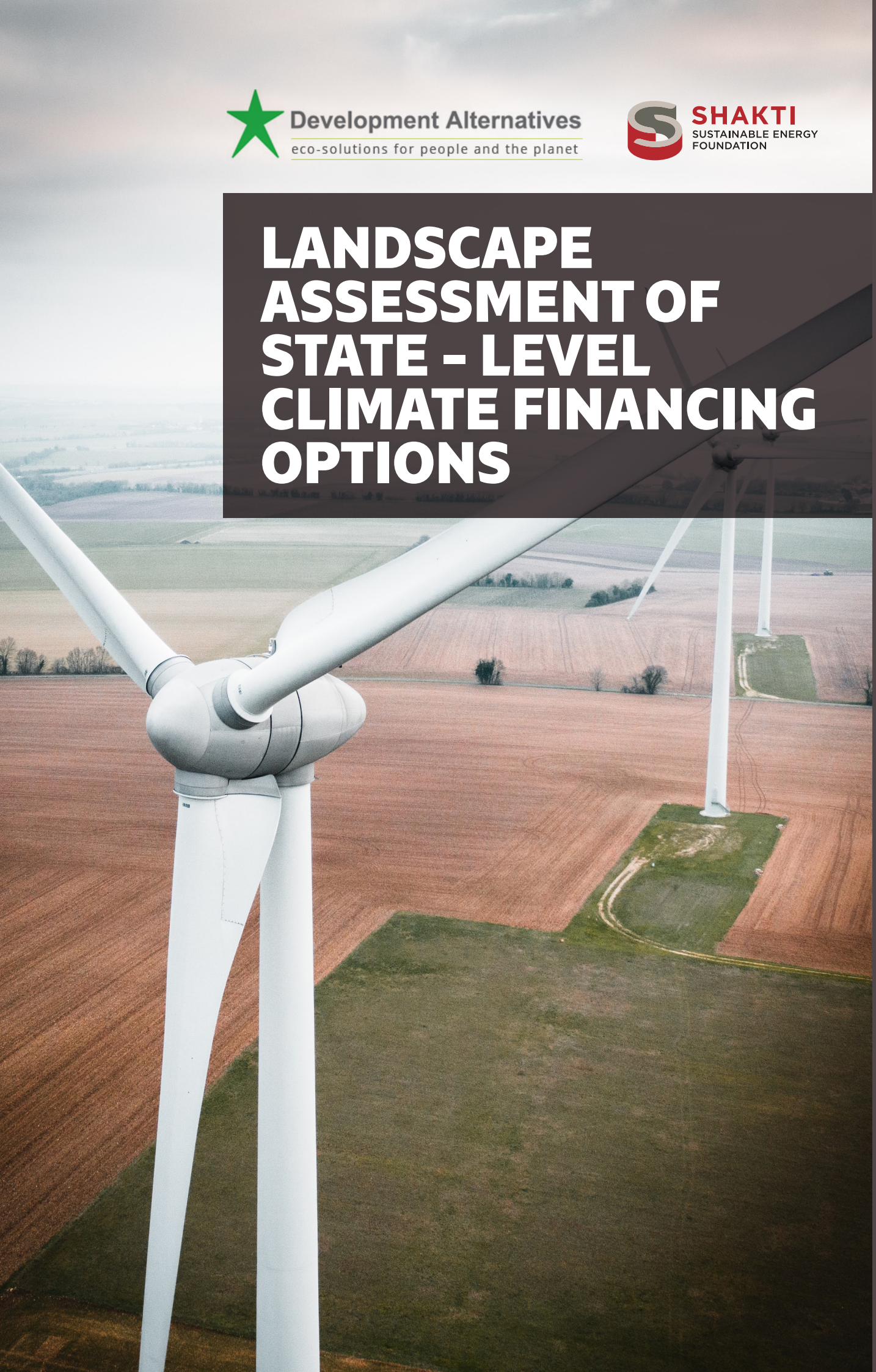
Development Alternatives
eco-solutions for people and the planet

SHAKTI
SUSTAINABLE ENERGY
FOUNDATION

LANDSCAPE ASSESSMENT OF STATE – LEVEL CLIMATE FINANCING OPTIONS



About Shakti Sustainable Energy Foundation

Shakti Sustainable Energy Foundation works to strengthen the energy security of the country by aiding the design and implementation of policies that encourage energy efficiency, renewable energy and sustainable transport solutions, with an emphasis on sub-sectors with the most energy saving potential. Working together with policymakers, civil society, academia, industry, and other partners, we take concerted action to help chart out a sustainable energy future for India (www.shaktifoundation.in).

About Development Alternatives

Development Alternatives (DA) is a premier social enterprise with a global presence in the fields of green economic development, social empowerment and environmental management. It is one of the leading Think Tanks in the field of Sustainable Development. DA is credited with numerous innovations in clean technology and delivery systems that help create sustainable livelihoods in the developing world. DA focuses on empowering communities through strengthening people's institutions and facilitating their access to basic needs. It enables economic opportunities through skill development for green jobs and enterprise creation and promotes greener pathways for development through natural resource management models and clean technology solutions. DA delivers environment friendly and economically viable eco-solutions to communities, entrepreneurs, government and corporate agencies through measures that foster the creation of sustainable livelihoods in large numbers. Development Alternatives drives strategic change through Innovation of eco solutions, Incubation of enterprise-based business approaches, demonstration and capacity building for Implementation of solutions at scale and the Influence of policies for sustainable development. For more information (https://www.devalt.org/)

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Contents

Abbreviations

ADB	Asian Development Bank
AEEE	Alliance for an Energy Efficient Economy
AIIB	Asian Infrastructure Investment Bank
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
BMZ	Basement Membrane Zone
CAPEX	Capital Expenditure
CBI	Central Bureau of Investigation
CPI	Climate Policy Initiative
CTF	Clean Technology Fund
DCF	Discounted cash flow
DFID	Department for International Development
EIB	European Investment Bank
ESCO	Energy Saving Company
FAME	Faster Adoption and Manufacture of (Hybrid and) Electric Vehicles
FMO	Entrepreneurial Bank of Netherlands
GCF	Green Climate Fund
GEEREF	Global Energy Efficiency and Renewable Energy Fund
GEF	Global Environment Facility
GHG	Green House Gasses
ICT	Information and Communication Technology
IFC	International Financial Corporation
IFRI	International Forestry Resources and Institutions
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
IREDA	Indian Renewable Energy Development Agency
IRR	Internal rate of return
ISA	International Solar Alliance
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau (Credit Institute for Reconstruction)
LEAP	Leading Asia's Private Infrastructure Fund
MDB	Multilateral Development Banks
MNRE	Ministry of New and Renewable Energy
NAPCC	National Action Plan on Climate Change
NBFC	Non-Banking Financial Company
NIIF	National Investment and Infrastructure fund
NPV	Net present value
NRDC	National Research Development Corporation
OPEX	Operating Expenses
PE	Private Equity
PSRF	Partial Risk Sharing Facility

PTC	Power Trading Corporation
RBF	Results Based Findings
RBI	Reserve Bank of India
REC	Renewable Energy Corporation
RESCO	Renewable Energy Service Company
RGO	Renewable Generation Obligation
RIDF	Rural Infrastructure Development Fund
RPO	Renewable Purchase Obligation
SAPCC	State Action Plans on Climate Change
SBI	State Bank of India
SEEP	Super Efficient Equipment Programme
SHS	Solar Home Systems
SIDBI	Small Industries Development Bank of India
SPAAS	Solar Power as a Service
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development

Project Summary

In 2014, the Government of India embarked on an ambitious plan to increase the share of renewable energy in the country's energy mix, setting targets to achieve 175 GW of installed renewable energy capacity by 2022. This includes generation of 5 GW of small hydropower, 10 GW of waste-to-energy power, 60 GW of wind power and 100 GW of solar power by 2022. With all the ambitious targets in place, the two major aspects required to transform India's economy into a green economy include building capacity for increasing both foreign and domestic financial investment and ensuring innovation in its distribution.

The present report focuses on the financing aspects of clean energy projects in India with the help of substantial evidence and examples. Based on a primary survey of financial institutions such as banks and non-banking financial institutions (NBFC's), the report enables its readers to comprehend the funding mechanism under renewable energy projects in India and its regulatory framework. Additionally, the report also emphasizes on the sources and the instruments adhered to by financial institutions for disbursement of funds.

The various policy recommendations provided under this report are as follows:

- Providing capital gains exemption on investment in renewable energy projects through bonds, debt and equity will create a huge incentive for both domestic as well as foreign investors.
- Providing grid charge exemptions to open access solar projects will boost domestic investor confidence and the number of rooftop and small capacity solar projects will increase.
- Creating a single clearance mechanism as against multiple clearances for initiation of renewable energy projects which will lead to shortening the duration time.
- Creating a minimum standard of benchmark for PV panels which will improve the overall quality of PV panels being used in the projects and will increase the yield as well as the duration of the project.
- Facilitating power-delivery contracts signed in foreign currencies which will allow the project developer to repay the debt faster and without the hassle of converting the amount from resident or local currency into foreign currency.
- The monitoring mechanism under the National Clean Energy and Environment Fund (NCEEF) has to be strengthened so there is effective utilization of the funds.

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This represents a quantum jump from current capacities of 3.5 GW, 23 GW, 4.4 GW and 4.2 GW, respectively (MNRE, November 2015).

The Indian government has pushed the goal further to generate

225 GW

by the end of year 2020 after successful execution of previous targets.

1. INTRODUCTION

Is global warming just a temporal anomaly or a real environmental condition? Is it the inflated claim of alarmists or a universal threat? The time for such debate is over, with the adoption of the Paris Agreement on December 2015 within the United Nations Framework Convention on Climate Change (UNFCCC). This unprecedented agreement between 195 countries clearly acknowledges climate change as the principal challenge and a global threat to civilization. As understood, climate change presents two conflicting propositions; on one hand, if left unaddressed it will have adverse impacts on businesses and cause irreparable damage to the ecology and civilization, but on the other hand, if adequately addressed it provides an opportunity to businesses to leverage on the risk and innovate. The shift in emphasis from increasing footholds to curtailing carbon footprints, from increasing productivity to enhancing resource efficiency and from profitability to sustainability has recalibrated the economic compass towards a low carbon, cleaner and greener future and has ushered in a new age, that redefines matrices of development and economic growth.

The new areas of development such as energy efficiency, climate smart agriculture, electric mobility, renewables, urban infrastructure, among others have emerged as the forerunners to transform to a low carbon economy. India has been at the vanguard of this crusade, fueled by reduction in the cost of technology and growing demand for electricity from renewable energy sources. In the domain of renewable energy India has voluntarily committed to a humongous goal of reaching 227 GW of clean energy generation by March 2022.[1]

In 2014, the Government of India embarked on an ambitious plan to increase the share of renewable energy in the country's energy mix, setting targets to achieve 175 GW of installed renewable energy capacity by 2022. This includes generation of 5 GW of small hydropower, 10 GW of waste-to-energy power, 60 GW of wind power and 100 GW of solar power. This represents a quantum jump from current capacities of 3.5 GW, 23 GW, 4.4 GW and 4.2 GW, respectively (MNRE, November 2015). The Indian government has pushed the goal further to generate 225 GW by the end of year 2020 after successful execution of previous targets.

The two main fronts on which action is required to transform India's economy into a truly green economy include building capacity for increasing both foreign and domestic financial investment and integrating innovation in its distribution. Deployment of substantial financial resources is expected to lead the transition towards a low carbon economy. Accomplishing India's Climate Action Plan 2030 is projected to cost $2.5 trillion to the Indian government.[2] The target of realising a renewable energy installed capacity of 225 GW by 2022 alone would require $189 billion in investments according to industry estimates (CPI, 2018).[3] The requirement of funding such initiatives has led to mainstreaming of climate finance as a potential source of funds for climate proofing of the economy. The following sections of this report will describe the objectives and scope of the study, methodology adopted, the global financial flows pertaining to clean energy mitigation projects, the Indian landscape of financial flows along with the associated barriers and enabling factors and ultimately, provide recommendations.

1 https://m.economictimes.com/industry/energy/power/india-will-add-225-gw-renewable-energy-project- capacity-by-2022-r-k-singh/articleshow/64461995.cms
2 https://www.indiabudget.gov.in/economicsurvey/doc/vol2chapter/echap05_vol2.pdf, Page number 124
3 https://climatepolicyinitiative.org/publication/reaching-indias-renewable-energy-targets-role-institutional- investors/

2. OBJECTIVES OF THE STUDY

This study aims to assess the current landscape of climate mitigation in clean energy finance, by identifying, comparing, and evaluating existing databases and initiatives for tracking finance:

- To assess current finance flows, especially private finance available at state level for climate action. This includes primary sources of climate finance, important intermediaries and recipients of climate finance.
- To identify main financial instruments used to finance climate change action. These broadly include grants, subsidies, bonds, and debt and equity instruments.
- To assist Indian states in understanding the pre-requisites and criteria which needs to be fulfilled to access these sources of finance.

3. RATIONALE FOR THE STUDY

The rationale for the study emanates from the fact that although there are some climate finance assessments conducted in the clean energy and energy efficient space for India, they do not necessarily address the specific data sources of climate finance from which states can accrue finance for clean energy projects and the conditionalities associated with it. The present study aims to address this gap.

4. SCOPE OF THE STUDY

The scope of the study limits to assess climate change mitigation finance available for clean energy and energy efficient projects in India. Within the clean energy space, renewable energy projects pertaining to solar, wind and biomass is considered. Similarly, in the energy efficient space finance available to electric vehicles in the transport sector is incorporated.

5. METHODOLOGY

Research Framework

To accomplish the objectives of the study, an exploratory research methodology has been undertaken. An exploratory research framework has been adopted to in the study to facilitate the allow the of expanding the scope of research to be expanded as required and the data collection of data through primary and secondary sources.

Sources of Data Collection

The sources of primary data include personal interviews with 15 relevant stakeholders that include representatives of multilateral development banks, non-banking financial institutions, bilateral agencies, commercial banks, development financial institutions, private equity investors, project developers and civil society institutions undertaken with the help of a semi-structured questionnaire.

Secondary data was sourced from existing databases of Climate Funds Update, World Bank, ADB, EIB and UNFCCC that track existing initiatives and schemes in India as also studies conducted by national and international institutions and documents obtained from Central and State government programs and schemes. Some of the important international sources include annual reports of IFC, Mercom India news reports, reports from Climate Bonds Initiative, Yes Bank and the Climate Fund Inventory Database of OECD.

Tools for Data Collection

Tools used for data collection included interview schedules, semi-structured questionnaires and case studies.

Stakeholders Involved

A multi-stakeholder consultation has been conducted to accomplish the objectives of the study. Figure 1 illustrates the typology of stakeholders surveyed. The detailed list of stakeholders consulted for the study has been provided in Appendix 1.

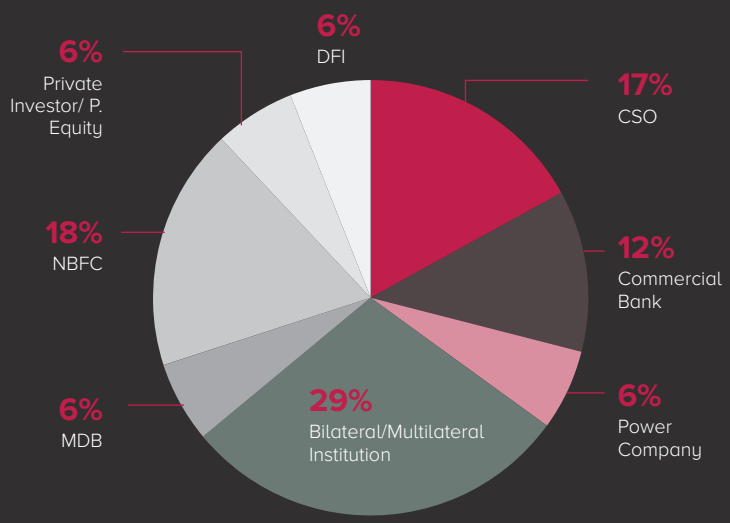


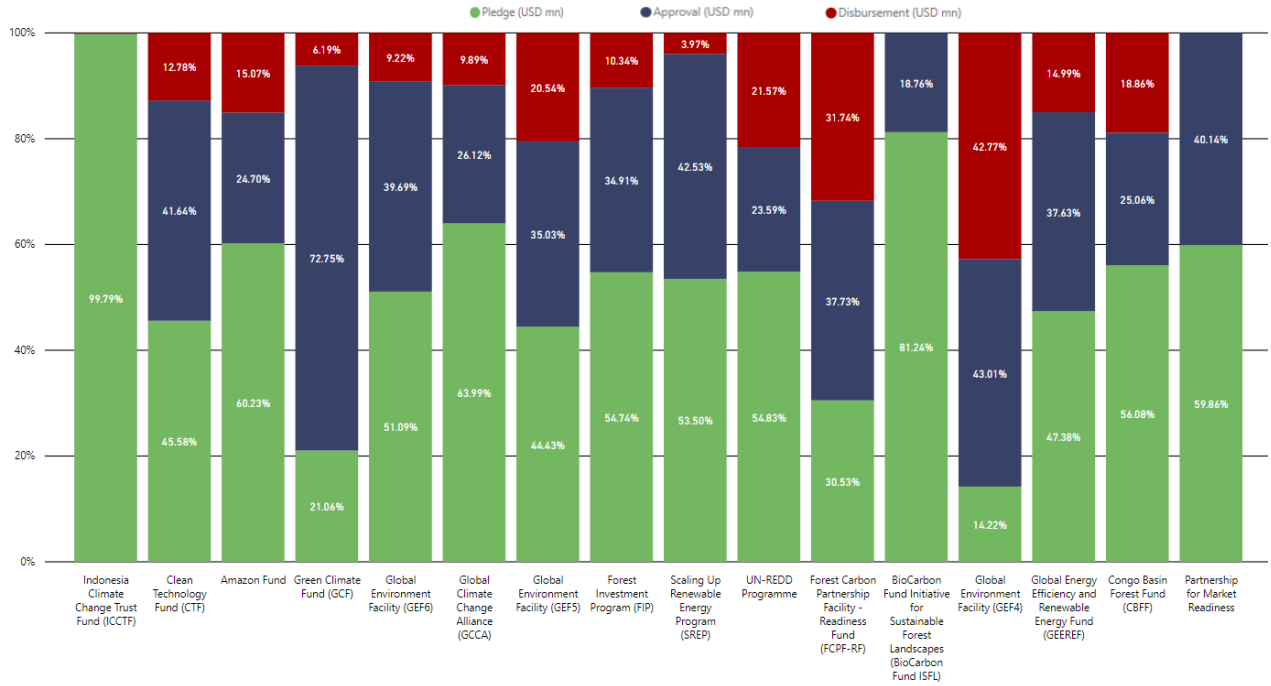
Figure 1: Classification of Stakeholders

Source: Development Alternatives Assessment

6. GLOBAL LANDSCAPE OF CLIMATE MITIGATION FUNDS FOR CLEAN ENERGY AND ENERGY EFFICIENCY PROJECTS

The global landscape of climate change mitigation funds comprises of Clean Technology Fund, Global Energy Efficiency and Renewable Energy Fund (GEEREF), Partnership for Market Readiness, Scaling Up Renewable Energy Program (SREP), Amazon Fund, Bio Carbon Fund Initiative for Sustainable Forest Landscapes (Bio Carbon Fund ISFL), Congo Basin Forest Fund (CBFF), Forest Carbon Partnership Facility (FCPF) - Readiness Fund, Carbon Fund, Foreign Investment Programme, UN-REDD Programme, Green Climate Fund, Green Environment Facility and Indonesia Climate Change Trust Fund. The funds which focus on clean energy and energy efficiency are illustrated in the figure 2 below. The following figure illustrates the state of pledged, approved and the disbursed amounts under some of the global funds. Comparison of the pledged and disbursed amounts is indicative of the fact that the disbursal rate from the GEF (4th phase) funds has been the highest and the same for the GCF has been extremely low. In fact, funds under GEF have witnessed higher disbursements over the years. Disbursal rates under the CTF and GREEEF has been low to moderate. It is also observed that although amounts to be disbursed from partnership for market readiness funds have been approved for some of the middle income countries of Brazil, Chile, China, Colombia, Costa Rica, India, Indonesia, Jordan, Mexico, Morocco, South Africa, Turkey, Thailand, Ukraine, and Vietnam, most of the funds have not been received by recipient countries.

Figure 2: Allocations vs Disbursement of Funds under major Global Funds (2007-2019)



Source: Development Alternatives Assessment

7. CLIMATE FINANCE LANDSCAPE OF CE AND EE PROJECTS IN INDIA

7.1 Regulatory Framework for Clean Energy development in India

The regulatory framework encompasses all the major acts, regulations and policies for development of power from renewable energy sources in India. The Electricity Act of 2003 is the most important Act in this regard and it aims to consolidate all laws pertaining to transmission, generation, trading, distribution and use of electricity so that positive action can be taken for the development of the energy sector. It seeks to promote competition in the sector, protect the interests of the consumer, ensure supply of electricity to all areas, rationalise tariffs, ensure transparency in subsidy policies,

promote efficient and environmentally benign policies and also specifies the constitution of the Central Electricity Authority Regulatory Commissions and Appellate Tribunals for resolution of matters related to these. In September 2018, several amendments were introduced into the Act for boosting the renewable energy sector in India. Some of the proposed amendments are mentioned as under[1]:

- Definitions of Renewable Purchase Obligation (RPO) and Renewable Generation Obligation (RGO) have been introduced.
- Some newer policies have been introduced such as National Renewable Energy Policy to promote smart grids, ancillary support and decentralized distributed generation in accordance with the provisions of the Act;
- Other than this, penalties have been imposed for non-compliance to the RPOs.
- Additionally, requirement for any licenses for generation and supply of renewable energy has been removed.

In order to promote energy efficiency by reducing the energy intensity of the Indian economy, the Energy Conservation Act was introduced in 2001. In order to cater to the energy needs while ensuring minimum increase in GHG emissions, the government is promoting greater use of renewables in the energy mix, mainly through solar and wind and at the same time shifting to super-critical technologies for coal-based power plants. Similarly, efforts are being on the demand side to improve energy use efficiency through various innovative policy measures under the ambit of the Act.

The overarching policies for facilitating growth in the renewable energy sector in India encompasses the NAPCC and its 8 missions, ISA, SAPCC, FAME Scheme for e-mobility, SEEP and AMRUT. The details of these schemes are enlisted in Appendix 2. Table 1 elaborates upon the objectives of the NAPCC.

Table 1: Objectives under NAPCC and its missions

Mission	Objective
National Solar Mission	20,000 MW of Solar power by 2020
National Mission for Enhanced Energy Efficiency	10,000 MW of energy savings by the end of 11th FYP in 2012
National Mission on Sustainable Habitat	Energy efficient buildings, transport, waste management systems, energy efficiency as an integral component of urban planning, improving the resilience of infrastructure, community-based disaster management, capacity building
National Water Mission	Increasing water use efficiency by 20 per cent through regulatory mechanisms with differential entitlements and pricing; formulating basin level management strategies; and establishing water conservation measures
National Mission for Sustaining the Himalayan Ecosystem	Understand the glacial changes through glacial monitoring, participatory management of Himalayan ecosystems
National Mission for a Green India	Six million hectares of afforestation over degraded land by the end of the 12th Five-year plan (2017)
National Mission for Sustainable Agriculture	Drought proofing, climate risk management, improving productivity of rain fed agriculture
National Mission on Strategic Knowledge for Climate Change	Assess vulnerability and identify responses to climate change through high quality and focused R&D

Source: DA Assessment

7.2 Global Financial Flow of Clean Energy and Energy Efficient Funds to India

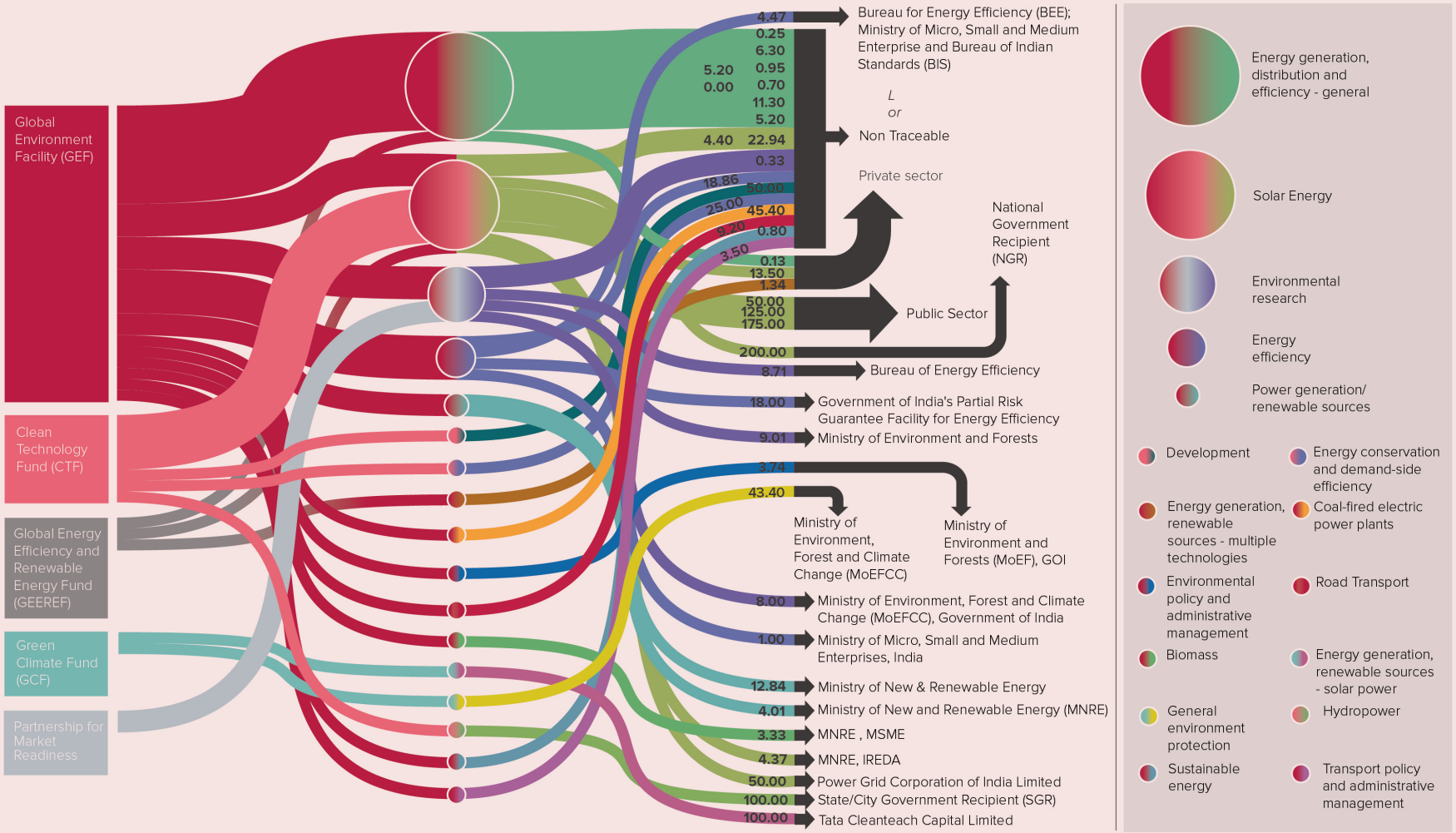
India receives a substantial amount of clean energy mitigation funds from developed economies. These include both bilateral agency funds and funds received from global climate funds in which developed countries are the major contributors. Figure 3 illustrates the funds received from Germany, Japan, UK, France and US in the form of both loans and grants. The recipients of these funds include various line ministries and public institutions.

Figure 4 exhibits the volume of funding received from the global funds for clean energy and energy efficient projects in India.

1 https://powermin.nic.in/sites/default/files/webform/notices/Proposed_amendment_to_Elelctricity_Act_%202 003.pdf

Figure 3: Finance flow from Global Climate Funds to India (2007-2019)

Finance flow from **Global Climate Funds to India**

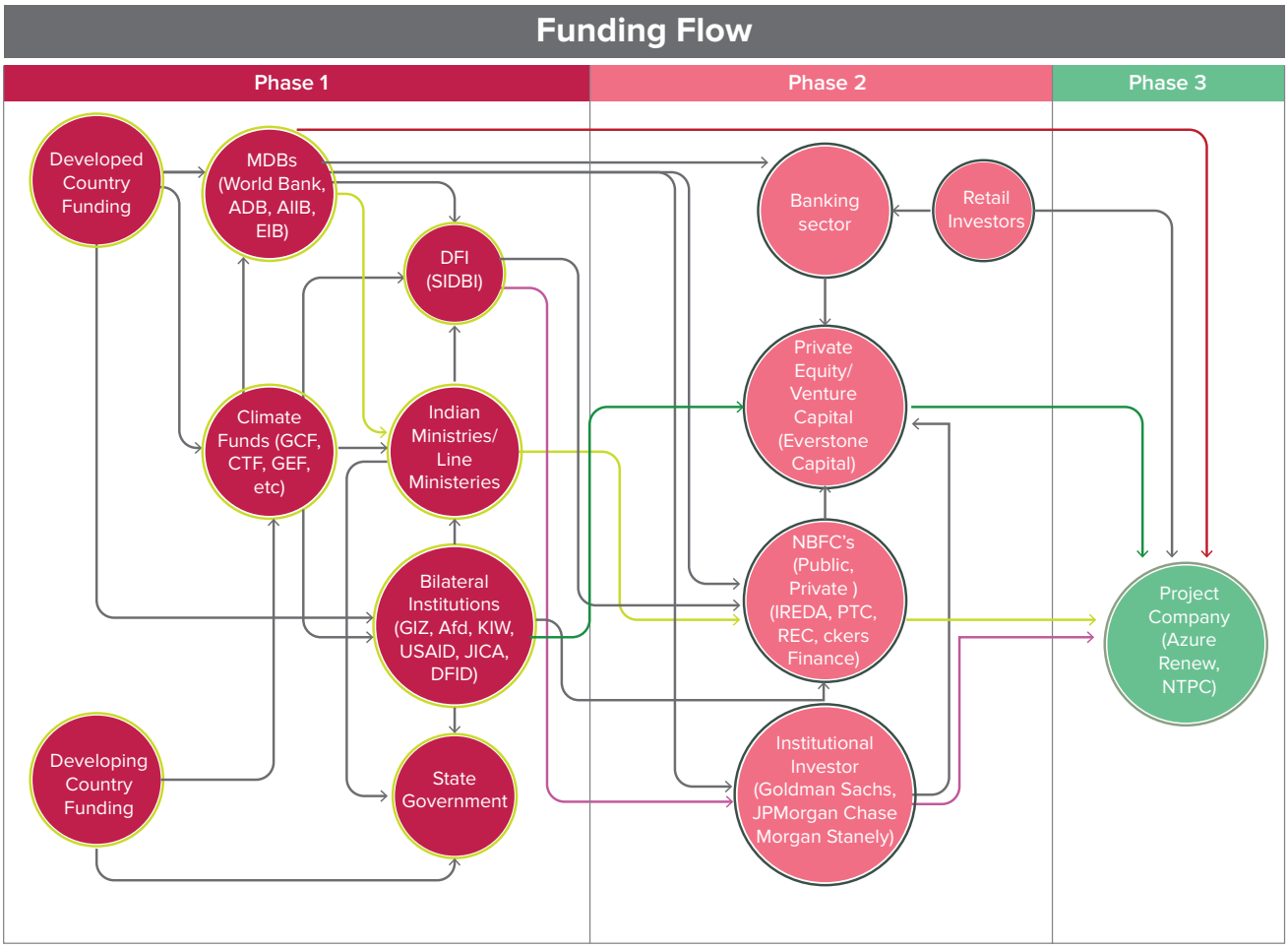


Source: DA Assessment

7.3 Snapshot of Funding Mechanism for CE and EE projects in India

There are several sources of funding available for clean energy projects in India. With the Indian government's priority lending defined for this sector, it is clearly understood that apart from public sources, private sources of finance are also to be mobilised. Most of the international funding is delivered through multilateral development banks (MDBs) such as World Bank, ADB, AIIB, EIB to name a few and also bilateral agencies such USAID, JICA, KfW and DFID. MDBs such as World Bank may provide direct funding to the project developers or route the funds through development financial institutions such as SIDBI, both public and private funded non-banking financial institutions (NBFCs) such as IREDA and Power Trading Corporation (PTC) and nationalised banks such as State Bank of India (SBI). On the investor side, some of the big institutional investors also receive funds from MDBs to be further channelized to project implementation agencies. However, investors can mobilise money from the market i.e. domestic savings which can be invested for development of clean energy projects. Figure 4 illustrates the funding mechanism for clean energy projects in India, in which some of the investments are received directly by the project developers and some of the funding is routed through the different governmental entities.

Figure 4: Funding Mechanism for Clean Energy Projects in India



Source: Development Alternatives Assessment

7.4 Financing Sources and Instruments for Clean Energy Projects in India

7.4.1 FINANCES ACCRUED THROUGH CLIMATE FUNDS-GRANTS

The primary sources of climate mitigation finance for clean energy projects in India comprise funds channelized through both UNFCCC and non-UNFCCC sources. The details of the sources are elaborated in the following sections. The funds investing in the clean energy and energy efficiency sectors in India include the GCF, GEEREF, GEF and CTF. The various sub-sectors that receive funds are illustrated in Figure 5 below. Most of the financial flow is routed through the various government entities as illustrated.

According to Article 9 of the Paris Agreement "As part of a global effort, developed country Parties should continue to take the lead in mobilizing climate finance from a wide variety of sources, instruments and channels, noting the significant role of public funds, through a variety of actions, including supporting country-driven strategies, and taking into account the needs and priorities of developing country parties. The article further states that "Such mobilization of climate finance through (GCF) and the Global Environment Facility (GEF), the entities entrusted with the operation of the Financial Mechanism of the Convention, as well as the Least Developed Countries Fund and the Special Climate Change Fund, administered by the Global Environment Facility, shall serve the Paris Agreement." Hence Climate Funds are one of the main sources of mitigation finance. The total number of projects being funded in India is 53[2]. Out of which 45 projects are focused on climate mitigation.

EXAMPLE 1:
Tata Cleantech Capital Limited was established as a joint venture between Tata Capital and IFC in 2011. Since then it has funded more than 80 renewable energy projects with a total capacity of 3,500 MW. In July 2017, IFC signed an agreement to subscribe to $40 million through a green bond issued by Tata Cleantech Capital Limited. Proceeds of the bond are used to finance wind, solar, and other climate finance projects that meet green bond eligibility criteria. The green bond will be structured to be compliant with the Green Bond Principles,2016 and with this Tata Cleantech Capital Limited is expected to become a signatory to the Green Bond Principles.

7.4.2 DEBT FINANCING

Debt Finance refers to money raised by the borrower (debtor – here project developer/ implementing company) for capital expenditures or working capital by issuing bonds, notes or bills to retail or institutional investors. The institutional or retail investors become creditors and are given a promise to be repaid the principal amount with the predetermined interest on the amount being borrowed by the debtor.

Finance provided by Non-Banking Financial Companies and Govt. backed NBFs

Non-Banking Financial Companies (NBFCs) are financial institutions which have a similar line of work as that of traditional banks, however, unlike traditional banks they cannot accept any deposit from the public. NBFCs can be funded by both public and private institutions. However, the RBI has classified NBFCs into two major categories, viz., NBFC deposit taking and NBFC non-deposit taking. These entities play a pertinent role either as direct financiers or as intermediaries in climate mitigation financing.

EXAMPLE 2:
Kolkata Night Riders (KKR) had provided a loan to CleanMax IIP, a subsidiary of CleanMax Solar for investments in the solar sector. However, to repay the debt, CleanMax IIP had obtained a loan of ₹1.58 billion ($22.6 million) from PTC India Financial Services. CleanMax is anticipated to disburse the amount for the development of its Bellary project which comprises of a 32 MW solar project owned by CleanMax IPP.

EXAMPLE 3:
PTC India Financial Services (PFS), a privately funded NBFC in India has also funded several projects in the country with 100 per cent emphasis on renewable energy projects. Distributed solar power projects being critical for India's energy transition, PFS has processed and sanctioned three distributed solar power projects with an aggregate debt amount of ₹242 crore. It has partnered with the US India Clean Energy Finance Initiative which is a partnership between MNRE and OPIC. PFS had set up its first Renewable Infrastructure Development Fund (RIDF) in partnership with UK Climate Investment LLP and DFID with a total corpus of 500 crores. Some of the beneficiaries of PFS have been Azure Power, Renew and Austro. PFS has invested in 12 States in clean energy projects (wind, solar and small hydro) specifically in Gujarat, Rajasthan, Maharashtra, Madhya Pradesh, Uttar Pradesh, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Bihar, Odisha and Uttarakhand.

EXAMPLE 4:
cKers Finance, a privately funded NBFC of the cKers Group provides finance for solar rooftops, energy storage, e-mobility, solar pumps, waste to energy and solar thermal projects. Some of its lines of credit include California Clean Energy Fund and the PACE Setter Fund, which has been awarded jointly by MNRE and USAID. One of the ways in which it finances its projects is through energy savings based on ESCO models.

2 Climate Funds Update, 2018

Finance provided by Private and Public Banks

Banks play a crucial role in providing finance to climate mitigation projects thereby driving low-carbon economy. Some of the Indian banks include ICICI Bank, Axis Bank, HDFC Bank, IDFC Bank, Standard Chartered Bank, Yes bank, Bank of Baroda, Union Bank of India, India Infradebt, IndusInd Bank and SBI.

EXAMPLE 5:

State Bank of India approved credit facilities amounting to ₹2,317 crore to corporates for financing grid connected rooftop solar projects under an SBI – World Bank programme. This funding created solar power capacity of an aggregate 575 MW. As India's largest bank, it has sanctioned loans to JSW Energy, Hinduja Renewables, Tata Renewable Energy, Adani Group, Azure Power, Cleantech Solar and Hero Solar Energy. The bank has a renewable energy loans portfolio of ₹12,000 crore with virtually zero non-performing assets (NPAs).

EXAMPLE 6:

Yes Bank, the 5th largest private sector bank has been one of the trend setters in renewable energy development in India. Rajasthan, Telengana, Maharashtra and Karnataka have been the selected states for these projects. Yes Bank has issued the country's first infrastructural bonds in the year 2015 worth 1,000 crores with a 2.13 times over-subscription. Additionally, INR 315 crores and INR 330 crores have been raised by the bank in 2015 and 2016 from IFC and FMO respectively. Recently the bank has committed to $400 million co-financing for renewable energy projects across various parts of the country with EIB.

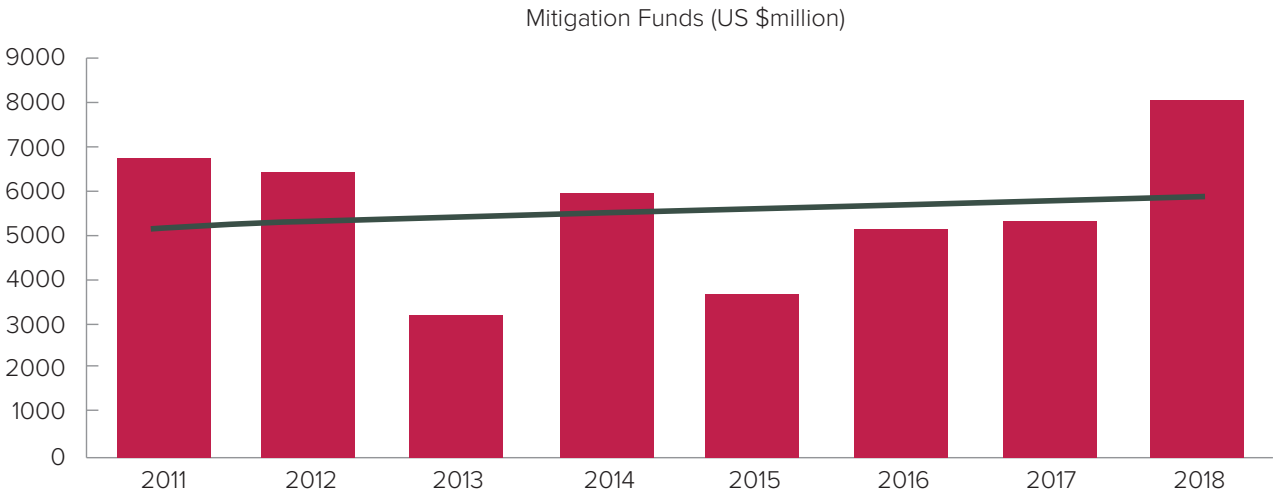
Finance provided by Multilateral Development Banks

According to the latest report issued by MDBs on providing finance to countries, almost $43.1 billion has been assigned to emerging economies in 2018 for investing in projects that help these countries reduce their emissions and address climate risks. An increase of nearly $7.9 billion is witnessed from the previous year, in which the climate funding was $35.2 billion. In 2018, MDBs reported a total of $30,165 million in financial commitments towards mitigation of climate change, with $28,068 million sourced from internal accounts and $2,097 million sourced from other MDB managed external resources.

EXAMPLE 7:

World Bank has been facilitating the development of renewable and energy efficiency projects in India since a considerable period of time either through direct loans to project developers or by co-financing such as for India's rooftop solar project development through loans to the public sector banks such as SBI. World Bank has sanctioned loans to the amount of $500 million to SBI for development of grid connected rooftop solar projects between 2016 to 2021. World Bank has also supported the Energy Efficiency Scale-up Programme for India to scale up energy savings in residential spaces and public sectors by strengthening Energy Efficiency Services Limited's (EESL) institutional capacity and enhancing its access to commercial financing. The diagram below illustrates the increasing trend in climate mitigation financing by World Bank in India.

Figure 5: Climate Mitigation Financing by World Bank in India



Source: Climate Funds Update

EXAMPLE 8:

Asian Development Bank (ADB) signed a contract to invest $50 million in solar energy project developer Avaada Energy Pvt Ltd to facilitate and expand the investment horizon of the company. The investment is likely to be equally split between Leading Asia's Private Infrastructure Fund (LEAP) and ADB's Ordinary Capital Resources. LEAP is an infrastructure co-financing fund which leverages and compliments ADB's existing non-sovereign platform to bridge financing gaps and accelerate investments in infrastructure projects. JICA is a major contributor to this fund.

Finance provided by Bilateral Institutions

A bilateral development bank is a financial institution set up by one country to fund development projects in an emerging country and its developing market. Some of the sources of bilateral funding in India for climate mitigation in clean energy projects have been JICA, KfW, DFID and USAID.

EXAMPLE 9:

KfW has signed a loan agreement of €200 million on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) with REC in India, a public infrastructure finance company in the power sector. The purpose is to offer low interest loans for installing around 200 MW of renewable energy capacity to back solar and wind power projects. The specific loans will be supplemented by counterpart contributions of up to 30 per cent from the borrowers and contributions from other lenders. The provided financing will target projects in the private sector and will support 200 MW of renewables.

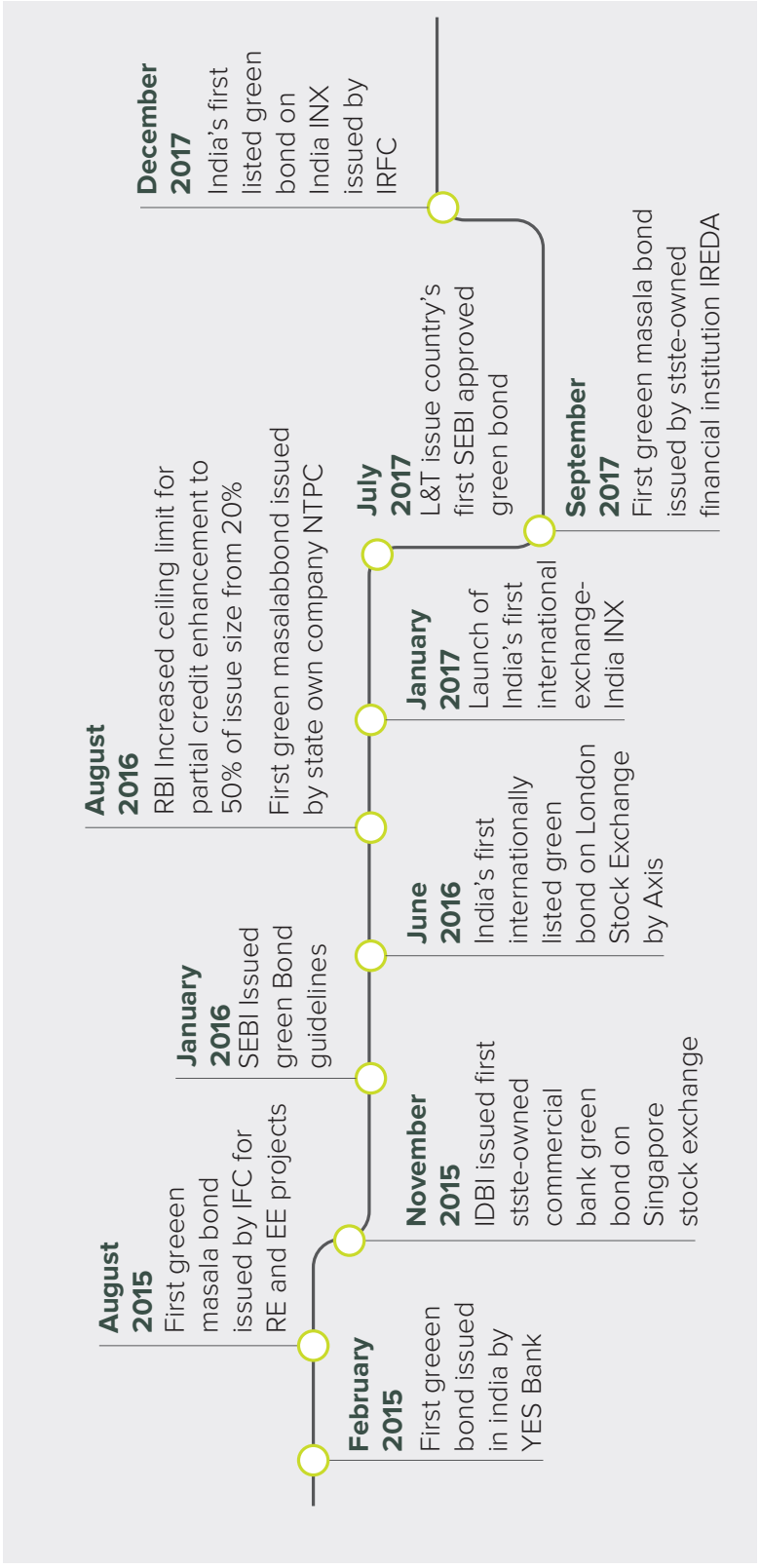
EXAMPLE 10:

JICA provides financing for energy, water & sanitation, infrastructure, agriculture, disaster risk reduction, forestry, solid waste projects and projects related to environmental policy in India. Most of the funding provided by JICA is routed through IREDA and SIDBI. Very recently, JICA completed its Phase II financing to the tune of ¥30 billion (INR 1,800 crores) by financing renewable energy projects in India through IREDA. JICA has also provided finance for undertaking Phase III of MSME Energy Savings Project through a two-step loan procedure. The finance for the pan India project is routed through SIDBI. However, loans provided by JICA are expensive being Yen dominated loans.

Green Bonds issued by private and public entities

A green bond is a financial instrument explicitly earmarked to be used for environmental and climate ventures. These bonds are archetypically asset linked and assured by the issuer's balance sheet and are also denoted as climate bonds. India had ventured into the green bond market with Yes Bank issuing the first green bond for financing renewable energy projects in India in the year 2015. These bonds can be issued either by public or private entities. In India, green bonds are issued by public sector undertakings, commercial banks, NBFCs, corporates and the banking sector. The proceeds from the bonds have been used to finance projects pertaining to renewable energy, energy efficiency, low carbon transport, low carbon buildings, sustainable water management, sustainable waste management, energy sector technologies and sustainable land use. The timeline of listed green bonds in India is illustrated in the following Figure 7.

Figure 6: Timeline of Listed Green Bonds in India



Source: TERI (2018)

An analysis by TERI (2018) highlights that the issuance size of green bonds in India varies from small size bonds below $100 million to large size bonds up to $1 billion. According to Climate Bonds Initiative, the total issuance of green bonds in India is up to $6.5 billion as of 2018, out of which 83.7 per cent of the proceeds have been used to finance renewable energy projects. The report also highlights the increasing trend towards government backed green bonds. The various green bonds issued by different entities are listed in Table 2.

Table 2: Green Bonds Issued by Domestic Entities in India

Issuer	Issue Month	Size (USD equivalent)	Tenor (years)	Jurisdiction of Issuer	Sector Criteria	Climate Bonds Approved Verifier
ReNew Power	Mar-19	$ 435.00	5	India	Solar Wind	Emergent Ventures India
State Bank of India	Sep-18	$ 650.00	5	India	Solar, Wind	KPMG India
Power Finance Corporation	Dec-17	$ 400.00	10	India	Solar, Wind	KPMG India
Indian Railway Finance Corporation	Dec-17	$ 500.00	10	India	Low Carbon Transport	KPMG India
Indian Renewable Energy Development Agency Ltd (IREDA)	Sep-17	$ 406.00	multiple (5 and 10 years)	India	Solar, Wind	Emergent Ventures India
Azure Power Ltd	Aug-17	$ 500.00	5	Mauritius	Solar	Emergent Ventures India
Rural Electrification Corporation Limited	Jul-17	$ 450.00	10	India	Solar, Wind	KPMG India
ReNew Power	Feb-17	$ 475.00	5	Mauritius	Solar, Wind	Emergent Ventures India
Hero Future Energies	Dec-16	$ 27.00	6	India	Solar	KPMG India
Hero Future Energies	Dec-16	$ 19.00	6	India	Wind	KPMG India
ReNew Power	Aug-16	$ 75.00	5	Madhya Pradesh, India	Wind	Emergent Ventures India
NTPC	Aug-16	$ 299.00	5	India	Solar, Wind	KPMG India
Axis Bank	May-16	$ 500.00	5	India	Solar, Wind, Low Carbon Transport, Low Carbon Buildings (Commercial)	KPMG India
Hero Future Energies	Jan-16	$ 28.00	3 and 5 years (two tranches)	India	Wind	KPMG India
Yes Bank	Feb-15	$ 600.00	5	India	Solar	-

Source: Compiled by Development Alternatives

EXAMPLE 11:

SBI has raised $650 million through green bonds to fund environment friendly projects in India. The bank is said to have received subscriptions three time higher than the actual size. The green bond framework of SBI steers towards funding of projects pertaining to renewable energy, low carbon buildings, industry, waste management and sustainable transportation projects. The processes in place under this framework include constitution of a green bond committee, monitoring of projects under green bond, reporting through sustainability reports and engagement of a CBI approved independent assurance provider to assure the Bond and certify compliance with the requirements of Climate Bonds Standard both at the pre-issuance and post-issuance stage.

EXAMPLE 12:

IREDA introduced its first green bond in the year 2014 to fund renewable energy projects in India. These bonds were open to a variety of public and private investors and issued for INR 1,000 each, aggregating to a total collection of INR 500 crores (with the option to extend to INR 1,000 crore). IREDA has issued bonds with 10, 15, and 20-year terms, carrying interest at 8.16%, 8.55% and 8.55% per year, respectively (NRDC, 2019). In 2017, IREDA issued the first green masala bond of $406 million, the proceeds of which are to be used to finance renewable energy in India of capacity 831 MW.

7.5 Equity Finance

Private Equity Finance

This is composed of funds and investors which directly invest in private companies that are not listed on the stock exchange. A private equity (PE) firm is managed by limited partners, who own maximum number of shares but do not have voting rights and general partners who have voting rights. There is a growing recognition of private capital investments in the renewable energy sector in India. Some of the pertinent examples in this regard include Green Infra Private Finance Limited (99 percent owned by IDFC Private Equity), Renew Power Ventures Private Ltd. (99 percent owned by Goldman Sachs Private Equity), and Continuum Wind Energy (majority owned by Morgan Stanley Infrastructure Partners), Private Equity/Venture Capital Funds).

> **EXAMPLE 13:**
> ReNew Power, one of India's largest independent power producers (IPPs), has received investment from the Private Equity arm of Goldman Sachs, ADIA, CPPIB, Asian Development Bank, Global Environment Fund and Japan's JERA. JERA had acquired 10 per cent stake by investing an amount of $200 million in 2017 at a valuation of $2 billion. ReNew has also raised about Rs 6,696 crore from all its investors. Goldman Sachs, the early backer of the company in 2011, had invested about $370 million in various tranches in 2013 and 2014.

Venture Capital

Venture capital is a category of private equity, a form of financing that is provided by firms or funds to small, early-stage, emerging firms that are deemed to have high growth potential, or which have demonstrated high growth. Start-Up India initiative coupled up with policy boosts such as received through FAME 2, decreasing capital cost and increasing renewable energy demand has created an inimitable opportunity for investors.

> **EXAMPLE 14:**
> EverSource Capital and the National Investment and Infrastructure Fund (NIIF) had jointly invested in an India-focused renewable energy platform floated by CDC, a UK based development finance institution. EverSource Capital is a joint venture between private equity (PE) firm Everstone Capital and British solar power company Lightsource BP. It was set up in 2018 to fund green and sustainable investments in India. According to its mandate, the group will collectively invest $330 million (around Rs 2,340 crore) in Ayana Renewable Power Private Ltd for installing two solar plants at Anantpur and Kadapa districts of Andhra Pradesh. It has also invested about $150 million in accelerating growth in the electric vehicles sector in India.

7.6 Partial Risk Guarantee Schemes

Partial Risk Guarantees (PRGs), also known as political risk guarantees cover private lenders and investors against the risk of the government (or a government owned agency) failing to perform its obligations vis-à-vis a private undertaking. These schemes assume the lenders' default risk on a part amount of debt provided to the project thereby improving a project's credit rating and reducing the perceived investment risk. Though the renewable energy space in India has seen a limited presence of partial risk guarantee facilities, ADB India Solar Generation Facility has been one of the pioneers in promoting this instrument.

> **EXAMPLE 15:**
> A memorandum of understanding was signed between Small Industries Development Bank of India (SIDBI) and Yes Bank under the Partial Risk Sharing Facility (PRSF) programme for financing energy efficiency projects sponsored by the World Bank[3]. SIDBI expects to provide credit guarantee to more than 500 projects and mobilize financing of up to $127 million through this association. While SIDBI is the project execution agency, Yes Bank is the first Indian lender to be empaneled for the programme. SIDBI will extend the guarantee for securing up to 75 per cent of the loan amount of up to Rs 15 crore extended by the bank to MSMEs under this programme (AEEE,2016).

3 https://www.deccanherald.com/content/556764/yes-bank-signs-mou-sidbi.html

EXAMPLE 17:

ADB has provided loans to the Punjab National Bank of India in the tune of $100 million to finance large solar rooftop systems on industrial and commercial buildings throughout India under the Solar Rooftop Investment Program which will cost $1 billion. In fact, this is the first allotment of the $500 million multi tranche facility solar rooftop investment programme (SRIP) approved by ADB in the year 2016. This multi tranche financing facility will include financing of $300 million from ADB's capital resources and $170 million from CTF.

7.7 Crowdfunding

Crowdfunding is the use of nominal amounts of money (capita) from a large number of individuals to finance a new venture. This has been mostly possible due to widespread use of information and communication technology (ICT). Starting in 1997, crowdfunding has been used for several purposes. The connect between the funder and the recipient can be a direct person to person link or it can be through an investment fund (CBGA, 2014).

EXAMPLE 18:

One recent example of such funding is by SunFunder. Crowdfunding has also been employed in India in the rural electrification space using solar panels.[4] A German crowdfunding platform, bettervest, has been investing in Mera Gao Power and Boond Engineering and Development Pvt. Ltd. – initiatives to energize rural India through renewables

8. CLIMATE FINANCING COMPASS FOR STATES

The disparity between the pledged amount and the disbursed amount is indicative of the lack of resources being put into verifying the sources of funding, minimum criteria, available funds, and the synergy matching between the funder and recipient. With increasing numbers of mitigation projects being put into action and the recent announcement by the government of India that it will increase the renewable energy output to 225 GW by 2020 from 175 GW, many more projects are expected to be set up in the near future.

The climate financing compass for states provides comprehensive information on funds at disposal for states and project developers on climate mitigation in clean energy. The recipient can identify the source of funding they need to target, based on a particular sector, amount of funding needed and if the recipient is searching for full funding or partial funding or technical assistance. This is expected to ease the process related delays linked to the identification of sources of funding. This compass provides detailed information pertaining to minimum criteria that need to be fulfilled, application process for individual funds, instances of projects previously funded and importantly, the main point of contact of the funding agency. Appendix 3 provides the necessary information on this.

9. BARRIERS ASSOCIATED WITH PRIVATE SOURCES OF FINANCING

Over the years, India has been progressively introducing policies both at the state and national levels to boost the clean energy sector in India. The policy support has been in the form of accelerated depreciation and generation-based incentive, viability gap funding, feed-in tariffs, net metering and tax duty exemptions (IFRI, 2018). The state level incentives have mostly been in the form of tax and duty exemptions and favorable transmission charges, such as in the state of Andhra Pradesh, which is one of the leading states in renewable energy generation. Growth in solar power has been driven by increasing policy competitiveness of government policies, viability gap funding for infrastructure projects through bidding, creation of solar parks and increased subsidies for installation of roof-top solar panels. However, there exists several barriers to the financing of clean energy projects in India.

- Private and public sector banks depend mostly on debt sources of financing. This is anticipated to become a critical concern because banks have a certain limit to provide loans to the infrastructure sector and may get overexposed due to high levels of debt funding. This may in return restrict their possibility of funding to other priority sectors. As estimated by IFRI (2018), as banks move close to their lending limits, their expected ability to provide debt is likely to reduce by USD 85 billion or 64% of the total expected debt.
- Though India has access to abundant sources for the generation of renewable energy, unfavorable terms of financing render loans expensive. In fact, most of the cost advantages received in terms of lower capital cost is offset by financing terms and lower levels of insolation for certain regions.
- There is significant amount of transmission and distribution losses which pose a considerable cost to developers.

4 https://unfccc.int/sites/default/files/paper_-_microfinancing_.pdf

These losses consist of technical losses (which may be due to ill maintained equipment, sub-stations and inadequate investment in infrastructure) and commercial losses (may be due to low metering efficiency, faulty meter reading, theft and pilferages).

- According to a TERI (2017) study, it takes approximately 6-9 months to procure land for renewable energy purposes. Moreover, the lack of digitization of land records makes the process even more cumbersome. The requirement of land varies depending on the project. Hence, for a wind project, factors such as wind speed, turbine technology and topography will be important and similarly for a solar project, latitude of the location, solar insolation and technology will be important. SECI has kept the minimum size of the land at 1.5 hectares per MW. As per capita land obtainability is truncated in India, there is stiff competition regarding allotment of land for installation of solar PV.
- There exist concerns related to the actual disbursement of funds earmarked for the development of renewable energy projects. In several instances, recipients are not informed about the sources of funds and the processes to avail them. Hence information asymmetry is one of the pertinent reasons because of which the funds remain unutilised. This also leads to reduced investor confidence regarding the state's capabilities as the fund disbursement agent.
- There are also concerns related to the quality of solar panels due to lack of standardized norms.
- In addition to the above factors, there are several risks and uncertainties related to the renewable energy sector in general such as policy and regulatory risks, operational, project development, technological and financing risks. Typology of the risks are elaborated in Table 3.

Table 3: Risks associated with Renewable Energy Projects

Risk	Description
Regulatory Risk	These emanate from the inter-linkages associated with the renewable energy sector and the power sector in general. Renewable purchase obligations (RPOs) being the major driving force towards promotion of renewable energy in India, non-compliance to RPOs leads to major uncertainties in the power sector. In additional to this, states have defined their own RPO regulations which might lead to a favorable and neutral/off-putting effect on the growth of the sector.
Project Development	These emerge at various phases of the project development. Investors are often intimidated by the non-standardised and heterogeneous approaches undertaken by developers in demarcating a location, land- acquisition, obtaining the necessary permits etc. This might lead to unnecessary escalation of costs and other unintended consequences (Sarangi, 2018).
Perceived	These emerge from lack of adequate knowledge on the vulnerabilities, information asymmetry within the domestic banking sector on the risks associated with clean energy technologies. Moreover, due to dearth of extended time series performance data, the investors are skeptical, thereby enhancing the perceived risks from the sector. According to Diacore (2016), this increases the cost of capital. Sarangi (2018) cites that the investors are unconvinced about the performance of newer financial instruments such as green bonds. Lack of empirical evidence also enhances the complexities involved.
Technical	These are associated with the quality of renewable energy equipment and products, technological upgradation of equipment, availability of resource data, error margin in the data and availability of data in plant load factors or plant efficiency. There are concerns relating to inadequate power evacuation infrastructure and stability of the grid. These factors limit the comfort of investors, especially debt investors in India. Other technological risks may also include the applicability of the technology deployed. For e.g. a wind turbine or a solar PV module may underperform or may not be available for use (Niti Aayog, 2015).
Financing	These include foreign exchange risks, off-taker credit risk, lack of investment choices, high payback periods, longer break-even times, incorrect investment appraisal of projects due to lack of appropriate financial tools for evaluation and limited availability of debt capital. In addition to this, inferior terms of debt due to and underdeveloped bond market in India have posed critical risks.
Operating	Concerns related to land acquisition, especially agricultural land in which Land Acquisition Act, (LAA) requires conversion of the agricultural land into non-agricultural land, obtaining forest clearances etc.
Additional	Possibility of the grid facing stability issues due to variability in power demand.

Source: Development Alternatives Assessment

10. ENABLING FACTORS FOR DEVELOPMENT OF CLEAN ENERGY PROJECTS IN INDIA

The enabling factors which prompt investment into the renewable energy sector by investors are as follows:

Partial Risk Guarantee Scheme – Partial Risk Guarantee Scheme or PRGS is one of the main enabling factors that induce investment into climate mitigation projects as these schemes ensure policy stability and also provide a minimum guarantee of return even in case of project failure.

Political Stability – Political stability is an enabling factor for investments because they ensure policies will not be changed and therefore projects under establishment will be not be hampered.

Priority Sector – One of the major factors for consideration is the synergy matching between the priority sectors and sub-sectors defined by the government and their match with investment funds thematic areas.

Decreasing Capital Costs – Decreasing capital costs leads to less investment being induced into the project with similar or greater capacity yield. The decreasing capital costs also reflect the market acceptance towards newer and innovative solutions being used in the projects.

Increasing Energy Demand – The power purchase agreements already in place for project operations ensure sustained cash flow to the projects in the long term as majority of the investment in the renewable energy sector is done with a long term perspective.

11. RECOMMENDATIONS

In order to accelerate investments into the renewable energy sector in India, the following recommendations are being made in order to boost investor confidence. This will also require targeted policy interventions in the sector. The following sections elaborate upon this aspect.

11.1 Measures to Enhance Private Investments in the Renewable Energy sector

Addressing the existing risks

Several measures have been taken by varied stakeholders to promote the renewable energy sector in India. Howsoever, to attract private investments in this sector, the confidence of the institutional investors needs to be boosted. In the aforementioned sections we have witnessed the several risks which are prominent in this sector. These risks have to be mitigated in order to drive private investments. The following sub-sections identify some of the corrective measures which can be undertaken.

Mitigating instrument risks

As aforementioned, some of the prominent financing instruments for promoting the renewable energy sector include finance from green banks, NBFCs, crowdfunding, green bonds, loans, public funding, grants from bilateral and multilateral institutions and infrastructure debt financing.

Role of green banks in India such as IREDA has been prominent in leveraging public investment into private sector lending. After several detailed conversations with the Ministry of New and Renewable Energy (MNRE), IREDA had issued its first green bond in 2016.

Following its footsteps, other nationalized banks such as the State Bank of India (SBI) and private sector banks such as IDFC and Yes Bank have issued their green bonds. The success of this initiative can be gauged by the fact that the green bonds have been oversubscribed. However, most of these banks have their own set of rules, regulations and standards which make private investments unattractive. Taking this into consideration, the Reserve Bank of India (RBI) has started developing a framework to standardize all the sets of rules and regulations. Though this process had started way back in 2017, more steps need to be taken in the right direction. Concrete measures undertaken by the RBI are predominantly important to attract investments in this sector.

Institutional investors such as mutual funds, pension funds etc. invest in projects with low risk and high credit ratings. One of the severe drawbacks of the solar projects has been its low credit rating. Apart from this, high paybacks and higher time for break even, poor financial health of the DISCOMS and non-compliance to power purchase agreements (PPAs) have been

the major disincentives. Some of the most prevalent reasons for deteriorating health of DISCOMS include the following (Aggarwal and Dutt, 2018):

i. Reduced tariff rates in India in recent times

ii. Losses incurred due to supply of electricity at concessional rates to consumers and agricultural sector

iii. Commercial and technical losses incurred

Most of the solar technologies are in the inception stage with little or no long-term performance assessment being available. In fact, with downward revision of tariffs and capping of prices at 2.5 INR per unit have made the conditions of developers and investors even more deplorable. Hence it is primarily important to scale up the solar projects by differential rates of lending in this sector. Penalties should also be imposed on DISCOMS which waste time through non-compliance, renegotiation and cancellation of PPAs.

For addressing the risks in the regulatory sector, prospects of single window clearance as against the multiple clearances required for establishing renewable energy projects should be emphasized. This will save a lot of time and resources and reduce complexity. While certain states such as Andhra Pradesh and Tamil Nadu have already taken efforts through setting up of SEZs and solar parks, most of the states in India are yet to undertake such efforts (Climate Parliament, 2014).

In order to combat the technology risks, it is highly recommended to maintain performance data on the solar and wind panels for necessary assessments. This will provide the necessary information to investors who are willing to invest in renewable energy. This apart, certification and standardization of solar PV modules which is done by the investors as a part of their due diligence can be undertaken by the developers which can reduce the cost on the part of the investors. At present, though this is not mandatory in India, the high cost of testing and certification ranges between $38,500 to $41,500 per project and this deters developers from getting certified (Chawla, 2016).

Solar parks in India were constructed to ease the infrastructure related delays in solar power projects; however, there still exists a dearth of proper transmission mechanisms to evacuate solar power. Moreover, according to Mercom (2018), there still exists land issues for these projects. In fact according to the report, government agencies continue to tender and auction without making the necessary arrangements for land and transmission infrastructure. This results in unnecessary project delays and discourages potential investors. Hence transmission infrastructure needs to be developed prior to bidding of the projects.

- It is highly recommended that **risk management frameworks** be developed to identify, assess, quantify, report and manage the risks. It has been widely noted that different financing entities have different risk assessment and accounting mechanisms. While public sector banks do not consider a delay in the payment by DISCOMS as a bad debt, for other private sector entities it is written off as a bad debt at the end of the accounting cycle. The risk management framework developed by Altran Gmbh & Co. is one such potential example which can be adapted for developing a comprehensive framework comprising of risk identification, evaluation, control, follow-up, feedback and management.
- **Constructing active market indices** to track clean energy projects in India is also recommended for incentivizing the investor community. One such example is the Dow Jones Clean Energy Index which provides exposure to best 30 companies across the globe that demonstrate best practices in clean energy. This index comprises of a diversified mix of clean energy production and clean energy equipment and technology companies. Private index providers such as MSCI can also be roped in for the purpose.
- **Creating active investment choices** in the renewable energy market through the creation of innovative investment products such as sustainable funds and mandates. This is already a developed market in the western countries for leveraging the existing market forces. This can be facilitated by stock exchanges in India such as the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE).
- **Innovative financial measures** may be applied for appraising renewable energy projects. One of the most important characteristics of renewable energy projects is that these are staged projects which incorporate modularity. This provides additional flexibility to the investor to assess the viability of the project after completion of a segment and decide whether to proceed with the project or wait till the demand reaches a certain level. Hence in all these cases, the investor need not make the initial investment all at once. Moreover, there is also a risk of technology obsolescence in these categories of projects due to rapidly changing technologies. Hence, the predominant methods used for evaluating these projects such as discounted cash flow (DCF), net present value (NPV), internal rate of return (IRR) cannot be used for assessments. Instead use of new financial measures such as risk adjusted NPV, stochastic NPV, net present sustainable value (NPSV) is advocated.

- **Innovative financing instruments** such as results based financing (RBF) which links the payment of projects to outputs delivered can be promoted in India. RBF is highly relevant for projects which contain a significant amount of risk and is based on the concept of risk transfer. Usually these are supported by public entities in which the payment is based on a predetermined set of outcomes. In addition to this, promotion of insurance and **reinsurance schemes** can insulate the insurance investors from project specific risks. Measures also need to be undertaken to rejuvenate the **secondary market for trading of renewable energy certificates** (REC) through the power exchanges in India.
- **Social risk assessments** need to be conducted by the companies or implementing agencies for renewable energy projects. This will significantly save time and resources for the private investors who need to undertake due-diligence prior to investing. The process of due-diligence also requires considering environmental and governance factors. This will also ensure that adequate measures have been undertaken to expedite the process of project development.
- **Competitive business models** must be developed in this sector. With the Indian government's ambitious targets for generation of renewable energy, rooftop solar models are proving to be a profitable proposition for investors. These solar systems generate power which is used for captive purposes with the excess being supplied to the grid. However, if the power generated is insufficient, the consumer can also draw from the grid. Based on the type of stakeholder interface, different types of business models such as net metering, gross metering, Capex and Opex models may be adopted. The capex models have been most prevalent amongst rooftop models in India. However, due to the high upfront costs, roll-back of government subsidies and removal of accelerated depreciated benefits, it is becoming unpopular among investors and Opex models are now gaining in popularity. Opex models function through two modes, viz. Renewable Energy Service Company (RESCO) model and solar power as a service (SPAAS) models. In the case of RESCO model, the developer bears the entire capital expenditure of the project and also oversees its operational viability and maintenance. The developer enters into a contract with the rooftop owner in which the rooftop owner can either consume the electricity generated by the developer or get appropriate rent for allowing access to the rooftop. For cases in which the developer pays the rent to the rooftop owner, the electricity generated is fed into the grid at a predetermined feed-in tariff set by the regulator. In the SPAAS model, a power purchase agreement is signed between the developer and the consumers/subscribers in which the subscriber receives solar power on payment of the subscription fee on a monthly basis.

As the Renewable Watch (2017) report mentions, there has been a sharp rise in the popularity of the Opex models over Capex models. Leveraging upon this change, incentives need to be provided by the Indian government in terms of subsidies so that investors can fathom the profitability proposition for newer investments.

- **Local financing institutions need to be mobilized** for attracting savings from low income households. This is essentially very effective for developing countries like India where a significant proportion of the population has low income. Providing subsidies to microfinance banks to provide loans at concessional interest rates is an effective way to incentivize installation of solar home systems (SHS) for households. The UNEP supported solar loan program has been successful in the states of Karnataka and Kerala.
- **Capacity building** exercises needs to be undertaken for enhancing skills in handling machinery and also enable the developers to develop core competencies in reducing greenhouse gas emissions from the projects and contribute to energy security. These training programs can be organized by the government departments on a regular basis in association with national and international organizations.

Policy Recommendations

In addition to the above recommendations, enabling policy recommendations are listed as under.

- **Capital gains exemption on investment in renewable energy –** Providing capital gains exemption on investment in renewable energy projects through bonds, debt and equity will create a huge incentive for both domestic as well as foreign investors.
- **Providing grid charge exemptions to open access solar projects -** Providing grid charge exemptions to open access solar projects will boost domestic investor confidence and will lead to increase in the number of rooftop and small capacity solar projects.
- **Creating a single clearance window –** Projects have to deal with multiple stakeholders and get numerous clearances before the project can be executed. A single clearance window will lead to a shorter lead duration such as is favored by investors.
- **Creating a standard of benchmark for PV panels –** Creating a minimum standard will improve the overall quality of PV panels being used in the projects and will increase the yield as well as the duration of the project.

- **Power delivery contracts signed in foreign currencies –** The project developers should be permitted to be remunerated in foreign currency. Since, the currency unit of the invested amount in the project is in the form of foreign currency, this measure will allow the project developer to repay the debt faster and without the hassle of converting the amount from resident or local currency into foreign currency.
- **Designated locations of the projects –** Land acquisition from owners must be the responsibility of the government and the project builder should purchase the land from the government. This means that the project builder will be dealing directly only with the government and not the land owners.

12. CONCLUDING REMARKS

The present report on 'Landscape Assessment on State Level Climate Financing Options' focuses on clean energy projects in India. The different sections of the report emphasize on the financing options available for the states to enable renewable energy development in India and elucidates upon the examples of such financing options applicable to India. As is clearly reflected in the report, most of the climate funding from developed economies is routed through the various government functionaries until it reaches the states. The climate finance mitigation framework in clean energy and energy efficient projects encompasses the global climate funds, funds from bilateral agencies, MDBs, DFIs, NBFCs, private and public banking institutions, investors and project developers. However, it is also noted that there exist several structural and infrastructural barriers to funding which can be addressed through appropriate policy and regulatory interventions and awareness measures. The policy-makers, NBFCs, investors and project developers are expected to be the greatest beneficiaries of this study.

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LIST OF APPENDICES

Appendix 1: list of participants of stakeholders consultation

Stakeholder Name	Company Name	Type
Neha Kumar	Climate Bonds Initiative	CSO
Nehmat Kaur	Climate Group	CSO
Kanika Chawla	CEEW	CSO
Suveen Sinha	IFC	MDB
David Morgado	AIIB	Bilateral/Multilateral Institution
Aditi Puri	JICA	Bilateral/Multilateral Institution
Udit Mathur	DFID	Bilateral/Multilateral Institution
Nisheeth Srivastava	KfW	Bilateral/Multilateral Institution
AP Sarma	SIDBI	DFI
KV Rao	NABARD	DFI
Pawan Singh and Team	PTC Financial Services	NBFC
Jayant Prasad	cKers Finance	NBFC
Dhanpal Jhaveri/Niyati Sharma	Eversource Capital	Private Investor/P. Equity
Chandan Bhavani	Yes Bank	Commercial Bank
Shameek Ray	ICICI Bank	Commercial Bank
Anand Shukla	Swiss Agency for Development and Cooperation (SDC)	Bilateral/Multilateral Institution

Appendix 2: Indian Govt. Missions under NAPCC

Plan	Description
NAPCC	The Action Plan covers eight major missions on Solar, Enhanced Energy Efficiency, Sustainable Habitat, Water, Sustaining the Himalayan Ecosystem, Green India, Sustainable Agriculture and Strategic Knowledge on Climate Change.
National Solar Mission	Establishment of a solar research centre, increased international collaboration on technology development, strengthening of domestic manufacturing capacity, and increased government funding and international support.
National Mission for Enhanced Energy Efficiency	Building on the Energy Conservation Act 2001, the plan recommends: Mandating specific energy consumption reduction in large energy consuming industries, with a system for companies to trade energy savings certificates; Energy incentives, including reduced taxes on energy efficient appliances; and Financing for public-private partnerships to reduce energy consumption through demand side management programmes in the municipal, buildings and agricultural sectors. Perform Achieve and Trade (PAT) scheme is a flagship programme of Bureau of Energy Efficiency under NMEEE.
National Mission on Sustainable Habitat	To promote energy efficiency as a core component of urban planning, the plan calls for: Extending the existing Energy Conservation Building Code; A greater emphasis on urban waste management and recycling, including power production from waste; Strengthening the enforcement of automotive fuel economy standards and using pricing measures to encourage the purchase of efficient vehicles; and incentives for the use of public transportation
National Water Mission	With water scarcity projected to worsen as a result of climate change, the plan sets a goal of a 20 per cent improvement in water use efficiency through pricing and other measures.
National Mission for Sustaining the Himalayan Ecosystem	The plan aims to conserve biodiversity, forest cover, and other ecological values in the Himalayan region, where glaciers that are a major source of India's water supply are projected to recede as a result of global warming.
National Mission for a Green India	Goals include the afforestation of 6 million hectares of degraded forest lands and expanding forest cover from 23% to 33% of India's territory.
National Mission for Sustainable Agriculture	The plan aims to support climate adaptation in agriculture through the development of climate resilient crops, expansion of weather insurance mechanisms, and agricultural practices.
National Mission on Strategic Knowledge for Climate Change	To gain a better understanding of climate science, impacts and challenges, the plan envisions a new Climate Science Research Fund, improved climate modelling, and increased international collaboration. It also encourages private sector initiatives to develop adaptation and mitigation technologies through venture capital funds.
International Solar Alliance (ISA)	ISA was jointly launched by Prime Minister Narendra Modi, and the then President of France, Francois Hollande in Paris on the sidelines of CoP 21 in 2015. The vision and mission of the
Action Plan	Description
NAPCC	The Action plan covers eight major missions on Solar, Enhanced Energy Efficiency, Sustainable Habitat, Water, Sustaining the Himalayan Ecosystem, Green India, Sustainable Agriculture and Strategic Knowledge on Climate Change.

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National Solar Mission	Establishment of a solar research centre, increased international collaboration on technology development, strengthening of domestic manufacturing capacity, and increased government funding and international support.
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National Mission on Sustainable Habitat	To promote energy efficiency as a core component of urban planning, the plan calls for: Extending the existing Energy Conservation Building Code; A greater emphasis on urban waste management and recycling, including power production from waste; Strengthening the enforcement of automotive fuel economy standards and using pricing measures to encourage the purchase of efficient vehicles; and Incentives for the use of public transportation
National Water Mission	With water scarcity projected to worsen as a result of climate change, the plan sets a goal of a 20% improvement in water use efficiency through pricing and other measures.
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National Mission for a Green India	Goals include the afforestation of 6 million hectares of degraded forest lands and expanding forest cover from 23% to 33% of India's territory.
National Mission for Sustainable Agriculture	The plan aims to support climate adaptation in agriculture through the development of climate-resilient crops, expansion of weather insurance mechanisms, and agricultural practices.
National Mission on Strategic Knowledge for Climate Change	To gain a better understanding of climate science, impacts and challenges, the plan envisions a new Climate Science Research Fund, improved climate modelling, and increased international collaboration. It also encourages private sector initiatives to develop adaptation and mitigation technologies through venture capital funds.
International Solar Alliance (ISA)	ISA was jointly launched by the Prime Minister Narendra Modi, and the then President of France, Francois Hollande in Paris on the side-lines of CoP 21 in 2015. The vision and mission of the alliance is to provide a dedicated platform for cooperation among solar resource rich countries that lie completely or partial between the Tropics of Capricorn & Cancer.
SAPCC	State governments have drafted climate strategies aligned with the eight National Missions under the NAPCC. The strategies focus on issues ranging from climate mitigation, energy efficiency, and resource conservation to climate adaptation.
FAME Scheme for E-mobility	Union Government in April 2015 launched Faster Adoption and Manufacturing of Hybrid and Electric vehicles (FAME) – India Scheme with an aim to boost sales of eco-friendly vehicles in the country. It is a part of the National Mission for Electric Mobility.

Plan	Description
SLEEP	The manufacturers are incentivized by the government to incorporate the technology advancements and elevate the efficiency standards of the equipment. BEE launched the program in the XII five-year plan with a focus on ceiling fans, considering its wide use and impact on domestic energy consumption.
AMRUT	Atal Mission for Rejuvenation and Urban Transformation scheme with the aim of providing basic civic amenities like water supply, sewerage, urban transport, parks as to improve the quality of life for all especially the poor and the disadvantaged.
Pradhan Mantri Ujjwala Yojana	The scheme provides LPG connections to five crore below- poverty-line beneficiaries. The connections are given in the name of women beneficiaries to reduce their dependence on fossil fuels and conventional fuel like cow dung for cooking food, thus reducing air pollution.
UJALA scheme	The scheme was launched by the Prime Minister Narendra Modi in January 2015 with a target of replacing 77 crore incandescent lamps with LED bulbs. The usage of LED bulbs will not only result in reducing electricity bills but also help in environment protection.
Swachh Bharat Mission	Swachh Bharat Abhiyan (Clean India Movement) is a campaign that was launched by Prime Minister Narendra Modi on October 2, 2014. The campaign seeks to clean the streets, roads and infrastructure of the country's 4041 statutory cities and towns.

Appendix 3: Investment Availability on Clean Energy Finance for Indian States

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
Acumen	3.00	Multi-Sector	Agriculture, Education, Energy, Health, Housing, Water	Online application	Equity Debt	Be an early-mid stage company which deliver a service that addresses critical need for the poor in Acumen sectors and geographic focus
ADB Carbon Market Initiative	237.00	Renewable Energy	Energy, Energy Efficiency, Low-Carbon activities, Renewable Energy, Waste Management	Through ADB staff from the relevant regional or private sector operations department	Co-financing Carbon finance Technical assistance	ADB Developing member countries
ADB Clean Energy Financing Partnership Facility	298.00	Renewable Energy	Energy, Energy Efficiency, Fuel Switching, Renewable Energy	Sending proposal to the contact/ CBFF Secretariat	Co-financing Guaranties Loan Grant Technical assistance	ADB Developing member countries
ADB Climate Change Fund	50.00	Multi-Sector	Agriculture, Energy, Energy Effiency, Forestry, Renewable, Energy Transport, Water	Due date for applications: 31 January; 31 March; 31 May; 31 July; 30 September; 30 November	Co-financing Grant Technical assistance	ADB Developing member countries
ASEAN Infrastructure Fund	485.30	Multi-Sector	Energy, Envrironment, Rural Infrastructures, Sanitation, Social Infrastructures, Transport, Water	There is no standard form of application for ADB assistance. However, ADB would need some basic information to evaluate a project.	Co-Financing Loan Technical assistance	Sovereign/sovereign guaranteed national and sub-regional projects of ASEAN developing member countries (also AIF shareholders)
Australia's International Forest Carbon Initiative	125.03	Multi-Sector	Sustainable Forestry	The Clean Energy Regulator will begin administering the scheme once legislative amendments start and the necessary legislative rules are made. The Clean Energy Regulator will publish a series of guidance notes in the coming weeks, as well as rules for the auction process and forward dates for auction	Grant	Developing countries with important forest reserves

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
BioCarbon Fund	84.00	Multi-Sector	Reduced greenhouse gas emissions from the land sector, from deforestation and forest degradation in developing countries (REDD+), and from sustainable agriculture; smarter land-use planning, policies and practices.	N-A	Grant funding and technical assistance. Results-based payments for achieved emission reductions (BioCarbon Fund)	A/R CDM projects and REDD+ and sustainable land management projects
Canada Climate Change Program	210.00	Multi-Sector	All	N/A	Loan, equity, Technical Assistance	UNFCCC Non-Annex I Parties to the Convention/ DAC/ODA Eligible countries
Clean Technology Fund	53000.00	Multi-Sector	Agriculture, Energy Efficiency, Renewable Energy, Transport, Other	Interested country requests a joint mission of the World Bank Group and relevant Regional Development Bank to prepare an investment plan	Grant Loan	Middle-income and developing countries. Countries that have an active MDB country program (World Bank and Regional Development Banks) including Algeria (MENA), Colombia, Egypt (Country and MENA), Indonesia, Jordan (MENA), Kazakhstan, Mexico, Morocco (Country and MENA), Philippines, South Africa, Thailand, Tunisia (MENA), Turkey, Ukraine, Viet Nam.
Climate Catalyst Fund	418.00	Renewable Energy	Climate/ resource efficiency	N/A	Equity (Fund of funds)	Emerging Markets
Climate Finance Innovation Facility	30.00	Renewable Energy	Energy Efficiency, Renewable Energy, Sustainable Forestry	Contact the Facility	Carbon finance Technical assistance	Financial Institutions
Climate Investment Funds	100.00	Multi-Sector	See individual funds	See individual funds	See individual funds	Low emissions and climate resilient development

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
Climate Public Private Partnership	283.00	Multi-Sector	Energy, Transport Urban Development, Water Treatment, Waste Treatment, Land management		Equity Loan Grant	The objective of the Climate Catalyst Fund is to stimulate the development of Climate Funds and climate friendly projects and companies which are expected to play a key role in accelerating the growth of investment in renewable energy and other low-carbon solutions.
Climate Technology Initiative (CTI) Private Financing Advisory Network (PFAN)	140.00	Multi-Sector	All	Contact country and regional offices via website or through one of the Clean Energy Financing Forums	Technical assistance	PFAN screens business plans, selects the most economically viable and environmentally beneficial projects, and provides extensive coaching and guidance before projects are presented to investors at Clean Energy Financing Forums hosted across Asia, Latin America and Africa.
Danish Climate Investment Fund	200.00	Renewable Energy	Energy Efficiency, Renewable Energy, Transport, Other	Online application	Co-financing Loan Technical assistance Equity	Danish company must participate in the project (or that it contains a Danish economic interest) in developing countries and must be commercially sustainable and employs known climate technology
DEG - Deutsche Investitions- und Entwicklungs-gesellschaft mbH	20.00	Multi-Sector	All	Depends on the product, please see the website for more information.	Loans Mezzanine financing Guarantee Equity capital	Developing and emerging market countries for profitable projects that contribute to sustainable development goals.
DFID	26.65	Multi-Sector	Multi-Sector	● Initial Application ● Information Gathering and Learning More ● Full Application ● Due Diligence ● Decision Panel ● Funding Agreement	● Grants ● Loans (including convertible debt) ● Equity investments ranging from £30,000 to £10 million.	
EIB Climate Change Technical Assistance Facility	20.00	Multi-Sector	All	www.eib.org/projects/documents/cctaf_guidelines_public.htm	Loan Technical assistance	Projects under CDM or JI

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
EIB-KfW Carbon Programme II	130.00	Multi-Sector	Energy, Energy Effiency, Fuel, Switching, Transport, Water	Project promoters are invited to contact the Programme Manager (KfW).	Forward purchase or advance payment for the contract value of carbon certificates	Least Developing Countries or Programmatic Approach. If country is not LDC or PoA, then only sectors: Renewable Energy, Energy Efficiency, Methane Avoidance (incl. landfill gas)
End-User Finance for Access to Clean Energy Technologies in South and South-East Asia (FACET)	70.00	Renewable Energy	Low-Carbon, Renewable Energy	Contact the FACET programme.	Co-financing Financial Incentives (loan, co-financing, guarantee, credit insurance) Technical assistance	Commercial banks that aim to build up loans portfolios of around 10 000 loans to technology suppliers
Eversource Capital	670.00	Renewable Energy	Renewable Energy	Concept Review Appraisal (Due Diligence) Investment Review Negotiations Commitment Disbursement of funds Project Supervision and Development Outcome Tracking Evaluation	● Equity	No minimum Criteria
FMO Entrepreneurial Bank (IDF and AEF)	9200.00	Multi-Sector	Agribusiness, Energy, Food, Water		Co-financing Loan and Grant Technical assistance	The AEF supports private sector projects that provide long-term access to energy services (generation, transmission and distribution)The IDF is aimed at long-term financing for large infrastructure projects.

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
Fund Solutions for Climate Finance (KfW & Partners)	1000.00	Renewable Energy	Energy Efficiency, Renewable Energy	Application procedures depend on configuration and program of partnering institutions	Loan	GGF: Southeast Europe region including Turkey (Albania, Bosnia and Herzegovina, Croatia, the Former Yugoslav Republic of Macedonia, Montenegro, Serbia, Kosovo, and Turkey). GCPF: Focus on countries which already have a significant industrial basis and a large population like Brazil, Chile, China, India, Indonesia, Mexico, Morocco, Philippines, South Africa, Tunisia, Turkey, Ukraine and Vietnam.
GEF Capital (Fund 2)	180.00	Multi-Sector	Multi-Sector	N/A	Equity (Minority Stake - Up to 30%)	The project synergies should be aligned with the thematic areas targeted by the fund.
GEF Small Grants Programme	450.00	Multi-Sector	Biodiversity, Climate Change, Land, Degradation, Sustainable Forest Management, Water Chemicals	Contact the SGP National Coordinator to receive application guidelines and form	Grant	NGO/CBO working in developing countries with project corresponding to GEF focal areas
GEF Trust Fund - Climate Change focal area (GEF 6)	3000.00	Multi-Sector	Biodiversity, Chemicals and Waste, Climate Change, Energy Efficiency, Forestry, Infrastructure, Land Degradation, Land-use Renewable Energy, Transport, Water	GEF resources can be accessed through accredited GEF Agencies (https://www.thegef.org/gef/gef_agencies) or, in the case of certain enabling activities, through a direct access modality ()	Grant	Countries eligible to receive World Bank (IBRD and/or IDA) financing or UNDP technical assistance through its target for resource assignments from the core (specifically TRAC-1 and/or TRAC-2).
Germany's International Climate Initiative	1800.00	Multi-Sector	All	Call for proposals through the Programme Office International Climate Initiative		Projects in IKI's four areas of support: mitigation, adaptation, conservation of carbon sinks and biodiversity

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
Global Climate Partnership Fund	300.00	Multi-Sector	All	Investment process available on the website at http://www.gcpf.lu/investment-process.html	Mainly senior debt, but also equity and mezzanine debt	Financial Institutions or ESCOS (small scale renewable energy and energy efficiency service and supply companies that serve energy efficiency and renewable energy market in the target countries). Require financing of between USD 5m and USD 30m for on-lending to green energy projects
Global Energy Efficiency and Renewable Energy Fund	230.00	Renewable Energy	Energy Efficiency Renewable Energy	Contact the team http://geeref.com/contact.html	Equity (Fund of funds)	Private equity funds investing in private sector projects in RE and Energy Efficiency
Green Climate Fund	10.20	Multi-Sector	All	Recipient countries can submit funding proposal through National Designated Authorities (NDAs). Package of the relevant documents "Operations Manual" is available at http://www.gcfund.org/operations/resource-guide.html#c1326	Grant Concessional loan Guarantees Equity	All developing country parties to the UNFCCC
Interact Climate Change Facility	450.00	Renewable Energy	Energy, Energy Efficiency, Industry, Renewable Energy	Two-step process. Project proposals should be sent to the Investment Committee.	Grant Senior Loans and Mezzanine Debt	Private sector projects in developing countries (African Caribbean Pacific countries, Asian and Latin American countries) and emerging markets in the sector of climate change proposed by any of the EDFI shareholders is eligible for ICCF funding.

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
International Climate Fund (UK)	4700.00	Multi-Sector	Agriculture, Climate-Resilient, Coastal Zone Management, Energy, Energy Efficiency, Forestry, Low-Carbon, Renewable Energy, Urban, Water	Proposals for ICF expenditure will be prepared for Ministers by an ICF Board comprising of Directors General from DECC, DFID, FCO, Defra, HMT, and chaired by DFID. ICF funds will be programmed through global, multilaterally administered programs (CIFs, Adaptation Fund, GCF, etc) rather than towards specific country programmes or projects.	Grant Loan Guarantee ODA	ICF will fund projects that display consistency with the DAC definition of ODA and ensure open and transparent project performance. Other critical eligibility factors include the choice of instrument and appropriate enabling environment.
International Climate Initiative (Germany)	120.00	Multi-Sector	All	Two-step procedure: Project outlines evaluation (templates are provided on the ICI website) and upon approval formal grant application.	Grant Loan	Climate and biodiversity projects in developing and new industrialising countries, countries in transition
International Finance Corporation (IFC)	70971.00	Multi-Sector	All	● Business Development ● Concept Review ● Appraisal (Due Diligence) ● Investment Review ● Negotiations ● Public Disclosure ● Board of Directors Review and Approval ● Commitment ● Disbursement of funds ● Project Supervision and Development ● Outcome Tracking ● Evaluation ● Closing	● Equity ● Debt Securities ● Guarantees and Partial Credit Guarantees ● Trade and Supply Chain Finance ● Structured Finance ● Blended Finance ● Client Risk Management Services ● Loan Mobilization	● Be located in a developing country that is a member of IFC; ● Be in the private sector; ● Be technically sound; ● Have good prospects of being profitable; ● Benefit the local economy; and ● Be environmentally and socially sound, satisfying our environmental and social standards as well as those of the host country.
Japan's Fast Start Finance	1500.00	Renewable Energy	Agriculture, Energy Efficiency, Renewable Energy	N/A	Grant Loan ODA Guarantees	Developing countries who have entered into direct, bilateral discussions with the Government of Japan are eligible for FSF, although some private sector actors may also be considered.

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
JICA	141.52	Multi-Sector	All		● Grants ● Loans (including convertible debt) ● Equity investments.	**For MSME** ● New / existing MSME units, as per the definition of the Micro, Small & Medium Enterprises Development (MSMED) Act, 2006 (www.Laghuudyog.com; www.Smallindustryindia.com). ● Existing units should have satisfactory track record of past performance and sound financial position ● Energy saving projects will be screened as per the Energy Saving Equipment List, which is available on SIDBI or JICA Project website ● Units should have minimum investment grade rating of SIDBI ● Sectors such as the arms industry, narcotics industry or any unlawful businesses are not eligible. Similarly, such projects which may result in larger negative social and environmental impact are also not eligible under this scheme. ● Equipment/ machinery with energy saving potential less than 10% is not eligible.
KfW Development & Climate Finance	400.00	Multi-Sector	Agriculture, Energy Forestry, Technology, Transport, Water Other	Funding varies as per the project requirements, Contact KfW via website	Grant Loan ODA Structured financing	Public and private entities Depending on contract
Korea Green Growth Trust Fund	40.00	Multi-Sector	Energy, Environment, ICT (Information Communication Technology), Transport, Urban, Water	Bank executed CoF, annual application through GP management approval	Grant Technical assistance	IBRD/IDA country members

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
Multilateral Carbon Credit Fund	2300.00	Renewable Energy	Energy, Energy Efficiency, Forestry, Fuel Switching, Renewable Energy, Transport	Project Idea Note (PIN) should be submitted to the Carbon Finance and Funds Unit.	Carbon Finance	Focus on JI but with some CDM and EUAs projects (provided that the reductions result from investment in a project) and AAUs in CEE and the FSU. Carbon credits must originate from EBRD and/or EIB-financed projects located in EBRD's 29 countries of operation
Nationally Appropriate Mitigation Action facility (UK and Germany)	205.00	Multi-Sector	All	Call for projects	Technical and financial assistance; Grants and loans	Bankable projects support the implementation of NAMAs, submission by a national government or qualified Delivery Organisation; financing volume between EUR 5-20 million; qualification as ODA
Partnership for Market Readiness	100.00	Multi-Sector	All	Submit expression of interest form at pmrsecretariat@worldbank.org	Grant	Countries must be participants in the PMR
Renewable Energy and Energy Efficiency Partnership	10.00	Renewable Energy	Energy, Energy Efficiency, Low-Carbon, Renewable Energy	Online at: https://pmis.reeep.org/index.cfm?way=200943	Carbon Finance Co-financing Grant Loan guarantee Technical Assistance	REEEP invites direct proposals from governments, energy regulators, and development financial institutions, and development agencies focusing on the REEEP priority countries. REEEP priority countries include Brazil, China, India, Indonesia, South Africa and several sub-Saharan African states.
Scaling-Up Renewable Energy Program for Low-Income Countries	769.00	Multi-Sector	Energy, Forestry Land Management, Natural Resources, Management, Renewable Energy	Project proposals should be sent to SCP Trust Fund SREP sub-committee	Grant Loan Equity Co-financing	Low-income countries prioritised, must be qualified for MDB funding. Preference is given to projects with strong poverty alleviation benefits.
Seed Capital Assistance Facility	10.50	Renewable Energy	Energy, Energy Efficiency, Renewable Energy	Proposals should be submitted through the website	Grant Equity	early stage clean energy enterprises and projects

Source	Fund Available (USD mn)	Sector Focus	Sub Sectors	Application Process	Financing Mechanism	Minimum Criteria
Special Climate Change Fund	345.00	Multi-Sector	Agriculture, Energy Forestry, Industry, Transport, Waste Management	GEFSCCF resources can be accessed through accredited GEF Agencies (https://www.thegef.org/gef/gef_agencies) See also the user-friendly guide available on their website	Grant	All developing country Parties to UNFCCC
State Bank of India	650.00	Renewable Energy	Renewable Energy		Debt Securities	
Strategic Climate Fund	1300.00	Multi-Sector	See individual funds	See individual funds	See individual funds	Framework fund of the FIP, PPCR and the SREP
UNDP/MDG Carbon Facility		Multi-Sector	Operated under the CDM, JI and voluntary carbon markets	The Project Idea Note (PIN) serves as the initial contact between project proponent and the Facility, and is the basis for the screening exercise to determine a project's eligibility to participate in the Facility		No specific exclusions
UNDP/ Spain MDG Achievement Fund	900.00	Multi-Sector	All	UN country offices submit project concept note in response to call for proposals	Grant Equity Loan	Select countries and members of the UN Development Group
US Global Climate Change Initiative	350.00	Multi-Sector	Clean energy Sustainable Landscape (REDD+) Resilience	Various http://www.usaid.gov/partnership-opportunities/respond-solicitation	Grant Loan Guarantee	Developing countries
World Bank Carbon Funds and Facilities	2500.00	Multi-Sector	Agriculture, Energy, Energy Efficiency, Forestry, Other	Project proponents must submit a Project Idea Note (PIN), a short form that provides the basic information about the project, to demonstrate, for example, the viability of technology, sound financing, credible baseline and adequate volume of emission reductions.	Carbon finance	IBRD/IDA member countries; CDM or JI-eligible project activities (also voluntary window mainly for forestry and agriculture-based projects) and AAU transactions (through GIS)