

Financing India's Energy Transition

A Guide on Green Bonds
for Renewable Energy and
Electric Transport

Executive Summary | June 2019

Arjun Dutt, Abhinav Soman, Kanika Chawla,
Neha Kumar, Sandeep Bhattacharya, and Prashant Vaze





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The Council on Energy, Environment and Water (<http://ceew.in/>) is one of South Asia's leading not-for-profit policy research institutions. The Council uses data, integrated analysis, and strategic outreach to explain—and change—the use, reuse, and misuse of resources. It prides itself on the independence of its high-quality research, develops partnerships with public and private institutions, and engages with the wider public. In 2019, CEEW has once again been featured across nine categories in the '2018 Global Go To Think Tank Index Report'. It has also been consistently ranked among the world's top climate change think tanks. Follow us on Twitter @CEEWIndia for the latest updates.

The CEEW Centre for Energy Finance (CEF) acts as a non-partisan market observer and driver, to monitor, develop, test, and deploy financial solutions to advance the energy transition. It aims to help deepen markets, increase transparency, and attract capital in clean energy sectors in emerging economies. It will achieve this by comprehensively tracking, interpreting, and responding to developments in the energy markets, while also bridging gaps between governments, industry, and financiers. CEF is an initiative of the Council on Energy, Environment and Water (CEEW), one of South Asia's leading think-tanks.

The Climate Bonds Initiative is an international investor-focused not-for-profit organisation working to mobilise the USD100tn bond market for climate change solutions. The Climate Bonds Initiative carries out market analysis, policy research, market development; advises governments and regulators; and administers a global green bond Certification Scheme. For more information, please visit www.climatebonds.net.

About CEEW Centre for Energy Finance

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The need for enabling an efficient and timely energy transition is growing in emerging economies. In response, CEF focuses on developing fit-for-purpose market-responsive financial products. A robust energy transition requires deep markets, which need continuous monitoring, support, and course correction. By designing financial solutions and providing near-real-time analysis of current and emerging clean energy markets, CEF builds confidence and coherence among key actors, reduces information asymmetry, and bridges the financial gap.

Financing the energy transition in emerging economies

The clean energy transition is gaining momentum across the world with cumulative renewable energy installation crossing 1000 GW in 2018. Several emerging markets see renewable energy markets of significant scale. However, these markets are young and prone to challenges that could inhibit or reverse the recent advances. Emerging economies lack well-functioning markets. That makes investment in clean technologies risky and prevents capital from flowing from where it is in surplus to regions where it is most needed. CEF addresses the urgent need for increasing the flow and affordability of private capital into clean energy markets in emerging economies.

CEF's focus: analysis and solutions

CEF has a twin focus on markets and solutions. CEF's market analysis covers energy transition-related sectors on both the supply side (solar, wind, energy storage) and demand side (electric vehicles, distributed renewable energy applications). It creates open source data sets, salient and timely analysis, and market trend studies.

CEF's solution-focused work will enable the flow of new and more affordable capital into clean energy sectors. These solutions will be designed to address specific market risks that block capital flows. These will include designing, implementation support, and evaluation of policy instruments, insurance products, and incubation funds.

About Climate Bonds Initiative

Climate Bonds Initiative (CBI) is an investor focussed, not for profit, dedicated to mobilizing the \$100 trillion bond market for climate change solutions. It promotes investment in the projects and assets that are necessary for a rapid transition to a low-carbon and climate resilient economy.

CBI's open source for-public-good work falls into three work streams:

- Market tracking and demonstration projects; CBI is a premier source of market information, and provides base data for use by multiple indices, such as MSCI and S&P DJI. It publishes the annual State of the Green Bond Market report and country briefings.
- Developing trusted standards: CBI established the Climate Bonds Standard & Certification Scheme, which provides trusted green definitions and standards, and certification for compliant green bonds. The aim is to help investors identify, and invest in, green investments.
- Providing policy models and advice: CBI has been providing policy supports for governments in various regions/countries including Europe, US, China, India, Brazil and Mexico. Our partners include UNEP Inquiry, OECD, the European Commission and C40.

The CBI strategy is to develop large, liquid Green/Climate Bond markets that will help drive down the cost of capital for climate projects in developed and emerging economies.

CBI has a strong international network of almost 100 Climate Bond Partners, including more than 25 supportive institutional investors with some USD 13 trillion of assets under management and most leading international green bond underwriters. These Partners are critical sources of forward-looking and region-specific market and policy information.

CBI is also playing a central role in the EU's push for sustainable finance, with CBI's CEO Mr Sean Kidney serving first as a member of the High-Level Expert Group on Sustainable Finance (HLEG) and now of the Technical Expert Group advising the European Commission on its Action Plan for Financing Sustainable Growth. CBI taxonomy has proven one of the main guiding documents, apart from the work of the European Investment Bank, to inform the EU's HLEG and TEG.

Climate Bonds Initiative has a world-leading role in advising about green bonds to governments, investors, issuers and underwriting banks. It is a key advisor to China's central bank on the creation of their green bond market, and is playing active role in nurturing nascent green bond markets in Australia, Brazil, Colombia, Germany, India, Mexico, the Netherlands, Nigeria and across the Nordics.

In India, CBI collaborated with the Federation of Indian Chambers of Commerce and Industry (FICCI) in 2016 to establish the India Green Bonds Council. It is a platform of market participants that comprises issuers, investors, financial institutions and underwriting banks, stock exchanges, rating agencies. IGBC is a vital sounding board for promoting green bonds work in India, and features regular participation of regulators, government representatives, international organisations, NGOs and think tanks.

CBI is also the secretariat for the India-UK Green Finance Dialogue – an emergent partnership between FICCI and the City of London, UK. It has hosted two editions of investor-issuer interactions between potential issuers from India and European investors in London. CBI's current areas of focus in India include scaling up investment in clean energy, mobilising capital at scale for sustainable and resilient agriculture, unlocking green capital flow at the level of states and cities; and providing support to policy and regulatory development on green finance.

About the authors



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Arjun Dutt is a Programme Associate at CEEW. His work spans renewable energy finance, policy and markets, and is geared towards analysing risks constraining renewable energy investments and enhancing the flow of finance to the renewable energy sector. Prior to his association with The Council, Arjun worked for over three years in equity research. He has a BE in Electronics and Communication Engineering from Delhi College of Engineering, and an MBA from Management Development Institute, Gurgaon.



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Kanika Chawla is a policy specialist working at the intersection of renewable energy and financial markets. She is the Director of the CEEW Centre on Energy Finance and also manages The Council's research and outreach in renewable energy policy, regulation, markets, and socio-economic value. She is actively engaged with private and public enterprises within and outside India in designing and developing financial de-risking instruments. Kanika has an MSc in Economics and Development Economics from the University of Nottingham, and an undergraduate honours degree in Economics from Miranda House, University of Delhi.



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Sandeep is responsible for coordinating the Climate Bonds Initiatives program to support the development of the Indian Green Finance market and related media outreach. Sandeep has more than 15 years of experience related to bond markets in India and SE Asia, including roles in credit evaluation, business development, execution and structuring of bonds as well as ABS transactions. Previous management roles include periods with Deutsche Bank Group and Cagamas Berhad, a subsidiary of the Malaysian Central Bank - Bank Negara.



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Executive summary

India's ongoing energy transition, led by a buoyant renewable energy market and increasing activity in the electric mobility sector, is characterised by consistent and strong high-level policy targets and ambition. The country's policy environment is enabling increased private sector activity in both clean energy deployment and electric mobility. The scale of the ambition and the size of the market in these sectors provides both an opportunity and a challenge. The ambitious targets provide an advance market commitment, encouraging market activity by private players. However, the quantum of capital required to realise these targets are mammoth. Constraints on access to capital—both in terms of adequacy and affordability—are impeding the pace and efficiency of the energy transition.

Bank debt has been the primary source of domestic currency capital for India's infrastructure projects. With competing demands on this limited pool of capital, which is highly regulated by the Reserve Bank of India (RBI), the bond market could be a critical source of debt finance for the energy transition. Identifying this potential, this report presents a detailed analysis of the case for green bonds as a complementary source of debt capital. Green bonds are a category of bonds, the proceeds of which can only be used in specific clean energy and climate-change-related end uses, including renewable energy and electric mobility. The report considers green bonds as a tool to address the capital raising needs of both the private sector, as well as sub-sovereign government (in this case state governments), for the renewable energy and electric mobility sectors.

Investment flows in RE capacity deployment have averaged USD 10 billion annually, over the period 2013-2017. However, to meet its Nationally Determined Contribution under the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement, India needs annual investments of USD 30 billion over the period 2018-2030. Similarly, the scaling-up of electric vehicle (EV) sales from less than 0.1 per cent of annual vehicle sales today to realise the ambition of 30 per cent of annual vehicle sales by 2030 will require considerable increase in investment flows. Apart from this, investments will also be needed for supporting infrastructure such as transmission infrastructure and solar parks for renewables and charging infrastructure for electric mobility.

In the face of such large credit requirements, the bond market could complement the traditional sources of debt, especially through refinancing of primary debt. Refinancing through bonds presents several advantages, including the lowering of the cost of capital and access to institutional investors such as insurance, pension, and mutual funds. Further, bond market investors favour longer term investments with fixed coupon rates, making them a better fit for renewable energy and electric mobility projects, creating more certainty over debt repayments, in contrast with shorter-tenor bank loans with floating rate interest rates.

The bond market has been critical for the advancement of the global energy transition. Labelled green bond issuances stood at USD 167.3 billion in 2018. However, India's nascent corporate bond market still needs significant policy support to propel it towards market maturity. Several planned and ongoing initiatives could increase the depth of the bond market, broadening its range of market participants and enhancing the use of debt for renewable energy and electric mobility refinancing. These include the implementation of the Insolvency and Bankruptcy Code (IBC), which could help address concerns pertaining to creditor protection in the event of default by bond issuers. The IBC has been characterised by improved outcomes, as compared to the pre-existing regime for creditor protection. Further, the introduction of instruments geared towards liquidity management (tri-party repo) could enable greater participation from institutional investors.

Measures have also been taken to encourage greater participation of large companies and institutional investors in the bond market, in order to boost volumes. These include regulatory developments disincentivising bank borrowing by large companies and mandating the fulfilment of a portion of their debt capital requirements through bonds; the lowering of minimum credit-rating requirements for pension funds; and tax incentives aimed at enhancing returns from asset-backed securities. Measures aimed at enhancing foreign portfolio investments and for helping reduce the transaction costs of bond issuance are also under consideration.

Given the bond market opportunity for accessing capital for renewable energy and other climate-linked green activities, India has become the twelfth largest green bond issuer in the world, with total cumulative issuance between February 2015 and December 2018 standing at USD 7.15 billion. However, it is important to note that a bulk of these issuances have been in foreign bond markets to avoid the challenges of the domestic market.

Green bond issuances have been used by project developers to refinance renewable energy projects, and by banks and non-bank financial institutions to raise capital for lending to renewable energy projects. The electric mobility sector could also make use of green bonds. A quick win would be using existing financing mechanisms such as asset-backed securities (ABS), which are already used for auto-loans, to start financing purchase of EVs or hybrids for commercial and private use. Under green ABS, cash flows from existing internal combustion engine (ICE) vehicle leases may be packaged with those associated with EV loans, which enables diversification of risks for the portfolio. In addition, creditworthy original equipment manufacturers (OEMs) could issue standalone green bonds to refinance existing loans. While start-up companies could find it challenging to issue green bonds, convertible green bonds could offer a solution for these companies.

While corporate bonds address the debt capital needs of private sector entities, state governments also regularly access the bond market. States could also, therefore, issue green bonds to finance investments undertaken by state entities to support the scaling up of renewable energy and electric mobility. These could take the form of either green sub-sovereign bonds or those issued by a state-backed corporate entity. The state-backed issuer could be a new special purpose green financing corporation or dedicated green financing operations or 'green windows' set up at existing entities. The readiness of a state to issue green bonds depends upon the availability of a pipeline of projects and the commercial viability of these end uses (which determines the expected returns for investors). Besides the viability of the assets themselves, the general creditworthiness of the issuer is an additional factor that lowers risks for investors and increases the attractiveness of any potential issuance. Being sub-sovereign entities, states are highly creditworthy entities as bond issuers, with market participants factoring in an implicit sovereign guarantee on their issuances. However, issuances by state-backed corporate entities are not characterised

by a sovereign guarantee. Their creditworthiness would vary depending on the extent of backing provided by the corresponding state government but would ordinarily not exceed the standalone creditworthiness of the corresponding state. From the perspective of assessing the creditworthiness of such an entity set up for the purpose of issuing green bonds, this report develops a framework for assessing states' standalone creditworthiness, incorporating parameters pertaining to its economic strength and both short and long-term debt management.

States' suitability for issuing green bonds depends on the availability of suitable current and potential end uses, for the deployment of these proceeds, and the ability to recover proceeds to service and repay the debt raised. Resource availability, in case of RE, and the presence and effectiveness of suitable policy and regulatory measures geared towards lowering risks for investors determine the attractiveness of a state for investments in renewable energy and electric mobility, and thereby the utilisation and viability of the supporting infrastructure which states invest in.

For the renewable energy sector, the report identifies planned investments in green transmission infrastructure, the development of solar parks, and working capital loans for utilities as the range of present end uses for the deployment of green bond proceeds by states. Resource availability, measures for mitigating offtake and transmission risks, the effectiveness of its regulatory regime in minimising construction and regulatory risks, the scale of its renewable purchase obligations (RPO), and compliance rates have been identified as determinants of the attractiveness of a state's RE ecosystem.

For the mobility sector, the report identifies the acquisition of EVs by state transport undertakings, the deployment of public charging infrastructure, and investments in setting up EV manufacturing clusters as the range of end uses for green bond proceeds by states. The existence of technical feasibility studies for electric buses, current and planned on-road EV deployments, and the scale of private sector investments in EV manufacturing have been identified as determinants of the attractiveness of the EV ecosystem in a state.

Based on a comparison using the state readiness framework between the states of Uttar Pradesh and Karnataka (used as examples), Karnataka is found to represent superior creditworthiness and readiness to issue green bonds to support both RE and EV deployment. The report also presents a toolkit (section 6.4) for prospective green bond issuers. The toolkit provides a step-by-step guide of the green bond issuance process, in order to facilitate operationalisation of the intent to issue green bonds for state governments.

While India has witnessed some initial momentum in green bond issuance, certain limitations of its green bond market need to be addressed in order to scale up finance flows through this route. There is a clear imperative to strengthen existing measures by adopting a granular, standardised taxonomy for disclosures by investors and by adding clear standards to define what is, and what is not, 'green' in order to generate transparency and confidence among investors with respect to the end use of green bond proceeds. Additional steps from the supply side include building a pipeline of green assets that may be refinanced through green bonds by tagging green assets on banks' balance sheets. This must further be complemented by improving awareness about the benefits of green bond issuances.

- For issuers, these benefits include diversification of the investor base, increased visibility in the market, and improved corporate governance.
- For investors, a certified green bond reduces due diligence requirements and potentially offers higher returns vis-à-vis conventional bonds.

- For policy makers, green bonds offer systemic benefits both to the financial sector, and to the advancement of the energy transition. These include more comprehensive risk identification in the form of climate change-related considerations that conventional bonds do not capture, building stronger sustainability awareness and capacity in the financial sector and the effective identification and allocation of capital to the low-carbon transition.

In order to maximise the advantage of mobilising capital through green bonds, it is essential to take steps to systemically lower the cost of capital for issuers of green bonds. Through measures such as aggregation, securitisation and credit enhancement, green bonds could become a potential source of capital for underserved markets such as distributed renewable energy, and parts of the electric mobility value chain. Greater support at the policy level is needed in order to identify and operationalise such measures needed to facilitate finance flows to financially underserved segments. A combination of the large capital appetite of the clean energy markets, as well as the overall ongoing and planned bond market reforms could see green bonds spearheading a surge in India's bond market, while also paying for its energy revolution.







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