# Financing the Indian green energy dream:

## Scale, Risk Nuances and Policy Response

Prayas (Energy Group)

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Sonali Gokhale

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## Prayas (Energy Group)

Unit III A & III B,
Devgiri, Kothrud Industrial Area,
Joshi Railway Museum Lane, Kothrud Pune 411 038.
Maharashtra.
☎ +91 20 2542 0720
✉ energy@prayaspune.org
https://energy.prayaspune.org/



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India's ambitions of increasing its non-fossil fuel based energy capacity to 500 GW by 2030 are formidable and present a unique set of opportunities and execution challenges. As of January 2022, the total Renewable Energy (RE) capacity was 152.3 GW (38.6% of the total installed capacity), with the majority from solar and large hydro (12% each) followed by wind (10%). This translates to ~ Rs. 17 Lakh Crore of capital requirement to make the additional utility scale RE target of 340 GW possible. At a debt: equity financing ratio of 80:20, the debt requirement for a 340 GW RE target works out to ~ Rs. 14 Lakh Cr over a period of 9 years[1].

As per publicly available data, the total outstanding of domestic financiers (banks and Government NBFCs like PFC, REC and IREDA) to RE/Non Conventional sector aggregates to Rs. 1.22 Lakh Cr as of March 31 2021 (on outstanding basis). There is no publicly available database that provides RE lending details of entities such as private NBFC-IFCs, NBFCs, IDF[2]s and capital market instruments with funds utilised towards RE. Hence the aggregate does not include RE finance contribution by these entities[3,4]. The entire power sector contributes to ~5% of total Non Food Credit by scheduled commercial banks and contributes to more than 50% of the total infrastructure sector. While the share of RE loans (~7% of total bank credit to the power sector as of March 31 2021) is not too large today, we expect the same to ramp up rapidly in the future as RE generation begins forming larger part of India's energy mix. This underlines the current need for policy measures to ensure accountability and safeguard public interest.

India received about USD 2.75 Billion or Rs. 0.20 Lakh Cr as RE debt through the External Commercial Borrowing (ECB)/Foreign Currency Convertible Bonds (FCCB)/ Rupee Denominated Bonds (RDB) route for year ended March 31 2021 (vs USD 2.33 Billion or Rs. 0.17 Lakh Cr for year ended March 31 2020). For the period of April 2021 till November 2021 for the FY22, India has received USD 4.09 Billion RE debt through this route (Rs. 0.31 Lakh Cr)[5]. The end use of the above mentioned debt is towards refinancing of existing debt, fresh debt towards greenfield RE projects and working capital debt. Apart from this, India received USD 1.39 Billion of Foreign Direct Investment (FDI) in FY20 (Rs. 0.10 Lakh Cr) vs USD 1.45 Billion in FY19 (Rs. 0.10 Lakh Cr)[6]. As is evident from the numbers, the amount of foreign capital both equity and debt received historically towards Indian RE appear well below the required amount envisaged.

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1. We have assumed capex cost per MW for solar at Rs. 4 Cr and for wind at Rs. 7 Cr. We have also assumed the incremental 340 GW of RE will be a mix of 60:40 of solar:wind.
2. NBFC: Non Banking Finance Company, NBFC IFC: Non Banking Finance Company Infrastructure Finance Company, IDF: Infrastructure Debt Fund
3. A detailed breakup by type of lending institution is available in Annexure 1
4. This exercise in attempting to determine the amount of RE finance outstanding in India was an indicator of the long road ahead for improving information symmetry and monitoring of the debt towards the sector.
5. https://rbi.org.in/Scripts/ECBView.aspx
6. https://www.prayaspune.org/peg/trade-and-manufacturing.html

The majority of the current discourse around the Indian RE story has centred around speed and scale of the installed capacity ramp up. The modular nature of executing RE projects puts them on the other end of the construction complexity spectrum as compared to conventional power generation plants. However, there are some unique characteristics of RE projects which puts them in a different class of risk compared to conventional power plants. At the heart of these risks is the potential for lower than estimated power generated based on the vagaries of the weather and aggressive bidding based on high generation assumptions. The implications of the same are profound, both, for the servicing of the debt sitting on individual RE projects (upto 80% of the project cost for RE projects is long term debt funded) as well returns for the equity investors.

Given the massive scale of resource mobilization this capacity addition plan entails, the funding for this planned RE capacity will need to come in from multiple sources, both domestic financiers and global participants. To put the required debt number of ~ Rs. 17 Lakh Crore in perspective, the entire loan book of State Bank of India (which is the largest Indian bank -private or public) as of March 31 2021 was Rs. 25 Lakh crores (consolidated). The 2nd largest loan book was of HDFC Bank at ~ Rs. 12 lakh Cr as of March 31 2021. A large amount of direct and indirect public monies will be involved in the future in the RE finance pie, and hence we felt the need for larger discourse on specific nuances of credit risk for RE debt as well as study the current policy responses to RE finance. We hope that these insights feed into policy making for attracting appropriately structured, priced and well monitored RE finance.

## A. India's RE Finance ecosystem:

The primary players involved in providing long term debt finance towards RE projects are banks (both public, i.e.>50% owned by GOI and private), non banking finance companies (NBFCs), NBFC- Infrastructure debt funds (NBFC-IDFs) and institutional capital (such as pension funds, insurance companies – both international and domestic). Equity participation in RE comes from private capital players, Government entities and foreign funds[8].

The RE lending experience of the three primary Government owned NBFC participants (PFC, REC and IREDA) was covered in detail in the Twenty First Report of the Standing Committee on Energy relating to the Ministry of New and Renewable Energy, to the Lok Sabha titled 'Financial Constraints in Renewable Energy Sector' from January 2022 (referenced as the January 2022 SC report in this paper)[9].

Non Performing Assets (NPAs) are loan assets which have remained in payment default for over 90 days. NPAs are an important part of financing entities' disclosures, as they indicate the health of the loan asset book. An increasing trend in NPAs signal a deterioration in the quality of the loan asset book of a financing entity.

8. A brief snapshot of the RE finance ecosystem and its regulators is provided in Annexure 2

9. https://eparlib.nic.in/bitstream/123456789/835464/1/17_Energy_21.pdf

Below is a snapshot of the NPA information provided by IREDA, PFC and REC in the January 2022 SC report:

| Name of entity | RE Loan book outstanding as of March 31 2021 (Rs. Cr.) | RE Gross NPA (Rs. Cr.)[10] | RE Net NPA (Rs. Cr.) | RE Gross NPA Ratio | RE Net Non NPA Ratio[11] |
|---|---|---|---|---|---|
| IREDA | 27,854 | 2,442 | 1,510 | 8.77% | 5.61% |
| PFC | 31,104 | 333.46* | | 1.07%* | |
| REC | 16,505 | 40.66* | | 0.25%* | |

* In the January 2022 SC report, it is not clear if the NPA numbers for PFC and REC are net of provisions or gross NPAs.

All three NBFCs put together account for ~ Rs. 2800 Cr of NPAs as of March 31 2021. IREDA with a loan outstanding of ~ INR 27000 Cr (March 2021) declared an 8.11% Gross Non Performing Asset (GNPA) ratio and a 4.88% Net Non Performing Asset (NNPA) ratio spread across 94 customer accounts. These GNPA and NNPA numbers are on the higher side and indicate high stress on the asset quality of IREDA (as compared to lets say State Bank of India which reported GNPA ratio of 4.98% and NNPA ratio of 1.50% as of March 31 2021). Utility scale solar and wind contributed nearly 50% of the NPAs for IREDA. Further, IREDA cited multiple reasons leading to NPAs including delay in receipt of payments from discoms (31%), delayed project implementation (22%), Force Majeure events (18%) and technology/resources/generation related issues (15%)[12].

Similar granular data on RE NPAs was not presented for PFC and REC in the January 2022 SC report. The large difference in the RE NPA ratios between IREDA, PFC and REC needs to be better understood.

It is an important point to note that the NPAs for IREDA increased sharply in FY19 (at Rs. 2373 Cr vs Rs. 1308 Cr as of March 2018, an 80% increase) due to a revision in Reserve Bank of India's (RBI) norms for NPA recognition in 2018. The revised norms guided that any loan asset that is in default for more than 120 days by March 2019 and 90 days by March 2020 should be classified as Non Performing Assets. The move to standardize the threshold for NPA classification across financing entities (banks, NBFCs and Government NBFCs) has been an instrumental step towards consistent and comparable reporting of asset quality by all financing entities under the aegis of RBI.

RE NPA disclosures for these three entities as well as other RE financing entities are an important monitoring tool for RE finance policy makers. Hence the consistency and standardization of reporting formats for RE NPAs, depth of the analysis of reasons for NPAs, and trends in NPA recovery in annual filings of financing entities would be critical areas for policy makers to intervene into with appropriate guidelines/rules.

10. Gross Non Performing Assets are those loans for which debt servicing is delayed for more than 90 days. Net Non Performing Assets are Gross Non Performing Assets minus the provision for the Non Performing Assets.
11. GNPA and NNPA ratios are simply GNPAs and NNPAs reflected as a percentage of total advances.
12. More detailed analysis is provided in Annexure 3

## B: RE projects' risk nuances:

Compared to thermal power projects, RE projects with their low construction and operational complexity and no fuel supply issues may be prone to being perceived as inherently less risky. However, this assessment would be incorrect. Generation variability of RE (due to nil control over natural inputs such as wind speed and solar irradiation levels), tariff design and the consequent stress on project debt servicing are some key differentiating factors between thermal power and RE projects.

RE projects' success (of which debt makes 80% of the project cost once the project is operational) is supported by annual average energy generation estimates based on a statistical level of confidence that it is expected that the predicted solar resource/wind resource energy yield may be exceeded with 90% probability. Any large dip in generation will automatically lead to stress for the project level debt. Most RE loans are financed at base case debt coverage ratios of between 1.20x to 1.15x (depending upon the PPA counterparty). This means that for an annual debt service burden of 10, the base case available cashflow is 12. In case of a 20% dip in annual generation (as was the case in CY2020 for wind power projects in India[13]), this would lead to available cashflows for debt service of 9.6 vs the annual debt service burden of 10. This generation linked debt servicing shortfall has not considered any delay in receipt of dues from the offtaker.

Further, the current dues from discoms to electricity generators continue to mount and aggregate to the tune of Rs. 97458 Cr (out of which Rs. 19675 Cr are towards RE projects) as of January 2022[14]. These overdue payments for RE projects mean that for some state discoms such as Tamil Nadu, Andhra Pradesh, Rajasthan and Maharashtra, the overdues are equivalent of a 8-10 months' worth of invoiced energy. Some of this delay in payment in many states could be due to ongoing disputes as well. Thus, the counterparty risks as well as the regulatory risk is significant in many cases. Recurrent generation shortfall and large overdues from offtakers will severely dent the IRR profile of such RE projects. This could potentially lead to defaults on project debt by RE developers who simply won't find operating such projects as economically viable.

The below table covers in detail the key differences in the risk profiles of thermal power and RE projects. The intent of the same is to bring out in sharp relief the very real financing risks sitting on RE projects (even for those projects which have stabilised operating histories running into multiple years)

| Area | Thermal Power Projects | RE Projects |
|---|---|---|
| Construction complexity & construction lead time | Very high construction complexity, long gestation time running into multiple years (5-7). | Low construction complexity, modular nature of plants. Moderate construction timeline of between 12 to 18 months. |
| Fuel risk | High fuel risk with respect to price and availability | Nil fuel risk |

13. https://www.ceew.in/publications/studying-the-impact-of-unexpected-climate-change-on-wind-energy-sector-in-india

14. https://praapti.in/

| Area | Thermal Power Projects | RE Projects |
|---|---|---|
| Control over quantum of power generation | High locus of control over electricity generation once the plant is set up within appropriate technical parameters such a technical minimum, ramp rates and start/shut down times. | Low locus of control over electricity generation as the inputs for solar and wind are connected to the weather and larger climate. Generation has potential to vary greatly. |
| Tariff design and Implications on project debt serviceability | Tariff has a two-part structure. It comprises the recovery of annual fixed charges and a variable charge per unit of generation. For cost plus projects, actual prudent expenses are recovered from consumers based on regulatory scrutiny. For competitively bid projects, the tariff is enshrined in the PPA with escalable and non-escalable components are agreed to by the parties. | Tariff has a single-part structure, mostly discovered through competitive bidding as a single non-escalable levelized rate over the PPA term. It is recovered per unit of generation as enshrined in the power purchase agreement. |
| | Thermal plants are base load generating plants and feature heavily in the merit order of despatch. In case the plant is available in line with norms, the recovery of capital invested is a given under the dual part tariff design for thermal plants. This delinks debt serviceability of such plants from the actual generation since fixed part of the tariff, which is linked to long term debt repayments is linked to 'availability' and not actual generation. | RE tariffs are single part in nature and recovery of capital invested is purely based on actual/scheduled generation and offtake by the consumer[15]. This exposes RE project debt to potential stress linked to lower than estimated electricity generation.<br>Given discom reluctance to offtake higher priced RE units (basis older PPAs), the curtailment risk for RE plants is playing out. Despite newer PPAs containing some generation compensation in case of generation curtailment linked to issues not pertaining to grid stability, it is difficult to prove whether the reason for curtailment is grid stability related or otherwise. This may expose RE projects to revenue loss in case of curtailment. This is despite the fact that RE projects also have a Must Run status. |
| Technology and Payment Risks | Technology for thermal power generation is stable. | Due to rapidly falling technology costs, the cost of new projects is falling rapidly. This exposes older RE projects with higher tariffs which now appear more expensive than their newer counterparts, leading to offtaker reluctance to pay for older projects. |

15. For ISTS projects, while tariff is single part, it is based on scheduled generation, not actual generation with the deviation balancing done afterwards on a weekly basis.

## C. Current RE Finance Policy Environment and the future:

Policy makers have been attempting multiple options to encourage investments in Indian RE. They have lowered credit risk thresholds for participation in RE for public financial institutions such as Life Insurance Corporation (LIC) and Employees Provident Fund Organisation (EPFO)[16], injected equity capital into entities such as IREDA to bolster its lending capabilities, have notified revised rules for setting up Alternate Investment Funds (AIFs) and Infrastructure Investment Trusts (InvITs), etc. The Budget in February 2022 also introduced the Government's plan of raising sovereign green bonds. Most of these initiatives clearly demonstrate the need for financial innovation for RE, disrupting the old guard mode of raising equity and debt capital.

The January 2022 SC report referenced in the earlier section however, has taken a different view of the matter and has put forth some incremental recommendations. The general theme of the recommendations revolves around making RE finance participation mandatory for banks and financial institutions as a percentage criterion, supporting public sector lending institutions like PFC, REC, IREDA to reduce their cost of funds, restructuring banks loans to RE to match the seasonality in RE generation. These ideas may not yield the desired result of well structured, remunerative RE investments (equity and debt) and in turn may distort the credit quality of public financiers' loan books. Specifically, the recommendation for relaxation of RBI norms for loans to RE projects due to their seasonal nature of generation is not justified. The option for banks to restructure repayment schedules to match the seasonality in generation could also lead to such restructuring for unrelated reasons. As of today, savvy financiers are already having the practice of matching the repayment schedule of an RE loan to the seasonality in generation. Unless, the basic issues plaguing the Indian RE sector such as regular and timely payments by discoms and the States safeguarding the sanctity of PPAs signed in the past, are addressed in a comprehensive manner, other such fixes will remain only temporary in nature and may even prove counter productive in the larger scheme of things.

In the past (2005-15/20), back when large scale thermal capacity was being planned and executed in India, the country was facing an electricity shortage situation. This shortage worked as the catalyst for aggressive policy action on promoting large capacity addition alongwith lower than desired debt underwriting safeguards in the public sector banks[17]. As a result, the Indian Banking sector today continues to grapple with the legacy of NPAs to the coal fired thermal projects, many of which are stranded even today for want of PPA tie up or fuel linkage. As per the latest publicly available Government data, 34 thermal coal fired projects aggregating to 40,130 MW with outstanding debt of Rs. 1,74,468 Cr (as of March 2018) are facing serious financial stress[18]. The resolution plans for some of the large projects facing financial distress have translated into massive haircuts for the project lenders which is essentially an irrevocable loss of public money[19].

16. https://www.irdai.gov.in/ADMINCMS/cms/whatsNew_Layout.aspx?page=PageNo4331&flag=1
17. This issue is covered in great detail in Prayas (Energy Group) (2017 January) Many Sparks but Little Light: The Rhetoric and Practice of Electricity Reforms in India.
18. http://164.100.47.193/lsscommittee/Energy/16_Energy_37.pdf
19. https://ieefa.org/wp-content/uploads/2019/12/The-Burden-of-NonPerforming-Assets-in-India-Thermal-Power-Sector_December-2019.pdf

Given the aforementioned risk nuances of RE, it is imperative to have a comprehensive policy response from various regulators to ensure a risk sentient approach to engender the right of kind of financial innovation. RE capacity is critical for India's decarbonization success. Indian RE tariffs are amongst the lowest in the world and are expected to provide much required low cost electricity supply. Supporting India's transition to RE capacity calls for a change in the existing framework of RE finance based on the guiding principles of transparent and consistent disclosures, efficient and timely data warehousing, and encouraging public discourse on material changes to existing policy. Below we present some pathways to achieving these objectives:

1. **Encouraging a robust monitoring atmosphere and tools for the RE sector:**

The RE pipeline is expected to be made up large capacity projects being awarded. Hence tightly controlled monitoring of individual projects is essential to catch any incipient stress in project debt clusters. We recommend the creation of a publicly available, robust and timely RE project level monthly generation data and invoicing details monitoring platform. The starting point for the same could be an exhaustive project wise RE project inventory. The Central Electricity Authority (CEA) publishes daily and monthly RE generation reports on their website[20]. The monthly RE generation report covers project wise monthly data for installed capacity aggregating to ~20 GW vs. installed RE capacity (utility scale solar and wind capacity) of 90.40 GW (as of January 2022)[21]. A comprehensive reporting public platform with details such as project wise monthly generation in units, type of project, billed amount to offtaker, date of billing, amount received against each bill, date of receipt of each amount, will markedly improve transparency and information symmetry for RE.

2. **RE Finance reporting framework for lenders and investors:**

- RBI and SEBI may design and stipulate a comprehensive, standardized and consistent reporting format for RE project level data pertaining to financing arrangements from all types of lenders (RBI)/ investors (SEBI) under their aegis. This database once collated to be made publicly available in the spirit of fostering transparency and accountability. As of today, no public database is available for financing of RE done by private NBFC-IFCs, NBFCs and IDFs.

- RBI to ensure that annual reports of all financing entities under its aegis should clearly delineate their RE finance portfolio alongwith data on offtakers, annual performance, etc. We noted that disclosures in annual financial reporting by entities regulated by the RBI regarding RE finance portfolios is found to be scant and inconsistent. For e.g., banks do not present their lending to RE as a carved out data point in their sector wise loan book exposure analysis. It is notable that private NBFC-IFCs, NBFCs and IDFs (barring one) do not have consistent dissemination of RE power portfolios in their annual reports and other regulatory financial filings. Additionally, RBI joined the Central Banks and Supervisors Network for Greening the Financial System (NGFS) in April 2021 and is currently working on a consultative paper for RBI regulated entities to assess their progress in managing climate risk covering, inter alia, (i) governance (ii) strategy (iii) risk management and (iv) disclosure[22].

20. https://cea.nic.in/renewable-generation-report/?lang=en
21. https://cea.nic.in/renewable-generation-report/?lang=en
22. https://m.rbi.org.in/Scripts/PublicationsView.aspx?id=20941

- RBI to ensure that annual reports of all financing entities under its aegis should clearly delineate their RE NPAs details in a standardized reporting format, alongwith the analysis of reasons for NPAs, and trends in NPA recovery. The NPA disclosures made by IREDA in the January 2022 SC Report referenced in the earlier sections are a noteworthy example which may be used as a good reference point.

### 3. RE Finance credit risk measurement approach:

The credit risk measurement approach to the potentially standardizable objective parameters for RE finance debt (such as generation performance, O&M cost incurred, debt service coverage ratio (DSCR), Delayed payments from offtakers, etc.) is inconsistent across Credit Rating Agencies (CRAs). The January 2021 IRDAI circular permitting infrastructure investments by public and private insurers in debt instruments with credit rating of A (a three notches lower threshold than the previous one of AA) has brought the criticality of the CRA function into sharp focus. Refer PEG report 'Expected Loss: Unexpected Outcomes' for a more detailed assessment of this issue along with some potential solutions.

### 4. Public discourse in policy making leading to better informed and participatory decisions:

As public funds will be utilised both for debt assistance and equity participation (NTPC's 60 GW RE plan) for the RE target, public comments may be invited and space be created for engagement on material changes to investment guideline for public money entities such as The Insurance Regulatory and Development Authority of India (IRDAI), The Pension Fund Regulatory & Development Authority (PFRDA), etc.

The above suggestions are pointed towards improving the information symmetry in the RE finance domain. Fostering a robust monitoring-oriented information strategy presents a twofold advantage to sector actors as well as regulators; 1. if any stress is building in a particular project, the same may be caught early and attempted to be remedied and 2. Data on generation trends may alert developers and financiers on which technologies and geographies are performing as per expectations or below. Such insights may ultimately contribute to reasonable bidding for RE projects in future auctions.

# Annexure 1

Below is a brief overview of the quantum of finance provided by various players to RE:

### Indian banks' exposure to Power sector

| Particulars | Outstanding as on (all in Rs. Cr.) | | | | |
|---|---|---|---|---|---|
| | 27/ Sep/2019 | 27/ Mar/2020 | 25/ Sep/2020 | 26/ Mar/2021 | 24/ Sep/2021 |
| I. Gross Bank Credit (II + III) | 9766854 | 10370861 | 10271581 | 10949509 | 10956792 |
| II. Food Credit | 60085 | 51764 | 66427 | 61254 | 62342 |
| III. Non-food Credit | 9706769 | 10319097 | 10205154 | 10888255 | 10894450 |
| III 2.18. Infrastructure sector | 1001193 | 1053033 | 1026233 | 1092217 | 1086038 |
| % of Infrastructure of total Non-Food credit | 10% | 10% | 10% | 10% | 10% |
| 2.18.1. Power | 557161 | 560613 | 548298 | 567584 | 570403 |
| % of Power of Infrastructure sector | 56% | 53% | 53% | 52% | 53% |
| % of Power of total Non-Food Credit | 6% | 5% | 5% | 5% | 5% |

Source: Sectoral Deployment of Bank Credit – September 2021, Reserve Bank of India, Data on sectoral deployment of bank credit collected from select 33 scheduled commercial banks, accounting for about 90 per cent of the total non-food credit deployed by all scheduled commercial banks (https://rbidocs.rbi.org.in/rdocs/PressRelease/PDFs/PR1118E10A63F6E8AA4FD99C1833C3AEA52FC4.PDF)

### Indian banks' exposure to RE sector:

| Year ended March | Occupation Group (in Rs. Cr.) | Private Financial Corporations | Private Non-Financial Corporations | Public Non-Financial Corporations | Others | Total |
|---|---|---|---|---|---|---|
| 2019 | Electricity, Gas & Water Total | 17056 | 229034 | 179119 | 111227 | 536633 |
| | **Non-Conventional Energy** | **3316** | **22703** | **7309** | **2358** | **35731** |
| | Total Bank Credit | 579655 | 2622922 | 1048427 | 5526126 | 9897595 |
| 2020 | Electricity, Gas & Water Total | 13838 | 184816 | 206533 | 126916 | 532810 |
| | **Non-Conventional Energy** | **3631** | **22046** | **6726** | **4165** | **36578** |
| | Total Bank Credit | 555320 | 2576890 | 1095686 | 6150890 | 10518812 |

| Year ended March | Occupation Group (in Rs. Cr.) | Private Financial Corporations | Private Non-Financial Corporations | Public Non-Financial Corporations | Others | Total |
|---|---|---|---|---|---|---|
| 2021 | Electricity, Gas & Water Total | 13091 | 177718 | 230876 | 126635 | 548404 |
| | **Non-Conventional Energy** | **3119** | **26181** | **7114** | **3754** | **40176** |
| | Total Bank Credit | 638700 | 2398650 | 1056161 | 6818805 | 11078050 |

Source: 'Basic Statistical Return on Credit by Scheduled Commercial Banks (SCBs) in India – March 2021'1 on its Database on Indian Economy (DBIE) portal (web-link: https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications#!19). The publication provides information on various characteristics of bank credit, based on data submitted by SCBs (including Regional Rural Banks) under the annual Basic Statistical Return (BSR) - 1 system, which collects information on type of account, organisation, occupation/activity and category of the borrower, district and population group of the place of utilisation of credit, rate of interest, credit limit and amount outstanding.

It is worth noting in the above table that, banks's participation in RE finance has been muted as is visible from the o/s for FY19 and FY20 being nearly flat in growth and FY21 showing only Rs. 3598 Cr increase. This could be a reflection of large pipeline of under construction RE projects drawing non fund based lines during the construction phase and drawing term loans only post operationalization of the projects.

### PFC, REC and IREDA: Vital financing sources for RE

| Particulars | Year ended March 31 2020 | Year ended March 31 2021 | Y-o-Y change |
|---|---|---|---|
| **Power Finance Corporation Ltd. (PFC)** | | | |
| Loans o/s to state sector | 287514 | 311387 | 23873 |
| Loans o/s to private sector | 57391 | 59384 | 1993 |
| Total Loans o/s | 344905 | 370771 | 25866 |
| **Loans o/s to RE** | **19210** | **37475** | **18265** |
| % of RE loans to Total Loans o/s | 6% | 10% | |
| Loans o/s to Transcos | 46255 | 29344 | -16911 |
| % of Transco loans to Total Loans o/s | 13% | 8% | |
| Loans o/s to Discoms | 50075 | 112299 | 62224 |
| % of RE Discoms to Total Loans o/s | 15% | 30% | |
| Fresh disbursements in the year | | 88300 | |
| Disbursements under the liquidity infusion scheme of the Government of India under Atmanirbhar Bharat (part of COVID relief package) | | 39884 | |

| Particulars | Year ended March 31 2020 | Year ended March 31 2021 | Y-o-Y change |
|---|---|---|---|
| **REC Ltd. (formerly Rural Electrification Corporation Limited)** | | | |
| Loans o/s to state sector | 284778 | 338974 | 54196 |
| Loans o/s to private sector | 38606 | 41062 | 2456 |
| Total Loans o/s | 323384 | 380036 | 56652 |
| **Loans o/s to RE** | **9164** | **17388** | **8224** |
| % of RE loans to Total Loans o/s | 3% | 5% | |
| Loans o/s to Transcos | 49659 | 61310 | 11651 |
| % of Transco loans to Total Loans o/s | 15% | 16% | |
| Loans o/s to Discoms | 110923 | 139834 | 28911 |
| % of RE Discoms to Total Loans o/s | 34% | 37% | |
| Fresh disbursements in the year | | 92987 | |
| Disbursements under the liquidity infusion scheme of the Government of India under Atmanirbhar Bharat (part of COVID relief package) | | 39116 | |
| **Indian Renewable Energy Development Agency Limited (IREDA)** | | | |
| **Loans o/s to RE** | **22978** | **26905** | **3927** |

Source: Annual reports of PFC, REC and IREDA

# Annexure 2:

| Sr. No. | Entity | Role in RE Finance | Regulator | Products |
|---|---|---|---|---|
| 1 | Banks : Private Public (ownership of >50% with GOI) | Debt assistance | RBI | Fund Based by way of debt: Short term loans, working capital loans, long term loans |
| | | | | Non Fund Based by way of debt: Bank guarantees (financial and performance), capex and working capital letter of credit |
| | | | | Treasury products: Financial derivate products such as options, swaps, futures, forwards and hybrid structures |
| | | | | Fund Based by way of investments: Subscription to bonds, debentures issued by various counterparties |
| | | | | Other products: Cash Management Services, Escrow Account Services |
| 2 | Non-Banking Finance Companies Infrastructure Finance Companies (NBFC-IFCs) such as PFC, REC | Debt assistance | RBI | Fund Based debt: Short term loans, working capital loans, long term loans |
| | | | | Fund Based investments: Subscription to bonds, debentures issued by various counterparties |
| 3 | NBFC-Infrastructure Debt Funds (NBFC-IDFs) | Debt assistance | RBI | IDF-NBFCs provide loans to PPP infrastructure projects which have successfully completed one year of commercial production. Such take-over of loans from banks would be covered by a Tripartite Agreement between the IDF, Concessionaire and the Project Authority for ensuring a compulsory buyout with termination payment in the event of default in repayment by the Concessionaire. |

| Sr. No. | Entity | Role in RE Finance | Regulator | Products |
|---|---|---|---|---|
| 4 | Capital Market participants such as pension funds, insurance companies (both domestic and international) | Debt assistance as well equity participation | Debt Issuances in form of bonds, debentures regulated by Securities and Exchange Board of India (SEBI) | Debt Issuances in form of bonds, debentures. |
| 5 | Credit Rating Agencies | Providing credit risk ratings (an opinion of the credit quality and repayment likelihood of a debt product) to bank loans, corporate bonds, debentures and other debt instruments | Securities and Exchange Board of India (SEBI) | Long term and short term ratings to working capital loans, long term loans, Bank guarantees (financial and performance), capex and working capital letter of credit; bonds, debentures issued by various counterparties. |

# Annexure 3:

**IREDA NPAs:**

| NPA | FY19 | | FY20 | | FY21 | | FY 2021-2022 (upto 30.06.2021) | |
|---|---|---|---|---|---|---|---|---|
| | Rs. in crores | % | Rs. in crores | % | Rs. in crores | % | Rs. in crores | % |
| NPA (Gross) | 1308 | 6.12 | 2373 | 10.08 | 2442 | 8.77 | 2163 | 8.11 |
| NPA (Net) | 780 | 3.74 | 1637 | 7.18 | 1510 | 5.61 | 1258 | 4.88 |

**Reasons for NPAs in IREDA's book:**

| Reasons for being NPA/Stressed | Total NPA | | | NPA in Last 3 years | |
|---|---|---|---|---|---|
| | No. of Accounts | Loan O/s (Book Debt) as on 31.03.2021 (Rs. in Crore) | % | Total No. of Accounts | Loan O/s (Book Debt) as on 31.03.2021 (Rs. in Crore) |
| Delay in payment from DISCOM & Tariff Related Issue | 14 | 755 | 31% | 13 | 695 |
| Force Majeure Events | 12 | 431 | 18% | 5 | 154 |
| Rise in Raw material cost | 12 | 82 | 3% | 1 | 6 |
| Delay in Project Implementation/ Commissioning | 7 | 528 | 22% | 4 | 237 |
| Promoters 'Dispute/ Court/NCLT/ Financial Stress of Promoters | 36 | 275 | 11% | 3 | 154 |
| Technology/resources/ Generation Related Issue | 13 | 371 | 15% | 6 | 371 |
| Total | 94 | 2442 | | 32 | 1617 |

**Sector wise breakup of NPAs for last three financial years, as furnished by IREDA is as follows:**

| Sector | No. of cases | Loan Outstanding (Book Debt) (Rs. in Crore) | Percentage Contribution |
|---|---|---|---|
| Wind | 7 | 488 | 30% |
| Solar | 6 | 286 | 18% |
| Hydro | 3 | 42 | 3% |
| Biomass | 2 | 8 | 0% |
| Cogeneration | 9 | 485 | 30% |
| Short Term Loan | 1 | 131 | 8% |
| Manufacturing | 1 | 82 | 5% |
| Transmission | 2 | 85 | 5% |
| Energy Efficiency | 1 | 10 | 1% |
| Others (Briquetting, WTE, Substation) | - | - | |
| Total | 32 | 1617 | |

Source: https://eparlib.nic.in/bitstream/123456789/835464/1/17_Energy_21.pdf

### PFC NPAs (In Rs. Cr.):

| | |
|---|---|
| Stage-III Renewable borrowers as on 31.3.2021 (Rs. crore) | 333.46 |
| Stage-III Renewable borrowers as on 31.3.2020 (Rs. crore) | 340.16 |
| Stage-III Renewable borrowers as on 31.3.2019 (Rs. crore) | 332.45 |

Stage-III borrowers are same as Non Performing Assets (NPAs),i.e. whose debt service is delayed by more than 90 days

Source: https://eparlib.nic.in/bitstream/123456789/835464/1/17_Energy_21.pdf

### REC NPAs (in Rs. Cr.):

| | |
|---|---|
| Stage-III Renewable borrowers as on 31.3.2021 (Rs. crore) | 40.66 |
| Stage-III Renewable borrowers as on 31.3.2020 (Rs. crore) | 4.35 |
| Stage-III Renewable borrowers as on 31.3.2019 (Rs. crore) | 80.06 |

Stage-III borrowers are same as Non Performing Assets (NPAs),i.e. whose debt service is delayed by more than 90 days

Source: https://eparlib.nic.in/bitstream/123456789/835464/1/17_Energy_21.pdf

India's ambitions of increasing its non-fossil fuel based energy capacity to 500 GW by 2030 are formidable and present a unique set of opportunities and execution challenges. The debt requirement for an additional 340 GW Renewable Energy (RE) target works out to ~ Rs. 14 Lakh Cr over a period of 9 years.

The majority of the current discourse around the Indian RE story has centred around speed and scale of the installed capacity ramp up. The modular nature of executing RE projects puts them on the other end of the construction complexity spectrum as compared to conventional power generation plants. However, there are some unique characteristics of RE projects which puts them in a different class of risk from the financing perspective compared to conventional power plants.

A large amount of direct and indirect public monies will be involved in the future in the RE finance pie, and hence we felt the need for larger discourse on specific nuances of credit risk for RE debt as well as study the current policy responses to RE finance. We hope that these insights feed into policy making for attracting appropriately structured, priced and well monitored RE finance.

Supporting India's transition to RE capacity calls for a change in the existing framework of RE finance based on the guiding principles of transparent and consistent disclosures, efficient and timely data warehousing, and encouraging public discourse on material changes to existing policy. In this paper, we attempt to present some pathways to achieving these objectives.

Prayas (Energy Group)