

THE CLEAN POWER TRANSITION IN INDIA

How philanthropies can fill the financing gap



SHAKTI
SUSTAINABLE ENERGY
FOUNDATION

Positive policy direction has been providing investors the required nudge to invest in India's clean energy transition at the necessary scale and pace. This white paper outlines the opportunity for philanthropic capital to address the gap that remains.



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About Shakti Sustainable Energy Foundation

Shakti Sustainable Energy Foundation is committed to advancing clean energy and climate action in India. We work with decision makers, civil society, think tanks and the private sector to identify and scale energy system interventions that will reduce GHG emissions to align with a 1.5°C future and address the climate crisis.

We envision a clean and secure energy future for India. By supporting the transition to clean energy sources, it is possible to boost economic development, spur innovation, deliver social and health gains and protect our climate—for today and future generations.

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Abbreviations

AIPA	Apex Committee on Implementation of Paris Agreement	PPA	Power Purchase Agreements
BESS	Battery Energy Storage System	RBI	Reserve Bank of India
CBI	Climate Bonds Initiative	RE	Renewable Energy
CEA	Central Electricity Authority	REC	Rural Electrification Corporation Limited
CEEW	Council on Energy, Environment and Water	RPO	Renewable Purchase Obligation
cKinetics	cKinetics Consulting Services Private Limited	SAPCC	State Action Plans on Climate Change
CPI	Climate Policy Initiative	SDG	Sustainable Development Goals
CSO	Civil Society Organisation	SEBI	Securities and Exchange Board of India
DRE	Distributed Renewable Energy	TCFD	Task Force on Climate-Related Financial Disclosures
EESL	Energy Efficiency Services Limited	UNDP	United Nations Development Programme
FAME	Faster Adoption and Manufacturing of Electric Vehicles		Indian Rupee
FY	Financial Year	\$	US Dollars
GFLC	Green Finance Leadership Collaborative		
GHG	Greenhouse Gas		
GW	Gigawatts		
IPSF	International Platform on Sustainable Finance		
IREDA	Indian Renewable Energy Development Agency		
MoEFCC	Ministry of Environment, Forest and Climate Change		
MoP	Ministry of Power		
MSME	Micro, Small and Medium Enterprises		
NBFC	Non-Banking Financial Company		
NDC	Nationally Determined Contribution		
NGFS	Network for Greening the Financial System		
PFC	Power Finance Corporation Limited		



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Executive Summary

The Indian economy is currently grappling with fallout from the COVID-19 pandemic, after an earlier slump in the automobile manufacturing sector and an NBFC crisis from 2019. With a record-low national sovereign credit rating, policymakers will be prioritising economic growth in the coming decade.¹ Building the narrative of climate change as the next 'crisis' is key to ensure that the issue is not forsaken in favour of 'competing priorities'. A clear policy signal behind the push for climate-aligned economic development can build investor confidence and bolster climate-aligned investing in the country.

With the announcement of 450GW renewable energy installation by 2030, Indian government has taken an assertive step toward clean energy transition. However, the transition requires an investment of \$500 billion² at a system level. Private sector investment is a must to achieve this ambitious target. However, private sector investment in renewable energy will require consistent policy and regulatory regimes at the national and sub-national levels that will allow investments and their recovery in a much more stable manner than at present. Philanthropies can play a critical enabling role to help overcome existing policy, regulatory and capacity challenges and help create a favourable and cohesive ecosystem to draw investment in renewable energy. Technical assistance and advocacy are required to:

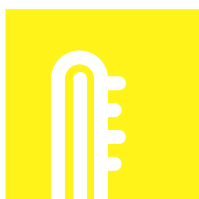
- ▶ *Develop consistent policy and regulatory regimes at the national level and the sub-national level to allow investments and their recovery in a predictable fashion*
- ▶ *Create much-needed regulatory frameworks and successful 'proof-of-concepts' that will accelerate investments into expansive transmission system and grid modernization*
- ▶ *Provide necessary training and capacity building support to both the DRE project developers as well as the financiers to ensure credit flows in the DRE sector.*
- ▶ *Design innovative financial instruments to reduce risk perceptions for attracting private sector finance at the requisite scale.*
- ▶ *Develop a just transition pathway for Indian power sector*
- ▶ *Build awareness and capacity amongst financial institutions*
- ▶ *Increase the leveraging capacity of public finance in clean power*
- ▶ *Build sub-national capacity for attracting green finance*
- ▶ *Develop theme-driven impact funds, start-up accelerators and mentorship programs*

This white paper takes a deep dive into the clean power sector landscape in India, clean finance collaborations, ecosystem players including investors, and the challenges to achieving the 450 GW RE target. It assesses key opportunities in large scale RE, and based on a situational assessment of the clean power sector finance in India, proposes opportunities for philanthropies.

Context

Global power sector investments are slated to bounce back to their pre-pandemic levels at \$1.9 trillion by the end of FY 2021.³ Increasing energy demand, coupled with high anticipated capital expenditure as a component of economic recovery packages, signals a probable growth in the global power sector. However, from a climate mitigation perspective, the \$750 billion that is expected to be spent on clean energy technologies and efficiency worldwide in 2021 remains far below requirements. In fact, investment into clean energy would need to double in the 2020s to maintain temperatures well below a 2°C rise and more than triple in order to keep the door open for a 1.5°C alignment scenario.

India emits a considerable ~7% of the world's GHG emissions, primarily accounted for by the electricity/thermal demand.⁴ While coal power continues to grow in India, it does so at a historically slow pace. In fact, the policymakers' preference to enable clean power pathways in India is indicated by the approval of a record-low 1 GW of coal-fired power in 2020.³ Signals such as these have been providing investors the required nudge to invest in India's clean energy transition at the necessary scale and pace. This white paper aims to outline the opportunity for philanthropic capital to address the identified gap.



India's Clean Energy Finance Landscape

Climate Policy Initiative (CPI) India published a landscape assessment on clean energy finance flows in India in 2020.⁵ Findings show that the quantum of clean energy finance has steadily grown from roughly \$17 billion in FY 2017 to \$21 billion in FY 2018, though this falls considerably short of India's Nationally Determined Contribution (NDC) estimates of \$170 billion (or about \$80 billion for climate mitigation) per annum till 2030.

Accounting for over **85 per cent of investments in this space between 2016-18, the power sector continues to dominate clean energy finance in India**-attracting nearly all private sector investments. This trend indicates that the power sector, particularly renewable energy generation, attracted large scale private finance. While the sector is set for explosive growth, an estimated \$500 billion in additional investment is needed by 2030 for the clean energy transition alone.²

Rapidly growing sectors such as green public transport, electric vehicles (particularly two and three wheelers) may yet require the de-risking support of patient/risk capital (from investors with high risk appetites) and public sector funding. These sources of funds can support research and shoulder the 'first-mover' risks associated with burgeoning industries, thereby inviting private investment in clean energy technology deployment.

It is worth noting that between 2016-18, the lion's share of public finance was channelled through public sector undertakings (PSUs), underlining their key role in facilitating clean energy investments in India. A major source of risk capital, private venture investment, has decreased by about 10 per cent since late 2019. However, levels of private venture capital remain above 2018-levels, with sustainable mobility, energy efficiency and energy storage (including hydrogen) receiving the most attention.⁶ Despite these positive developments, energy and transport start-ups accounted for just 5 per cent of the total Indian start-up ecosystem to successfully raise funds in 2019-20.

Figure 1 indicates that during the fiscal years 2016-18 commercial banks invested \$13.2 billion followed by \$9.75 billion from government and public sector. Investment from project developers (including investors) and foreign direct investment was \$3.97 billion and \$1.71 billion, respectively.

As of FY 2020-21, a total of 94 GW renewable energy (RE) capacity has been installed, with another ~50 GW in various stages of construction.⁷ Visualised in figure; 2, wind and solar installations have been steadily growing though at a decreasing growth rate (in part due to their starting at a low base value). Underpinning this growth was a series of central policies that introduced real time markets, generation incentives, feed-in-tariffs (which progressed to competitive bidding) and policy instruments to increase the confidence in the sector. It is safe to assume that private sector investment has been attracted to these sectors due to favourable economics – much of which can be attributed to policy support in the light of national climate targets.

LANDSCAPE OF GREEN FINANCE, FISCAL YEARS 2016-2018

INR 248 THOUSAND CRORES TOTAL TRACKED GREEN FINANCE

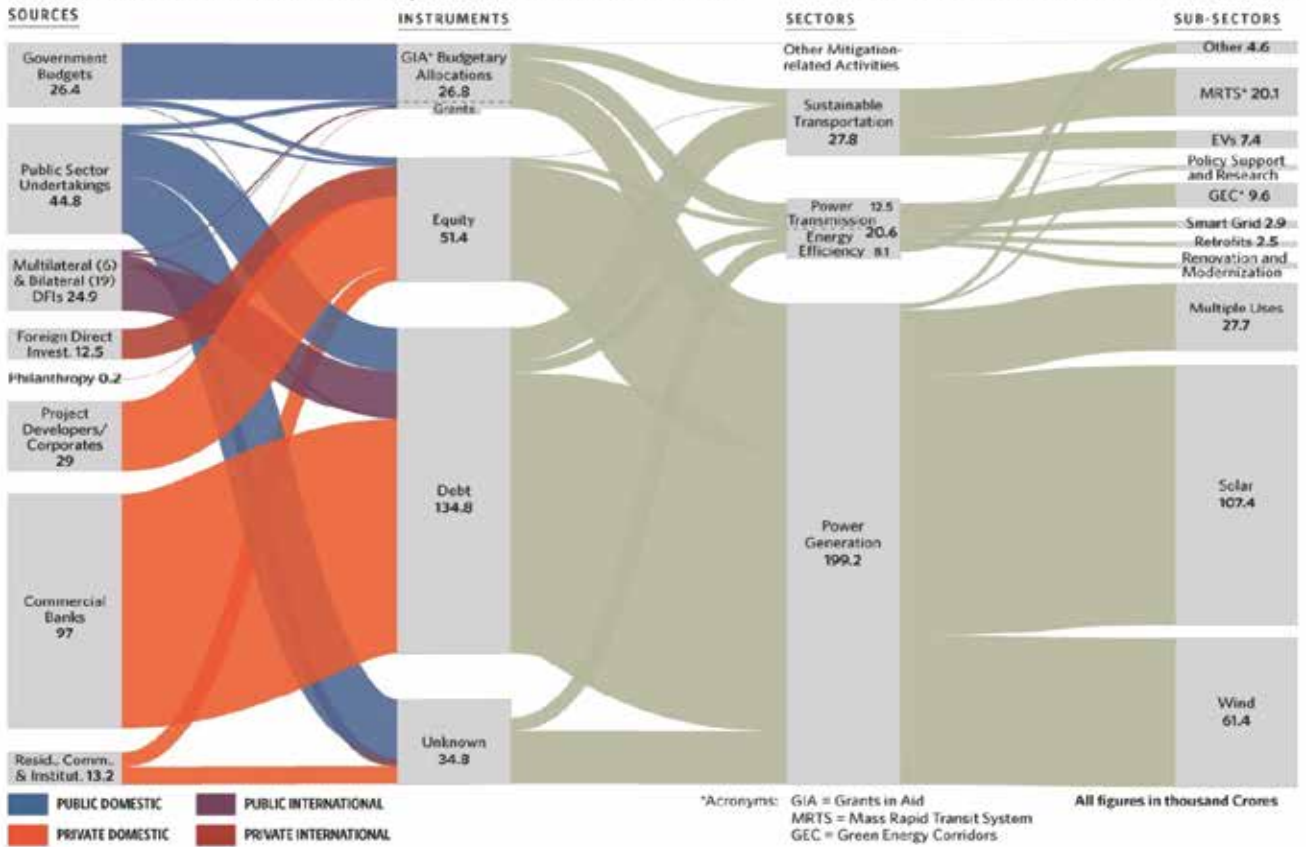
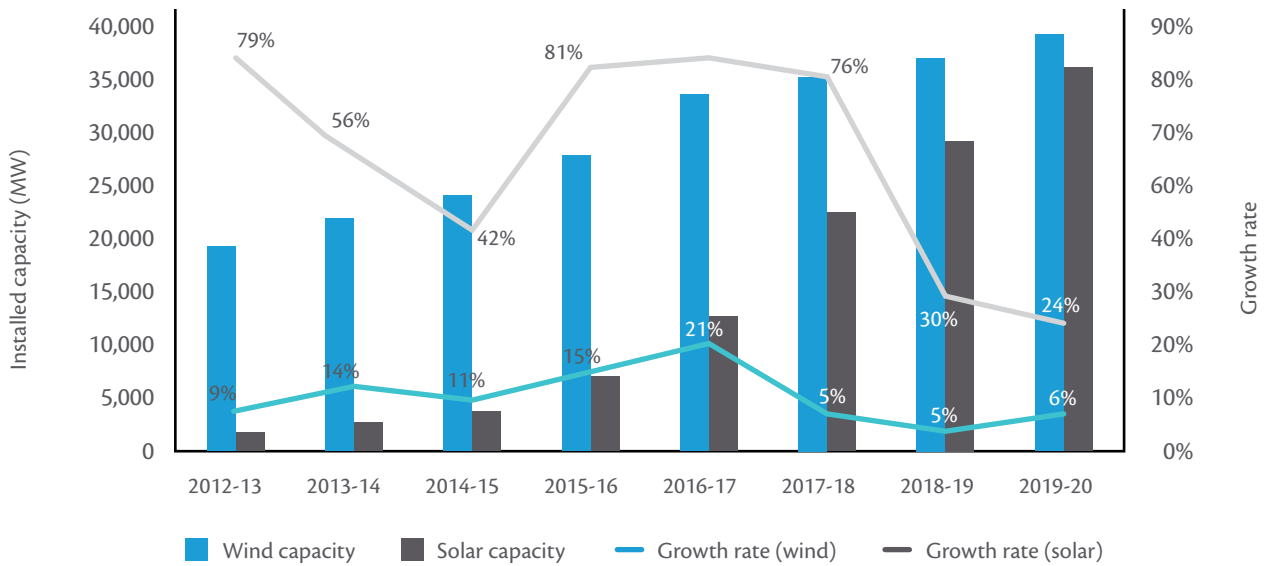


Figure 1: Landscape of green finance to India during fiscal years 2016-18



Note: Figures for 2019-20 are only up to December 2019.

Figure 2: Capacity additions of Wind and Solar energy in India (source: CEEW analysis)

Collaboration on Climate Finance

Most of the ongoing initiatives in the space of climate finance in India work to address fundamental hurdles. The Green Finance Leadership Collaborative (GFLC), run by cKinetics and CPI, looks to create a bottom-up adoption of India's Green Finance Taxonomy by financial institutions. Similarly, Climate Bonds Initiative (CBI) has its own green bond taxonomy and UNDP is developing an SDG-financing facility that relies on a sustainable finance taxonomy to steer investments. The Climate Change Unit within the Ministry of Finance's Department of Economic Affairs has shown leadership in this space, spearheading India joining the International Platform on Sustainable Finance (IPSF)- signalling the government's commitment to developing domestic green finance regulation.⁹ As a follow up to the Sustainable Finance Collaborative launched in 2020, the Department of Economic Affairs has constituted a task force on sustainable finance with representation from various ministries and regulators with UNDP as the secretariat. Finally, in a welcome development, Reserve Bank of India (RBI) joined the Central Banks and Supervisors' Network for Greening the Financial System (NGFS) as a member on 23rd April, 2021.



LANDSCAPE OF
ECOSYSTEM PLAYERS

Major Clean Energy Investors



Noteworthy financiers in the clean power investment space have been identified and summarised in the table below. Please note that due to a lack of granular information, the list is not ranked or arranged in any particular order (except for the Domestic Public list, which

is ranked in descending order over the years 2016-18). It is worth noting that amongst domestic public funders, IREDA, PFC, REC, and EESL collectively accounted for ~90 per cent of PSU funding over the same period. Public funds are always limited by national constraints and must, therefore, be effectively deployed to de-risk the sector and leverage-in private sector finance.

Indicative List of Prominent Clean Energy Investors in India

International Public	International Private	Domestic Private – Equity	Domestic Private - Debt	Domestic Public	PE Investors	Ministries and State Governments
Japanese International Co-operation Agency	Greenko Mauritius	ReNew Power	YES Bank	IREDA	GIC, Singapore	Ministry of New and Renewable Energy
	SBG Cleantech Two	NLC India	Convergence Energy Services Ltd (CESL) (new entrant)	PFC	Global Environment Fund	
European Investment Bank	Fortum Sun	Greenko Solar	IndusInd	Rural Electrification Corporation	Goldman Sachs	Ministry of Housing and Urban Affairs
KFW	Acciona Energia	Skeiron Green Power	L&T	EESL	IFC	Ministry of Heavy Industries
IBRD	Guayama P-R Holdings	Acme Solar Energy	UCO Bank	NTPC	Actis	Govt. of Delhi
French Development Agency	Azure Power	Adani Green Energy	IDFC Bank	BEE	Morgan Stanley	Govt. of Maharashtra
Asian Development Bank	Global Orange Renewables Holding	Sunsourc Energy	TATA Cleantech Capital	SECI	Future Fund	Govt. of West Bengal
Clean Technology Fund			Union Bank of India			Govt. of Kerala

Philanthropic Landscape

Funding in the space of climate finance has varied over the past few years though results from various sources differ based on their methodologies. From an overall **international amount of close to \$338 million directed towards climate action in India, it is estimated that maximum philanthropic grants have been directed toward the electricity sector at about \$143 million (close to 41 per cent), followed by climate finance (12 per cent) over the period FY 2015-20¹²**. Power sector (electricity) and finance interventions as overarching themes have clearly attracted the highest share of philanthropic capital, underlining their continued significance as fundamental drivers. Conversely, this also highlights a gap – and subsequent opportunity – for philanthropy to focus on the sub-sectors that can directly bolster the demand for clean energy finance (such as cooling, cities, industry, buildings, etc.) This can take the form of grants for research and policy advocacy or even directly as catalytic capital to minimise risk and attract private sector interest.

Philanthropic focus within the electricity sector has largely been **on supporting comprehensive clean electricity focused strategies, power system reforms (including utility business model reforms, grid efficiency and RE integration with the grid) and RE development and deployment** to provide necessary impetus to reduce dependence on fossil fuel-based generation technologies¹². We expect this trend to continue with an increased emphasis on technology innovation, adoption and implementation to increase last mile supply of reliable electricity. Even though there has been limited **philanthropic focus on the energy access front, we believe this is an opportune time to invest in energy access projects**. Efforts are required to ensure availability of reliable, affordable and quality electricity for livelihood, health and education sectors, specifically in rural India. The DRE sector is expected to play a critical role in addressing this challenge.

Cumulative philanthropic support towards climate finance highlights the **ecosystem's focus on market development to support transactions that accelerate low-carbon development to catalyse direct investments into green projects¹²**. An unfortunate side effect has been the limited emphasis on public finance and policy research, which create immense opportunity to de-risk sectoral investments, signal policy support and leverage-in private finance.



LANDSCAPE OF
ECOSYSTEM PLAYERS

Civil Society Capacity

The power sector is undergoing a major overhaul to adapt to changing paradigms.

It is vital to accelerate the development of clean energy technologies, improve forecasts of demand and clean energy, improve system optimization and manage and enhance system monitoring. Furthermore, there is an implementation gap between national-level policies and sub-national action. Pushing the growth of RE financing requires continuous updating of policies, best practices and innovation in the RE sector. CSOs and think tanks play a crucial role here in conducting cutting-edge research and building capacities to alleviate pain points.

Climate finance in general is still a relatively nascent but rapidly developing subject both in India and internationally. New datasets and methodologies are constantly emerging in a manner that puts a fresh spin on the sectoral narrative. On multiple occasions, the Indian ecosystem has had to adapt and adopt international frameworks, even though they are not necessarily situationally appropriate. Life cycle assessment databases, geospatial information, risk modelling financial frameworks (such as Real Option Analysis models) and innovative financing vehicles should ideally be developed domestically to ensure their appropriate application. For India to be at the forefront of these developments, it is key to build domestic research capability, particularly amongst CSOs, think tanks and academic institutions through targeted core grants and training.



Capacity Expansion

Recently, India has increased the renewable energy (RE) target to 450 gigawatts (GW) by 2030.¹⁰ It is anticipated that conversion of this target would require a deployment of \$500 billion² at a system level. Along with the financial resources, the path to RE-led generation requires consistent policy and regulatory regimes at the national levels and their translation at the sub-national levels to allow investments and their recovery in a predictable fashion. Further, to address the supply side challenges, it is important to identify solutions to the challenges pertaining to revenue certainty for project developers through appropriate system integration of intermittent RE supply. Additionally, there exist technology-specific challenges with respect to administration and implementation. For instance, utility scale solar plants have made a headway but the challenges of land acquisition and access to the transmission networks have remained unresolved.¹¹

Historically, the technology focus in this sector has been on solar and wind resources. But for India to realize the 450GW target, it is imperative to provide impetus to other RE technologies as well. There exist multiple solutions that are technologically proven and await commercialisation through similar policy support provided by the government for the traditional RE, allowing for a diversified energy mix.

For India to achieve its 450 GW RE target, multi-dimensional efforts are required, covering a broad spectrum of interventions, including the formulation of promising policies and incentives for creating appropriate demand for RE, reducing investment risk for project developers, ensuring revenue certainty and paving the way for RE integration. Philanthropies, multilateral and bilateral organisations can play a vital role in funding research and technical assistance that assesses the commercial potential of various technologies and their eventual integration. These assessments will be critical to analyse grid compatibility at sub-national levels so that timely and appropriate infrastructure augmentation planning can be carried out.

With disruptions unfolding in the power sector with respect to increased RE capacity and changing demand patterns, clearly there is a need to devise alternative financing mechanisms and business models to attract the scale of capital required for the envisaged transition in the power sector. **Technical assistance is required to develop these frameworks and to explore new financing platforms and innovative financing instruments to mobilize investments for its expansion and modernization initiatives of the power sector.**



System Integration

With growing adoption of RE on account of technological advancements and falling costs, India's power systems need to undergo significant transitions. With RE expected to dominate the country's power mix by 2030¹² implications for overall system planning and grid integration would be manifold. With generation systems becoming more variable in nature, addressing grid integration issues at both transmission and distribution levels becomes imperative.

Transmission assets are capital intensive and require right-of-way approvals at multiple jurisdictions. Long gestation periods to build transmission capacity augmentation to absorb the power produced by new RE projects deters investors.¹³ If India is to achieve its ambitious RE targets, expansive transmission system and grid modernization techniques will be required to enable RE evacuation and ensure smooth transfer of surplus power across regions and states. Additionally, distribution level infrastructure is plagued by aging assets and urgent investments are required to reinforce the infrastructure to handle intermittent influx of RE generation. India's transmission system is one of the largest operational and integrated grids built upon significant investments in high voltage lines and substations. With policy-backed focus, the transmission sector has been growing steadily, yet there exist critical challenges that affect the RE integration. For instance, in the southern region, peak solar power evacuation is projected to increase to 31GW in 2022, almost tripling from 12GW in 2018. The transmission network will have to increase by the same measure to accommodate capacity expansion. However, only for about

5 per cent of the time in a year, the system is expected to evacuate power in the range of 26-31GW, and the additional 5GW of transmission infrastructure will be idle for the remaining 95 per cent of the time. According to the cost estimates from the first phase of Green Energy Corridors, the cost for building a 1MW transmission system is about 1.2 crore. The option of building large-scale energy storage systems to offset the investment network expansion needs to be evaluated going forward, both at the transmission and distribution levels.

Energy storage technologies such as battery energy storage system (BESS) have shown considerable progress on technology and cost front. Despite this, the uptake has been limited, the current project mainly comprises of demonstration and pilot projects due to significant challenges associated with traditional procurement methodologies and regulatory uncertainties. To boost the sector, Government of India recently approved a production linked incentive scheme for the battery manufacturing with an outlay of 18,100 crore. This initiative sends a clear signal to the stakeholders about the push to create a manufacturing ecosystem for battery storage in India. It is expected that this initiative will attract direct investments of ~ 45,000 crore and create additional employment opportunities in the energy sector.

Besides fiscal incentives, efforts are required towards developing policy and regulatory frameworks specifically for RE integration of energy storage systems. There is ambiguity in the existing policy/regulations on storage applications, such as the distinction in jurisdiction (SLDC/SERC/SNA) and regulations (whether to be interpreted as a part of generation/transmission system or as a separate holding system). **The sector needs appropriate technical assistance to create much-needed regulatory frameworks and successful 'proof-of-concepts' that would accelerate effective implementation and outlay on RE projects.**

INDIA'S ROAD TO 450GW: DRIVERS AND OPPORTUNITIES

Decentralised Applications

India aims to achieve 175GW of RE by 2022: of this about 40GW is earmarked for DRE systems, primarily consisting of solar rooftops.¹⁴ DRE plays a critical role in India's clean energy transition effort by providing 24X7 power supply to the un-served and under-served segments of the rural population. In addition, DRE has multiple downstream applications in agriculture, electric vehicle charging and productive use. It is estimated that the DRE sector would require an annual investment of \$18 billion by 2024¹⁵ to meet sustainable energy targets.

Lately however, the DRE sector has lost its initial momentum given shifting policy focus on large scale RE. By the end of 2020, the total installed capacity of solar rooftop was less than 6GW, indicating the presence of bottlenecks such as system sizing restrictions, non-favourable tariff mechanisms and changing regulatory mandates that put a question mark on the sector's survival.

An immediate priority is to identify the root causes and workable solutions for all the stakeholders involved in the DRE value chain.

Challenges can be addressed through a mix of continued policy support, enhanced planning capacity within sub-national entities and providing access to mainstream finance. Besides, there is an imperative to develop frameworks to increase the financial credibility of DRE projects that currently garners

limited interest from the private capital.

The Decentralized Renewable Energy Evaluation & Monitoring Tool (DREEM Tool) standardizes



Prashanth Vishwanathan / IWMI

enterprise valuations in the sector and support enterprises in navigating through credit appraisal processes.¹⁶ However, there still exist large gap in terms of transaction advisory for small project developers. In order to ensure scalability, it is vital to bridge this gap and ensure access to capital for project developers.

Philanthropies, multilateral and bilateral organisations can provide necessary training and capacity building support to both the DRE project developers as well as the financiers to ensure credit flows in the DRE sector.

INDIA'S ROAD TO 450GW: DRIVERS AND OPPORTUNITIES

Targeted Financial Instruments

As discussed in the sections above, reducing risk perceptions is key to attracting private sector finance at the requisite scale. Risk perceptions emerge from a variety of macroeconomic factors, many of which can be mitigated through the deployment of innovative financing instruments. Identifying various investor groups with their own distinctive risk appetites allows stakeholders to align instruments with investor needs.

Green bonds, for example, are a growing financial instrument due to their ability to free up power sector exposure from India's wary non-bank financial institutions (NBFCs). Re-financing clean energy projects thus lowers the cost of project debt for developers while also allowing NBFCs to recycle capital towards other new investments. Pooled projects are able to collectively achieve investment-ready risk ratings, while stand-alone projects struggle to obtain the ratings required to interest domestic investors. Highlighting their success is the fact that Indian developers have issued nearly \$12 billion worth of green bonds since 2015¹⁷ – most issuances have been oversubscribed in international markets.

Philanthropies, multilateral and bilateral organisations can play a key role in supporting research to design and develop similar innovative fiscal reforms and financial instruments. While this is not a traditional area for philanthropic investment, there has clearly been a push towards supporting research to promote equity investments into clean-tech start-ups, reduce foreign exchange risk for international climate finance and mitigate.

off-taker risks through third-party payment guarantee mechanisms (amongst other similar areas). Another emerging topic of import is providing technical assistance program to identify pathways for the Discoms to leverage development funds for undertaking long-term financial reforms. **Funds that actively deploy these innovative financial instruments can be capitalised by philanthropic capital to absorb risk and eventually invite private sector finance as well.**



INDIA'S ROAD TO 450GW: DRIVERS AND OPPORTUNITIES

Thermal Power Phase-out

Policymakers and financiers alike are growing sensitive to the transition risk associated with investing in thermal power. States such as Gujarat and Maharashtra have already announced a “No new coal” policy, and a report by the Centre for Financial Accountability shows significant reductions in private debt towards coal power nationally.¹⁸ However, the transition away from thermal power must balance expediency with the need for a just and inclusive approach.

Many thermal power plants operate despite low plant load factors from changing demand patterns and a push towards adoption of cleaner technologies, they assured of revenue from contract-bound Discoms. Discoms continue to pay substantial fixed charges on long-term power purchase agreements (PPAs) for thermal power, posing a challenge to increasing RE mix in the grid. **A significant opportunity lies with supporting research to determine plant identification criteria and the costs of decommissioning. There is a need to develop frameworks to rationalise PPAs, provisions for retirement of thermal power plants including assessments of the impacts on regional economy from such decommissioning and/or repurposing.**

Effort is further needed to catalyse the arduous process of bringing stakeholders, power producers, Discoms, coal producers, state governments, central government

and others (including the staff and contract workers at these plants and mines) – on to the same page to ensure a swift and just transition. It is important to reinforce the narrative that workers from the coal sector– which employs a significant half million people directly¹⁹–should ideally be re-skilled and re-employed in clean energy or allied sectors.



INDIA'S ROAD TO 450GW: DRIVERS AND OPPORTUNITIES

Growing Emphasis on ESG Risks and Disclosures

Scaling up the overall quantum of climate finance requires an increase in funding from investors that actively seek climate- positive investment opportunities. Currently, investors do not seem to appreciate the quantifiable economic impacts of climate change on their portfolio or the broader economy. A landscape study by Intelicap highlighted the financial sector as the worst-performing industry with regards to TCFD (Task Force on Climate- Related Financial Disclosures) uptake in India²⁰. Recent analyses show that even international financial markets and actors are not yet pricing climate change risk in the value of financial contracts.²¹ This makes it difficult to underline the narrative that returns from clean energy investments are higher in the long run and that they also act as portfolio level insurance against the economic impacts of physical and transition risks associated with unchecked climate change impacts.

Intelicap's landscape study also highlighted the vast knowledge gap amongst Indian financial institutions regarding the various financial risks associated with climate change. Most organisations, including insurance agencies, view climate change typically as a 'business continuity risk', i.e., a factor that might slow down or temporarily halt physical operations. They do not have frameworks in place that quantify and integrate long term bottom-line impacts of climate risks-both

physical and transition-linked-into their financial portfolios and broader strategies.

A lack of awareness, data and standardised templates were cited as primary reasons justifying their unpreparedness.

By incorporating climate risk mitigation as a business strategy, corporations will clearly be incentivised to invest in low-carbon technologies that provide added benefits of cost-saving and transition-preparedness.

We have to develop a narrative that allows financial institutions to view renewable energy investments as 'insurance payments' against the risk of climate impacts in the medium-to-long term.

Targeted training and the introduction of international gold-standards (such as TCFD for banks) stand as prime opportunities for CSOs to support financial institutions in raising their climate ambitions. In anticipation of the inevitable climate- positive financial sector regulations, creating bottom-up climate leadership is another identified high-impact space. Not only does this prepare financial institutions to meet impending regulatory measures, but also affords them an opportunity to carve a niche for themselves in the burgeoning climate finance sector.

A growing strategy for investors to reduce transition risk and become climate-aligned involves pressuring current investees to decarbonise their operations and reduce their overall carbon footprint. Corporations that typically absorb a large portion of investor funds must have the incentive structures, internal capabilities and technology options to set and achieve ambitious climate targets. Organisations such as The Climate Group, WBCSD, CDP, etc., are trying to address these issues, though in India it is typically just the largest corporates that are capable of taking any meaningful action. **These organisations should be targeted to join initiatives such as RE100, TCFD-alignment, SBTi etc.,**

to incentivise investments in RE projects as a pathway towards meeting decarbonisation commitments.

The MSME sector is also a large untapped opportunity for decarbonisation – particularly as these organisations comprise Scope 3 emissions²⁶ for the larger corporations that are setting climate targets for themselves. MSMEs struggle to obtain loans due to the limited fixed asset ownership by which to provide collateral. Therefore, **increasing availability of financing for MSMEs to undertake green projects, de-risking investments through syndication or other innovative financial models, coupled with incentives/penalties from anchor clients for carbon intensity reduction can carry large-scale impact.**



Green Finance Regulation

India's nascent green finance ecosystem is currently regulated by several disjointed government agencies. For example, the Climate Change Unit within the Ministry of Finance looks at the subject from a public expenditure and climate negotiations angle, Reserve Bank of India (RBI) sets priority sector regulations, Securities and Exchange Board of India (SEBI) guides green bond issuances and corporate reporting standards along with the Ministry of Corporate Affairs, Ministry of Environment (MoEFCC) acts as the national Carbon Defence Mechanism authority and nodal agency for relevant missions and funds, while state governments develop individual action plans on climate change and handle local infrastructure financing. Bolstering clean energy investments also requires the obvious support of Ministry of Power (MoP), Central Electricity Authority (CEA). such a disjointed regulatory environment creates policy uncertainty amongst investors.

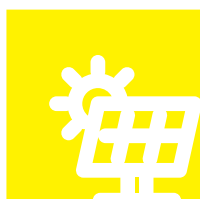
For instance, the 450GW renewable energy capacity target is ambitious and has caught the eye of global investors. However, frequent tweaking emphasizing domestic manufacturing through the Atmanirbhar Bharat initiative caused policymakers to place excise duties on imported solar cells and wafers, thereby increasing the average cost of solar plant installation in the country. This creates opposing incentives for actors across various jurisdictions, potentially signalling uncertainty to investors.

There is mounting evidence that policy uncertainty can reduce investor confidence and potentially raise the cost

of financing for capital-intensive projects by up to 40 per cent²². India, like many other governments around the world, falls prey to this issue by sending mixed policy signals due to competing development priorities set across ministries.

A recent study by the Council on Energy Environment and Water (CEEW) finds that renewable energy is a preferred choice amongst private sector financiers due to the early policies that helped propel the sector. However, legacy issues within cumbent service providers and developing ecosystem context in light of India's macroeconomic goals threaten the status quo. Existing policies that have worked thus far may not be adequate to sustain growth in the RE sector going forward. The various ministries within the Indian government must be aligned on climate goals, processes, and roles, to catalyse investments that help India achieve its RE goals. Fundamentally, this entails adopting a 'green' lens by which policies—both existing and proposed—are scrutinised. **By formally recognising a qualifying taxonomy for climate finance, the government can create clarity on sectoral focus areas for actors across the spectrum and ensure cohesive policymaking.** This also allows for accurate tracking of India's progress towards meeting RE goals, measuring the economic benefit of climate-friendly policies and targeted policy design to address any identified gaps.

A recent positive development has been the institution of the Apex Committee on Implementation of Paris Agreement (AIPA) which has been tasked with coordinating inter-ministerial efforts towards achieving our NDCs²³. Establishing a nationwide carbon pricing mechanism has been discussed for years but, as a taxation issue, is highly political. **Regulating India's domestic carbon markets is a key role of the AIPA, which signals inter-ministerial commitment to developing carbon pricing systems across the country. Doing so could symbolise a turning point, thereby setting the stage for large-scale redirection of capital if designed and implemented through rigorous research and stakeholder consultation. It could also bolster India's demand for clean energy through integration with the national REC mechanism – thereby providing 'teeth' to renewable purchase obligation (RPO) target implementation.** This is a heartening first step that opens doors for the CSO community to provide technical support in data collation and analysis, establishing a recognised taxonomy, designing cohesive and targeted policies and creating climate-positive regulations for financial institutions.



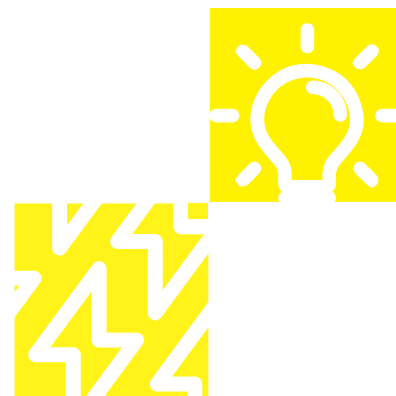
Maximising the Impact of Public Finance

Electricity in India is a concurrent subject between the States and the Centre. Further, state governments are responsible for over two-thirds of India's public capex,²⁴ look after local development plans as well as the design of State Action Plans on Climate Change (SAPCC)-typically in silos. There are numerous opportunities for overlaps, however, that go unrealised due to a lack of awareness and capacity amongst relevant stakeholders.

A 'green' project with state government backing and favourable risk capital support from multilateral development agencies can attract significant private sector investment interest if designed appropriately. **Training subnational government stakeholders to identify and leverage similar prospects is a considerable opportunity to create large-scale impact. Likewise, convening relevant stakeholders—ranging from inter-ministerial policymakers to project developers, financiers and multilateral agencies-can promote collaborative action.**

Conversely, subnational governments should be made aware of the broader implications of a clean energy transition, such as reduced revenues from fossil fuel taxes and potential fossil fuel industry job losses. **To pre-empt and compensate for the same, support is required to underline and leverage the sub-national economic opportunities in advancing RE manufacturing and innovation eco-system. States with considerable economic dependence on fossil fuel supply chains must invest in re-skilling of the thousands of employees that stand to lose their jobs as an unfortunate by-product of the clean energy transition.**

States and central agencies may also leverage public funds to subsidise burgeoning sectors, as has been successfully done through the FAME (I and II) scheme to promote EV investments in the country. Research by CEEW underlines that credit enhancement through targeted subsidies to the tune of \$650 million can leverage-in enough finance to double India's ground-mounted solar capacity.²⁵ By restructuring taxation and public finance policies, healthy competition between states to become attractive climate finance destinations will lead to a 'race to the top' wherein climate finance can fuel economic growth.



INDIA'S ROAD TO 450GW:
DRIVERS AND OPPORTUNITIES

Demand-pull Through Innovation

“Financing Green”—defined as the money flowing towards green projects and outcomes, has been steadily growing as outlined in section 2. Increasing this amount further is a question of bolstering the ‘demand’ for climate finance, i.e., creating a pipeline of attractive projects and start-ups that (based on their ‘investment-worthiness’ alone) are capable of absorbing mainstream private finance.

Diversifying climate finance options means attracting investors to sectors beyond utility-scale renewable energy as well. Technologies with the potential to disrupt the clean energy sector such as chemical storage, hydrogen, hybrid systems, and even cold fusion are in various stages of development and deployment. A system that rewards innovators to develop unique technologies and business models will play a catalytic role in broadening the landscape of available clean technology options for investors. Public sector backing through domestic manufacturing drives and the Atal Innovation Mission underpin the expected rapid growth of India’s innovation ecosystem.



Evidence hints at the growing interest of venture capital in entering the clean power space as its next big bet. This can be achieved through overcoming sector-specific hurdles and supporting innovative ‘proof-of-concepts’. **Philanthropies and development banks can play a key role in establishing and developing theme-driven impact funds. Further, start-up accelerators and mentorship programs are some strategic pillars that can support the rapid growth of this ecosystem.**

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NOTE

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