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ORF SPECIAL REPORT

DECEMBER 2017



Mobilising Private Capital for Green Energy in India

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This report is part of the Observer Research Foundation's "Financing Green Transitions" series which aims to find potential linkages between private capital, in all its forms, and climate action projects. The series will primarily examine domestic and international barriers to private capital entry for mitigation oriented climate projects, while also examining potential avenues for private capital flow entry towards adaptation and resilience projects.

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ISBN 978-93-87407-21-3

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INTRODUCTION

Background

In late 2015 the Paris Agreement, ratified by nearly every sovereign nation in the world, was passed. The international climate treaty aimed to restrict increases in the global temperatures to two degrees Celsius over the course of the 21st Century. More than 140 countries submitted Intended Nationally Determined Contributions, outlining the specific actions they would take to reduce carbon emissions over the next 50 years. Additionally, established economies pledged funds towards the developing world to help them catalyse their low carbon transitions.

Unfortunately, developed countries are not on track to provide the \$100 billion of collective annual assistance promised to the developing world for climate mitigation and adaptation purposes. Current estimates show that approximately \$51 billion a year are flowing to developing economies, with \$22.8 billion coming in the form of bilateral assistance and \$16.6 billion stemming from multilateral organisations.¹ Additionally, according to certain experts, the actual amount of annual funding needed to achieve the goals set forth in the Paris agreement is closer to \$300 billion,² further highlighting the need for climate action financing in the developed world. While bilateral funding, multilateral organisational funding and domestic government spending will continue to play an important role in funding climate action projects in the developing world, the flows need to be complemented by a substantial increase in private capital in order to meet the goals set forth in the Paris Agreement.

While most climate action projects do not have any inherent investment problems associated with them, they do require large scale upfront investments and years until cost can be recovered. The guaranteed and predictable returns associated with such projects should fit the investment profile of long term institutional investors (insurance companies, sovereign wealth funds and pension funds). Climate action projects, however, make up less than 1 percent of the \$100 trillion worth of investments from institutional investors.³ This figure is much lower for climate action investment in developing economies, with a number of factors hindering private capital investment.

Context of the Study

This study, part of the Observer Research Foundation's "Financing Green Transitions" series, will analyse the domestic barriers preventing institutional investment towards climate action projects in the developing world. Impediments to private capital flows have been analysed across three emerging economies –

India, Nigeria and South Africa –with a specific spotlight placed on the renewable energy sector and the regulators and investors involved in formulating policies and making investment decisions within the domain. Opportunities and policy recommendations designed to catalyse private capital flows within each nation will be proposed, with a separate report detailing recommendations applicable to the developing world in general. This report, specifically, will focus on barriers to private capital flow in India.

Box 1: Stakeholder Consultation Methodology

The information in this report is derived from both primary and secondary data sources. Primary data consists of responses collected through interviews with key members of the two major stakeholder groups – regulators and investors – within each nation.

A roundtable on ‘Private Capital for Climate Action’ was organised by the Observer Research Foundation (ORF) in January 2017 to set the course of the study. The roundtable saw active participation from members of the aforementioned stakeholder groups, who provided valuable contributions with their insights.

The first round of primary data gathering was conducted by interviewing participants of the roundtable. Additional sources were obtained using snowball sampling,⁴ with interviewees providing access to important sources within their networks.

A semi-structured, open ended questionnaire was prepared and shared with the interviewees in advance. Interviews were conducted through formal face-to-face meetings or telecon, subject to the convenience and availability of the interviewees.

Secondary literature including publications by government agencies, private research papers, national and subnational renewable energy policies, regulations, and tariff orders were consulted, as needed.

Strict anonymity has been maintained with regards to the name and organisational affiliation of participants for the purpose of this study.

Key Stakeholder Group - Regulators

Regulatory bodies seek to address market failures such as anti-competitive behaviour, market misconduct, information asymmetries, and systemic instability in order to ensure economic efficiency, consumer protection and social justice. Given their expertise in devising and monitoring rules for policy implementation, they are an important part of the policymaking process.

Regulators can be influential in directing institutional investment for renewable energy projects in the developing world. By creating helpful policies,

fostering conducive business environments and encouraging legislation designed to protect private corporations, regulators can provide powerful incentives for private capital flows. On the other hand, weak or unclear renewable energy policies, significant bureaucratic red tape, and a legislative arm that hinders investments, can make institutional investors view regulations as an additional impediment.

Key Stakeholder Group - Investors

The term “investors” can cover a large portion of the financial world, but in the context of this study, the term is meant to signify international institutional investors - insurance companies, sovereign wealth funds and pension funds with billions of investment capital at their disposal. Generally, institutional investors tend to be risk averse, with a preference for low risk, low return investments over the higher risk, high return investments preferred by hedge funds and private equity firms. Given these tendencies, institutional investors are less willing to expose themselves to what they perceive as risky investments with the renewable energy sector or the developing world, leading to a higher threshold for investment approval compared to other parts of the financial framework.

INDIA OVERVIEW

India’s Power Sector

India occupies a prominent position in the current global energy scenario.⁵ India’s energy demands have risen exponentially due to a number of factors, including but not limited to, economic growth, population surge, and rapid urbanisation. In order to meet rising demands and achieve its economic targets, India must dramatically expand its power sector.⁶

India is heavily dependent on fossil fuels for power generation, as 75 percent of India’s electricity generation comes from coal based thermal plants. India’s Twelfth Five-Year Plan, a framework document outlining India’s governance blueprint over the 2012-2017 period, reports varying degrees of energy shortages over the last six decades despite significant additions in generation, transmissions and distribution capacities.⁷ To address these shortages, the government has set a target of two trillion kilowatt hours of domestic energy generation by 2019. Achieving this goal will require India to double its current energy production capacity.⁸

With climate change issues taking centre stage in the international policy arena, India has voluntarily adopted a low carbon transition strategy, placing a high priority on increasing renewable power generation capacity. Renewable energy sources currently account for 29% of India’s power generation capacity, placing it second only to thermal.⁹ India’s renewable energy installed capacity has

grown from 27 GW in 2000-14 to approximately 93 GW in December 2016.¹⁰ Hydropower and wind energy have been the primary contributors to this growth accounting for 73.84 GW or 79% of the installed capacity. Solar power (9.01 GW), biomass power (7.85 GW) and small hydro power (4.33 GW) make up the rest of India's renewable energy installed capacity.

India continues to view renewable energy as a crucial part of its future energy plans and plans to install 175 GW of installed renewable energy capacity by the year 2022.¹¹ The government aims to achieve this goal by increasing solar energy capacity to 100 GW, recapturing 10 GW of waste-to-energy power, upscaling wind energy production to 60 GW, and restarting previously stalled hydro power projects. To meet this renewable energy target, India will require \$189 billion in additional financing.

Policy and Regulatory Framework governing Indian Renewable Energy

Under the Indian constitution, administrative power is shared between the central and state government. India's governance model relies heavily on bureaucracy, with a number of departments involved in regulating and creating policy for the renewable energy sector.

The Ministry of Power and Ministry of Finance develop policies pertaining to electricity tariffs and provide fiscal incentives for the promotion of renewable energy. The Ministry of New and Renewable Energy (MNRE) provides overall policy guidance for the sector.

The Central Electricity Authority (CEA) prepares a national electricity plan every five years, assists the Ministry of Power and MNRE in all technical and economic matters, and is entrusted with a number of statutory functions. The Indian Renewable Energy Development Agency (IREDA) is the non-banking finance arm of the MNRE, and is dedicated to the promotion of renewable energy financing.

The Central Electricity Regulatory Commission (CERC) and State Electricity Regulatory Commission (SERC) provide regulatory oversight for the Indian power sector. At their respective levels, CERC (on a central level) and SERC (on a state level) set guidelines for feed-in tariffs and electricity rates.

The 2003 Electricity Act, is the key policy document guiding the development of renewable energy in India while the 2006 National Tariff Policy, provides the impetus for state government's purchases of a certain minimum percentage from renewable energy sources.

India's demographics, demands and governance model have coalesced to provide a unique set of barriers for institutional investors looking to develop renewable energy projects in the country.

BARRIERS TO PRIVATE CAPITAL INVESTMENT

Policy and Regulatory Bottlenecks

India's renewable energy policies and regulations are a significant deterrent to private capital investment in clean energy projects. Policies regarding renewable energy projects have evolved rapidly and at times haphazardly due to the Modi government's ostensible commitment to a low carbon transition. The policy making process has not been inclusive, however, as private sector contributions have only been requested towards the later stages of the policy framing process. Stakeholders interviewed for this study believe that investor and business owner inputs are needed throughout the entire formulation and implementation process in order to formulate cohesive and meaningful policy measures.

Additionally, regulatory measures and frameworks for renewable energy seem to be inconsistent with certain other government policies. For instance, India has pledged to reduce coal based electricity generation to sixty percent of overall power generation by 2050 per its Intended Nationally Determined Contributions (INDCs). Current policies, however, indicate limited scaling down and shuttering of thermal plants over the next two decades.

Further examples of misaligned policies can be seen in India's push towards 175 GW of renewable energy capacity by 2050. In order to achieve this goal, financial regulations would need to be changed as well. Yet, there has been no indication of a concurrent policy shift by the government. The lack of alignment between climate policy and other macro policies has created further unease amongst financiers looking to make renewable energy investments in India.

An additional issue pertains to the unpredictability of government policies. Large scale economic shifts such as demonetisation, as well as sector oriented policy shifts such as the recent reduction in depreciation benefits for renewable energy sources have contributed to investor uncertainty. Studies show that frequent changes in policies can significantly impede the scaling up of renewable energy investment in India's foreseeable future.¹²

In addition to policy unpredictability, another area of concern is the non-enforcement of central government policy. A stark illustration of this can be seen in the case of certain Indian states where only ten percent of renewable energy investors have received promised government subsidies. Additional examples can be seen in the state of Maharashtra, where the government has refused to provide payments for electricity generated by wind farms ostensibly due to a lack of demand.

Renewable energy investors looking to initiate projects in India also have to deal with inconsistency in power procurement policies. Certain states, for example

award contracts to developers based on determined, fixed tariffs. In other states, however, developers are required to go through a reverse auction bid process.

While subnational variances can be problematic for investors, of even greater concern are post hoc shifts in energy procurement policy. A number of states have shifted their policies arbitrarily, going from fixed tariff to reverse auction bid and vice versa. The mismanagement of the procurement process by Indian states have created uncertainty around what should be a straightforward procedure, which can have an adverse effect on investor confidence.¹³

Additionally, concerns have also been raised about the competitive bidding processes implemented in certain states. Discussants, citing the dramatic drop in renewable energy rates over the past five years, believe that the bidding mechanism could incite financially unsound bids from renewable power producers. While technology developments have led to lower material and project development costs, somewhat justifying the downward trend in overall project cost, there remains uncertainty over the medium and long term sustainability of these renewable projects. The worst-case scenario is an en masse collapse of the Indian renewable energy industry, which would certainly hamper future private capital flow for such projects in the future.

Political Risk

A corollary to India's policy and regulatory issues are the politics present within the Indian governance architecture. The non-enforcement of central government policies mentioned in the previous section is part of the problematic dynamic that exists between India's central and state governments. India's constitution accords a fair amount of autonomy to states – for example, resources such as land and water fall under state jurisdiction rather than that of the central government. The pricing of electricity for consumers and the determination of power procurement methods also fall under the purview of the state government. As a result, state governments can play a critical role in the advancement or discouragement of private capital flow for renewable energy projects.

The importance of the state as an entity was elucidated by an interviewee who recalled a scenario in which a particular state government was governed by the central government's opposition party. Despite the incentives laid out in central government policies, the state government was able to impede a potential renewable energy projects through sheer obstinance. Intransigent local authorities were able to induce significant time delays, using bureaucracy and red tape to stall information requests and clearances. The discussant registered complaints to the heads of the appropriate departments to no avail. Eventually, after having exhausted all options, the discussant was forced to drop the proposed project.

Wilful use of delaying tactics on the part of the state authorities are not simply the by-product of partisan politics - administrative turf wars between the federal and state government can also side-line promising projects. Significant time delays in a project can be costly, serving to further dis-incentivise private capital flows.

Off-Taker Risk

One of the most significant areas of concern in India is the poor financial health of the power sector and the consequential dampening effect on the flow of private capital for renewable energy projects. Concerns are specifically focused on the power distribution companies (DISCOMS) which have been, with a few exceptions, operating at a loss for many years, with the government having to bail the sector out three times in the past 13 years.

The largest factor for the continued failures of Indian DISCOMS are the policies that govern electricity prices for consumers. Consumer electricity rates are determined by state authorities and rates are largely set for political reasons¹⁴ with certain powerful lobbies, such as the agricultural sector, receiving fully subsidised electricity. These electricity rate policies have unfortunate consequences for the DISCOMS, who have to pay power generators between thirty to fifty percent more than the amounts charged to end users.¹⁵

There are additional reasons for the financial losses incurred by Indian DISCOMS – among them large scale distribution issues.¹⁶ The distribution issues come most often in the form of power theft and transmission leakage due to unstable electricity grids.¹⁷ Operational inefficiencies, largely manifested in the form of collection issues and misallocation of resources also affect DISCOMS, serving to add further cash flow strains to financially stressed balance sheets. The amalgamation of loss generating activities often force DISCOMS to take out loans to continue operational activities, which only further exacerbates the matter. Adding interest payments to the list of costs places firms under greater financial duress, leading to the aforementioned scenario wherein the government is forced to rescue the entire industry.

Despite the implementation of policies aimed at revamping the sector, certain DISCOMS have been unable to follow through on their payment commitments to power generators over the past few years fulfilling only a portion of their power purchase commitments. This has once again put the Indian power sector in a precarious position leading to a great deal of investor uncertainty with regards to the financial viability of future power purchase agreements.

The difficulties faced by the Indian power sector are further aggravated by policies implemented in certain states. Renewable Power Obligations (RPO), a policy initiative designed to encourage renewable energy projects, compel DISCOMS to purchase a certain percentage (five to ten percent) of their electricity from renewable power sources.¹⁸ While renewable energy prices have been steadily

falling, there are states where thermal power remains less expensive for distributors. Unfortunately, this has led to a scenario where DISCOMS have avoided entering into agreements with large renewable energy producers, as the power provided by said sources would exceed the percentage required under the RPO's.

There are no easy solutions to the issues facing the Indian power sector. Under the India constitution, issues related to electricity pricing fall under the jurisdiction of the state government. Unless there is a constitutional amendment, the central government has no discernible way to regulate electricity prices charged to consumers, and are therefore powerless to make wholesale changes to the industry.

Technology Risks

Another area of concern for investors is the technology risk associated with the renewable energy sector. An overarching issue, on the global level, pertains to the perception of renewable energy as a technology that is still evolving. Consequentially, investor sentiment among certain segments view the risk of technology obsolescence to be too high. The possibility of a scenario in which renewable energy investments quickly become antiquated and the potential downside of the losses that could be incurred, act as a psychological hurdle for some investors.

In addition to the risk of industry wide technological risks, interviewees also voiced concerns about the adaptability of renewable energy technologies to local conditions. Solar and wind component manufacturing is dominated by China and while the technologies have been tested in other regions, their performance under Indian conditions is uncertain given the nascent nature of its renewable energy sector. Ideally, there would be standards to ensure the capability of all foreign manufactured renewable energy components – unfortunately, India does not have any governing guidelines or regulatory body overlooking such imports. The lack of adaptability to the subcontinent's environment could lead to excessive inefficiency or even failure of the technology under extreme conditions creating further uncertainty in the mind of investors.

A further issue pertinent to the Indian renewable energy ecosystem is the lack of easily accessible environmental data. In order to determine the viability of a renewable energy project, investors tap into country specific databases to procure information regarding environmental factors. The importance of this data is perhaps best illustrated by looking at the example of a solar power plant.

During the beginning stages of a solar project, potential investors attempt to identify the amount of solar radiation that a location receives over a certain time period. This data is then fed into software that calculates the amount of energy that will be generated if a solar plant is set up in the location, taking into account a

multitude of factors. India does not currently have an existing solar radiation database. As a result, potential investors looking to build a solar plant have to use other data sources which have been shown to have discrepancies of up to seven percent when projecting energy generation. The variance is hard to account for in the profit forecasting models that financiers use to make investment decisions, thereby creating an added layer of uncertainty for private capital to take into account.

The state of India's electricity grids is an additional source of apprehension for investors. India's electrical grid infrastructure is below standards, with a transmission and distribution (T&D) loss percentage of twenty one percent in 2014, four times the T&D Loss percentage of China and the United States in the same year.¹⁹ Revenues losses due to T&D leakages are further compounded by the transmission constraints of the national electricity grid. India's national electricity grid cannot currently handle excess electricity generation transfers between regions, which has leading to significant curtailment of renewable energy power in certain states.²⁰ If the issue is not rectified, there is the possibility of a worst-case scenario where over congested grids could lead to a scaling back of future contracts in an otherwise conducive renewable energy environment.

Leaving aside the T&D losses and the inherent inflexibility of the national electricity grid, India still faces problems in integrating renewable power sources to the grid. The variability and intermittency associated with solar and wind power, combined with a lack of grid capacity, has led to major bottlenecks in the transmission of renewable based electricity within states themselves. Curtailment rates have been as high as fifty percent due to issues related to transmission and the lack of a smart grid.²¹ Baring a dramatic uptick in investment, technology related concerns will continue to act as a deterrent for large scale private capital flow.

Upgrades to the grid infrastructure are not enough however – they need to be paired with adequate inflows of technical knowledge in order to truly make the grid stable enough to handle increased energy capacity. The dearth of technical expertise is not restricted to grid-related issues – it is pervasive throughout India's renewable energy sector. Construction and maintenance of renewable energy sources require specialised skill-sets. If appropriate capacity building measure for said skills sets are not prioritised within the labour force, there could be manpower shortages for renewable energy construction and inadequate responses to operational problems for existing renewable energy sources. Both scenarios could result in institutions rethinking private capital investments for renewable energy in India.

Construction Risk

An issue that continues to trouble investors attempting to conduct business in India are the risks associated with the construction of renewable energy projects

within the country. Stakeholders participating in the study have cited a number of challenges endemic within India's supply chain and construction process that can lead to potential projects being derailed.

Problems can be seen as early as the land acquisition step of the construction process. The lack of an organised and regulated real estate market can lead to land prices doubling or tripling at the advent of any surveying activities of the potential area. Furthermore, protests, barricades and other nuisances are sometimes used by district organisations to coerce businesses into providing additional off the books fees or guaranteed employment for locals. The largest disruption, however, is caused by the red tape and bureaucracy that is involved with any transfer of land rights. Per industry estimates, the real estate acquisition process in India can take anywhere from a month to 22 years to complete, depending on the state and municipality.²²

Problems also arise in other parts of the supply chain, as raw materials are not always appropriate to particular projects, are not what was originally ordered by the firm, or are damaged upon arrival. There is also a propensity amongst vendors in India to deliver partially completed or severely delayed orders. Furthermore, there is also the possibility that a vendor will simply not fulfil an order. Legal recourse is costly for investors in such cases, due to the onerous judicial system – contract disputes take close to four years to resolve in Indian courts.²³ To avoid a protracted legal battle and the ensuing fees, investors resort to simply re-ordering the materials from a different vendor – which leads to time delays and extra costs.

The acquisition of solar panels is particularly problematic given India's import dependency for the material; 87 percent of solar components used for Indian solar projects come from China. Domestic cell manufacturing capabilities are currently unable to meet demand, largely due to high manufacturing costs, lack of technical expertise and inability to match competitive market prices. Considering these factors, it is more economical to import panels for Indian solar projects rather than manufacture them domestically. This is problematic for investors, as imports can be subject to both geo-political and geo-economic shifts, which further contributes to an environment of uncertainty.

Potential fluctuations in solar panel prices and the lack of forward markets also contribute to uncertainty when projecting costs for solar plant investments. An unexpected uptick in global solar module prices can make an otherwise profitable project, financially unviable. A dependence on imports for solar panels also leaves entrepreneurs open to foreign exchange risk, as significant currency fluctuations can make projects unprofitable.

The assorted construction risks faced by investors lead to unexpected costs, time delays and general difficulties in getting projects up and running, all of which

effect profit margins. The uncertainty associated with revenue streams and profits act as strong disincentives for investors.

Lack of Available Debt Financing

The lack of available domestic debt is also a major barrier to the flow of private capital for renewable energy projects in India. India's financial sector has grown significantly over the past two decades but capital markets have not yet fully matured, making access to domestic debt problematic for many investors.

An overarching hurdle for renewable energy projects across the world are the formidable start-up costs associated with such investments. The high capital requirements result in longer payback periods, which tend to deter some investors. The high upfront investment and the long payback period can drive more risk-averse investors towards "safer" investments.

Investors attempt to mitigate the issue of high start-up costs by using long term bank loans to raise at least a portion of the needed capital. Loans provided by Indian banks, however, tend to have short term tenures. Consequentially, international investors have to resort to refinancing, leading to higher interest related costs. Indian banks also have a number of prudential regulatory policies that makes access to debt difficult for renewable energy investors. Paramount amongst these regulations are the exposure limits for sectors, which force banks to set an upper limit to the portion of a bank's balance sheet that can be lent to each major economic sector. Renewable energy is typically classified as either infrastructure or energy, categories dominated by capital intensive projects such as roads or nuclear energy plants. Unfortunately, this leads to a crowding out of renewable energy projects, as most banks tend to be approaching their sector limits due to the length and capital of the loans that characterise said sectors.

There is also a common perception among investors that banks are not comfortable in extending loans for renewable energy projects because of their lack of expertise in assessing projects within the space. The lack of capacity amongst lenders has led to unorganised risk assessments and inconsistent due diligence methodologies, per stakeholder interviews. An example of this was provided by a discussant who described a scenario where their firm approached five banks to obtain funding for a renewable energy project. All five institutions provided different risk ratings, interest rates and collateral requirements illustrating the lack of consistency inherent in the assessment of renewable energy projects across Indian banks.

Given that institutional investors rely on bank debt to not only provide necessary capital, but to also leverage their equity, the high cost of debt in the Indian market tends to significantly deflate returns, making renewable energy projects financially unviable for investors.

The immaturity of the Indian banking sector is mirrored by its underdeveloped insurance industry. Indian insurance companies are not permitted to provide performance guarantees to the renewable energy sector due to restrictive regulations set out by the Insurance Regulatory and Development Agency (IRDA). Performance guarantee clauses, which are readily available in American, European and Australian markets, help protect investors in cases where power generation output does not match the terms set forth in the contractual agreement. Environmental, technical and business conditions make this a likely scenario in India, and the lack of performance guarantees act as a disincentive for private capital flow for renewable energy projects within the subcontinent.

RECOMMENDATIONS

While the aforementioned areas of concern have undoubtedly created hurdles for the inflow of private capital for renewable energy projects in India, there are also opportunities available to overcome many of these problems.

Given the large role that government organizations play in the creation of hurdles, policy based initiatives must play a key role in overcoming the barriers for private capital flow. One possible policy based initiative could be the proactive implementation of Special Incentive Packages (SIPs) designed to promote the construction of domestic manufacturing plants. Support could be provided to the industry through low-cost government based financing and low-tariff electricity, as is the case in China. Fostering the cell manufacturing industry under the 'Make in India' initiative can allay some of the investor uncertainty associated with solar plant investments in India.

In order to address concerns regarding the lack of operation and management expertise for renewable energy technologies, capacity building measures and skills training can be undertaken. The Ministry of New and Renewable Energy has already put forward plans to provide skill training to 50,000 people over the next two to three years in order to maintain and manage renewable energy technologies. This initiative could be scaled up, with additional training programs aimed at skill training for the domestic manufacturing of renewable technologies as well.

There are additional opportunities that could address technical suitability issues with regards to renewable materials. An initiative designed to create a regulatory body for quality assurance purposes could address the flow of ill-fitting imports and serve to provide further structural support for a nascent domestic manufacturing industry.

Political discord between central and state governments could be bypassed by leveraging existing state nodal agencies (SNAs), who could play a significant role in the facilitation of the myriad state clearances required for renewable energy

projects. The creation of a single window clearance mechanism could foster a conducive investment environment by facilitating the approvals required from different line departments such as pollution control, land, fisheries, forests etc.

A comprehensive policy or action plan for all-round development of the sector should also be formulated, and structures should be set up to ensure strict adherence of procedures and practices at all scales and levels of policy implementation. The action plan should be prepared in consultation with all actors involved including state governments, sector experts and investors.

The Ministry of New and Renewable Energy has stated that policy formulations are underway, to make the business atmosphere more conducive for renewable energy investments. The ministry is also working on a comprehensive renewable energy law which attempts to address issues surrounding policy uncertainty. However, the timeframe for the formulation and enactment of such a law has not been fixed. Considering the time delays prevalent within the Indian bureaucratic system, the government must set a deadline in order to ensure that the desired law is enacted expeditiously.

One of the crucial elements involved in the construction of renewable energy projects is the availability of reliable and accurate resource data. While the MNRE has allegedly taken steps to address the data gap,²⁴ there are only a few agencies maintaining a comprehensive data bank on renewables at the state level. This provides an opportunity for India to enter into research ventures with firms attempting to devise modelling systems for more accurate climate data. Additionally, a database with accurate forecasts of power production, prior transaction records, and potential project pipelines can address the uncertainty that currently acts a disincentive for private capital investors.

Non-enforcement of policies, laws and regulations are a significant issue within Indian. A potential opportunity to tackle said issues can come through changes within the legal encouraging punitive action and bypassing the often-convoluted litigation process in India. A tribunal arm dedicated to dealing with conflicts in priority sectors such as infrastructure and renewable energy could provide assurances to private capital investors that there are indeed viable legal recourses available to them. The newly created tribunal arm could also be tasked with the formation of binding arbitration proceedings for vendor-customer disputes, issuing ordinances dealing with disruptive local elements and enforcing payment of purchase power agreements.

While the public sector can catalyse capital for green investments, the private sector can also be employed to remove barriers. One such opportunity involves the national electricity grid. Currently, the national electrical grid is under the purview of the government, which has led to slow moving changes with regards to upgrading and stabilising the grid. By entering contracts with players from the private sector, the delays and red tape associated with grid issues could be avoided.

Considering the urgent need for changes to the grid, the private sector might be able to provide a better solution than the government.

One of the largest opportunities to bring private capital for renewable energy into India stems from the revitalisation of the electricity distribution sector. Considering the ongoing and decades spanning problems associated with DISCOMS, there is only one sensible solution in regards to the industry. The central government must take steps to ensure that the free market determines electricity rates, rather than the state government. One potential solution could involve the government taking on and paying off all current debts owed by DISCOMS, and then privatising the entire industry – a strategy that has been advocated by a number of Indian policy strategists.²⁵

The prevalent pricing issues, operational inefficiencies, collection issues, and problematic borrowing tendencies of DISCOMS stem from public sector malaise and political manoeuvring. If for-profit corporations are allowed to operate electricity distribution, DISCOMS can be quickly revamped. Direct subsidies to certain disadvantaged consumers can cushion the harmful effects of electricity prices hikes for the general populace.

The pricing uncertainty associated with solar panels is also an issue that can be tackled through private sector solutions. The creation of a forward market for solar panels by Indian banks could be a solution designed to help ease investor uncertainty and encourage private capital flow. An ancillary benefit to the creation of a solar forward market could be the establishment of India as a potential international leader for a portion of the renewable energy ecosystem. Farfetched as it may seem, the branding benefits could help investor perceptions leading to a further influx of private capital.

CONCLUSION

As elucidated by this report, India needs a significant amount of private capital investment in order to successfully conduct a low carbon transition. There remain a number of barriers to private capital investment, however, including regulatory bottlenecks, political risks, off-taker risks, technology risks, construction risks and the lack of domestic debt finance. These risks can be managed through policy initiatives aimed at resolving the regulatory, political and technology issues, strengthening of the judiciary to deal with construction risks and private sector involvement to better manage off-taker risk. 

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