

Acronyms

ECB	External Commercial Borrowing
EMEA	Europe, Middle East, and Africa
ESG	environmental, social, and governance
GBP	British Pound
GW	gigawatts
ICMA	International Capital Market Association
INR	Indian Rupees
INX	India International Exchange
KPI	key performance indicator
LSEG	London Stock Exchange
MIFOR	Mumbai Interbank Forward Offer Rate
MNRE	Ministry of New and Renewable Energy
MW	megawatts
NBFC	non-banking financial corporation
PFC	Power Finance Corporation
PPA	power purchase agreement
RBI	Reserve Bank of India
RE	renewable energy
SEBI	Securities and Exchange Board of India
SECI	Solar Energy Corporation of India
SGX	Singapore Stock Exchange
SPV	special purpose vehicle
US	United States
USD	United States Dollar
VRR	voluntary retention route



Indian developers have refinanced at least 10 GW of renewable energy capacity through international green bonds issued from 2014 to H1 2021.

Image: REGEN



Executive summary

To realise India's ambitious target of installing 450 GW of renewable energy (RE) capacity by 2030, developers and financing institutions in India must mobilise funds at an unprecedented rate. Although domestic institutional debt is the primary source for RE project debt in India, international debt capital (bond) markets have grown sharply since 2019. Bonds issued for financing or refinancing RE assets typically carry third-party certification as 'green' bonds. Bond markets provide developers with an additional avenue for fundraising beyond the traditional lender route. With funds availability with domestic lenders proving a bottleneck for RE projects, developers must fully utilise all available routes to accelerate fundraising and project deployment. We believe that green bonds can play a vital role in this process.

RE developers have raised over USD 11 billion through international bond markets since 2014

Indian entities have raised USD 15.6 billion through international green bonds since 2014. Developers account for most of this share, with a total of USD 11.2 billion raised through 21 green bonds issued by 8 developers. In comparison, the State Bank of India's entire lending to the RE sector amounted to USD 4.3 billion as of March 2021, further illustrating the growing prominence of international bond markets in financing Indian RE (Nair 2021). By May 2021, green bond issuances by Indian RE developers had already surpassed the previous calendar year record, with USD 3.6 billion raised in the first five months

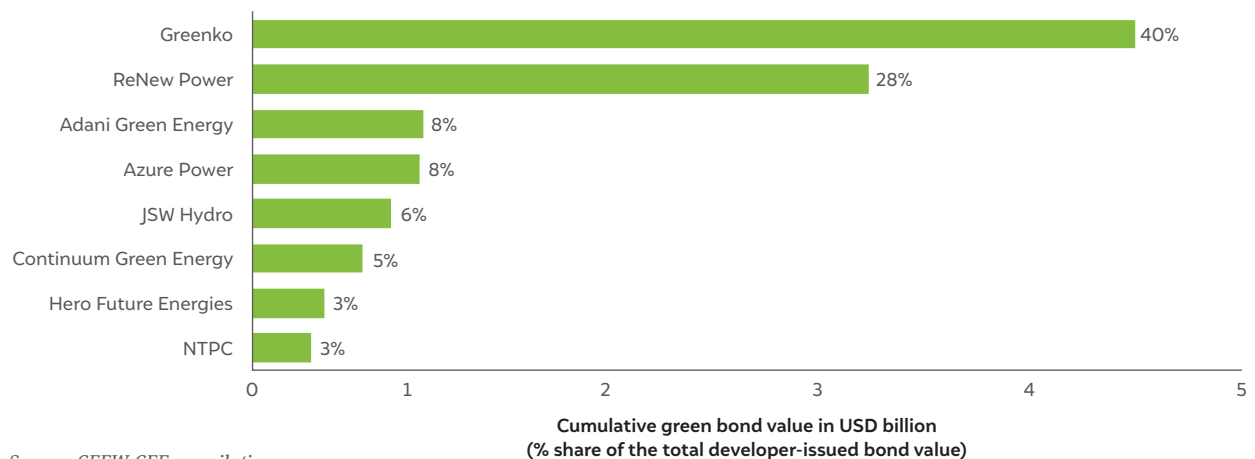
Developers have already raised USD 3.6B through international green bonds in 2021, higher than any previous calendar year.

of the year. The two largest RE developers,¹ Greenko and ReNew Power, dominate the market, as shown in Figure ES1. However, 2021 saw three new entrants (Continuum Green Energy, Hero Future Energies, and JSW Hydro), indicating increasing interest in the route.

It is crucial to understand this critical source of debt, particularly in light of its immense potential to support India's energy transition. We have built a database of international green bonds issuances by Indian RE developers and analysed their listing documents available on trading exchanges. In this report, we have detailed the characteristics of such bonds, including their coupon rates, spreads, maturity periods, and buyers. We have also taken a deep dive into the underlying RE portfolio that has been refinanced through these bonds to understand its technology split, offtaker profile, operational history, and tariff profile.

Our report covers green bonds issued by Indian RE developers. We have not included green bonds issued by other entities, such as lenders and non-power, non-financial corporates. While a portion of funds raised through bonds by these entities may also finance RE projects, proceeds from such bonds cannot be directly mapped to projects due to widely varying reporting standards.

Figure ES1 Greenko and ReNew Power dominate Indian RE green bond issuances



Source: CEEW-CEF compilation

1. By installed capacity as of June 2021.

Asian investors have led the market charge for high-yield Indian RE green bonds

Markets have shown a keen interest in green bonds issued by Indian RE developers, with offerings being oversubscribed by 3.6 times on average. Asian fund managers have led this market rally, picking up 48 per cent of bond proceeds. Green bonds issued by Indian developers since 2019 carry an average spread of four per cent over the United States (US) treasury benchmark, making them a relatively safe high-yield instrument for investors.

Developers are entering international bond markets to access new sources of capital, particularly as domestic institutional lenders are reaching their lending limits to the power sector. Through green bonds, developers can raise vast amounts in a single instance and refinance existing INR loans with easily recyclable capital.

We found that of the total USD 11.2 billion raised since 2014, developers deployed 16 bonds worth USD 9.2 billion to directly refinance project loans that are overwhelmingly INR-denominated. More recently, developers have also been able to obtain cost advantages due to favourable hedging costs. We found an average pre-hedging differential of six per cent between the bond coupon rate and INR loan interest rate. Once the cost of hedging is accounted for, green bonds are likely to be at par or a slight advantage compared to INR loan interest rates; however, hedging costs are market-dependent, and a cost advantage may not always exist.

International green bonds have refinanced 10 GW of Indian RE capacity

Our analysis reveals that international green bonds raised by Indian developers have refinanced a unique

10% of India's solar and wind capacity has been refinanced through international bond markets.

portfolio of 10 GW of RE capacity in India. Of this, 8.4 GW was evenly split between solar and wind, while the balance was made up by hydro.

Further, state-owned utilities are the offtakers for almost two-thirds of this 10 GW of RE capacity, while central and open-access buyers make up the rest. State offtakers are dominated by utilities with a poor track record in paying developers, although this risk is typically diversified by including multiple state utilities in the portfolio.

Investors have stayed largely agnostic towards the RE portfolio's profile

We found that despite the higher offtaker risk, bonds dominated by state utilities as offtakers have performed at par with bonds dominated by central buyers as offtakers. This suggests that the developer's financial health determines the bond's pricing and that investors are comfortable with a portfolio dominated by state utilities if the risk is diversified. However, given the low volume of capacity contracted by central buyers, this trend may evolve as more projects auctioned by central buyers are refinanced through international bonds in the future.

Further, we found that international bond markets have also shown a healthy appetite for project portfolios with a short to moderate operational history. Most bond portfolios have operational histories below four years, with no material trend against bond pricing. Similarly, we found no significant trend between portfolio tariffs and bond pricing. While projects with tariffs over a wide range have been refinanced, developers typically diversify portfolios and balance out high-tariff and low-tariff projects, thereby reducing the dependence on individual projects.

Our deep dive into bond parameters and the underlying RE portfolio showcases the advantages of raising debt through international bond markets; developers will be able to access a wider pool of funds, raise large sums through single offerings, and potentially obtain pricing advantages depending

on hedging agreements. With only eight developers having accessed international bond markets so far, we believe that both gigawatt-scale and smaller-scale developers in India must seriously evaluate this option.

With increased focus on ESG investing, developers can unlock new funding avenues through international green bonds.

Beyond developers, industry players that are inherently 'green', such as upstream RE manufacturing, and energy-intensive industries looking to go green, can raise climate-aligned bonds to obtain wider access to capital for new projects. Finally, we suggest that policymakers can use key learnings from international bond markets to revive the domestic market. Although Vector Green Energy recently raised an AAA-rated domestic green bond, developer activity has been low since 2016.

Delivering on India's ambitious RE targets will require tapping the full potential of all debt funding sources. Our analysis reveals the key role that international bond markets have played so far and calls for developers, consumers, and policymakers to ramp up green bonds and accelerate India's energy transition.

1. Introduction

As of May 2021, a total of 96 GW of renewable energy (RE) capacity had been installed², with a further 50 GW in various stages of construction (MNRE 2021). The Government of India has set an ambitious target of installing 450 GW of RE capacity by 2030. Achieving the 2030 target will require significant investments in power generation, transmission, and distribution infrastructure. An analysis by CEEW-CEF in 2020 suggests that approximately USD 199 billion would need to be mobilised for India to meet its 2030 RE power generation targets alone (Singh, Dutt, and Sidhu 2020). To put this in context, outstanding exposure to the power sector by Indian banks and non-banking financial corporations (NBFCs) totalled to approximately USD 168 billion as of March 2020.³ Banks have limited headroom to further ramp up

further lending for RE at such levels of exposure to the power sector.

Therefore, to successfully achieve the 2030 target of 450 GW of installed RE capacity, developers must mobilise an unprecedented amount of funds over the next decade. Project finance comprises two components – equity, which is invested by the developers themselves, and debt, which is a mix of externally raised debt and parent loans. Developers' equity contribution for RE power projects in India has typically been 25 per cent, with debt making up the rest (Dutt, Arboleña, and Gonzalez 2020).

When raising debt, RE project developers can raise money from international USD-denominated markets or domestic INR-denominated markets. Additionally, capital can be raised in either denomination from institutions or debt capital (bond) markets. As depicted in Figure 1, four sources of debt emerge from these considerations.

Institutional domestic debt is the predominant source of funds for the Indian RE sector (Sinha, et al. 2020). Institutional debt from international entities is dominated by lending from multilateral and sovereign development banks. However, in recent years, alternate sources of funds are emerging, as seen in the case of Adani Green Energy's 2021 debt raise of USD 1.35 billion from a consortium of private international lenders (Adani Green Energy 2021).



Image: iStock

2. 96 GW includes 81 GW of wind and solar and 15 GW of bio-power and small hydro.

3. Credit from banks = USD 77 billion (RBI 2020); credit from NBFCs includes only Power Finance Corporation at USD 47 billion (PFC 2020) and REC at USD 44 billion (REC 2020), as these are the dominant NBFC lenders to the power sector.