PAHLE INDIA FOUNDATION

FACILITATING POLICY CHANGE

DISCUSSION PAPER

Green Bonds

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PIF/2016/FERU/DP/04

By

Saurabh Roy

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saurabh.roy@pahleindia.org

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Introduction

India's energy mix is dominated by fossil fuels with 60 per cent of total power being generated from coal [1]. Even though India has among the largest coal reserves in the world, supply constraints and the low quality of domestic coal have led to increased demand for imported coal for power generation. Wind energy has matured and is now competitive with conventional energy whereas solar was able to achieve the milestone in September 2015 when solar power prices breached the INR 5/kWh barrier. This being said, the renewable energy sector receives significant support from the government without which it will harder to sustain. Solar power prices are expected to fall in the future and once net metering is supported on Indian grids, we should see a huge rise in rooftop solar deployment too. A further push to roof-top solar power is expected to come from improvements in storage technologies.

India has set an ambitious target of generating 100GW of energy from solar and 60GW from wind energy sources by 2022. As of March 31, 2016, the corresponding figures stood at 6.76GW and 26.7GW respectively. Unfortunately, renewable energy is more capital intensive than coal and financing this push will require $160 billion (INR 11 trillion) of capital – $120 billion as debt and $40billion as equity [2]. To put this number in perspective, the Government of India's gross borrowing for FY17 is budgeted at INR 6 trillion. This number is more than four times the country's annual defence spending.

Only a quarter of the cost of Greenfield renewable energy projects is usually financed by promoter's equity; the remaining is usually financed through bank loans. Currently, most renewable projects are financed by bank commercial loans at 11-12 per cent interest per annum. The Indian banking sector is currently going through a balance sheet adjustment where the RBI has forced banks to come to terms with their non-performing assets. In such a phase, banks are unlikely to be able to finance the additional requirements of the renewable sector, which is a gap green bonds may be able to bridge by increasing the investor base of renewable projects and raising money from the markets rather than depending on banks.

In this brief, we try to:

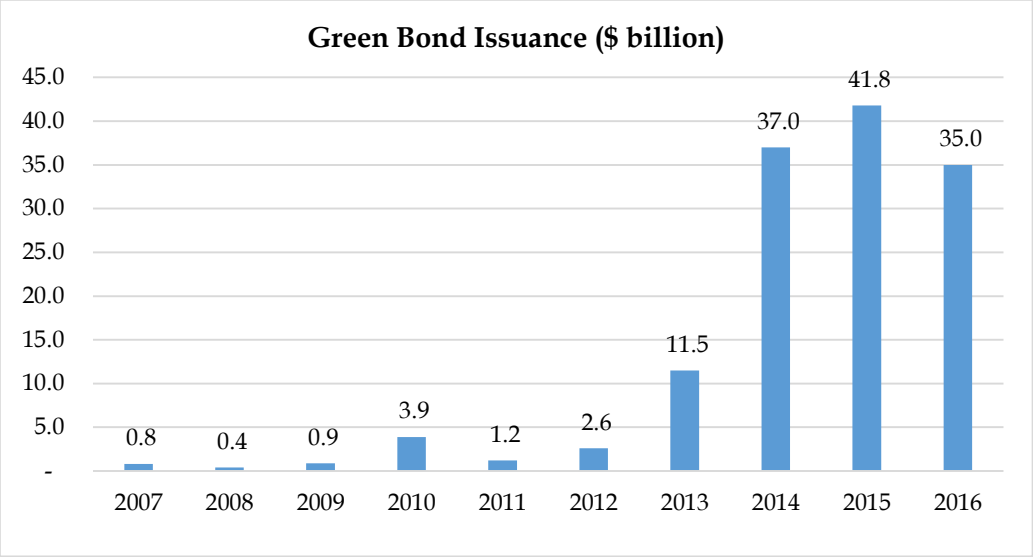
1. Analyse what hurdles green bonds face
2. Come up with recommendations that would improve the access to capital for environmentally sustainable projects and
3. Provide recommendations that would increase the overall liquidity of the secondary bond market in India

History of Green Bonds

A green bond is a fixed income instrument for the purpose of raising debt capital through markets. In addition, it certifies that the proceeds will be used for specific "green" purposes. The green bond market started in 2007 when the EIB (European Investment Bank) issued its first climate awareness bonds and raised $800mn. This was followed by a $400mn green bond issue by the World Bank in 2008. Corporates took some time to enter the green bond market, but in 2013, the first sizable "green" (classified as 'use of proceeds') bond was issued by the Électricité de France.

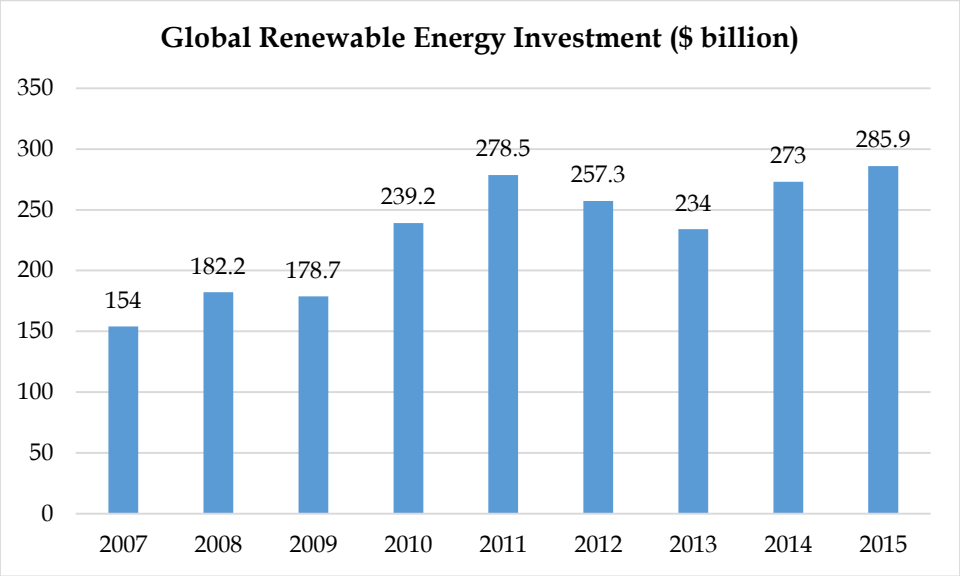
To better classify what can be called "green", the Climate Bond Initiative, 2009, came out with its "green bond principles", which have since been adopted by a consortium of banks and financial institutions as the definition of "green". They are voluntary process guidelines that recommend transparency and disclosure and promote integrity in the development of the green bond market by clarifying the approach for issuance of a green bond [3].

Figure 1: Annual green bond issuances since 2007



Source: Climate Bonds Initiative

Figure 2: Global investment in renewable energy since 2007



Source: UNEP, Bloomberg New Energy Initiative

Green bonds are a ***process and not a product***. The green bond principles are voluntary guidelines on process and lack detail, leading to a lack of consensus on what classifies as a green bond. Market participants are not sure whether a stringent set of standards on what constitutes "green" would increase credibility or inhibit growth and innovation.

The green bond principles address specific areas of concern such as climate change, natural resource depletion, loss of biodiversity and pollution. It lists categories of investment which are, but not restricted to:

1. Renewable energy
2. Energy efficiency
3. Pollution prevention and control
4. Sustainable management of living natural resources
5. Terrestrial and aquatic biodiversity conservation
6. Clean transportation
7. Sustainable water management
8. Climate change adaptation
9. Eco-efficient products, production technologies and processes

Assets under management by signatories to the UN-supported principles for responsible investment (PRI) stand at more than $60 trillion [10]. More and more institutional investors and financial institutions are publicly pledging to increase green bond holdings including Zurich Insurance, Deutsche Bank, Barclays, HSBC,

KfW and ACTIAM. In addition, there are increasing numbers of specialised green bond funds [11].

Development of a Green Bond Market

Long-term bonds are a perfect fit for financing low carbon infrastructure assets, which are characterised by high up-front capital costs and long-dated and frequently inflation-linked income streams.

Bonds can provide a long-term source of debt capital needed by renewable infrastructure projects. Given the fact that the cost of project finance debt given by banks is higher than the yield for investment-grade project bonds [7], it may be possible to achieve a reduction in the weighted average cost of capital (WACC) for green infrastructure financed or re-financed by bonds [8]. Lowering the cost of capital for renewable energy is important because an estimated 50-70 per cent of the costs of electricity generation are in the financial cost of capital, with only the balance being the physical or operational costs of the installation [9]. Thus, even small changes in the WACC can have a substantial impact on the long-term cost of capital-intensive renewable energy projects and their competitiveness.

It must be noted that while green bonds can facilitate the flow of capital to low carbon infrastructure investments, the demand for such investment is driven by other factors, notably low-carbon policy mandates, such as clean energy standards or deployment targets. An enabling policy context, therefore, is vital for actual use of debt capital available through bond markets.

The following are the advantages of green bonds.

1. **Investor Diversification:** Green Bonds give the issuer access to a broader range of investors who are focussed on environmental, social and governance performance.
2. **Risk Mitigation:** In the case of "use of proceeds" bonds, the funds are raised for a specific project whereas the repayment is tied to the issuer and not to the success of the project. This reduces the risks of the bond for investors.
3. **Public Relations:** Issuing green bonds enhances the issuer's reputation and demonstrates its green credentials.
4. **Refinancing:** Refinancing bank loans by issuing a green bond reduces the cost of funding for Brownfield projects by over 1.5 per cent. Since the project has started, its risks are lower enabling the issuer to reduce cost of funds and frees up bank limits for new projects.

Issuers

India has seen some traction in terms of green bonds in the last couple of years. Yes Bank became the first issuer of INR denominated green bonds in February 2015 when it issued INR 1000cr of green bonds at 8.85 per cent to finance new renewable energy projects. The bonds are assured as "green" by KPMG. Yes Bank also came out with a second INR 315cr 10-year issue, which was completely subscribed to by the IFC. In our discussions, we gathered that there was no pricing advantage for Yes Bank or any advantage to the borrowers whose projects were invested in.

A couple of corporates have also dipped into the green bond market with CLP Wind Farms raising INR 600cr for a Brownfield wind project. This enabled CLP to reduce its bank loans and reduce funding cost by 200 bps. Similarly, Hero Future Energy too has raised INR 300cr from the capital market.

IDBI, Exim and Axis bank have tapped the off-shore green market by issuing green bonds in dollars. Banks may have an additional advantage in issuing green bonds in dollars as it may allow them to fund their dollar books while a similar amount can be deployed in India to fund green projects.

Table 1. Rupee denominated green bond issuers

Company	Amount	Currency	Issue Date	Maturity
Yes Bank	10,000,000,000	INR	Feb-15	Feb-25
CLP India	6,000,000,000	INR	Sep-15	Apr-20
Hero Energy	3,000,000,000	INR	Feb-16	Aug (19-21)
KBN	210,000,000	INR	Mar-11	Mar-15
IFC (Yes Bank)	3,150,000,000	INR	Aug-15	Aug-20
PNB Housing Finance	5,000,000,000	INR	Apr-16	Apr-21
Credit Agricole	4,610,000,000	INR	multiple issues	
EBRD	3,426,000,000	INR	multiple issues	
World Bank	3,310,700,000	INR	multiple issues	

Table 2. Dollar denominated Indian green bond issuers

Company	Amount	Currency	Issue Date	Maturity
IDBI Bank	350,000,000	USD	Nov-15	Nov-20
Exim Bank	500,000,000	USD	Mar-15	Mar-20
Axis Bank	500,000,000	USD	May-16	May-21

Policy Overview

The government currently provides subsidies for green projects in the following ways:

1. **Accelerated depreciation provisions:** Capital expenditure for renewable energy is allowed to be depreciated by 80 per cent in the first year and the remaining in the following 5 years under current regulations. This allows cash flow positive companies to depreciate their stock faster and pay their debts using the extra cash flow.
2. **Feed-in Tariffs:** Feed-in tariffs are long-term contracts with discoms to purchase power from a renewable project, usually at higher rates than from conventional power generators.
3. **Viability gap funding:** Viability gap funding is a capital grant from the government that bridges the gap between the project cost under the prevailing electricity rate and the price quoted by the developer. It is done via a reverse bidding process where the feed-in tariffs are bid for.
4. **Generation-based incentive:** These are subsidies provided to power producers for every unit of electricity fed into the grid up to a specified limit. Under this scheme, the government provides INR 0.5/kWh supplied to the grid, subject to a cumulative maximum of INR 10 million/MW. The incentive must be availed of in a period between 4 and 10 years of the project becoming operational.
5. **Renewable purchase/generation obligations:** RPOs are the minimum percentage of the total power that electricity distribution companies need to purchase from renewable energy (RE) sources. RPO creates a market for renewables in the absence of pricing externalities of conventional power generation. The National Action Plan on Climate Change (NAPCC) has set an ambitious RPO target of 15 per cent by 2020, which has been implemented by 28 states in the country.
6. **Net Metering Incentive:** Net-metering allows customers who generate their own electricity from solar to feed unused electricity back into the grid and be compensated for it. Net metering incentives have been introduced in 12 states in India but have not yet taken off in a big way. Residential and agricultural tariffs are usually kept low; the actual average tariff rate varies widely in

ranging from INR 2.8/unit in Chhattisgarh to INR 6.15/unit in Maharashtra for MSEDCL consumers. Residential rooftop solar PV systems produce electricity at an approximate cost at around INR 10/unit (2015). Thus, a net-metering customer in Chhattisgarh will have to sell electricity at a loss of almost INR 7/unit. Only residential customers in the highest consumption bracket in some states can benefit from this as they can sell at a profit (their cost of electricity is higher than that of the general populace) and recover their investment.

Issues in the Development of the Market

Green bonds have been around for a decade but the regulations governing, and the investment, in them is still miniscule compared to the total market for debt. There are certain issues that need to be addressed before the market can grow further. These issues can be classified as an issue with "green" bonds or with the Indian markets in general.

Issues with "green" bonds:

1. **Green Bond Standards:** The International Capital Markets Association (ICMA) has the green bond principles and the Climate Bonds Initiative has the climate bond standards. There are also green bond indices, which are developed by the various banks or rating agency. These indices and principles specify standards and practices defining what is considered "green". The definitions in both are quite broad and the guidelines voluntary; so they do not in a sense hamper innovation in green financing. However, the definitions have also led to a great deal of confusion over what is can be considered green. CICERO, a second-party reviewer of green bonds, offers a "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 carbon standards. This has kept some mandated green investors, who prefer to do their own due diligence, away, thus raising the cost of investing and monitoring. Issuers face reputational risk and potential accusations of "greenwashing" 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 important.

2. **Investors:** So far, all Indian green bond issues have seen 15-20 per cent investment by dedicated green funds. These include supra-nationals like International Finance Corporation, KfW, European Investment Bank, Asian Development Bank, and other funds, which have a mandate to invest in green projects [4]. For any pricing advantage over conventional bonds, this proportion needs to go up to 50 per cent.
3. **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 a post-financial crisis banking sector and discoms with constrained balance sheets. Indian PSU banks are already grappling with huge NPAs and are credit constrained. Bond markets, which provide both an alternative and a complement to bank financing of debt, will need to play a pivotal role. Bonds with long tenors are potentially a good fit with institutional investors' long-term liabilities, allowing for asset-liability matching.
4. **Low Credit Rating of Potential Green Bond Issuers:** Infrastructure companies in India do not have a very good credit history to command the highest rating. In addition, apart from the biggest names in the power generation sector, viz., NTPC and Tata power, no other company has the credit rating to be able to issue bonds in the capital markets. Because of the nature of the business, power generation is very capital intensive and relies heavily on debt for funding, which further hampers new companies from being able to raise debt in the capital markets.
5. **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 discoms are not in the best financial state currently. They are burdened by heavy losses and the Ujwal DISCOM Assurance Yojana (UDAY) scheme is a temporary palliative. The incentives that allowed discoms to amass such huge losses by supplying power cheaply still remain. Renewable energy PPAs are more expensive for discoms, and they supply only a miniscule amount of power compared to conventional energy. In such a scenario, 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 RPO:** Considering the financial condition of discoms in the country, RPOs have not been enforced strictly. This affects the demand for renewable energy as energy from renewable is more expensive than thermal power and RPOs increase the cost for discoms.

Issues with Indian financial markets:

1. **Seed Financing:** Financing of Greenfield renewable projects in the initial stages is a problem unless the promoter company is highly rated because financiers are averse to taking a risk on project implementation.
2. **Duration Mismatch:** Indian banks lend money for project finance up to a maximum 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. These restrictions are discussed in detail in the policy recommendations below.

Policy Recommendations

In our discussions with banks, investors and issuers of green bonds, we found that there are currently no advantages in calling a bond green. It only adds to the monitoring and certification cost and increases the cost of an issue by 5-7bps. The current issuances of green bonds are driven more by corporate positioning and branding than by any advantage gained in the market by being "green".

Given the ambitions goals but limited budget capability of the government, the cost effectiveness of government policies becomes an important consideration. According to a study by the Climate Policy Initiative and the Indian School of Business, debt related policies are the most cost effective incentive for green financing [5]. In particular, a combination of reduced cost and extended debt tenors are most effective. Green bonds have the ability to reduce the cost of debt for green projects by 150-200bps as compared to project finance loans.

For a green bond to have any pricing advantage over conventional bonds, over 50 per cent of an issue will have to be subscribed to by funds whose mandates are solely to invest in green projects. In such a scenario, issuers will have a market incentive to certify bonds as green. The amount of money that is currently mandated to be invested solely in green energy projects is miniscule compared to the investments required in

energy efficiency and green energy projects. To increase this pool and to meet the renewable energy targets, the government has a primary role to play in the creation of an enabling environment for long-term green investment.

Currently, in India, almost all infrastructure projects are financed largely by debt where the debt is in the form of project finance loans from banks or NBFCs. There are very few cases like NHAI and other government owned companies (whose credit ratings enable them to raise debt), which raise debt from the capital markets. The fact that banks are not well suited to provide finance to infrastructure projects due to asset-liability mismatches is well known. Insurance and pension funds, which have long tenor liabilities, are perfectly suited for the task but are held back by lethargic regulations.

In order to develop a green bond market, the government essentially needs to increase the funds available for investment in green projects. This can include specific tax incentives and development of long-term finance markets in general. We recommend the following measures:

1. **Regulatory changes in IRDA:** This fact has been belaboured many times before; deeper capital markets are required in India. One of the major reasons the market for corporate debt in under-developed is regressive regulations. A couple of regulatory changes by PFRDA and IRDA will go a long way in creating a market for debt in India. We note a few regulations that hamper the growth of a bond market in India and which may be relaxed. But, we do not recommend that the IRDA mandates insurance companies to invest in areas if they choose not to. These companies handle public money and 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 from investing in private limited companies. This restriction prevents them from investing in many infrastructure projects and renewable projects, specifically because renewable power developers are usually smaller companies that are privately held.
    b. The IRDA requires 15 per cent investment in infrastructure and housing for life insurers (10 per cent in infrastructure by non-life insurers). But the following regulations are restrictive:
        i. Investment is permitted only in AA or higher rated companies
        ii. Exposure is allowed up to 25 per cent of the net worth of the infrastructure company (Most infrastructure SPVs are up to 75 per cent debt financed, making their net worth low compared to the size of the

investment required. This restriction requires a large number of insurance companies to invest for even very small projects, viz., for an INR 100cr project, INR 75cr of debt would be required and this would still require investment from 20 insurers.) Exposure norms should be rationalised, based on the net worth of the insurance company and not the project SPV.

iii. Recently, IRDA allowed exposure up to 20 per cent of project cost but requires 100 per cent guarantee by a AA rated parent. This restriction becomes very capital intensive for the guarantor and the AA rating requirement also prevents the development of a vibrant bond market

iv. IRDA requires 75 per cent investment in AAA and only up to 15 per cent in other investments (including rated lower than AA). Further, it allows up to 5 per cent investment in A or lower rated papers. Such restrictions need to be relaxed if India is to develop a bond market.

2. **Regulatory changes required in PFRDA: Pension Funds/EPS/PPF/EPF/NPS:** As with insurance, we do not recommend that pension funds be forced to take risks that they are not willing to, but given the size of the EPS and PPF corpus, even a small allocation to infrastructure or green projects will go a long way in developing the market.
   a. The pension funds sector in India is regulated by multiple entities with EPF and EPS coming under the Ministry of Labour and Ministry of Finance, while PPF and NPS are regulated by the PFRDA. These multiple regulators for the same product makes no sense and all pension products should be handed over to either a unified super-regulator or to the PFRDA.
   b. For pension funds, there are no mandates to invest in infrastructure, while banks, NBFCs and insurance companies are mandated to invest in infrastructure. Pension funds with their long-term horizon are especially well suited to finance infrastructure projects and regulators should mandate pension funds to invest in infrastructure projects.
   c. Pension funds in India usually invest in government securities, AAA rated papers or AA rated papers of financial institutions. This is an extremely conservative approach and limits the returns for investors while restricting flow of credit into the broader economy.
3. **Revisiting PSL Norms for Green Investing (RBI):**The RBI 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 is probably right to want banks to lend to newer borrowers and not classify their existing renewable loans to large players to be classified as PSL.

Under the current cost structures, INR 15 crore is sufficient to install solar capacity of only 3MW. This is a very miniscule amount and does not really help renewable power producers. It can only promote very small-scale distributed generators. The RBI may want to look into the limits considering the targets for renewable energy that have been set for India.

4. **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 [6]. However, government incentives cannot operate in grey areas where the definition of green is "voluntary". If the Government of India decides to provide an incentive for green bonds, the definition of "green" must be standardised.
5. **Bond Guarantee Fund:** A green bond guarantee fund on the lines of IIFCL bond guarantee program (or an expansion of the same) can have a significant impact on the credit rating of renewable power projects. Apart from the NTPC, Tata Power and a few others, most power companies in India do not have a credit rating that can enable them to issue bonds. Renew Power was able to raise money from the capital markets via credit enhanced bonds where 28 per cent of the bond issue was guaranteed. This improved the rating of the issue from BBB- to a AA and thus reduced the cost of debt for the specific project.

   Although banks too have been permitted to guarantee bonds by the RBI, with Basel III norms coming into effect, guaranteeing bonds is very capital intensive for banks and hence, they cannot be relied upon to provide credit enhancements.
6. **Retail Tax Incentive for Green Bonds:** To mobilise 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.

Conclusion

The "green" bond market is a relatively new feature of global capital markets and has been pioneered by multi-national institutions. Although it comes under the fixed income umbrella, the number of dedicated investors with mandates 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 apt 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 channelling investments in "green" projects. Although the market is nascent, broad guidelines are coming to the fore. 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 in fact 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 to reduce the carbon footprint. First, governments around the world would do well to promote the development and standardisation of "green" bonds as a way to finance environmentally sustainable projects. Second, there should be incentives to 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.

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Pahle India Foundation (PIF) is a not for profit, financial, economic and political research think tank, dedicated to the task of making India first by putting India first. Over the years, we have learnt that there is no universally accepted development model. Each country has to take into account its people, its resources and its socio economic and cultural legacy for effective policy formulation and implementation. At PIF, we work towards this objective of creating the necessary paradigm shift in development thinking and practices in India to achieve this aspirational goal. PIF currently has an analytically strong team of dedicated researchers who are self motivated. PIF's highly qualified team specialises in analyzing India's political economy and its engagement with the global flows in finance, trade and technology.

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