- positive impact on foreign reserves - Ability to work well with emerging climate regimes and funds - Energy Security	• Low operational risks in the invested RE assets - Liquidity - Fulfillment of green targets - 'Value' of assets improve with time, as RE becomes more competitive vis-à-vis conventional energy

Figure 1: Benefits of Green Bonds for Different Stakeholder

Globally, the issuance of Green Bonds has been growing exponentially since 2013, with fresh issuance in the last two years account for over 80 percent of the total issuance so far. (See Figure 2.) As of October 2014, the size of the international market for Green Bonds USD 54 billion[4] which includes USD 32.5 billion[5] of fresh issuance, more than the cumulative issuance of Green Bonds in the last eight years. It is predicted that the total issuance will be at USD 100 billion[6] in 2015, while Green Bonds will become one of the mainstream instruments in 2016[7]. The growth of Green Bonds market in the last few years can partly be attributed to an overarching trend towards including Environmental, Social and Governance (ESG) issues in the decision process for investments by institutional investors. Currently, over USD 45 trillion[8] of global asset under management (AUM) incorporate ESG issues into investment decisions and are signatory to Principles of Responsible Investments (PRI).

In addition, since more than half (55 percent) of the asset base of institutional investors is exposed to climate risks (including heavier regulation of dirty industries), participation in green bonds also provides an option for investors to diversify their portfolios.

[4] Crédit Agricole CIB: Report on Green Bonds, 2014
[5] Crédit Agricole CIB: Report on Green Bonds, 2014
[6] Sean Kidney – Climate Bond Initiative
[7] Sean Kidney – Climate Bond Initiative
[8] Bonds and Climate Change - The State of the Market In 2014 – HSBC and Climate Bond Initiative Publication, 2014

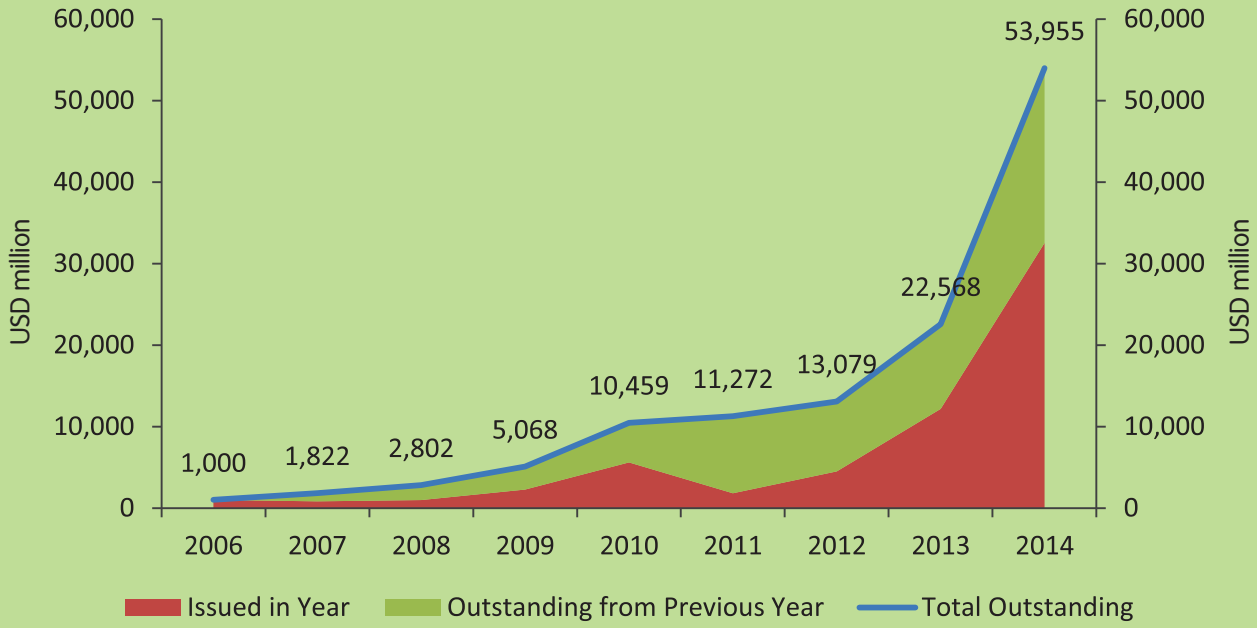


Figure 2: Historical Issuance of Green Bonds[9]

The Indian Context

In the Indian context, there are certain challenges for the issuance of Green Bonds in the international markets. These include high currency hedging costs; poor sovereign ratings (currently at BBB-); and low tenure (currently, Green Bond tenures are mainly concentrated between 3-10 years, with only some issuances reaching or exceeding 15 years tenure).

However, there are opportunities for Indian entities to participate in Green Bonds at this nascent stage —though on a smaller scale issuance, ranging between USD 150-250 million. Such an early participation could provide an opportunity to Indian entities to capture attention of investors (in a yet uncluttered Green Bonds market), potentially leveraged for future issuances, thereby enabling better terms (due to expected low risk perception by international investors)) for prospective similar issuances.

Further, for enabling the initial issuance of Green Bonds by Indian entities, the following measures could be undertaken to reduce the cost of capital raised:

- Credit enhancement through donor agencies (a readily available facility from agencies such as International Finance Corporation (IFC), Agence Française de Développement (AFD), United States Agency for International Development (USAID), etc.)

[9] Crédit Agricole CIB – Report on Green Bond Market, 2014

- Low tenure bond issuance (for example 3-5 years) could reduce costs; serving the purpose of making an early entry to the market
- Issuance for high performing, low risk portfolio of existing projects rather than projects under development, wherein the perceived risks can be higher
- Developers can use excessive capital (due to bullet payments at maturity of bonds rather than monthly installments) as equity to expand installed capacity; in this regards, Green bonds can be treated as low cost equity capital for developers.

As a long term policy measure, it is recommended that the Government of India could announce the following steps to reduce costs associated with Green Bonds for Indian entities:

- Development of an exchange risk liquidity facility through foreign reserves for a range bound period to entities participating in the Green Bonds
- Seek support of the Green Climate Fund (GCF) to provide risk mitigation products such as partial credit guarantees, risk guarantees or hedging products, etc.
- Reduction in hedging risks through policy measures such as indexing electricity tariffs to inflation rates or to foreign currency in export oriented facilities/zones

International Market Trends and Issues for India

There are a number of issues that are critical to understand, for an effective participation by Indian institutions in the Green Bonds market. These issues as outlined below are important, since Indian financial institutions have high expectations from Green Bonds:

Interest arbitrage against normal bonds does not exist: Currently, the Green Bond market is at its infancy in India, but it is rapidly maturing, and reaching a critical mass with a larger investor participation. The current market trend indicates that while a demand and supply gap exists, it is yet to be reflected as a pricing advantage for Green Bonds.

Green Bond investments are not social funds: All issuers should view Green Bond issuance competing with other bond issuances. Irrespective of the mandate for ESG, investors will not allow climate change to take precedence over the risk/reward equation. At the same time, investors prefer Green Bonds over normal bonds that offer similar risk/reward terms.

The bond tenures are still low against requirement: Currently, Green Bonds issuances have low tenure, in the range between 3-10 years; however, there are issuances that have occurred with maturities of over 15 years. In the Indian context, it is suggested that Indian financial institutions proceed with Green Bond issuances with shorter tenures. With development of an international reputation in the bond market, subsequent issuances by Indian financial institutions can be of longer tenure.

1 INTRODUCTION & BACKGROUND

India is planning to reset its RE capacity addition target to 165 GW by 2022, in view of the significant RE potential in the country, estimated at ~ 3,000 GW. While the substantially higher capacity target will ensure greater energy security, improved energy access and enhanced employment opportunities, it will require higher capital investments, estimated at around USD 200 billion, over the coming years.

Based on the huge projected capital and investment requirements, it is widely accepted that current project financing sources namely Scheduled Commercial Banks (SCB) lending, Non-banking Finance Company (NBFC) sponsored project financing, multi-lateral and bi-lateral lines of credit to financial institutions (FIs), domestic bond issuances, etc., which are prevalent in the Indian market would be inadequate to meet the financing requirements for capacity addition. There is a need to introduce new means of financing and innovative financial instruments that can leverage a wider investor base such as pension funds, sovereign wealth funds, insurance companies, etc. (estimated to manage over USD 80 trillion) that can invest in the RE sector.

Another driving factor for the introduction of new sources of financing and instruments is the high cost and low tenure of project financing currently available for RE projects in India. At present, NBFCs and commercial banks are the main sources of debt financing in India. However, these organizations typically face difficulties in providing long-term funding for infrastructure projects due to asset-liability mismatch[1] and the relatively higher cost of borrowing. In addition, banks have to deal with internally set sector limits[2] (Power sector limits vary as per SCB guidelines). As such, instruments that can help tap long-term, low-cost debt from investor classes such as insurance, pension funds, and other long-term investors, (both domestic and foreign), to refinance bank debt for infrastructure projects are critical to meet the financing requirement for capacity addition. Further, since equity investments from various investor classes are dependent on the depth of debt markets, improvements in debt market need to be targeted first.

1.1 Requirement for Alternate Financial Instrument for RE Sector in India

While the capital demand from the sector has been low in past two to three years due to policy changes and economic slowdown, it is widely accepted that India needs to diversify its sources of capital to meet its capacity addition targets. The country's domestic debt market does not offer sufficient depth or flexibility from its capital markets and this will be a key limitation as the demand for debt financing is expected to rise in the near future. As such, instruments that allow financial institutions and independent power producers (IPPs) to access capital at suitable terms are critical. The following sectionhighlights the key issues constraining RE financing in India:

- **High general interest rate environment in India:** It is estimated that higher interest rates and unattractive terms under which debt is available in India, raise the cost of renewable energy by 24-32 percent[3] compared to similar projects being financed in the U.S. or Europe.

[1] An asset-liability mismatch occurs in a situation where the bank has substantial long-term assets (such term loans) but short-term liabilities, such as deposits

[2] In order to diversify their risk across sectors, banks internally set lending limits for each sector

[3] Climate Policy Initiative: Meeting India's Renewable Energy Targets: The Financing Challenge

- **Non-availability of longer tenure debt:** SCBs in India are generally comfortable with debt tenure of five to seven years due to short-term nature of the funds which these banks raise. According to the Reserve Bank of India (RBI) estimates, nearly 79 percent[4] of 2009-10 bank deposits have an average maturity of less than three years. While some infrastructure projects, including RE projects, have been able to procure ten year tenures they are significantly limited in number.

- **Fixed interest rate debt is rare:** In India, loans commonly have variable, rather than fixed, interest rates, primarily due to the short-term lending by the banks (asset-liability mismatch) and the near-absence of bond markets. Long-term hedging instruments (term-swaps and bonds), are typically unavailable due to the lack of maturity in the financial markets and risks related to a growing economy. Variable rate debt makes cash flows to equity holders (which include project cash flows minus the interest payments to debt holders) less certain as they are subject to changing interest expenses.

- **Sectorial limits of SCBs:** The SCBs have a defined sector limit, which limits exposure to any one market, sector, or technology. The RE sector comes under the overall power sector limit, which typically does not have the depth required for large-scale RE funding. With increase in RE deployment, more banks will reach and cross their sector exposure limits for the power sector, leaving RE projects without adequate bank financing.

- **Limited financing from other public/private sector financing sources:** A large section of financiers shy away from lending to the RE sector due to lack of awareness, limited understanding of technologies, and uncertainty of regulations.

Thus, it is concluded that to meet the need of the huge deployment of RE in the country, the financial market will need to bring in instruments and mechanisms which meet the specific requirements of the sector such as long tenure, high infusion of funds, and active participation of a variety of investors.

As part of its clean energy finance component, the USAID PACE-D TA Program has identified seven potential innovative financing mechanisms[5] that can help accelerate RE deployment in India. The program held several discussions with key stakeholders including MNRE, FIs, private entities and finance experts to deliberate on the mechanisms and determine if the proposed mechanisms can address the existing financing challenges and subsequently be launched in India. Based on the stakeholder feedback, it was established that Green Bonds should be explored to tap scalable long-term, low-cost debt from institutional and market investors.

1.2 What are Green Bonds

Green bonds are standard fixed-income financial instruments (bonds) where the proceeds are exclusively utilized for financing climate change related projects or programs. Currently, green bonds are popularly issued as corporate self labeled bonds, green asset-backed securities, green project bonds, supranational/international bonds, government and municipal bonds, etc.

With increasing focus on environmentally sustainable and green infrastructure, investments in the sector have increasingly been adopted as part of social and corporate responsibility by investors. Green Bonds, in this regards, provide means to unlock private capital flows into projects that support such purposes. Currently, there is no definition of what qualifies as green; however areas such as RE, EE, waste, water, sustainable transport, afforestation, etc. qualify as green. Green Bond issuers generally specify the usage of proceeds from the bond issuance such that investors may take a call whether the proceeds are being used for green projects. Standards, such as Green Bond Principles, are also being developed in order to standardize the definition and governance of these instruments.

1.3 Potential Impact of Green Bonds in India

With implementation of Green Bonds, there is a multiplier effect (towards deployment of RE in India) due to lower costs, increased capital inflow, and access to finance at various stages of the project lifecycle. These include:

- **Low cost-long term debt:** With low financing cost, there is a direct impact in reduction of cost of generation from RE. With reduction in the cost of power generation, there is larger adoption of RE projects from stakeholders such as consumers, IPPs, technology manufacturers, and distribution companies.

- **Increased capital access:** With Green Bonds being tradable instruments, there is improved liquidity; hence exit for investors during any point of time post investment is possible, thus allowing for flexibility in managing liquidity requirements on a short term basis. Such flexible instruments attract a larger pool of investors to the RE sector. Some of the key investor pools that can be attracted towards participation in Green Bonds for RE are:

    - Pension funds
    - Insurance companies
    - Sovereign wealth funds

- **Financing across development stages:** Green Bonds can facilitate access to capital for various development stages (pre-construction, construction and post commissioning) for IPPs and project developers (as shown in Figure 3), thus leading to larger implementation of projects.

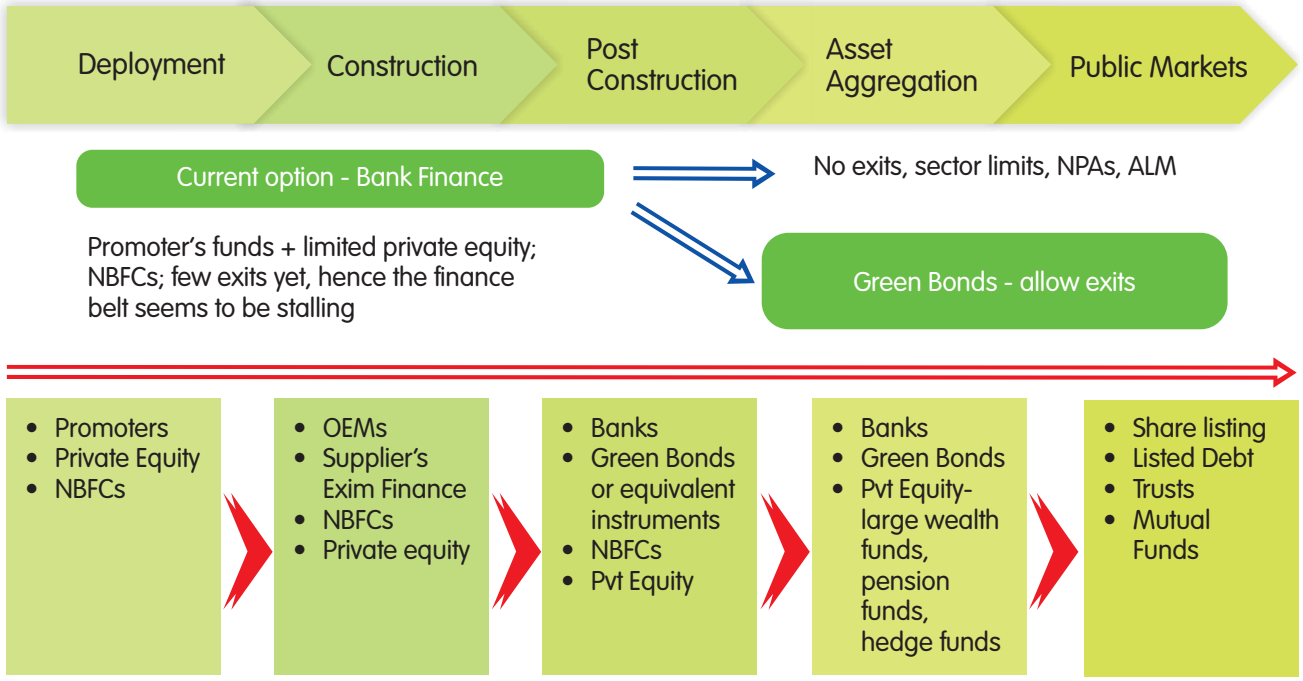


Figure 3: Financing Conveyor Belt – Access to Capital at Various Development Stages

1.4 Green Bonds – Benefits for Stakeholders

The benefits associated with Green Bonds have been evaluated from the perspective of four key stakeholders: Financial Institutions (Bankers/Lenders), Developers, Green Bond Investors and the State.

1.4.1 Key Benefits for Financial Institutions

1. **Overcome challenge of sector limits:** FIs in India have self imposed limits which restrict exposure to a particular sector. With Green Bonds, FIs have an option to offload holding assets through RE portfolio issuance, thereby allowing the institutions to adhere to the sector limits, while deploying bond proceeds into new projects.

2. **Ability to manage asset liability mismatch:** A key challenge faced by mainstream SCBs in India is the asset-liability mismatch as deposits are largely short-term. The lack of long-term liquidity in the system does not allow banks (barring specific institutions such as IREDA, PTC Financial Services, etc., which have access to long term capital from multi-lateral and bi-lateral agencies) to procure long-term lending to the sector. Green Bonds address this challenge as they allow FIs to raise long-term capital from the market. In addition, they provide an exit option to FIs via securitization of projects portfolios at certain stage of maturity to overcome asset liability mismatch.

3. **Ability to obtain premium on performing assets through issuances:** Due to roll out of "mature" projects portfolio through Green Bonds, FIs can command risk premiums via pricing arbitrage that may exist during issuance of Green Bonds due to low risk portfolio and potentially higher ratings in open markets.

1.4.2 Key Benefits for Developers

1. **Access to capital at attractive terms:** Project developers currently have limited options of approaching FIs in India who offer low tenures and high rates. Green Bonds will allow developers to access international capital at attractive terms.

2. **Excessive cash flow for capacity expansion:** Developers can generate surplus cash flow through longer tenure and bullet payment structures for bonds that allows access to capital to expand capacity without proportional equity infusion. Based on PACE-D TA Program analysis, it is estimated that redeployment of excessive cash flow can allow for 30-50 percent faster growth rates per year for the same equity base. Figure 4 depicts Green Bonds leveraged for provisioning growth capital for developers.

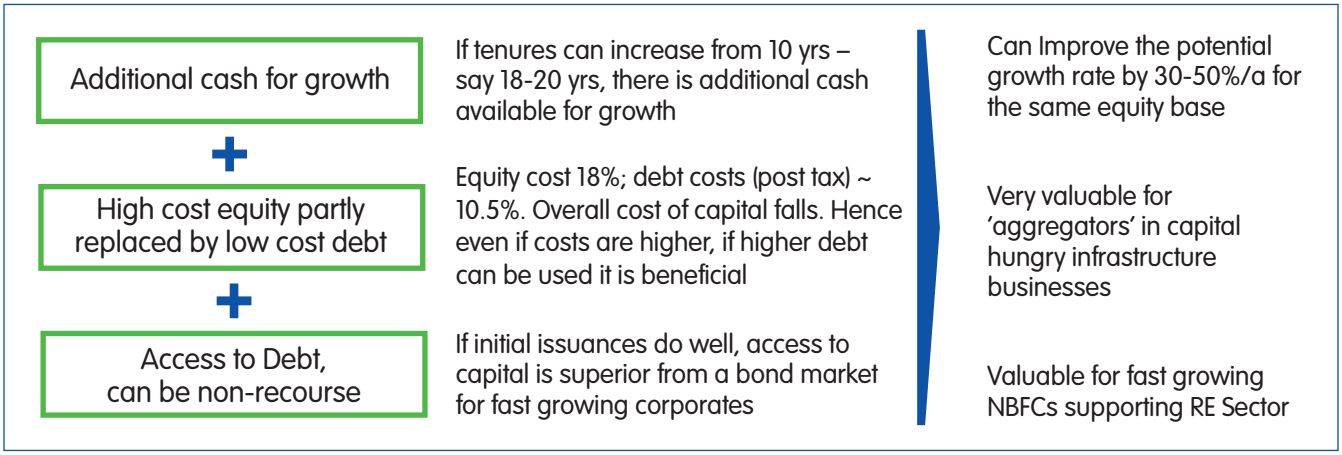


Figure 4: Green Bonds as Growth Capital

1.4.3 Key Benefits for Green Bonds Investors

While some institutional investors are promoting climate-friendly business practices, others are diversifying their investment portfolio to hedge the risks associated with climate change. Green bonds can help investors on both fronts. The long-term competiveness of green assets, higher liquidity associated with the bond market, and low operational risk offer institutional investors an attractive basket of investment through the use of Green Bonds.

1.4.4 Key Benefits for the State

With an aggressive target of 165 GW of installed RE by 2022, the Government of India will require large investments for the RE sector. For this, it is important to explore options beyond the traditional sources of funds. Green Bonds, in this regards, will enable India to attract capital and consequently scale its RE investments and meet the target set under the National Action Plan on Climate Change. Large-scale foreign capital inflow into the country will also expand foreign reserves while offsetting India's energy import and enhancing energy security.

2 GLOBAL MARKET TRENDS – GREEN BONDS

2.1 Global Investments in Green Bonds

Green Bonds have been growing exponentially since 2013, with fresh issuances in last two years accounting for over 80 percent of the total outstanding. As shown in Figure 5, the total outstanding investments in Green Bonds as on October 2014 is USD 54 billion, which includes USD 32.5 billion of fresh issuances, more than 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[6]. Green bonds are expected to become mainstream financing instrument in 2016[7], with total issuance expected to reach USD 100 billion by 2015.

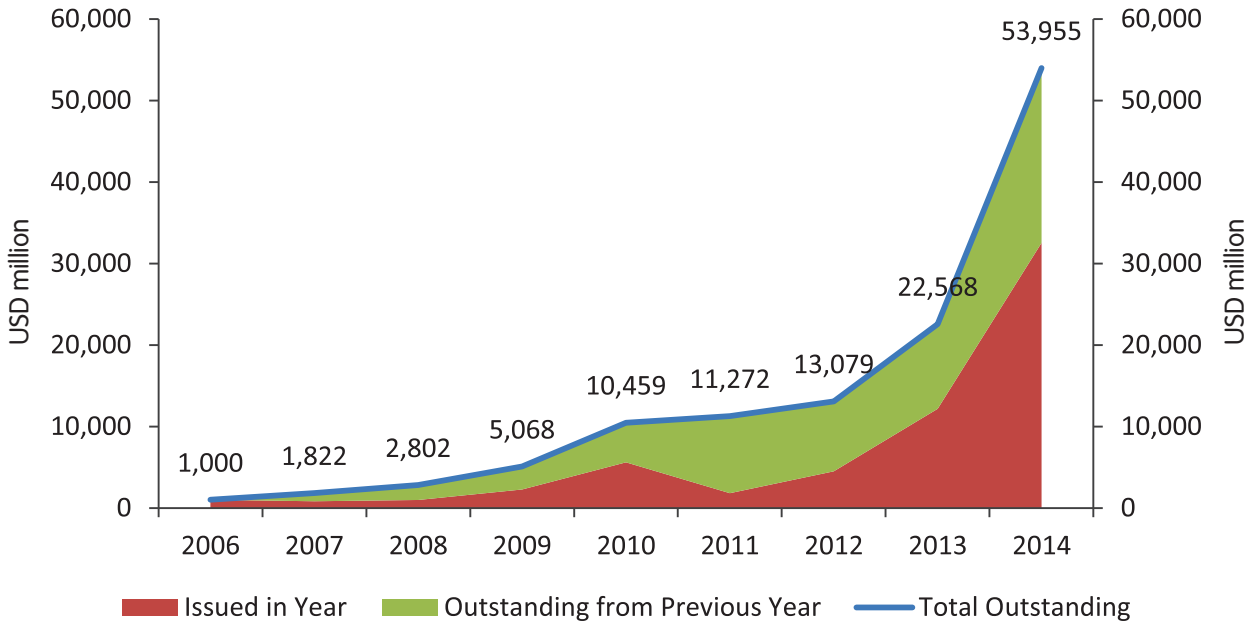


Figure 5: Historical Issuance of Green Bonds[8]

As shown in Figure 6, the size of bond issuances has been steadily increasing – over 31 bonds were issued in the last two years which grossed over USD 500 million each, in comparison to seven such issues over the period 2006-2011, indicating increased market base for Green Bonds.

[6] Press Release - Climate Bond Initiative

[7] Sean Kidney – Climate Bond Initiative

[8] Crédit Agricole CIB – Report on Green Bond Market, 2014

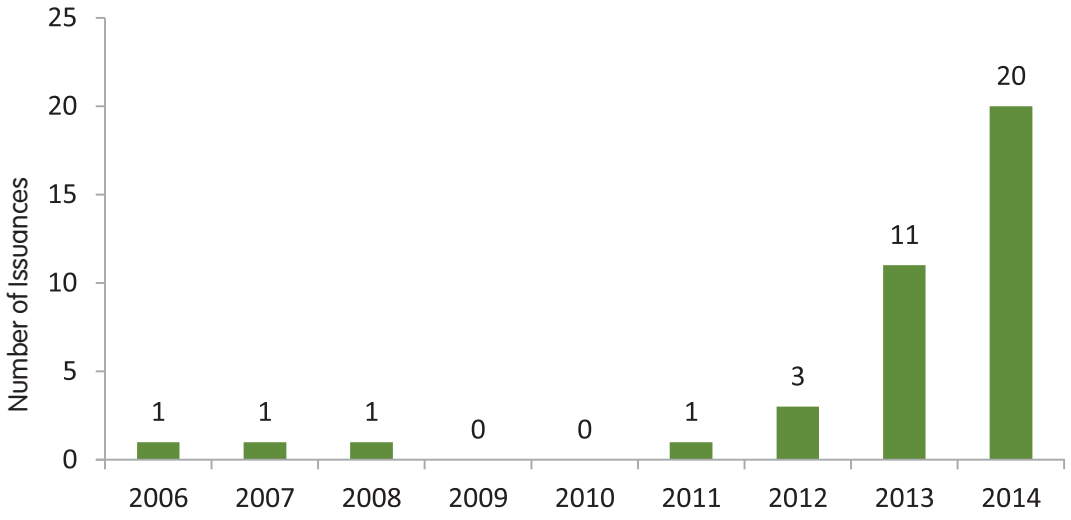


Figure 6: Green Bond Issuances: Minimum Size USD 500m[9]

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. Currently, over USD 45 trillion of Global "Asset under Management (AUM)" incorporate ESG issues into investment decisions and are signatory to Principles of Responsible Investments. Figure 7 shows the number of number of FIs signatory to the PRI, while Figure 8 indicates the geographical spread of the FIs (that are signatory to PRI) across the globe.

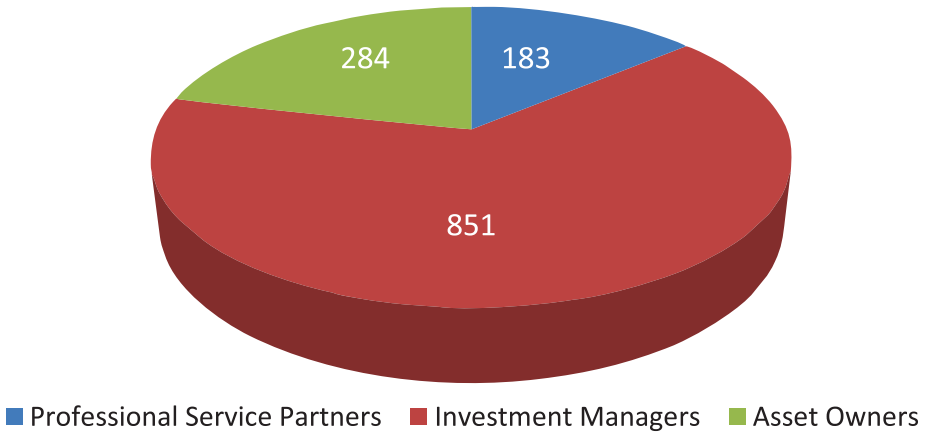


Figure 7: Category of PRI Signatories - Financial Institutional[10]

[9] Crédit Agricole CIB – Report on Green Bond Market, 2014

[10] Crédit Agricole CIB – Report on Green Bond Market, 2014

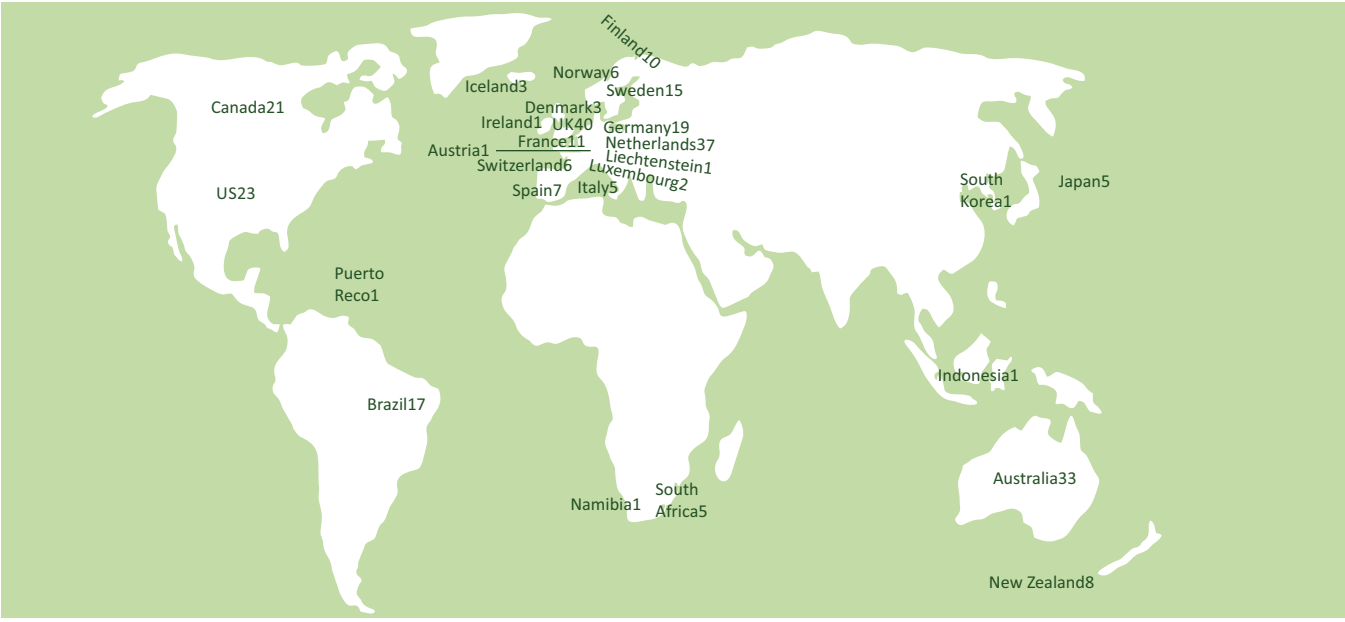


Figure 8: PRI Signatories in Various Geographies (FIs)

On the other hand, observing the large demand for Green Bonds in the market, the sell-side group (originally formed by Citi Group, Bank of America Merrill Lynch, JP Morgan and Crédit Agricole CIB and currently comprising of over 13 members) launched the Green Bond Principles with the aim of providing greater clarity and transparency to Green Bonds issuers and investors. The voluntary principles describe the processes for designating, disclosing, managing and reporting on Green Bonds. They were developed by group of banks in consultation with IFC, the World Bank, and other Green Bond issuers and investors to promote "ring-fenced" Green Bond model for corporate bonds.

2.2 Participation Trends in Green Bonds – Issuers and Investors

In the initial years, Green Bonds were niche products, pioneered by a handful of development banks. However, with growing market appetite for such bonds there is increasing diversification of issuers and investors participating in Green Bonds.

Over the past two years, the issuance of Green Bonds has witnessed exponential growth led by a new class of issuers--corporates, commercial banks and municipalities--as highlighted in Figure 9. Such issuances thereby indicate a tremendous opportunity for developers and financial institutions to access the market directly, thereby opening doors for the sector to access a larger pool of capital directly instead of depending on traditional sources of funding/financing such as deposits, domestic markets, donor agencies, etc.

Figure 9: Issuer Types for Green Bonds[11]

[11] Crédit Agricole CIB – Report on Green Bond Market, 2014

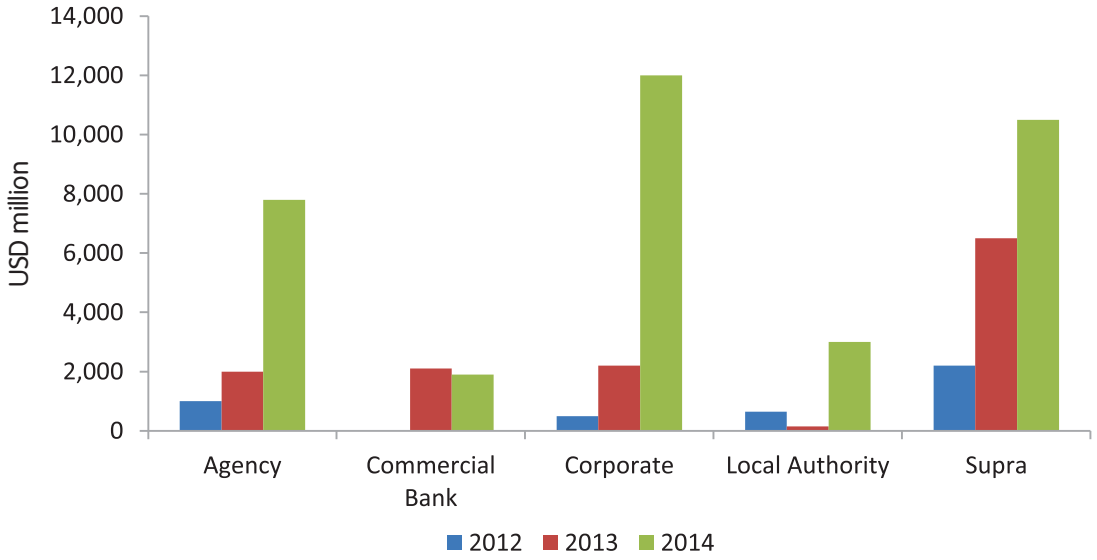


Figure 10: Diversification of Issuer Type[12]

The diversification trend is not just limited to issuers, but has also been observed for investor base participation in Green Bonds.

With the initial Green Bonds issuances, the investor participation was limited to public sector institutions such as the California State Teachers' Pension Fund and Sweden's AP Pension Fund, etc. However, with the general consensus building up towards socially responsible investing amongst the investment community, in November 2013, IFC's USD 1 billion Green Bond offering observed a new set of investors such as the Ford Motor Company, Microsoft, and the central banks of Brazil and Germany. Further, in January 2014, the World Bank's floating rate Green Bond attracted large institutional investors such as BlackRock, TIAA-Cref and Goldman Sachs Private Wealth Management in addition to other pension funds and sustainable investors. In the same period, Zurich Insurance announced USD 1 billion commitment towards Green Bonds.

Asset owners and managers are increasigly focussing on Green Bonds. The primary economic consideration by insitutional investors for such participation is that 55 percent of their assets are exposed to climate risks (including heavier regulation of dirty industries); hence, participation in Green Bonds helps offset such risks. As per Skandinaviska Enskilda Banken (SEB), a Swedish bank that is the largest underwriter of Green Bonds, more than 250 institutional investors have bought at least one Green Bond, up from a handful two years ago. Such large investor participation can be validated with recent oversubscription pattern for some of the popular corporate/commercial bank Green Bonds issuances that were oversubsribed: GDF Suez (3x); EDF (2x); Unibail-Rodamco (3.4x); Korea Export Import Bank (3x). Some of the other interesting observations in regards to a larger pool of investor participation towards Green Bonds include:

- Unilever issued a EUR 250 million (USD 416 million) Green Bond in March 2014, in which 40 percent of investor participation was from outside Britain—an uncommon response to a Sterling bond.

[12] Crédit Agricole CIB – Report on Green Bond Market, 2014

- Historically, AfDB benchmark bonds are mainly (average of 75 percent) bought by central banks and other official bodies; however, with issuance of Green Bonds by AfDB, over 70 percent of investor participation was from asset managers, insurers and pension funds.
- In South Korea, Green Bonds outperformed less colorful bonds. Last year, the yield on most South Korean bonds rose 0.6 percent in response to tensions with North Korea. However, Green Bonds issued by South Korea's Exim Bank rose by only 0.1 percent. As such, Green Bondholders proved more resilient than others.

With rising interest of investors, the market has witnessed a strong demand for new types of issuers and bond structures:

1. **Asset-backed securities (ABS)** – example, Toyota for hybrid and electric vehicle loans, etc.
2. **Corporate bonds** – example, Unilever for internal water and energy targets; Unibail-Rodamco, Vasakronan, Regency Centres for green building portfolios, etc.

However, in most cases, increased demand for Green Bonds has not yet translated into pricing differences - pricing remains largely in line with similar other category bonds. Figure 11 highlights the class of investors participating currently in the Green Bond market.

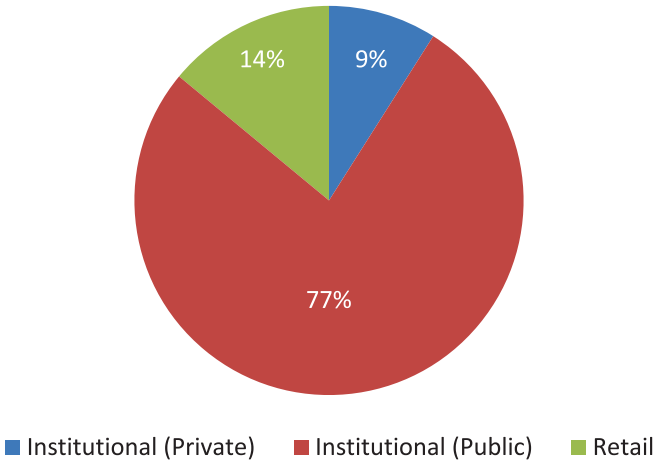


Figure 11: Investors (Type) Participation in Green Bonds[13]

2.3 Terms of Issuance – Bond Rating, Coupon Rates, Tenure

Based on the recent issuance of Green Bonds, Figure 12 provides a scattered plot for comparison of trends in relation to ratings, interest rates and tenure of Green Bonds.

[13] Crédit Agricole CIB – Report on Green Bond Market, 2014

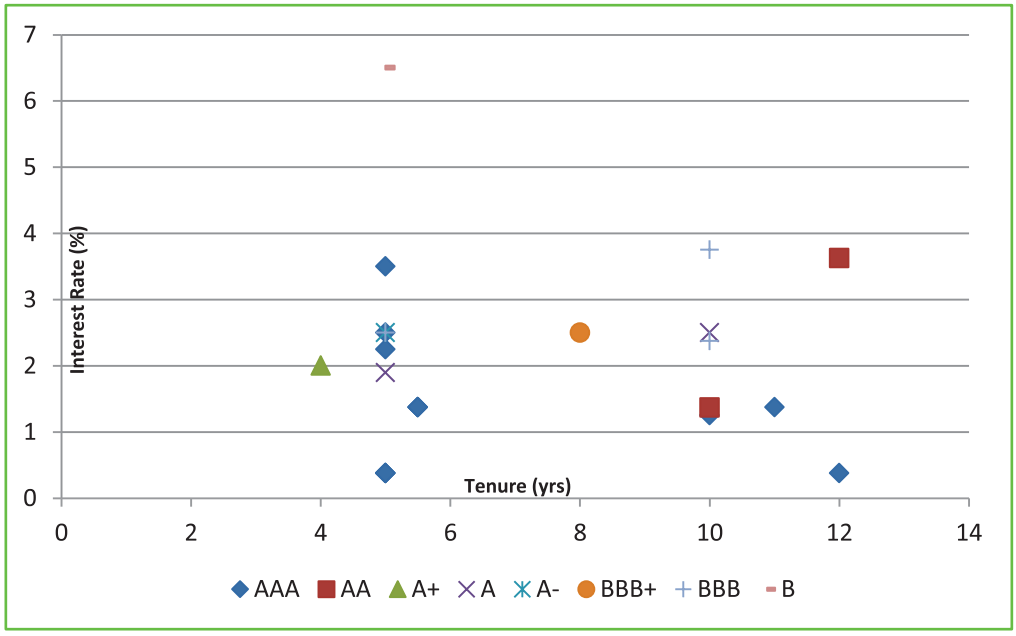


Figure 12: Rates and Tenure for Similar Rated Green Bonds[14]

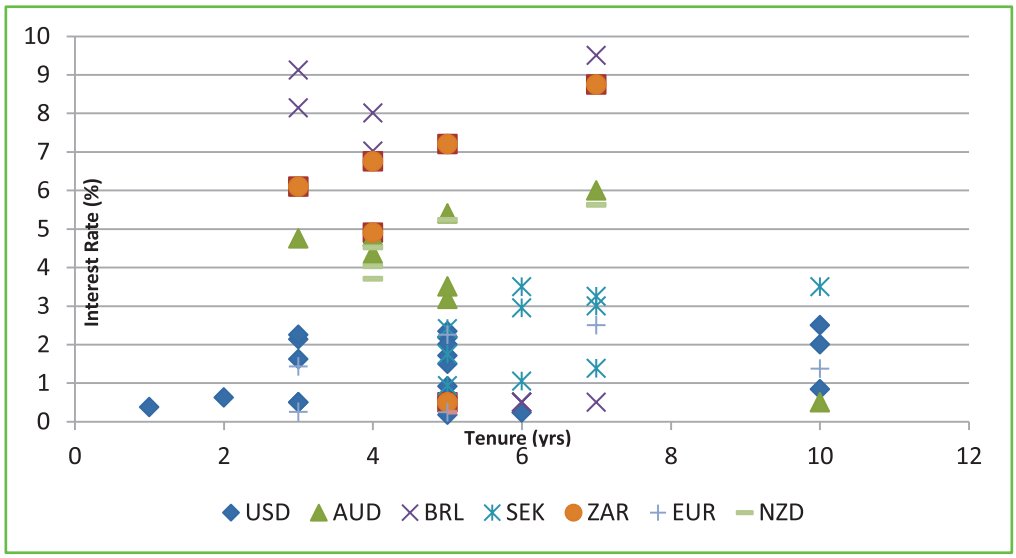


Figure 13: Rates and Tenure for Similar Currency Green Bonds (AAA Rated)[15]

[14] The Currency of Green bonds issuance included at USD, EUR, GBP, CHF, SEK – Please refer Annexure I for details

[15] Supranational Bonds Issuances

As can be observed in Figure 12, there is no distinct pattern in relation to ratings, interest rates and tenure for Green Bonds at present. There are instances wherein a AAA rated bond of lower tenure is almost priced similarly as BBB or AA. Further, within similar rated bonds, shown in Figure 13, tenure has not shown a strong relationship with respect to the interest rates, as can be observed for AAA rated bonds for similar currency issuances. Such a trend is peculiar for recent corporate-issued Green Bonds in the market.

Consultation with leading merchant banks indicate that pricing of the bond is related to targeted investor base and reputation of the issuer. While rating does have an impact on the pricing of the bond, a good positioning and marketing can skew pricing either ways for a rated bond.

Figures 14, 15, 16 and 17 provide the issuance trends for Green Bonds globally.

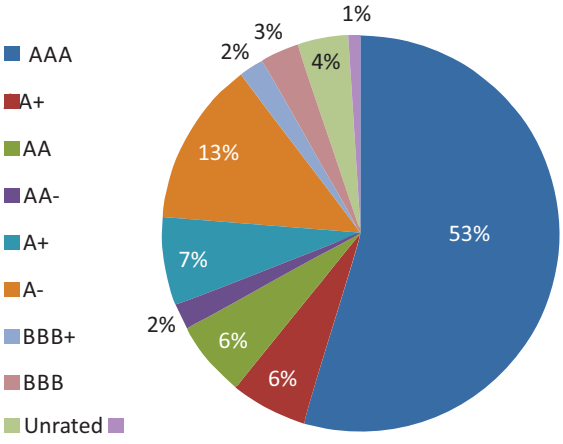


Figure 14: Percentage Issuance of Green Bonds at Various Ratings

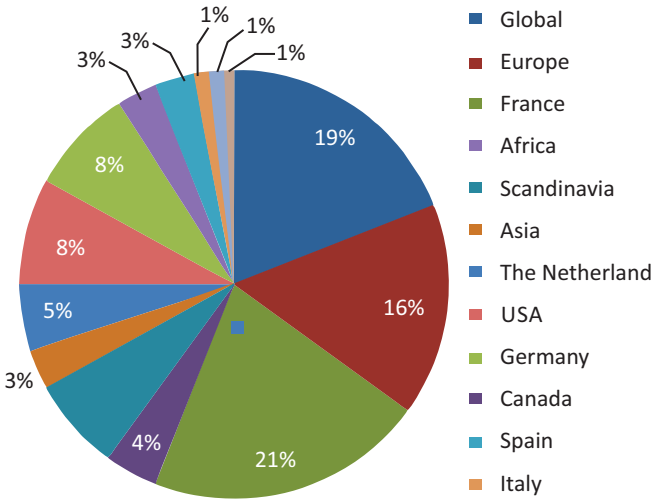


Figure 15: Percentage Issuance of Green Bonds in Various Geographies

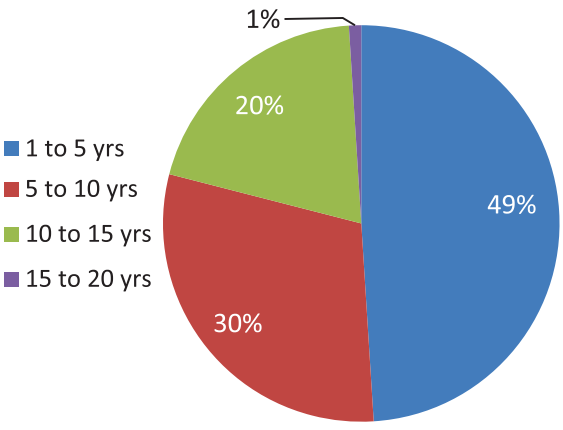


Figure 16: Percentage Issuance of Green Bonds for Various Tenures

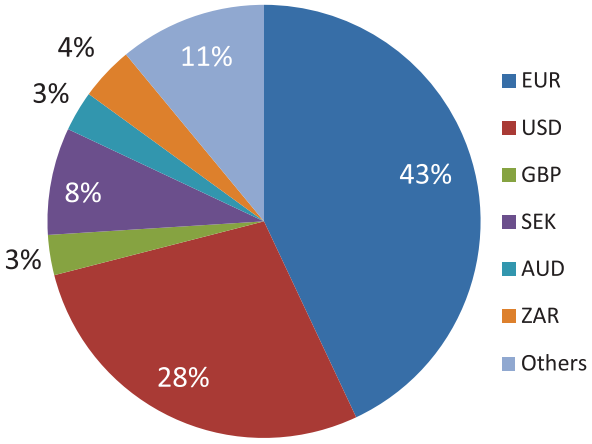


Figure 17: Percentage Issuance of Green Bonds for Various Currencies

2.4 Merchant Bankers – Active in Green Bonds

Merchant bankers have assisted various institutions in underwriting Green Bonds globally. As shown in Figure 18, Crédit Agricole CIB, BAML and SEB are the main drivers of growth of Green Bonds.

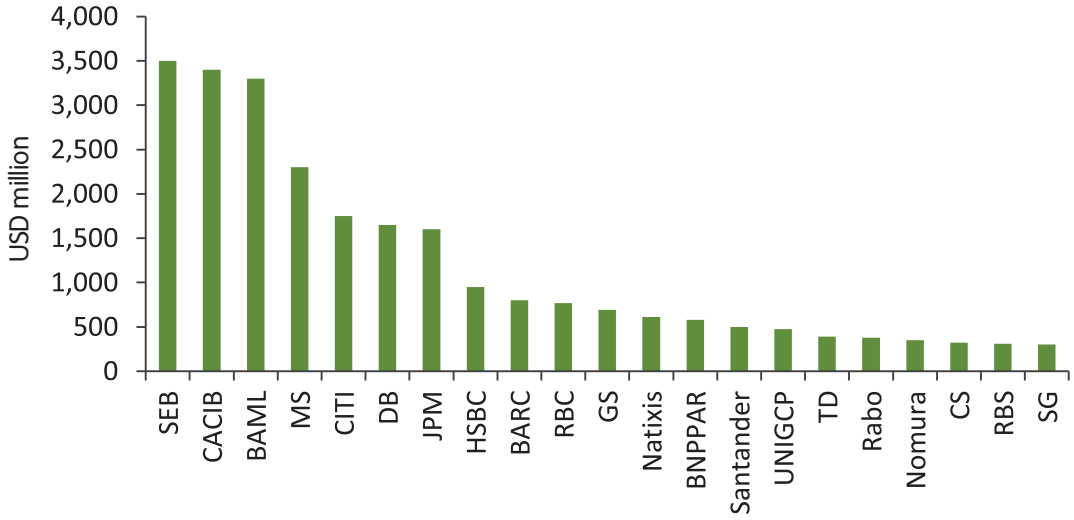


Figure 18: Underwriters - Issuance Volume

During the third quarter of 2014, Crédit Agricole CIB was the lead underwriter (in terms of value) of Green Bonds, followed narrowly by Bank of America Merrill Lynch (BAML) with issuance of over USD 140 million by each of the banks. Further, Crédit Agricole CIB was the lead underwriter on four of the top five deals of the quarter, including EUR 1.5 billion bond issuance by KfW. New merchant banker participation this quarter included Raiffeisen Bank International, National Financial Bank, Bank of Nova Scotia, Jefferies International Ltd., DBS Bank, Swedbank and ABG Sundal Collier. Table 1 provides details of top Green Bonds issuances in 2014.

Table 1: Top Green Bond Issuance in 2014 and Lead Underwriters

Issuer	Size	Lead Underwriters
KfW	EUR 1.5 billion (USD 2.04 billion)	CACIB, DB and SEB
AFD	EUR 1 billion (USD 1.3 billion)	BAML, BNPPAR, CACIB and HSBC
EIB	EUR 500 million (USD 645 million)	CACIB, DZK, RABO and Raiffeisen Bank International
NRG Yield	USD 500 million	BAML, CITI, GS, RBC
NIB	USD 500 million	BAML, CACIB, SEB

2.5 Green Bonds – Key Learnings from International Market Trends

It is important to understand the international market trends while exploring Green Bonds for the Indian market. The key learnings from the international market include:

Interest arbitrage against normal bonds does not exist: Currently, the Green Bonds market is at its infancy but it is rapidly maturing and reaching a critical mass with larger investor participation. Therefore, current market trends indicate that

while demand and supply gap exists, such a gap has not still reflected into pricing advantage for Green Bonds.

Green Bond investments are not social funds: All issuers should view Green Bond issuance to be competing with other normal bonds. Irrespective of the mandate for ESG, investors will not allow climate change take precedence over the risk/reward equation. On the contrary, investors prefer Green Bonds over normal bonds falling into similar risk/reward equation.

The bond tenures are still low against requirement: The recently issued Green Bonds have low tenure mainly concentrated between 3-10 years; however, there are issuances that have occurred for maturity of over 15 years. For the Indian market, it is suggested to undertake shorter tenure Green Bonds issuance in the initial stage and go for longer tenure after the international reputation in the bond market develops.

3 ISSUANCE OF GREEN BONDS IN INDIA

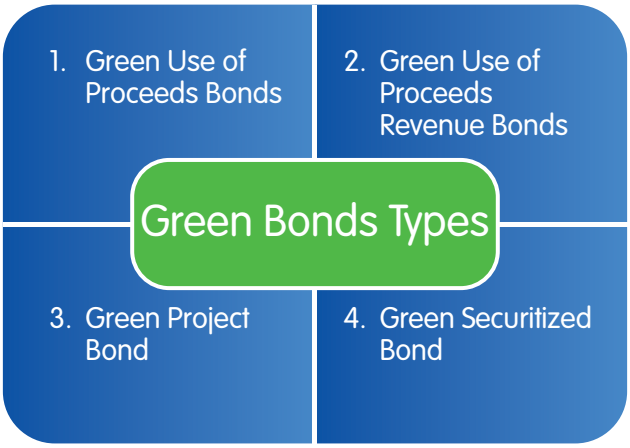
3.1 Structures for Green Bonds

Green Bonds can be structured in four ways. These are shown in Figure 19.

'Recourse' to the Issuer, use of proceeds to a sub portfolio of green projects.

Issuer defines the usage and sets up an internal process to track and report. Also sometimes cited as Corporate Green Bonds.

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.



'Non-Recourse' to the issuer. Normally cited as Portfolio Bonds.

Bond holders have recourse to pledged cash-flows, revenue streams, fees, taxes, etc. of selected projects.

Use of proceeds may go to related/ unrelated green projects. Usage declared and tracked by the issuer.

A bond collateralized by one or more specific projects, including but not limited to covered bonds, ABS, and other structures.

The first source of repayment is generally the cash flows of the assets. This type of bond covers, for example, asset-backed securitizations of rooftop solar PV and/or energy efficiency assets.

Figure 19: Types of Green Bonds

Use of Proceeds Bonds (Corporate Green Bonds): The issuance, under this structure, is undertaken by the corporate entity and proceeds from the bonds is allocated for a sub-portfolio of green projects under the corporate. The issuer sets up internal processes to track the usage of proceeds and reports the same to investors on regular intervals. This structure allows for complete recourse to the issuer.

In June 2014, Hera Group, one of the largest utilities in Italy, issued EUR 500 million Green Bonds at coupon rate of 2.375 percent and tenure of 10 years. The structure for the bonds issuance was corporate bonds, with proceeds to

be utilized to refinance current portfolio of green projects and further expand company's green assets. The areas of investments included RE (EUR 54 million), Energy Efficiency (EUR 282 million), Clean Water (EUR 37 million), and Waste Management (EUR 57 million).

These Green Bonds, which received a rating of BBB by S&P and Baa1 by Moody's, were oversubscribed by three times. Investors with ESG investment criteria accounted for 69 percent of the total demand, with over 75 percent of investors being non-Italian asset managers. From the proceeds, total current asset refinanced was estimated at EUR 503 million and new pipeline investment estimated at EUR 108 million. Post issuance, the company could either finance/refinance the declared eligible green projects.

Use of Proceeds Revenue Bonds (Portfolio Bonds): This structure allows bond holders to have recourse to pledged cash-flows, revenue streams, fees, taxes, etc. of selected projects ring-fenced for the bonds. However, use of proceeds may go to related/unrelated green projects. The usage of the proceeds is declared and tracked by the issuer.

In 2013, Hannon Armstrong Sustainable Infrastructure issued USD 100 million Green Bonds through securitization of assets at coupon of 2.79 percent. The bonds were backed by contracted cash flows generated from 100 individual wind energy, solar energy, and energy efficiency infrastructure installations valued at approximately USD 110 million. Details of the underlying assets such as investment-grade credit quality of the obligor, the quality of the equipment, the strength of the contracts, and the sound project structures were shared with the investors during the issuance of the bonds.

Green Securitized Bond: A bond collateralized by one or more specific projects, including but not limited to covered bonds, ABS, and other structures. The first source of repayment is generally the cash flows of the assets. This type of bond covers, for example, asset-backed securitizations of rooftop solar PV and/or energy efficiency assets.

In 2014, Toyota Financial Services (TFS) issued USD 1.75 billion asset-backed Green Bonds, wherein, the proceeds from the bonds are used to fund new retail finance contracts, while the issued bonds are backed from the proceeds of the car loan portfolio of TFS.

Green Project Bond: For 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.

In 2014, the Overseas Private Investment Corporation (OPIC) issued USD 47.3 million Green Project Bonds with interest rate at 3.28 percent and tenor of 15 years for the Luz del Norte solar project (141 MW) in Chile. The coupon payments for the bond are streamed from the revenue of the project. As an additional safety for the investors, OPIC offered a guarantee of payment to investors in case of default on payment from the project proceeds. Such guarantee allowed for lower risk perception by the investors and hence OPIC was able to raise the bonds at a lower coupon rate.

Portfolio of operating assets/under development assets can be built in two ways:

3.1.1 Aggregate Assets from Project Developers

Under this method, IPPs will constitute a portfolio of high quality operating/underdeveloped assets from their current projects or pipeline. The IPPs thereon issue Green Bonds for this portfolio. Special Purpose Vehicles (SPV) could be used to ring-fence the cash flows of the portfolio. Proceeds of Green Bonds can thereon be used to retire loans from domestic FIs.

This structure is also known as Corporate Bonds or Green Project Bonds. Figure 20 highlights this structure.

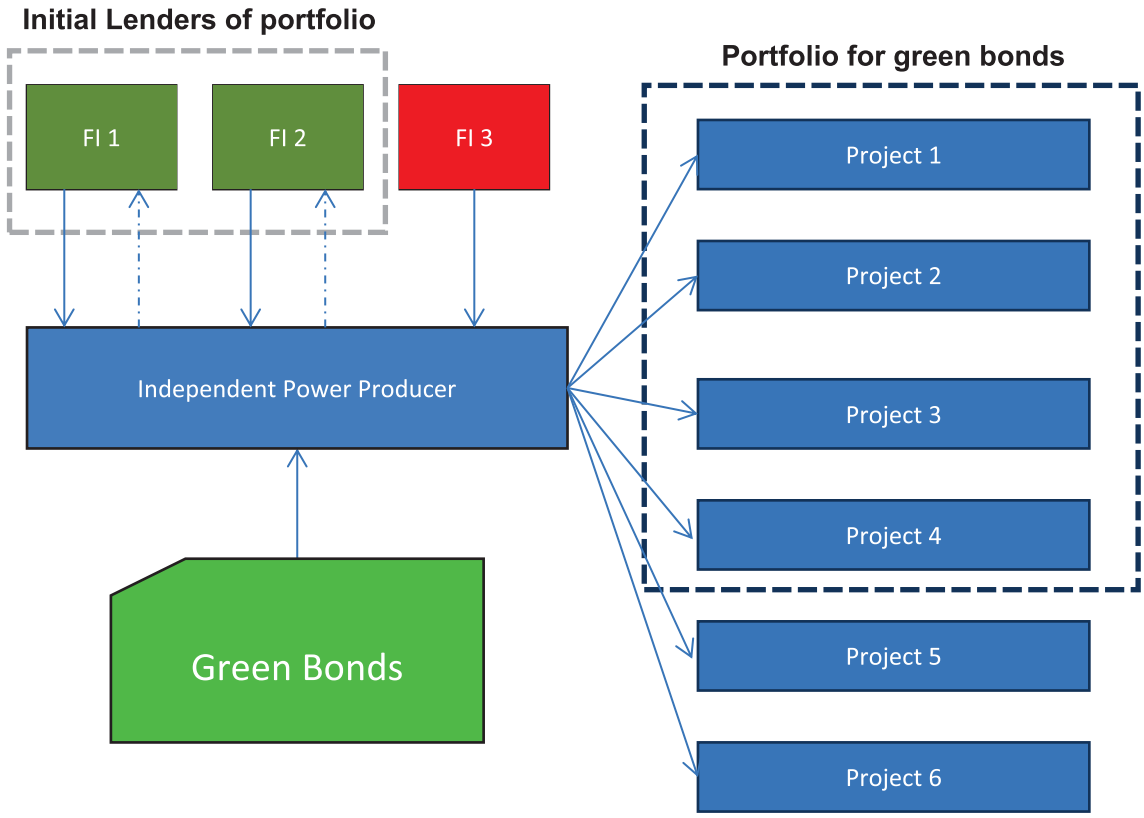


Figure 20: Structure of Corporate Bonds

3.1.2 Aggregate Assets from Lenders

Under this method, FIs constitute a portfolio from their current/prospective loans into a ring-fenced SPV. FIs issue Green Bonds on the portfolio and the SPV channel the cash flows of the portfolio for repayments. Based on the terms and tenure of the Green Bonds, FIs can renegotiate the terms of loans with RE developers.

This structure is also called Portfolio Bonds or Green Securitized Bonds. Figure 21 highlights this structure.

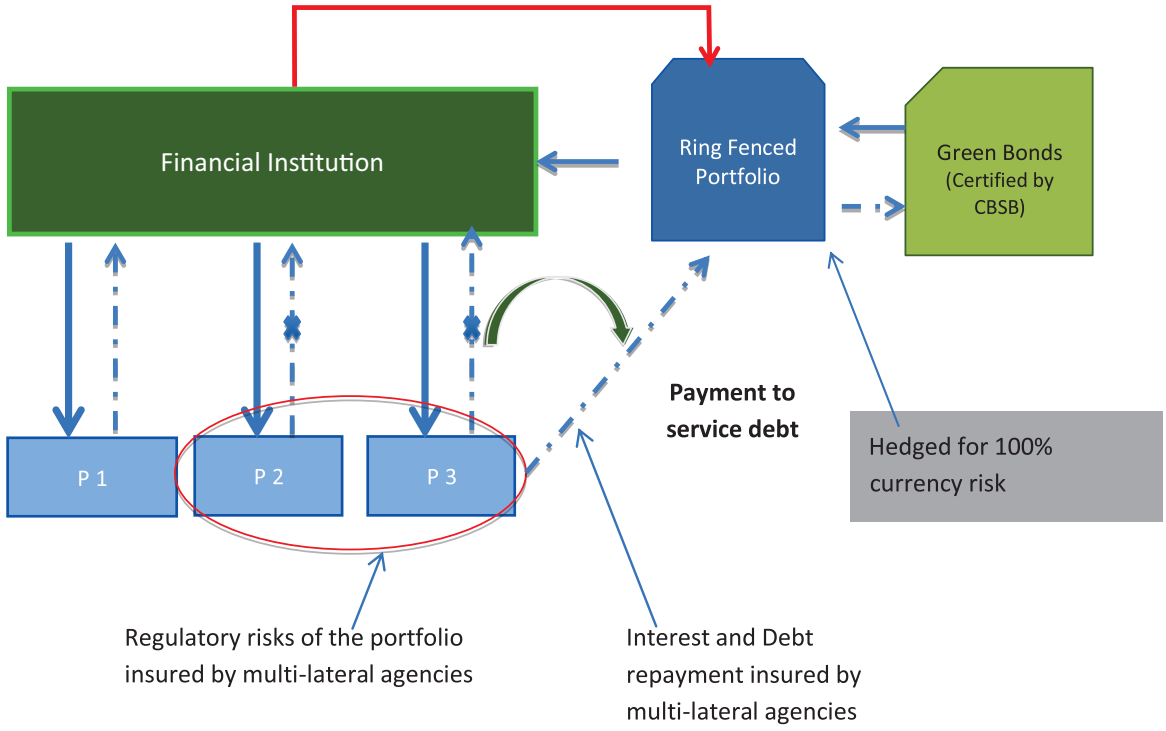


Figure 21: Structure of Portfolio Bonds

3.2 Process Flow for Issuance of Green Bonds

A typical Green Bond issuance by an agency involves the following steps:

1. **Structure of Green Bonds and risk mitigation:** There are multiple ways to structure Green Bonds (as described in Figure 19). However, the key consideration for selecting a structure should be to minimize risks associated with the underlying bond issuing agency. Measures such as insurance, currency hedge, etc. can be further undertaken to reduce risks associated with the underlying issuing agency and its asset pool.
2. **Credit enhancement:** Based on the ratings, which will be capped by sovereign ratings, further measurements of partial guarantee by internationally AAA rated agencies such as IFC, ADB, USAID, AFD, etc. can be undertaken to upgrade the ratings beyond the sovereign ratings which can lead to reduction in cost of capital raised through the instrument.
3. **Ratings and green certification:** Based on the above, agencies can get ratings by international agencies such as FITCH. Green certification can also be obtained through standard bodies such as the Climate Bond Initiative.
4. **Issuance of Green Bonds:** Such issuances can be undertaken by international merchant bank(s) that can thereon assist in processes such as exchange listing, roadshows, etc.

A general process flow for issuance of Green Bonds in the market is shown in Figure 22.

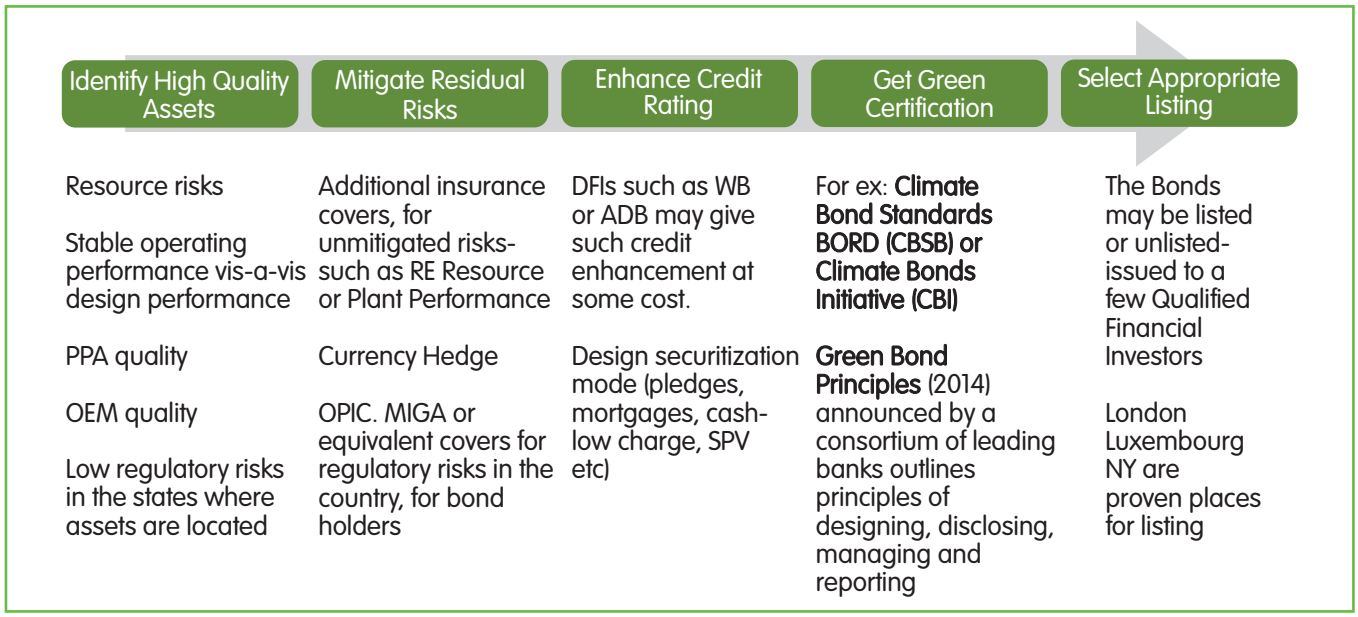


Figure 22: Process Flow for Issuance of Green Bonds

3.3 Key Challenges for Indian Entities

The following challenges are considered key risk elements for issuance of Green Bonds for Indian entities. Please note that the PACE-D TA Program is currently focused on evaluating such risks in greater details.

- **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 to explore instruments/methods that can enable reduction of such costs.

- **Credit ratings:** India's current sovereign rating of BBB- is not attractive to risk-averse investors. Thus credit enhancement, offered by multiple agencies such as IFC, AFD, and USAID-DCA, can help enhance credit rating. However, there are costs associated with such credit enhancement services. Such costs vis-à-vis potential benefits of interest rates reduction are required to be analysed.

- **Regulations:** The external commercial borrowing (ECB) guidelines pose certain challenges for the usage of proceeds from Green Bonds. Viable solutions could include:
    - Refinancing SPVs by IPPs that issue 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
    - Only 25 percent of ECBs are allowed to refinance existing loans. Remaining 75 percent should be used for development of new construction, which poses a challenge for launching Green Bonds for operational assets.

Some of the key applicable ECB norms include:

Category	Norms
Automatic Approval under ECB norms	1. Maximum USD 750 million per transaction 2. Minimum maturity of five years 3. Interest rates have to be < 300 bps+ Libor for 3-5 years tenure and 500 bps+ Libor for higher tenures
Withholding Tax	1. 5%
On-lending	1. Only Infrastructure Finance Companies (IFCs) can use ECBs for on-lending with 75% of currency hedging

- **Double taxation:** Interest on ECBs may be subject to double taxation, first locally[16] and then in the resident country of the SPV issuing the bonds. Issuing bonds while avoiding double taxation will make green bonds more attractive. However an intermediate structure through a tax efficient domicile could be required to bring funds from foreign investors.

[16] Withholding tax

4 RECOMMENDATIONS FOR IMPROVEMENT OF FLOW OF GREEN BONDS IN INDIA

At present, the biggest challenge for Indian entities to participate in Green Bond issuances in foreign currencies is the high cost of hedging and low sovereign credit ratings. In this regards, the impact of such factors can have a cost escalation of 100-250 basis points as shown in Figure 23.

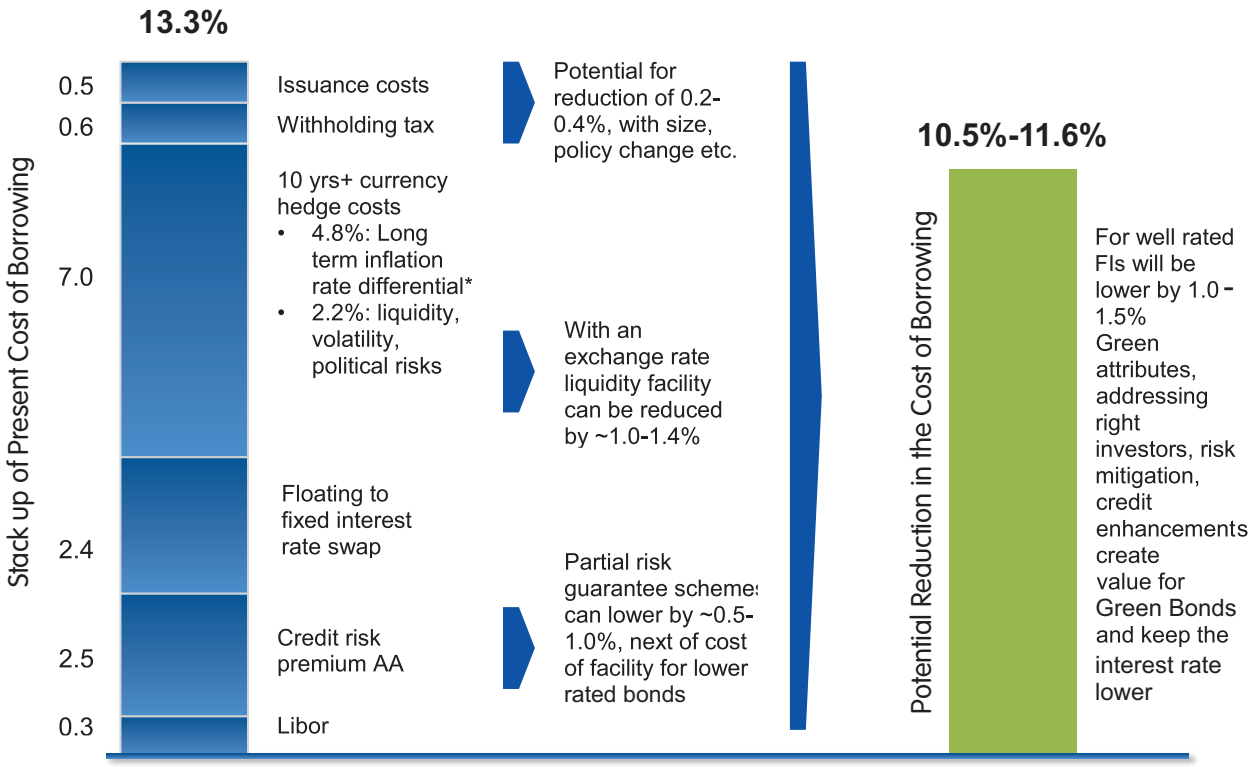


Figure 23: Estimating 'Cost' of Green Bonds for Borrowers[17]

Based on the existing challenges and market analysis, the program recommends the following steps to promote Green Bonds in India. See Figure 24 for details on assistance provided by the PACE-D TA Program for Green Bonds.

- **Exchange risk liquidity facility:** The Government of India can provide such facility through its reserves for a range bound period especially when there is larger fluctuation in currency, which leads to higher costs.

- **Seek support of Green Climate Fund (GCF):** The sovereign rating for India is BBB-, while rating of AA onwards will be required to attract large pension funds, insurance companies, etc. to offer favorable rates and tenure. Hence, India should seek support from Green Climate Fund to provide risk mitigation products such as partial credit guarantees, risk guarantees or hedging products for entities issuing Green Bonds. Such instruments will enable issuing entities to overcome the sovereign ratings cap.

[17] Nov 2014; IMF Estimate, CPI, ISB report 2014

- **Reduction in hedging risks:** Currency risks can also be mitigated through the following measures:
  - Indexing electricity tariffs to inflation rates (will act as an exchange risk liquidity facility)
  - Indexing tariff for export oriented facilities/zones to foreign currency (for example, USD) such that that utilities can buy corresponding power linked to the foreign currency and the generators can thereby borrow in the same denomination
  - Re-financing restrictions for well rated issuers/portfolios could be relaxed.

The PACE-D TA Program is providing assistance to IPPs, corporates, and financial Institutions in evaluating Green Bonds as a financing option. It is currently in talks with institutions such as IREDA and welcomes other stakeholders to initiate a dialogue to evaluate the possibility of issuing Green Bonds in India. The following support activities are been undertaken by the program.

Design	Get credit rating and Green Bond Certification	Establish Structure	Roadshow to the Investors	Issue Bonds	
• Define Size, type of bond for issuance and potential markets to issue • Create a business case for issuance • Assess Regulatory FIT and securitization structure-issuing and investor domains • Identify partners for issue management • Discuss with project developers	• Approach appropriate agency for Bond Certification and start the process. • Facilitate Credit rating for the project portfolio • Assess the need for credit enhancement-with issue manager	• Design necessary SPVs/structurs • Design appropriate documentation and securitization/ collateralization structure • Design key terms/ agreements with borrowers • Design proposal and key terms for investors	• Prepare IM for the Bonds • Get necessary approvals/ check regulation in issuing and investor domains • Informal checks with important investors • Arrange road show to investors • Review documentation if needed	• Develop Statement of Additional Information (SAI) • Help in issuance of bonds • Chose listing regime and assess listing conditions • Help in establishing Tracking, Management and Reporting	Advisor (PACE-D TA Program)
• Management sign off on Business case • Jointly identify pool of projects • Provide project information to design the bonds • Evaluate and approve potential partners for issuance	• Provide necessary information and documentation support • Make a decision on credit enhancement, additional insurance	• Evaluation and management sign off • Establish appropriate structures and documentation • Create and Finance the new structure	• Roadshow for Investors	• Listing of bonds • Ensure that Agreed management and reporting structure is working and investor commitments can be met.	Anchor

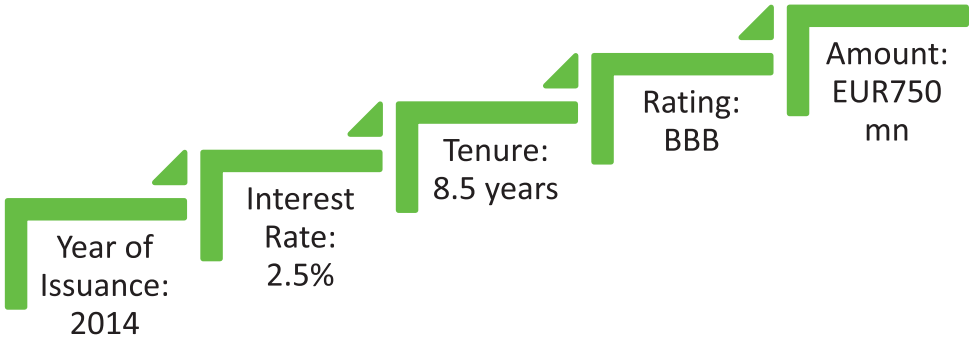
Figure 24: Assistance Provided by the PACE-D TA Program for Green Bonds Issuance in India

5 ANNEXES

5.1 Case Studies

5.1.1 Case Analysis - Corporate Green Bonds Issuance for RE Companies

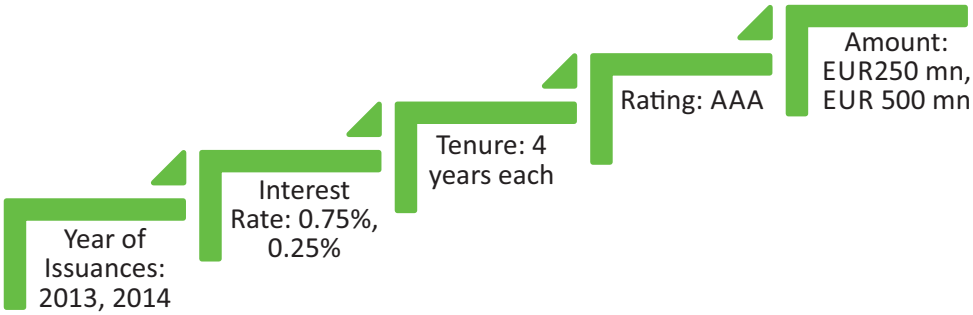
Iberdrola, a Spanish renewable energy company, issued green bonds in 2014 that was oversubscribed by four times with investors with ESG investment criteria accounting for 57 percent of the total demand. The structure for the bonds issuance was corporate bonds, with proceeds to be utilized to refinance current portfolio and further expand company's green assets. The projects included in the area of RE, transmission and distribution that connect renewable energy, and smart grids.



The different investor participation ratio for the issuance was as follows: fund managers – 68 percent; insurance and pension funds – 21 percent, bank – 7 percent, and others – 4 percent. The geographical participation included Germany and Austria – 28 percent, France – 24 percent, Iberia – 17 percent, UK – 14 percent, Benelux – 8 percent, and Switzerland – 3 percent.

5.1.2 Case Analysis - Green Bonds Issuance for Banks/Financial Institutions

NRW Bank, Germany based regional commercial bank, raised EUR 250 million in November 2013 to fund environment friendly water and energy projects through Green Bonds. Green Bonds were rated AAA and carry coupon rate of 0.75 percent and tenure of four years. Encouraged with the success of the first issuance, the bank followed it up with another offering in October 2014 for EUR 500 million worth of Green Bonds. These bonds received a rating of AAA carrying coupon rate of 0.25 percent and tenure of four years. The offering got oversubscribed by two times. About 50 percent of the investors were SRI investors.



The proceeds from the issuance were declared for usage both for refinancing portfolio and financing new projects. Further, in 2013, NRW Bank did not get second party opinion on its green credentials; however in 2014, the bank obtained second opinion, which lent more transparent declaration for bond proceeds usage--a case that potentially may have impacted bond cost reduction for the second issuance.

5.1.3 Case Analysis - Green Bonds Issuance for Banks/Financial Institutions

Greenko Group, an India based IPP with diversified portfolio of about 700MW operational RE assets and 300MW of RE projects pipeline recently issued bonds for USD500mn in Singapore with a coupon rate of 8% and tenure of 5 years pipeline. While the issuance was not classified as Green Bonds; however, the green asset backed bonds was oversubscribed 2 times over, while its ratings was at 'B' as per Standard & Poor (S&P).

The company issued bonds from fully owned offshore subsidiary Greenko Dutch BV in USD and Greenko Dutch BV on lend Rupee term loans to SPVs to refinance debt from local banks and NBFCs. This structure allowed Greenko Group to refinance local debt with debt raised from foreign market and pay higher interest for foreign debt than allowed by RBI under ECB norms.

Currently RBI is seeking clarification from the company on the structure of the issued bonds and indicators are that RBI may restrict further issuances under similar structures.

5.2 List of Green Bond Issuance

5.2.1 Supra-National Green Bond Issuance

Issuer	Issue Date	Amt. O/S (in US$)	Currency	Coupon	Maturity
African Development Bank	Mar-14	$157.0	SEK	1.75%	Mar-19
	Oct-13	$500.0	USD	0.75%	Oct-16
	Feb-14	$153.8	SEK	0.933%	Feb-19
	Aug-10	$11.5	AUD	0.5%	Sep-20
	Mar-10	$77.4	NZD	4.52%	Mar-14
	Oct-10	$70.0	AUD	4.8%	Oct-14
	Oct-10	$38.4	NZD	3.71%	Oct-14
Asian Development Bank	Aug-10	$73.0	BRL	0.5%	Sep-17
	Aug-10	$107.6	AUD	4.35%	Sep-14
	Aug-10	$19.9	BRL	7.02%	Sep-14
	Aug-10	$44.7	TRY	0.5%	Sep-17

European Bank for Reconstruction & Development	Sep-13	$250.0	USD	1.625%	Apr-18
	Feb-14	$10.3	NZD	4.032%	Sep-18
	Aug-13	$67.9	BRL	8.01%	May-17
	Mar-14	$40.0	BRL	9.12%	Sep-17
	Mar-11	$15.1	BRL	0.5%	Mar-17
	Nov-10	$24.9	AUD	4.8%	Dec-14
	Oct-12	$6.3	IDR	4.38%	Nov-16
	Jun-11	$10.0	BRL	0.5%	Jun-17
	May-11	$8.2	BRL	0.5%	May-17
	Dec-13	$9.8	AUD	3.18%	Jun-18
European Investment Bank	Nov-13	$98.2	ZAR	6.75%	Sep-17
	Apr-12	$443.6	SEK	3.0%	Apr-19
	Jan-14	$387.0	CHF	1.625%	Feb-25
	Jan-10	$34.0	BRL	0.5%	Mar-16
	Jul-13	$176.6	SEK	1.381%	Jul-20
	Nov-09	$348.4	SEK	2.95%	Feb-15
	Jul-13	$2,944.1	EUR	1.375%	Nov-19
	Nov-09	$79.8	SEK	1.052%	Feb-15
International Bank for Reconstruction & Development	Mar-14	$757.7	EUR	0.25%	Mar-17
	Feb-10	$176.8	BRL	9.5%	Mar-17
	Feb-10	$114.5	ZAR	8.75%	Mar-17
	Feb-10	$67.0	RUB	7.5%	Mar-17
	Feb-10	$254.0	AUD	6.0%	Feb-17
	Jul-12	$23.2	RUB	6.5%	Jul-19
	Jan-14	$550.0	USD	0.177%	Jul-15
	Aug-13	$550.0	USD	0.375%	Aug-15
	Feb-10	$80.6	MXN	7.5%	Mar-20
	Jan-12	$20.1	PLN	3.25%	Jan-19
	Oct-12	$134.9	MXN	3.75%	Nov-14

	Feb-10	$91.0	COP	8.0%	Mar-20
	Feb-10	$48.8	TRY	10.0%	Mar-17
	Feb-10	$67.5	NOK	3.75%	May-17
	Feb-10	$34.7	NZD	5.625%	Mar-17
	Nov-08	$415.7	SEK	3.5%	Nov-14
	Feb-10	$218.7	SEK	3.25%	Dec-17
	Feb-10	$2.7	EUR	2.5%	May-17
	Feb-10	$11.1	HUF	5.5%	May-17
	Jun-13	$16.1	RUB	6.75%	Jun-23
	Jul-12	$10.0	USD	0.625%	Jul-17
	Jan-13	$9.2	ZAR	0.5%	Jan-18
	Jul-12	$5.0	USD	1.5%	Jul-22
	Oct-10	$3.9	MYR	1.375%	Nov-15
	Jul-11	$28.3	EUR	2.25%	Jul-16
	Jan-10	$106.8	NZD	5.23%	Jan-15
	Dec-12	$7.5	MYR	2.5%	Dec-19
	Aug-11	$7.7	USD	2.5%	Aug-21
	Oct-10	$15.1	SEK	3.5%	Nov-20
	Dec-10	$10.0	USD	2.0%	Oct-16
	Jul-11	$10.1	CAD	3.0%	Aug-21
	May-11	$2.1	USD	0.236%	May-21
	Jan-12	$10.0	USD	0.84%	Feb-17
	Feb-12	$50.0	USD	0.92%	Jun-15
	Jan-11	$30.0	USD	2.135%	Apr-16
	Mar-11	$10.0	USD	2.2%	Mar-16
	Apr-11	$10.0	USD	2.18%	Apr-16
	May-11	$10.0	USD	1.71%	Jun-16
	Feb-10	$1.4	JPY	0.875%	Mar-20
	Feb-11	$10.0	USD	2.34%	Feb-16

	Feb-11	$30.0	USD	2.0%	Feb-16
	Nov-10	$29.2	AUD	5.4%	Nov-15
	Jun-10	$3.1	MXN	6.15%	Jun-15
	Jun-10	$3.2	ZAR	7.2%	Jun-15
International Finance Corp	Nov-13	$1,000.0	USD	0.625%	Nov-16
	Apr-12	$500.0	USD	0.5%	May-15
	Feb-13	$1,000.0	USD	0.5%	May-16
	Apr-10	$200.0	USD	2.25%	Apr-14
	May-11	$22.7	EUR	1.43%	May-14
	May-11	$44.0	AUD	4.75%	May-14
	May-11	$25.6	ZAR	6.1%	May-14
	Oct-13	$203.3	BRL	8.14%	Oct-16
	Oct-13	$20.9	AUD	3.51%	Oct-18
	Sep-13	$77.8	SEK	2.413%	Sep-18
	Feb-14	$54.6	EUR	0.241%	Feb-19
	Aug-12	$75.5	SEK	2.75%	Sep-32
	Oct-11	$120.1	ZAR	4.9%	Nov-15
Agence Française de Dévelopement	Sept-14	EUR1bn	EUR	1.37%	Sept-24

5.2.2 Government Agency - Green Bond Issuance

Issuer	Issue Date	Amt. O/S (in US$)	Currency	Coupon	Maturity
Region of Ile de France	Mar-12	$466.8	EUR	3.625%	Mar-24
Region of Nord-Pas de Calais France	Sep-12	$103.2	EUR	3.42%	Oct-24
Region of Provence Alpes Cote d' Azur France	Jul-12	$145.8	EUR	3.6%	Jul-24
Kommunalbanken AS	Nov-13	$500.0	USD	0.75%	Nov-16
	Nov-13	$500.0	USD	0.75%	Nov-16

	Feb-11	$4.7	INR	5.0%	Mar-15
	Feb-11	$7.2	AUD	5.0%	Mar-15
	Feb-11	$13.5	BRL	0.5%	Mar-15
City of Gothenburg Sweden	Sep-13	$39.4	SEK	2.915%	Oct-19
	Sep-13	$39.4	SEK	1.439%	Oct-19
Connecticut	Jan-14	$60.0	USD	3.25%	Dec-28
Hawaii State	Feb-13	$150	USD	3.42%	Nov-31
East Central Wastewater - Florida	Nov-14	$86.6	USD	5%	Nov-23
Export Development Canada	Jan-14	$300.0	USD	0.875%	Jan-17
Export-Import Bank of Korea	Feb-13	$500.0	USD	1.75%	Feb-18
Province of Ontario	Oct-14	$500.0	CAD	1.75%	Oct-39
District of Columbia Water	Sept-14	$350	USD	4.81	100 yrs
Commonwealth of Massachusetts	Sept-14	$350	USD	2.13%	Oct-39

5.2.3 Commercial – Green Bond Issuance

Issuer	Issue Date	Amt. O/S (in US$)	Currency	Coupon	Maturity	Issuer Type
Credit Agricole Corporate & Investment Bank SA	Dec-13	$52.0	USD	2.01%	Dec-18	Commercial Bank
	Jan-13	$3.6	BRL	6.0%	Aug-16	Commercial Bank
	Oct-13	$136.2	JPY	0.35%	Oct-17	Commercial Bank
	Jun-13	$0.4	BRL	2.0%	Jul-20	Commercial Bank
	Dec-13	$53.6	AUD	4.54%	Dec-18	Commercial Bank
	Sep-13	$54.7	JPY	0.68%	Sep-20	Commercial Bank
	Jun-13	$1.2	JPY	4.8%	Jul-18	Commercial Bank
	Oct-13	$20.0	MXN	4.22%	Nov-18	Commercial Bank
	May-13	$5.5	MXN	0.5%	Dec-17	Commercial Bank
NRW Bank	Nov-13	$339.9	EUR	0.75%	Nov-17	Commercial Bank
Bank of America Corp	Nov-13	$500.0	USD	1.35%	Nov-16	Commercial Bank
Electricite de France	Nov-13	$1,899.8	EUR	2.25%	Apr-21	Private Corporation

Vasakronan AB	Mar-14	$55.1	SEK	2.473%	Mar-19	Private Corporation
	Nov-13	$152.3	SEK	1.315%	May-16	Private Corporation
	Nov-13	$45.7	SEK	1.774%	May-16	Private Corporation

5.2.4 Private Corporations – Green Bond Issuance

Year	Issuer	Bond Name	Rating	Tenure	Issuance Amount	Rate
2014	Toyota	Auto Receivables Green ABS	AAA	2/3/5	$1,084m	
2014	BNG	Sustainable Bond	AAA	5	EUR500m	0.375
2014	Münchener Hypothekenbank	ESG (sustainable) Pfandbrief	AAA	5	EUR 300m	0.375
2014	NIB	Environmental Bond	AAA	7	USD500m	2.25
2014	Region Ile de France	Green Sustainability Bond	AA	12	EUR 600m	3.625
2014	Unilever	Unilever Green Sustainability Bond	A+	4	GBP 250m	2.0
2014	Unibail-Rodamco	Green Bond	A	10	EUR 750m	2.5
2014	Lloyds Bank	Green Bond	A	4.5	GBP250m	
2014	GDF Suez	Green Bond	A	6/12	EUR 2,500m	1.895
2014	SCA	Green Bond	A-	5	SEK 1,500m	2.5
2014	Iberdrola	Green Bond	BBB+	8	EUR 750m	2.5
2014	Skanska	Green Bond	BBB	5	SEK 850m	
2014	Regency Centers	Green Bond	BBB	10	USD 250m	3.75
2014	Vornado	Green Bond	BBB	5	USD 450	2.5
2014	HERA	Green Bond	BBB	10	EUR500m	2.375
2014	Abengoa	Green Bond	B	5	EUR265m	6.5
2014	Spokane	Green Bond - Water/ Sewers	AA	1-20	USD181	3-5
2014	Verbund AG	Green Bonds – Hydro/ Wind	BBB+	10	EUR500	1.5
2014	Martha's Vineyard Land Bank	Green Bonds	AA+	5-20	USD35	3.25-5
2014	NTE	Green Bonds – Hydro		5	NOK400	NIBOR+67bps
2014	NTE	Green Bonds – Hydro		3	NOK100	NIBOR+48bps

2014	NTE	Green Bonds – Hydro		7	NOK300	NIBOR+79bps
2014	Stockland Trust Management Ltd	Green Bonds – Waste/Water/ Energy/Green Building	A-	7	EUR300	1.50
2014	Innovatec SpA	Green Bonds - Efficiency		6	EUR10	8.125
2014	Orebro kommun	Green Bonds – Municipal Programs	AA+	5	SEK750	5
2014	Fastighets AB Förvaltaren	Green Bonds- Hydro	AA-	5	SEK400	
2014	Advanced Semiconductor Engineering	Green Bonds – Low Carbon Transition	BBB	3	USD300	

5.2.5 Potential Green Bonds Issuer in India

Developers			
ONGC	NTPC	Greenko	Greenko
Renew Power	Bharat Light and Power	Green Infra	Green Infra
Azure Power	Hero Future Energy	Tata Power	Tata Power
Panama Wind	NSL Renewable	NALCO	NALCO
Financial Institutions			
IREDA	IIFCL	PTC Financial	Tata Capital
REC	L&T Infrastructure	SBI	ICICI
Yes Bank	ICICI	Sriram Capital	SREI
PFC	IDFC	IL&FS	IDBI
Punjab National Bank	Bank of Baroda	Union Bank of India	Central Bank of India
Axis Bank	HDFC Bank	ING Vysya	Kotak Mahindra

Notes

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U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523
Tel: (202) 712-0000
Fax: (202) 216-3524
www.usaid.gov