सत्यमेव जयते
Government of Rajasthan

Chief Minister's Rajasthan Economic Transformation Advisory Council (CMRETAC)

DEPARTMENT OF PLANNING, RAJASTHAN

POLICY STUDY ON FINANCING GREEN INFRASTRUCTURE IN RAJASTHAN

indicc associates

Technical Support Organisation
CMRETAC

CEEP
CENTRE FOR ENERGY, ENVIRONMENT & PEOPLE

ESYA centre

2023

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Chief Minister, Rajasthan
& Chairman, Economic
Transformation Advisory Council

CHAIRMAN'S MESSAGE

Every state is important in the scheme of national development. We cannot assure the progress of India without the progress of the states. The Constitution binds us in a federal polity where every order of the government (Union, State and Local) has an important role to play. State governments are certainly closer to the people and hence bear an enormous responsibility towards ensuring effective delivery of goods and services.

In this endeavor, they have a direct, indirect, and enabling role to play. Rajasthan is committed towards that goal and has been at the forefront of many reforms since long. Our sincere and unceasing efforts, during the pandemic and otherwise, have been recognized widely.

The Bhilwara COVID-19 containment model has been recognized as a replicable model globally. Ours was also one of the first states in India which came up with a comprehensive strategy for economic revival in the wake of the pandemic. Besides taking a plethora of immediate steps to extend social and economic relief to the people during COVID-19, Rajasthan has also introduced several transformative measures in the recent past to boost the economy of the state. MSME Facilitation Act, 2019; Food Processing Policy, 2019; Tourism Policy, 2020; Mukyamantri Chiranjeevi Swasthya Bima Yojana, 2021; Handicraft Policy, 2022; Rajasthan Investment Promotion Scheme, 2022; Rajasthan Right to Health Care Act, 2022; Indira Gandhi Urban Employment Guarantee Scheme, 2022 and Vision 2030 are some of the path breaking initiatives undertaken by the government.

We also started a practice of 'thematic' annual budgets for converging our efforts and energy on most pressing issues and have ensured that governance is truly decentralized. Our campaigns on 'Prashasan Shehron Ke Sang Abhiyan' and 'Prashasan Gaon Ke Sang Abhiyan' are examples of that spirit.

While our efforts are incessant, structural slowdown and unexpected shocks like the pandemic can derail the economy. This calls for continuous preparedness on our part.

Creation of Chief Minister's Rajasthan Economic Transformation Advisory Council (CMRETAC) was a significant step to ensure our preparedness for short-term and long-term development objectives. In the year 2021-22, the Council prepared nine (09) policy studies on areas as diverse as Fiscal Management; Managing Urban Informal Sector; Integrated Agro-Business Infrastructure; Sustainable Agriculture; Doing Business; Quantifying Intangible Cultural Assets; Education and the New Paradigm (bridging digital divide); Medical Services; and Public Private Partnership in Infrastructure.

In the year 2022-23, the Council undertook six (06) new policy studies. These pertain to Building Energy Transition Roadmap; Financing Green Infrastructure; Urbanization of Rural Areas; Recalibrating Institutions to meet Climate Challenges; Using Data for Better Policy Formulation and Evidence-based Decision Making; and Redesigning Trade in the Era of E-commerce.

These policy areas may appear to be separate and discreet but one commonality that binds them all is that they are truly geared towards a bottom-up approach to the development of the state while embracing and addressing new challenges. I urge my colleagues in the state government to also focus on inter-linkages in these policy areas for the best possible outcomes.

I am confident that these fifteen (15) path breaking studies would be a valuable input for the state and I am happy to state that the present policy study is very much part of this endeavour.

I am grateful to the Members of the Council, my Ministerial colleagues, officers of the Government, all collaborators and organizations who have worked tirelessly to make this possible. My special acknowledgement of Dr. Arvind Mayaram, Vice Chairman, CMRETAC, whose leadership and contribution towards this endeavour has been extremely valuable. My appreciation is also to the entire team at CMRETAC which has diligently worked to put these reform-oriented studies together.

(Ashok Gehlot)

सत्यमेव जयते

Economic Advisor to CM
& Vice Chairman
CM's Rajasthan Economic
Transformation Advisory Council

VICE CHAIRMAN'S MESSAGE

Over the last few years several studies have indicated a significant financing gap for climate action. As per an estimate by Climate Policy Initiative roughly INR 11 lakh crores (USD 170 billion) per year is needed to meet India's enhanced Nationally Determined Contribution (NDCs). Several other studies have also suggested a significant financing gap. Incidentally, most of the finance will be required for sustainable infrastructure, and if all transition and adaptation costs are adequately factored in, the finance requirement is likely to increase many fold. In other words, the requirement may be much more than what public finances can cater to.

Therefore, there is a need to tap into private capital market. However, this would require careful calibration as debt limits have to remain sustainable. Sub-national action will be critical because a large part of infrastructure is with states and is monopolistic in nature.

This necessitates simultaneous action on several aspects. This would include gap assessment, transition plans and innovative use of financing instruments and structures.

Towards this objective, the Chief Minister's Rajasthan Economic Transformation Advisory Council (CMRETAC) in collaboration with Indicc Associates prepared the present study on 'Financing Green Infrastructure in Rajasthan'. The study aims to address the gaps and propose strategies in the short, medium and long term, and envisions the creation of institutional mechanisms that can address the gaps.

The study also entails a case study from the power sector and articulates policy options to finance the same. Importantly, the study draws attention towards an

innovative approach to finance sustainable infrastructure in the back drop fiscal headroom.

My gratitude to the Hon’ble Chief Minister Shri Ashok Gehlot for his continuous guidance and support. I also thank Hon’ble concerned Ministers, esteemed members of CMRETAC for their valuable guidance, all the concerned secretaries, officers in the government, Technical Support Organization to CMRETAC and all other collaborators.

(Dr. Arvind Mayaram)

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Abhishek Kumar
Technical Advisor, CMRETAC
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EXECUTIVE SUMMARY

Green transition is imminent, and trillions of dollars are estimated for making this a reality. The current investment numbers suggest that the overall flow of finance is insufficient to meet the climate goals. Climate Policy Initiative estimates that US $ 44 billion flowed in green finance to India as compared with the annual requirement of US$ 170 billion to meet India's NDC[1]. Private sector's contribution to finance has been 59% whereas the rest is public sector's contribution evenly supported through Government Budgetary spends (Central and State) and PSUs at approximately 54% and 46% respectively.

Going forward there will be two challenges with public finance, namely, the debt limits prescribed by law and the loss of tax revenue where there is large fossil fuel dependent economy. The fiscal resources will have to be used more efficiently to crowd in private capital. More importantly there is also a need to scale up finance for adaptation that at the moment remains limited.

In this backdrop, this report looks at some critical and fundamental aspects so that a sustainable finance pathway can be ushered in Rajasthan. At the outset, the report highlights two seminal messages from Rajasthan's Climate Action Plan. First, the state needs equal focus on mitigation as well as adaptation measures. This is an important message, particularly in light of the fact that most studies highlighting the financing gap tend to predominantly focus on mitigation. The second important aspect that that the state climate action plan draws the attention towards is the absence of specific action that needs to be taken in order to calibrate state's growth strategies in accordance with regional vulnerabilities.

This is important to consider because a large part of climate action and sustainable development depends on infrastructure creation and without an adequate assessment of infrastructure requirement in accordance with regional vulnerabilities, the risk profile of investments may go up. Therefore, there is a need for more granular approach to green infrastructure planning.

Be that as it may, creation of Green infrastructure in the state is also highly contingent upon fiscal headroom which is severely limited at the moment. In fact, a singular message that can be extrapolated from the financing requirement that various studies have highlighted at the national level, is that sooner or later all states in India will have to step up unprecedented debt management strategies in order to meet climate goals as public finance will not be enough.

[1] Landscape-of-Green-Finance-in-India-2022-Full-Report.pdf (climatepolicyinitiative.org)

This study is a testament of the fact that Rajasthan is one of the few states that recognizes this reality and hence is keen to undertake a strategic approach to sustainable infrastructure creation.

In order to do this, it is important to identify and use tools to access Green finance and expand the envelope of financing through secure and innovative mechanisms. Accordingly, role of few instruments, structures and institutions have been elaborated upon in the first section of this report. These include (Green) Sustainable Development Loan (SDL), Public Private Partnerships (PPP) in Green Infrastructure, Infrastructure Investment Trusts (InvITS), Infrastructure Debt Fund (IDF), and revamped role of PDCOR Ltd – a state level institution that holds immense potential to enable access to long term private capital for green infrastructure creation.

While the Green SDL route, owing to concerns around fungibility and absence of comprehensive Green tagging in the budget, appears to be a relatively a limited avenue, it can have a significant demonstration effect. However, with 'Green' classification of assets using internationally recognized taxonomy, there is a possibility to expand Green financing through SDL route in the future. But since SDL is mostly used to finance fiscal deficit, its scope still remains limited as the requirement for Green transition is likely to be significantly higher. In other words, over and above the borrowing limits available under fiscal responsibility legislation.

This necessitates exploring other avenues like PPPs which can substantially enlarge the financing envelope without significant fiscal overhang. Importance of PPPs is also significant as large part of infrastructure is with states and is monopolistic. In PPPs the asset is inherently public while financing and management can be taken care of by the private player. This allows a win-win for both parties while serving the public interest effectively. Until now no specific framework for PPPs in Green Infrastructure is publicly available barring some studies such as from the World Bank which have taken a very high-level view. Therefore, this study attempts to spell out a framework for PPPs in Green infrastructure in some detail. It may be further refined and institutionalized as necessary institution (PDCOR LTD) is available in Rajasthan to actualize this.

The report then turns to the discussion on two critical avenues namely InvITs and IDFs. While PPPs can be very effective for new infrastructure creation, InvITs and IDFs can come in handy especially in the context of creating investment circularity, expanding the financing envelop and channelling private capital while managing debt. The instruments can be particularly useful for low-risk assets i.e. those that have achieved revenue stage.

The report then turns to a detail framework to mobilize private capital in the state and in doing so emphasizes the need for recalibration of PDCOR Ltd. It is pertinent to highlight that PDCOR Ltd is an ideal institution that can aid structuring of Green Projects in the state. For optimal results, Rajasthan needs to have a detail State Level Green Infrastructure Finance Plan (SLGIFP), whose formulation can be both top down and bottom up. This will enable a dynamic formulation of the plan. In other words, the state does not have to wait for a detailed plan to be first formulated before taking an action. Both top down and bottom up activities can be roll out simultaneously and immediately leading to the structuring of the plan. Given the 2030 timelines and climate urgency, such an approach will be in order.

For the short term, the report also highlights key elements, policies and avenues for alignment with national action so that a concerted action between the union and state can be built on climate action and financing. Most of these are available as annexures which are referred to in different sections of the report. Another important annexure is a detail chapter on Green taxonomy and Green Bonds issuance. Amongst other things, the chapter takes a detailed look at state level considerations Green Bonds issuance.

The report also argues that while technical assistance on Green project financing and access to private capital can be facilitated by PDCOR Ltd, the role of department of finance in close concert with PDCOR will be essential in order to calibrate a glide path to FRBM limits in a time bound manner. For this purpose, the report argues that the Public Finance Management (PFM) Division of Government of Rajasthan, currently supported by the World Bank, could be immensely useful, if equipped by relevant public finance experts. A tight coordination between project structuring and PFM division will go a long way in ensuring a robust fiscal management in the context of climate action.

The report also argues that in the mid to long term there is a need for greater alignment between fiscal and monetary policy. This will be an inevitable reality because as more and more states step up expenditure towards climate action, they would need to calibrate their debt carefully. Even the union government will have to align its short, medium and long term strategies with states. In this context, the report highlights that an important factor that necessitates coordination between fiscal and monetary policy is public debt – a fact amply emphasized by the International Monetary Fund (IMF) as well.

Section 2 of the report looks at the power sector, in particular, at the state Power Generation Company of Rajasthan and its potential financing requirements under different scenarios. However, since designing the exact financing strategy is contingent upon various design factors including regulations such as Tariff Based

Competitive Bidding (TBCB), the report limits itself to providing policy options through different instruments and structures in the short term. In other words, while section 1 looks at both short and long term structural changes on Green infrastructure financing; Section 2 highlights policy options that can be exercised immediately or in the near future.

It is also recommended that institutional framework as suggested in Section 1 should be put in place to systematically plan financing of green infrastructure in the state. Power sector financing ideally should form a part of such a systematic effort in order to usher in a holistic fiscal & debt management strategy.

Section 3 deals with recommendations as do the ensuing paragraphs of the executive summary.

In light of the above, key recommendations from the report are as follows:

With respect to State Level Climate Action Plan

- State level climate action plan highlights the need for high focus on both mitigation as well as adaptation measures while most studies highlighting financing gaps at the national level have preponderance on mitigation strategies. This necessitates the need for Rajasthan to carry out its own assessment of finance requirement for Green infrastructure over the long term.
- The regional or district level infrastructure planning in the state needs greater focus. The current climate action plan does not contain specific action agenda even though there are thoughtful yet disparate steps being taken by several state entities. Therefore, as an immediate step the state should carry out a consolidation exercise to identify projects that may be eligible for Green finance.

Financing Green Infrastructure

- Given limited fiscal headroom, the state should deploy simultaneous options which include use of internationally recognized taxonomy to identify Green assets. The taxonomy may also be used for Green tagging of assets for the preparation of Green budget and fiscal risk statement. For this purpose, a dedicated body may be setup as suggested in the report. This will enable easier flow of private capital and better monitoring of financial resources
- In the short term, earmarking of ‘pure play’ green assets for a Green SDL will be useful. This will have a positive impact on Quality of Expenditure. Once a comprehensive, Green classification of assets is done, the state may enlarge the quantum of financing through Green SDL as well. A Green SDL category could also be built into the composite index prepared by RBI which could

potentially bring down the cost of finance through SDL. This however will be outside the realm of the state government

- For expanding the finance envelop, the state should embark on a State Level Green Infrastructure Finance Plan and institutionalize the framework for PPPs in Green Infrastructure, set up an IDF and increase the use of InvITS for ensuring circularity of finance and managing debt. For these purposes, PDCOR Ltd. could be recalibrated to provide necessary technical assistance. The detail framework presented in the report could be used for the same
- The Public Finance Management Division under Department of Finance could work in tandem with PDCOR Ltd to ensure a sustainable glide path to fiscal deficit over a time bound horizon

Financing the Power Sector in Rajasthan

- While substantial progress has been made in the state on Green power, most of it is meant for export purposes and is led by the private sector. The state power generation company may also embark on a diversification path incorporating greater share of renewables, much on the same lines as some other states like Andhra Pradesh, Tamil Nadu and Gujarat. For this purpose, policy options highlighted in the report (subject to applicable regulations) may be exercised and a detailed design could be adopted using relevant technical assistance. Broadly, this transition should be part of overall state financing strategy on Green infrastructure so that a cogent approach to public finance and its use to crowd in private capital can be systematically structured
- For detail planning on Green infrastructure creation, its impact on public finance and role of private capital, the state should not only recalibrate Public Finance Management Division and PDCOR Ltd. (as discussed above) but may also setup a Green Transition Committee (GTC) under the Chairmanship of the Chief Minister which shall supervise all Green transition activities. These may include Green infrastructure creation, Green financing and formulate strategies to address other costs that would be entailed in additionalities that come with delinking from the carbon economy. An indicative list of those additionalities has been provided in this report. For detailed assessment of those costs, a separate study or set of studies would need to be carried-out. In addition, it is also important to develop a framework of quantification of direct and indirect benefits that can accrue across various sectors during climate transition. Quantification of such benefits and escrowing them for debt servicing could lead to lower cost of finance. Details of GTC composition may evolve after detail deliberation.

ABOUT THE REPORT

The issue of Climate Change has become progressively palpable across various sectors of the economy and therefore understanding of various kinds of risks and their implications is fast evolving across geographies and institutions. There is a growing realization that there are no short cuts to long term planning. The strategies in the short, medium and long term must therefore conform to containing climate change and managing the various risks it entails across these time horizons.

Sub-national action in this endeavor will be the key as action will have to be driven from bottom up. However, different states are impacted differently and therefore sub-national action and capacity need considerable convergence with international and national efforts.

This report is about **'Financing the Green Infrastructure in Rajasthan and explores Green financing options for the Power Generation Company of the State'.** The report is divided into three sections. The first section explores a general framework and strategies to finance green infrastructure in short, medium and long term while the second section is more specific to the power sector, particularly it elaborates upon the transition scenarios and policy options for the power generation company of the state in the short term. The third and the last section entails specific recommendations. The report has been contextualized in the backdrop of limited fiscal headroom and therefore emphasis is upon instruments and structures for debt management while Greening the infrastructure.

SECTION 1

1 Climate Profile of Rajasthan – An Overview of Vulnerabilities and Gaps

In 2008, the National Action Plan on Climate Change (NAPCC) was instituted to address the challenges posed by climate change in India. Since then, various states across India have developed their state action plans and have used them to align state strategies on Climate Action. In that sense, state climate action plans have come to serve as the base document upon which climate aligned state strategies are built.

The latest comprehensive Rajasthan State Action Plan on Climate Change (RSAPCC) was released in 2022 by the Department of Forest, Environment and Climate Change, Government of Rajasthan. The plan addresses district wise climate vulnerabilities, risks, impacts and opportunities that are specific to the State of Rajasthan and therefore it is in order to capture its essence to contextualize this report from the perspective of climate change.

Rajasthan has very high climate sensitivity compared to other states in India and is prone to extreme events such as erratic rainfall with frequent dry spells, occasional heavy downpours, and extreme seasonal temperatures, sandstorms, droughts, famines and floods. The fact that over two-third of the population depends on climate sensitive sectors such as agriculture, animal husbandry and forestry, it is all the more important to plan infrastructure in accordance with vulnerabilities of the state.

The risk analysis at the State and the local level shows that groundwater levels in the north-eastern districts of Rajasthan have a high decreasing trend in terms of magnitude, which implies rapid groundwater depletion. Rajasthan is also characterized by arid and semi-arid regions and is therefore already highly susceptible to droughts. Patterns suggest an increase in drought months for several areas across Rajasthan. Even though analysis suggests increase in the water availability in the south-eastern part of Rajasthan in the future, overall water scarcity can be a problem where the effects of reduced rainfall and overexploitation of ground water are likely to compound the problem in the future. Apart from high climate sensitivity and vulnerability, Rajasthan also has the lowest adaptive capacity of all states owing to its geographical attributes.

This necessitates a comprehensive re-look at the adaptation and mitigation strategies in the state. The plan highlights several infrastructure requirements across key areas and emphasizes the need for decentralized planning such as the one undertaken in

Kota city. To elaborate Kota city has undertaken extensive documentation of the vulnerabilities due to climate change. This includes detailed studies on solid waste management, water supply, toilet facilities, sewerage, storm water drain connectivity and flood risks. Risk assessments and infrastructure readiness are conducted at the ward level by paying special attention to vulnerable hot spots and social groups. However, similar comprehensive assessments and evaluations are not available for other cities, towns, and panchayats in the state even though sector specific strategies have been developed for certain cities such as Comprehensive Mobility Plan for the city of Jaipur.

With respect to broad infrastructure requirements, the plan highlights the need for rainwater harvesting including in building designs, recharge of underground aquifers through artificial recharge methods, creation of green areas in urban regions through the use of paving materials that facilitate ground water infiltration, centralization of groundwater extraction to ensure judicious and regulated distribution of groundwater resources, using more efficient methods of irrigation, reducing the area under water-intensive crops, changing farming practices to sustainable agriculture (organic), carbon sequestration from forestry and agro forestry, and aligning overall infrastructure with climate requirements.

Since, most of these practices would span across urban and rural areas, they need to be explicitly included in policy mandates. Interestingly, the Rajasthan Urban Development Policy is sensitive to issues of disaster management and sustainability as is the Rajasthan Urban Housing and Habitat Policy of 2017. However, unlike, the Rajasthan State Highway Investment Program (2019) which entails an evidence-based assessment of the vulnerability of roads and highways to climate change, most of the policies and strategies are silent about climate aligned goals or tend to be generic at best. Evidence of this fact is that very few local government bodies directly include climate in their agendas or plans. A few master plans do mention solar panels, afforestation, water conservation, indigenous knowledge, green zones, etc., but they also do not comprehensively recognize and address climate risks.

There are also issues pertaining to definition of concepts and strategies for Green and Sustainable infrastructure which affects systematic green and sustainable infrastructure development.

The plan also examines the emission profiles of eight sectors namely thermal power generation, industrial manufacturing, brick production, transportation, residential, agriculture, waste management, and tourism.

Power is one of the highest CO_2 emitters in India, however, in Rajasthan, sectors like industrial production, agriculture and tourism are equally important. In 2019-20 (the base year), the highest CO_2-eq. emissions came from power generation (40 MT CO_2-eq./y) and the agricultural sector (40 MT CO_2-eq./y), followed by industrial production (27 MT/year), transport (10 MT CO_2-eq./y) and the residential (10 MT/year) sectors.

In the future, Rajasthan is estimated to contribute a total of 137 MT CO_2-eq./y with significantly increasing trends. By 2030, emissions from brick manufacturing are expected to more than double with the present technology mix; in the transport sector, they will increase by 2.7 times; in the residential sector, it is likely to grow by 20%; and in the agricultural sector, it will increase by 18%. Overall, emissions are expected to increase by approximately 1.7 times the present value in 2030 under the Business-as-Usual Scenario. This necessitates concerted action on adaptation as well as mitigation strategies.

2 The Urgency

Given the above, it is important that Rajasthan embarks upon a detail development plan encompassing climate imperative in the context of regional vulnerabilities (**See Table 1.1**). Such an action must be on priority as cost of inaction is likely to be significant.

A report by the United Nations estimates that the direct costs of India's lack of disaster preparedness in the last two decades amounted to INR 13.14 lakh crore (USD 179.5 billion). Extreme climate events have costed India over USD 99 billion in the last 50 years (UN 2020). A Carbon Disclosure Project (CDP) analysis suggests that such events will likely cost India INR 7 lakh crore (USD 100 billion) and Indian banks over INR 6 lakh crore (USD 84 billion) in the next five years (CDP 2022).

Table 1.1: Vulnerability of Districts in Rajasthan[1] (Read Left to Right)

Highest	Jaipur	Sikar	Kota	**High**	Jodhpur	Sirohi	
Jodhpur	Sirohi	Ajmer	Pali	Bikaner	Jhunhunu		
Dausa	Bharatpur	Nagaur	Karoli	Jaisalmer	S. Madhopur		
Medium	Churu	Udaipur	Baran	Tonk	**Low**		
Barmer	Dungarpur	Ganganagar	Alwar	Hanumangarh	Bundi		
Rajsamand	Bhilwara	Jhalawar	Jalore	**Lowest**	Banswara	Chittor	Pratapgarh

Source: Rajasthan Climate Action Plan, 2022 (Representation: Indicc)

[1] Names of Districts as before the announcement of new districts

The cost of inaction gets compounded as the effect of climate risks are not always localized but easily get radiated across different segments of the economy depending upon the severity of climatic events (**See Table 1.2).**

Table 1.2: Compounding of Climate Risks

Compounding of Climate Risks			
Direct **First Order Effects**		**Indirect** **Second Order Effects**	**Spill Over** **Intra-economy and cross-border impact or contagion risks**
Originate in sectors which are exposed to climate events more than others		Impact sectoral value chains at various levels	Impact arise from interactions between **financial sector** and trade (internal & external)
Acute Occurrence of extreme weather events	Chronic Gradual shifts in temperature and precipitation patterns		
Acute risks increase the risk profile of investments in Infrastructure while chronic also exacerbate acute risks		**Can impact industrial productivity, supply chains, employment, inflation**	**Impacts resource availability across geographies**

Source: Report on Currency and Finance, RBI

Lastly, the action is also urgent because the deadlines for Sustainable Development Goals (SDGs) and India's updated Nationally Determined Contributions (NDCs) is barely eight years away i.e. 2030. Since climate action is well subsumed under Sustainable Development Goals (SDGs), doing so will be in alignment with NDCs and SDGs (**See Table 1.3** for NDCs and accompanying pathways articulated by the Union government).

Table 1.3: NDCs and Pathways

India's NDCs (Panchamrit)	Long Term - Low Emission Development Strategy (LT-LEDS) – Pathways to achieve NDCs[2]
• Reach 500 GW Non-fossil energy capacity by 2030 • 50 per cent of its energy requirements from renewable energy by 2030. • Reduction of total projected carbon emissions by one billion tonnes from now to 2030. • Reduction of the carbon intensity of the economy by 45 per cent by 2030, over 2005 levels. • Achieving the target of net zero emissions by 2070	• Low Carbon Development of Electricity Systems Consistent with Enhanced Development Benefits • Develop an Integrated, Efficient, Inclusive Low-Carbon Transport System • Promoting Adaptation in Urban Design, Energy and Material-Efficiency in Buildings, and Sustainable Urbanisation • Promote Economy-Wide Decoupling of Growth from Emissions and Development of an Efficient, Innovative Low-Emission Industrial System • CO_2 Removal and Related Engineering Solutions • Enhancement of Forest and Vegetative Cover Consistent with Socio-Economic and Ecological Considerations. • Economic and Financial Aspects of Low-Carbon Development

Representation by Indicc Associates

Important to note that for institutional intermediation and execution of India's LT-LEDS, a strong foundation is in place through existing extant agencies namely, the Executive Committee on Climate Change (ECCC) and the Apex Committee for the Implementation of the Paris Agreement (AIPA). Going ahead, the LT-LEDS will be based on coordinated climate action that spans across several sectors and Ministries, as well as its 28 States and 8 Union Territories, operating in a predictable, federalized structure of governance.

[2] https://unfccc.int/sites/default/files/resource/India_LTLEDS.pdf (A preliminary mapping of Rajasthan's specific initiatives that corresponds to LT-LEDS is discussed later).

3 The Challenge – Financial Resources!

A key challenge to fight the climate change is the availability of financial resources. Numerous estimates indicate that India's total financing requirements for climate action could range from approximately 5 to 6 percent of the annual GDP by 2070. As per another estimate an annual investment of about 2.5 percent of GDP is required to bridge the infrastructure gap by 2030[3]. This assessment however does not include investment required for mitigation and adaptation due to climate change. However, if that is accounted for then the actual funding requirements are likely to be higher and in consonance with higher estimates suggested by other sources (**See Table 1.4**).

Council for Energy, Environment and Water (CEEW) highlights that India would need cumulative investments of USD 10.1 trillion to achieve net-zero emissions by 2070. These investments would mainly go into power, industrial, and transport sectors but majority i.e. USD 8.4 trillion, would be required in the power sector alone. The shortfall highlighted in the report amounts to USD 3.5 trillion to achieve the net-zero targets[4].

Another report by Climate Policy Initiative (CPI)[5] highlights that India needs approximately US$2.5 trillion by 2030 to fulfill the NDCs while McKinsey suggests a decadal investment of around US$431 billion by 2030.

[3] https://www.rbi.org.in/Scripts/AnnualPublications.aspx?head=Report%20on%20Currency%20and%20Finance
[4] https://www.ceew.in/press-releases/india-will-require-investments-worth-over-usd-10-trillion-achieve-net-zero-2070-ceew
[5] https://www.climatepolicyinitiative.org/publication/landscape-of-green-finance-in-india-2022/

Table 1.4: A Macro Overview of Climate Finance Landscape

Organisation	Global Green Investment Requirements	India's Green Investment Requirements	
	NDCs by 2030	NDCs by 2030	NZ by 2050 or 2070
Estimates highlighted in RBI Report on Currency and Finance, 2023		Upwards of 2.5% of GDP by 2030 for Climate aligned Infrastructure.	5 – 6% of GDP by 2070 (may increase if NZ horizon is shortened)
Climate Policy Initiative, 2022[6]	US$4.5-US$5 tn annually	US$170 bn annually (2015-2030) Cumulative US$2.5 tn by 2030	
McKinsey, 2022[7]		Cumulative US$1 tn by 2030 (2.6% of GDP)	Cumulative US$7.2 tn by NZ 2050 (3.5% of GDP) US$2 tn by 2030-40 (3.1% of GDP) US$4.2 tn by 2040-50 (4.1% of GDP)
International Energy Agency, 2022[8]		US$160 bn annually under Stated Policies Scenario (STEPS)	
CEEW, 2021		Cumulative US$542 bn by 2030 (taking 2040 as peak emission year and 2070 as NZ year) Cumulative Decadal breakdown: 2030-40: US$0.89 tn 2040-50: US$2.5 tn 2050-60: US$2.8 tn 2060-70: US$3.8 tn	Total US$10.1 tn by NZ 2070 Invt support of US$1.4 tn needs to be mobilised (US$28 bn per year from 2020 to NZ 2070)

6 https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2021/

7 https://www.mckinsey.com/~/media/mckinsey/business%20functions/sustainability/our%20insights/decarbonizing_%20_india%20charting%20a%20pathway%20for%20sustainable%20growth/Decarbonising-India-Charting-a-pathway-for-sustainable-growth-ES-Oct-2022.pdf

8 https://iea.blob.core.windows.net/assets/1de6d91e-e23f-4e02-b1fb-51fdd6283b22/India_Energy_Outlook_2021.pdf

Interestingly, the analysis conducted by all the aforesaid organizations reflects preponderance of 'mitigation' strategies and within 'mitigation' strategies they are focused on the energy sector (**See Table 1.5).**

On the other hand, The Adaptation Gap Report, 2022, published by United Nations Environment Program, reveals that although adaptation measures are funded internationally through Green Climate fund, Global Environment Facility, Least Developed Countries fund, Adaptation Fund and Special Climate Change Fund, the adaptation finance gap is significant and about 5-10 times higher in the developing countries. Another report by National Institute of Public Finance and Policy (NIPFP) highlights that even the external funding rate is lower for the developing countries and is dedicated for a specific purpose[9]. It is pertinent to highlight that several adaptation measures can also have a positive impact on energy economics. However, it is not clear if aforementioned studies do take into account such correlations.

In the case of Rajasthan**,** as has been highlighted under the State Climate Action Plan, sectors like industrial production, agriculture, tourism et al are equally important and therefore highlight the need for adaptation and mitigation in significant proportion. Therefore, state specific strategies require much broader, deeper and granular analysis of finance requirements.

Table 1.5 Preponderance of Mitigation over Adaptation

Organisation	Sectors/Areas Addressed	Focus
Climate Policy Initiative (CPI), 2022[10]	Green investments in Clean Energy (generation & access); Clean Transport (Low-emission Vehicles, Charging Infrastructure) & Energy Efficiency (Smart Grids green energy corridors, Renovation & Modernization of thermal Power technologies, Green Buildings, Renovation, upgradation, and modernization of existing building stock	Mostly Mitigation
McKinsey, 2022	Green investments in power, automotive, aviation, steel, cement and agriculture along with technologies for carbon-capture usage and storage (CCUS), natural climate solutions (NCS), material circularity and green hydrogen	Mostly Mitigation
International Energy Agency (IEA), 2022	Green investments in Clean Energy & Grids that includes investment in renewable power, battery storage, renewables for end use, energy efficiency, EVs and chargers	Mostly Mitigation
CEEW, 2021	Green investments in Electricity (generation, integration, transmission, distribution), hydrogen (production), and vehicles (manufacturing)	Mostly Mitigation

Representation by Indicc

[9] https://nipfp.org.in//media/medialibrary/2023/09/WP_401_2023.pdf
[10] https://www.climatepolicyinitiative.org/wp-content/uploads/2022/08/Methodology-Document.pdf

4 Fiscal Headroom for Rajasthan in the backdrop of Greening the Infrastructure

There are two elements which are critical to understanding the financial resource challenge for Rajasthan. The first is the fiscal headroom available with the state over 2030 horizon based on available reference points namely Medium Term Fiscal Policy and Historical Trends. The second is to appreciate additionalities that may not have been taken into account.

4.1 Fiscal Headroom

With respect to understanding fiscal headroom available with the state, two kinds of estimates can provide substantive insights. The first is the estimates under Medium Term Fiscal Policy (MTFP) statement of Rajasthan which looks at significant reduction in the fiscal deficit. MTFP projections are available until 2024-25. In order to understand the fiscal headroom until 2030, the same trend has been extrapolated. Alternatively, historical trend has also been taken into account and extrapolated for each year until 2030. The revenue collection projections built into the MTFP provide some fiscal headroom. (**See Table 1.6**) However, in either case, the state seems to have limited space via public finance and therefore aggressive strategies for revenue collection and innovative mechanisms to finance Green infrastructure will need to be deployed.

Table 1.6: Fiscal Headroom Based on MTFP and Historical Trends

Year	Fiscal Deficit Projected by MTFP (% of GSDP)	Fiscal Deficit Projected as per Historical trend (% of GSDP)	Debt to GSDP past trend (%)	Debt to GSDP_MTFP (%)
2016-17	-6.09%	-6.09%	33.59%	33.59%
2017-18	-3.06%	-3.06%	33.99%	33.99%
2018-19	-3.74%	-3.74%	33.83%	33.83%
2019-20	-3.77%	-3.77%	35.35%	35.35%
2020-21	-6.20%	-6.20%	42.65%	42.65%
2021-22	-4.21%	-4.21%	42.65%	39.53%
2022-23	-4.61%	-3.48%	43.13%	39.80%
2023-24	-3.99%	-3.42%	44.55%	39.84%
2024-25	-3.48%	-3.37%	45.85%	39.37%
2025-26	-3.48%	-3.33%	47.02%	39.37%
2026-27	-3.48%	-3.28%	48.10%	39.37%
2027-28	-3.48%	-3.25%	49.09%	39.37%
2028-29	-3.48%	-3.21%	49.99%	39.37%
2029-30	-3.48%	-3.18%	50.83%	39.37%

Prepared by Indicc

4.2 Key additionalities that may impact fiscal calculations in the context of Greening the Infrastructure

In addition to the infrastructure costs that will have to be incurred in the creation of Green infrastructure, there are likely to be other additional elements that may have an impact on the fiscal architecture of the state. These can be broadly divided into potential cost and avenues for revenue (**See Table 1.7**).

On the cost side, in the short term, there are likely escalations in the cost of power on a purely green grid; in the medium term, costs of raw materials like cement and steel are likely to increase while new technology deployment may require investments in R&D, incentives, subsidies, public procurement et al. These may directly and indirectly impact costs for other industries thus affecting competitiveness of goods and services while the regime of climate aligned 'standards' can affect international and domestic trade.

Moving to climate aligned economy would also require decommissioning of fossil based thermal plants, change in agriculture practices and higher uptake of electric vehicles. Such costs may affect local population dependent on fossil industry, incomes for farmers during transition and sub-national revenue.

On the other hand, moving to climate aligned economy can also result in subsidy savings and new avenues of finance through justified taxes/cesses, grants and concessional finance. However, while mobilizing revenue inflationary aspects of such steps would need to be taken into account. Therefore, fiscal math for Rajasthan would require identification and balancing of costs, new avenues of finance available with the state and resource gaps. At the same time, investment is also needed into overhauling of data regime for informed decisions, creating or revitalizing relevant institutions and beefing up capacity and coordination amongst government departments, different federal orders, institutions, academia and the private sector.

Incidentally, instrumentation for raising fiscal resources at the state level appears to be limited. Further, carbon credits and carbon tax currently also appear to be sub-optimal instruments owing to concerns regarding uncertainty over emission reduction and pricing, respectively.

Table 1.7: Other Climate Related Additionalities with Impact on Fiscal Resources

Potential Costs on Backward Linkages				
Power	Raw Materials			Technology
Standards - Potential Costs on Forward Linkages				
Competitiveness		Trade		
Incomes and Livelihoods - Potential Costs of Transition				
Skilling/Reskilling	Income Support for Transition			Investment facilitation for Green Jobs
Potential Cost for Governance				
Data	Capacity	Institutions		Coordination
Potential Avenues for Green Finance				
Savings	Cess/Taxes	Grants	Concessional Finance	Carbon Credits

Prepared by Indicc

5 Navigating through the Constraints of Financial Resources

While the above discussion provides an idea around specific and general fiscal aspects concerning Rajasthan, the fact remains that financing required for Greening the infrastructure will be considerable. In the absence of any comprehensive assessment at the state level, the finance requirement can be gauged from the financing gaps highlighted previously at the country level. It is also highlighted that if all economic, social and administrative costs are included, the finance gap is likely to widen.

At the same time, it is pertinent to highlight that without sub-national action, it is simply not possible to achieve India's committed climate goals as a large part of infrastructure is with states and monopolistic in nature. Therefore, climate finance strategy for Rajasthan, much like other states, will essentially revolve around accessing private capital and managing more debt. This requires simultaneous deployment of multiple secure and innovative financing mechanisms so that fiscal stability is maintained while creating 'Green' infrastructure.

In this regard, the state can use the following instruments, structures, and institutions separately or in combination with each other. This section provides an insight into each one of these mechanisms.

Table 1.8: Secure and Innovative Mechanisms for Financing Green Infrastructure

SDL Route	Innovative Financial Structures		Institutions
	PPP	InVITS	
Entry Point: Can help reduce fiscal deficit if accompanied by Green Bond Issuance **Limitation:** Could be relatively small ticket size Currently, Color blind but has positive correlation with Quality of Expenditure provided it entails issuance of Green Bonds	**Entry Point:** Can lower fiscal burden and enhance finance envelope if structured carefully **Limitation:** Success is contingent upon the state's readiness to attract the private sector and requisite expertise to structure PPP in Green Infrastructure	**Entry Point:** Can lower fiscal burden and enhance finance envelope substantially **Limitation**: Awareness and capacity may be a constraint	- Infrastructure Debt Fund - PDCOR Ltd.

5.1 The Case for a Green State Development Loan (Green SDL)

State governments borrow directly from the market via the Reserve Bank of India (RBI) through State Development Loans (SDL). SDLs are typically (or as of now) color blind. However, if they are earmarked to Green projects and accompanied by issuance of Green Bonds, they can become doubly secure instruments. This is for two reasons, first, they are backed by sovereign guarantee and second, issuance of Green Bonds ensures use of proceeds to green projects thereby guaranteeing non-fungibility.

At a sub-national level, only the state of Maharashtra has adopted this route. However, at the national level, there has been a Sovereign Green Bond Issuance by the Union government. While the former did not qualify for a ‘Greenium’, the latter did. This discrepancy suggests that there is a need for regulatory as well as market clarity on this issue.

Be that as it may, on both counts, the ticket size of issuance has been small as a percentage of overall borrowings (**See Table 1.9).** This may be on account of two limitations. First (and as has been discussed above), it would typically require non-fungibility if accompanied by Green Bond issuance. Secondly, in the absence of holistic and scientific identification of Green assets, governments are constrained on

their part to identify the quantum of finance that can be accessed through such an instrument.

Table 1.9: Proportion of Green Bonds to Total Expenditure, CO and Borrowings

Green Bonds Issuance	Amount INR in Crore	Total Expenditure INR in Crore	Capital Outlay INR in Crore	Borrowings (INR in Crore)
By Centre in FY22-23	16,000	41,87,232 (RE)	6,20,204 (RE)	17,55,319
%age of Green Bonds		0.38%	2.58%	0.91%
By Maharashtra in FY23-24	5,000	5,47,450 (BE)	73,901 (BE)	1,31,207 (BE)
%age of Green Bonds		0.91%	6.77%	3.81%

Be that as it may, there are some explicit positives. For example, non-fungible capital expenditure positively reflects on Quality of Expenditure as higher capex is its key determinant. It is often viewed as having a multiplier effect on economic growth and consequent fiscal benefits in terms of an increase in revenues. Additionally, Green SDLs can also help state governments develop administrative capacity to expand Green Bond issuances in the future.

Related to this point, a recent RBI paper on 'States' Fiscal Performance and Yield Spreads on Market Borrowings' (2022) argues that there is a lack of differentiation in the cut-off yields of State Development Loans (SDLs) issued by various Indian states as they are narrowly clustered, in majority of auctions.

This eliminates the market incentive mechanism for states to better manage their finances. In order to address this discrepancy the RBI paper has put forth a holistic measure of the states' performance by developing a composite index (State Performance Composite Index – SPCI) that incorporates fiscal, debt and market-related indicators. The index can be used by investors to make more informed investment decisions, which in turn, can enhance the efficiency of the price discovery mechanism of state government securities in India[11].

Authors of the paper have found a statistically significant association of the index with SDL yield spreads, suggesting that better fiscal management and improved market liquidity can help states to reduce their cost of borrowing.

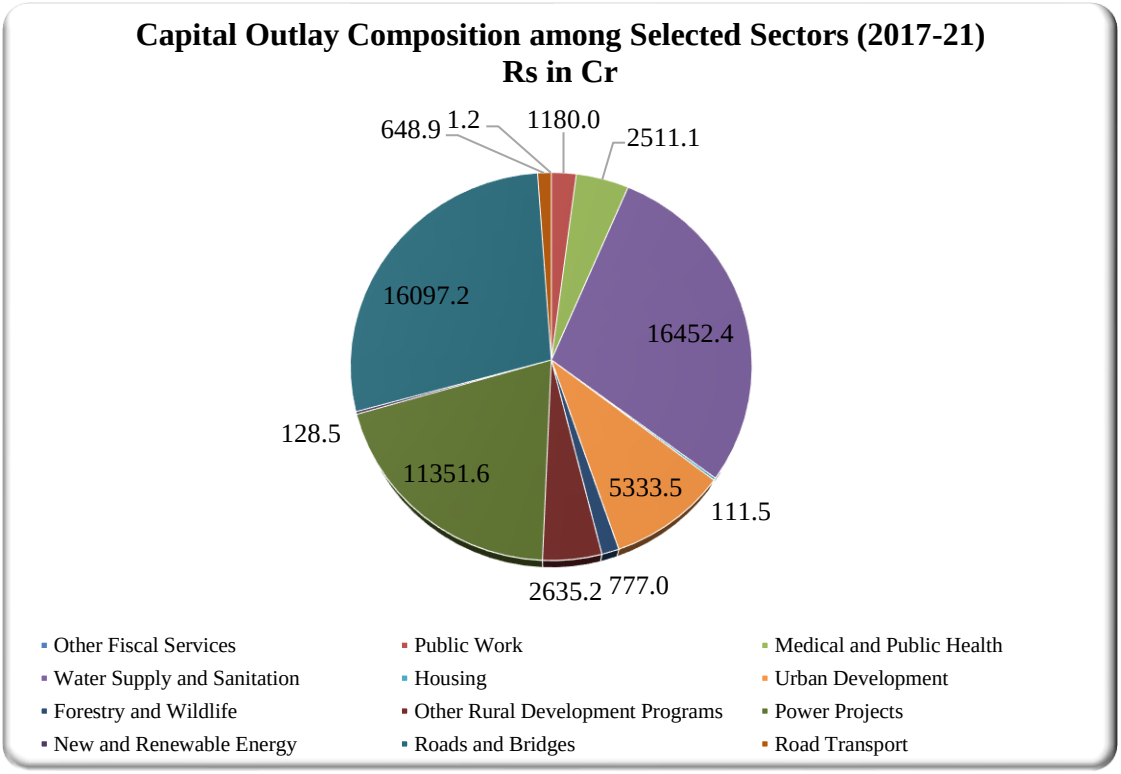
The argument for earmarking for green infrastructure expenditure fits well with this analysis. Therefore, as an immediate step, Rajasthan may like to undertake an exhaustive green tagging exercise of all infrastructure assets/projects using

[11] The index incorporates 13 indicators, reflecting various aspects of fiscal performance, and subsume them into five major sub-indices, viz., deficit index, own revenue effort index, expenditure quality, debt sustainability and market liquidity.

internationally recognized taxonomies and set up a Green Finance Working Group with a clear mandate to issue a Green Bond[12].

It is also likely that some part of the infrastructure might already been 'Green' as per recognized taxonomies but might not have been classified as such. A snap view of past (actuals) budgetary expenditure (**see Figure 1.1**) in key infrastructure areas provides an idea of the opportunity that lies ahead.

Figure 1.1 Expenditure in Key Infrastructure Areas (2017-2021)



Source: Indicc analysis bases on actual budget figures for past five years.

Green tagging of infrastructure can also lead to much broader set of tangible benefits. Some of them are listed below:

- Lower cost of borrowing through thematic bonds such as Green Bonds
- Better quality of expenditure
- Opening up of Green investment opportunities
- Identification of 'Green' infrastructure components in central and state schemes (and policies). This may help in both central and state government borrowings
- Better alignment with budgeted and actuals figures due to non-fungibility and transparency
- Better monitoring of climate action

[12] Please See Annexure 1 for a detailed note on Taxonomy, Green Bonds, Issuance Processes, Reasons and Considerations for Issuances of Green Bonds by States.

Starting with this exercise immediately, in the medium term Rajasthan can comprehensively embark upon the process of 'Green Budgeting'. Towards this endeavor, as a first step, it is recommended that Rajasthan sets up a dedicated body under the Public Finance Management (PFM) division under the Department of Finance to enable a smooth institutionalization of 'Green Budget' process.

Such a body can be a mix comprising climate experts, former & current government officials from finance and environment departments, and taxonomy experts. Sectoral experts and regulators can be invited from time to time on need basis. The key to its success will be a formal mandate by the state government. To begin with, some of the issues such a body can look into in the short term are as follows:

- A state level climate action plan should serve as a base document to guide overall state strategy on mitigation, adaptation, sectoral development and investment. The actionability of state climate action plan is therefore critical. Currently, district wise action strategies in the state climate action plan are generic in nature. This could be made more specific in accordance with vulnerabilities identified for each district under the plan, compliances sought by National Green Tribunal (such as National Capital Region plan on Transport), new policy announcements such as Rajasthan Hydrogen Policy, re-look at policies that may need better alignment with the market trends and Greening (Example EV policy[13]) and alignment of state polices with Long Term- Low Emission Development Strategies (LT-LEDs) articulated by the central government to complement India's updated NDCs[14]
- Identification of relevant departments and their respective allocations towards Green spending to enable understanding of overall expenditure towards its Green Infrastructure. A recent paper by National Institute for Public Finance and Policy (NIPFP) titled 'G20 and Climate Responsive Budgeting' can be instructive in this regard[15]. Amongst other aspects, the paper highlights the role of disarmaments that directly and indirectly linked towards achieving the Green targets
- A state level fiscal risk statement can serve as an overall guideline document to better plan fiscal management in the backdrop of climate imperatives. For instance, Odisha periodically comes out with such a document[16]. Fiscal risk statement must also include risk management strategies such as creating fiscal buffers, ensuring budget flexibilities (for example, contingencies for natural disasters, provisioning), and using risk transfer instruments (for example, insurance)
- A medium term fiscal policy statement needs to be adjusted in the backdrop of climate considerations. In other words, the fiscal trajectory specified in a

[13] See **Annexure 2 for EV Policy Analysis**
[14] See **Annexure 3** for preliminary mapping of state polices with LT-LEDS
[15] https://www.nipfp.org.in/media/medialibrary/2023/09/WP_401_2023.pdf
[16] https://finance.odisha.gov.in/sites/default/files/2022-07/FISCAL%20RISK%20STATEMENT%202022-23.pdf

MTFP should be consistent with debt sustainability analysis, which should cover the effects and risks related to climate. This would inform policymakers in the implementation of risk mitigation measures

- Climate tagging of infrastructure assets as per recognized taxonomies done by respective departments would come in handy and will not only help in Green budget formulation but also during the budget execution. An indicative list of Green assets is available as an Annexure[17]
- For the ease of tracking, program-based budgeting frameworks can be incorporated
- Control and audit mechanisms should be used to examine, measure, and monitor the efficiency and effectiveness of Green budget

Table 1.10: High Level Framework for Green Budgeting in the Medium Term

Planning and Fiscal Framework	Preparation of Budget	Execution of Budget	Audit
Requirements Revision of Climate Action Plan to incorporate more specific action strategies in accordance with vulnerabilities highlighted under the plan Set up a committee of experts in Public Finance Management Division of the Finance Department Fiscal Risk Analysis	**Requirements** Identification of sectors based on planning approach Mapping of relevant schemes and policies (For this purpose, alignment with updated NDCs and LT-LEDS with state action can be a starting point) Identification of expenditure allocation by all relevant departments towards specific mitigation and adaptation requirement Applying recognized green	**Requirements** Tracking of green expenditure through chart of accounts to include a green or climate coding Financial management information system with adequate functionality for accounting and reporting of climate-related expenditure Should enable direct comparison between estimates and actuals	**Requirements** By Department of Finance, Line Ministries and External Audit Note: External auditors need to improve their own capacities to audit green budgets effectively

[17] **Annexure 4**

	taxonomy for Green tagging		

5.2 Innovative Financial Structures

5.2.1 Public Private Partnerships (PPP) in Green Infrastructure

As discussed above, the Green SDL route for infrastructure in the immediate future may be a limited one. Moreover, as SDL borrowings primarily finance fiscal deficit and are currently color blind, it does not guarantee a substantive glide path.

Therefore, the need is to substantially enlarge the envelope of infrastructure finance within the constraints of fiscal responsibility legislation. Towards this endeavor, PPP can be a useful mechanism as it represents an important tool available to governments to plug the sustainable infrastructure deficits, while enhancing availability of services.

In other words, Public Private Partnerships (PPP) are an important vehicle for governments to augment programs of infrastructure services delivery by bringing in much needed capital and management expertise from outside the government under robust contractual arrangement. Infrastructure services inherently represent resource consumption that will occur daily for all human activity. It is, therefore, important to take measures that will Green such services and mitigate the impact on climate as part of day to day living.

As a pioneer state in development and use of PPPs and in climate-change related initiatives, Rajasthan is well placed to modify and implement changes in policy and practice relating to infrastructure services and PPPs.

For this purpose, it is important to reflect on conceptual areas such as classification of Green Infrastructure and PPPs, process changes and institutional framework. These are discussed below.

Green infrastructure broadly falls into the following three categories:

Green by Taxonomy: This would include renewable energy (solar, wind, hydro), forest expansion and management, and offset programs for normal activities (example: green cover in buildings and real estate development). As such the entire sector or project is classified as ‘Green’. No significant changes are required here in any government process, other than the monitoring, evaluation and certification. However, there may be some elements related to infrastructure through PPPs that may be required here which are discussed later.

Greening of Conventional Infrastructure Services: Conventional infrastructure development may include transportation systems, sanitation, waste management systems, energy delivery systems, to name a few. In Rajasthan (and India), the focus is on cost-efficient systems that can effectively deliver services to all citizens. Given that a segment of citizens in the lower income groups may be unable to pay or bear full costs of such services, the government usually defrays these costs from its budgets to the extent it can.

Since 'Green' design can substantially impact climate change related targets, it is possible that such green design may add to costs per unit of service delivery due to enhanced capital investments and/or operations costs.

For instance, a switch to Electric Vehicles (EV) in urban transportation systems may require accompanying infrastructure by way of charging stations and battery banks, amongst other things. EV themselves may entail higher costs. Thus, both capital and operations costs could increase. Similarly, capturing methane emissions from distributed off-grid septic management systems, which are present in substantive number, would require additional investments for capture, enforcement and monitoring. Even switching goods transportation systems to biofuels, something already under implementation by California State, may require investments in bio-fuel agriculture, extraction plants, entire collection and recycling systems for used oil, amongst other things.

There is thus a clear distinction between conventional project design that is compliant with national and state level laws and 'Green' project design that will specifically use abatement systems, technologies and processes.

Emerging PPP Scenarios for Infrastructure Development and Services: Infrastructure as defined above entails supply side interventions i.e. provision of services. However, equally important is the demand-side intervention that will contribute considerably to reduction of resource usage i.e. 'Green' consumption. For instance, domestic demand from household appliances can be aligned to climate imperatives through new technology such as light bulbs or ceiling fans (DC) which consume anywhere between 30-80% less energy for the same service level output. Such changes may require households to switch from their current appliances to green-tech appliances. The latter are sold at a considerably higher price when compared to normal appliances.

These examples indicate a need to embark on transition programs which can be undertaken in the PPP mode but not classified currently as 'infrastructure' or even 'public services'. They can be funded by government grants along with some commercial finance (blended finance routes). As a one-off example, government

actively sought and supported private sector partners for COVID vaccination in a time-bound manner with elements of complete subsidy (free) and normal user charges for citizens.

To summarize, there will be PPPs in three kinds of projects and programs – those that are classified clearly as 'Green' by recognized taxonomy, those services that will require modifications for 'Green' design over and above normally compliant projects and those that form a new category of time bound transition programs for 'demand management' and which have considerable potential gains for combating climate change (**See Table 1.11**)

Table 1.11: PPP in Green Infrastructure

PPP in Green Infrastructure (Projects and Programs)		
Green By Taxonomy	Incremental green projects in infrastructure (beyond normal environmental compliance required by law)	Managed Services for 'Demand Management'

As discussed above, while the first category projects do not require significant changes apart from monitoring and certification, the latter two would require process changes.

Essentially, this would include, project design from concept to bid process where Expressions of Interest (EOI) are sought from potential partners to the government in the PPP bid process and evaluation for 'Green' elements, as additionality to existing processes on infrastructure PPPs, and in processes during implementation and after commencement of operations. This will relate to verification, certification, and quantification of Green impacts.

A clear process of modifications, dispute settlements that may emerge due to systemic risks associated with newer, emergent 'Green' technologies and systems also may need to be factored into processes used for PPPs currently.

These elements are explained in ensuing paragraphs.

At the design and DPR stage, it will be necessary to develop and design the project at two levels i.e. best cost design compliant with all existing rules and laws for conventional sector projects (Level 1) and with additionality of 'Green' elements in design after clearly identifying incremental capital costs, investment as well as operations related costs, if any (Level 2).

Additionally, intangibles need to be also earmarked as 'Green' costs. These could include programs of behavioral change, awareness and community partnerships to aid implementation and monitoring.

The above highlighted two-level feasibility tests need to go through a rigorous system of evaluation prior to approval. This will inter alia include – check on the robustness to see if proven 'Green' technology is appropriate to the scale of the project and suitability for the context of the project (geography, socio-economic profile, personnel availability to operate services, etc). Specific recommendations relating to monitoring and evaluation including operations and for the project life cycle may also be made for incorporation into contracts and costed accordingly.

This can be done by constituting a panel of 'Green' technology experts who will be part of development approval committees for the project PPP. Experts from this panel may join the conventional approval committees so that 'Green' additionality is integrated into the existing systems. One expert group could work with the Project Manager/PPP cell in project development, while another set of experts could be part of project approval committees of government, sourced from within and outside the government.

The costs arising from design modifications approved by such committees, relating to 'Green' design, may be identified as incremental costs to the project.

It is desirable that the project approval committee approve a specific design for the PPP based on recommendations of the Project Manager/PPP Cell. The DPR process should also include consultation with Green domain experts to arrive at the recommendations.

At this stage, the Government will also be clear about the financial support (and any other required measures such as regulation changes) for the selected design. It must be highlighted that this will also help government indicate 'Green' component of financial requirements to relevant national and international institutions. Such commitment, based on selected project design, may be specifically stated in the bid documents.

In addition to the above, in the case of 'Green' infrastructure, it is necessary to spell out specific competencies to identify suitable project design and execute Green elements, as decided by the approval committee that includes the Green panel and to accommodate a consortium style bidding to enable prime bidders to bring on board the competent agencies and personnel.

Given the nascent growth of Green projects, it is likely that no prior and proven expertise may exist with bidders. However, it is not different from the government's initial foray into airports, where no domestic experience of managing airports existed.

Bidders must, as part of the bid documents sought, clearly indicate their agreement to identifying 'Green' components of their bid, as part of their overall and final bid quotations. Rationale for such classifications may be provided with the bid-quote, on matters that are particularly grey.

The decision of the PPP project approval committee in such matters may be deemed final for the purposes of bid-evaluation. The approval committee therefore must include relevant Green technology experts as highlighted earlier.

Additionally, bidders may be given an incentive, by way of additional points in scoring the overall bids for innovations in the design, that may enhance the Green credentials of the project. On the other hand, bids will separately indicate the innovation done vis-à-vis design defined in the invitation to bid, and the additionality by way of Green impacts, lower costs and any such relevant matter.

The contract agreement for the PPP should also spell out the following incremental aspects relating to Green elements of the project.

Monitoring and certification of implementation as per contracted design: Such certification must also include non-physical aspects of the implementation such as behavioral change programs. Certification will also enable processes regarding accessing finance and reporting Green impact gains.

Monitoring and certification of operations over project life cycle: Similar monitoring of Green elements over the project life cycle, as opposed to contracted project tenure are necessary. For the purposes of the PPP contract, such monitoring and certification through independent agencies should be part of the contract 'Green' costs. This is because such costs would not have been incurred but for the transition.

With respect to contract payment, dispute settlement and re-negotiation, recommendations have been detailed in the report on 'PPPs in Infrastructure' submitted to CMRETAC by PDCOR limited in March 2023[18]. The additions in process and personnel on Green elements are discussed below for each of these areas.

Contractual payments: The above stated report spells out in detail the role of an Independent Project Manager (IPM) post-contract to manage the PPP projects for government. Such an IPM will need to be qualified for expertise relating to green component compliances as per the contract. This will be the basis for normal contractual payments, plus triggering of additional initiatives to obtain green finance (ex. carbon credits, additional grant funds and incentive for performance

[18] https://jankalyanfile.rajasthan.gov.in//Content/UploadFolder/DepartmentMaster/111/2022/Dec/30409/124056.pdf

achievements etc). The process should be time bound as per conventional PPP contracts.

Dispute Settlement: The IPM, as recommended earlier in the above stated report should also be responsible for managing disputes in a time bound manner. The appointment of an IPM may be agreed upon by both parties, soon after execution of the contract, as a time bound condition in the PPP contract. Dispute settlement including Green elements must also be handled as part of this process with the IPM being suitably pre-qualified to decide such issues.

Renegotiation: Green technologies and systems are in various stages of development and operations around the globe. There are some inherent risks to such programs, including the robustness of the technology in scale in a given geography or context. As part of the monitoring mechanism, it is desirable that the IPM, independently flags matters that could constitute significant risks to the Contract terms and likely to create a case for renegotiations and the same may be captured in an annual review. The recommended process for renegotiations has also been extensively described in the above stated report.

The institutional framework to manage the new dimension of 'Green' infrastructure services can be best accomplished by institutions already tasked with PPP projects (from concept and design till post-operations matters)

Empanelment of Expertise – personnel and / or institutions for different roles: For this, government can empanel institutions and individuals with relevant expertise for climate change/Green technologies. The advantage of such open-ended empanelment is that those who are competent to discharge the specific tasks can be pre-qualified and appointed to specific roles in the project development process. This will also integrate the Green dimension into existing processes without creating another institution and point-of-approval for new project development

Project Manager (PM) / PPP Cell for Project Development Enhancement: It has earlier been recommended to appoint a Project Manager (PM) for development of PPPs working with government PPP Cell for project development and implementation. The PM should also have Green technology and systems competence as part of its executive team. The PM, with Green expertise on board, will thus undertake evaluation of bids including Green design components and can *provide* recommendations relating to final design, contracting and post-contracting systems for monitoring and evaluations.

Independent Project Manager for Post-Contracting management of disputes, payments, recommendations for renegotiations: Separately, there needs to be empanelment of institutions for the role of Independent Project Manager (IPM) that are distinct from those involved in other aspects of PPP projects. This will ensure that there is no likely conflict of interest where an agency is involved in bid evaluation, and monitors the same project on which it has evaluated the winning bidder. The integrity of the IPM is thus maintained.

5.2.2 Infrastructure Investment Trusts (InvITs)

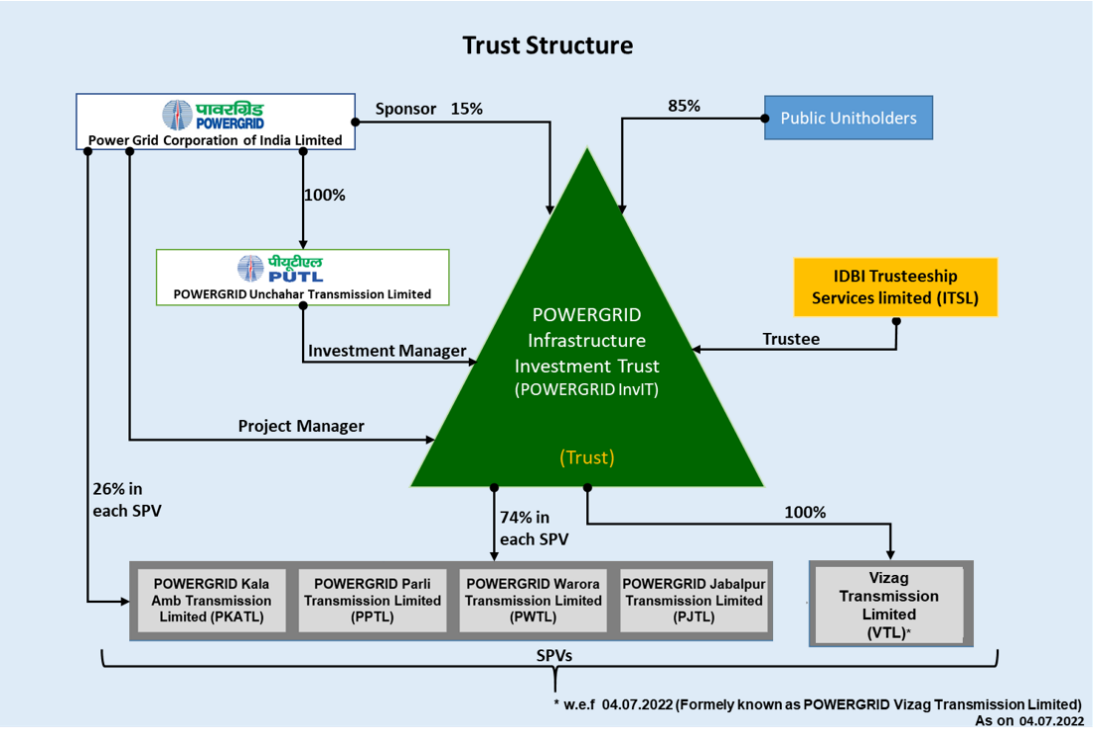
InvITs are a very uniquely Indian financial instrument developed by the Government of India during the 2013-14 period and have features which are unique to infrastructure projects. These are investment instruments that have characteristics like mutual funds. Their units, both debt and equity, are listed on different trading platforms like stock exchanges. InvITs are attractive because of several advantages which include diversification (offer investors an opportunity to diversify their investment portfolio helping them in lowering associated risks and assures steady returns in the long run), and accrual of fixed income for long term investors like the pension funds and sovereign wealth funds, providing liquidity, as it is easy to enter or exit from InvITs.

In order to structure a calibrated glide path for fiscal deficit, Rajasthan can structure a combination of MDB financing with InvITs to ensure circularity by earmarking new Green projects for MDB lending. Since much of MDB lending portfolio is sovereign in nature, this will help. This is also true of bilateral financial institutions (BFI) such as JAICA and KFW amongst others. As these loans would be against sovereign guarantees, governments would be able to negotiate lower interest rates, bringing down the cost of finance.

Once the construction risk is over, revenues have stabilized and the projects reach exit stage (full completion or partial completion), they can settle InvITs and monetize future earnings through issuance of units. By doing so, they can repay the debt and contract new debt, without any overhang on fiscal deficit ceilings, and invest in new Green projects. This virtuous cycle would assist governments to scale up the creation of Green assets and also achieve transition smoothly and timely while accessing private finance in a much larger proportion.

The same process would apply even if state government borrows from commercial sources, both domestic and international, and use the finance to build infrastructure and later settle for InvITs. Similarly, they can seek funding from other institutions such as the sovereign wealth funds, or through capital markets and as risk profile mitigates for projects, an InvIT can be formed. A typical example of InvIT is provided below.

Example of InvIT



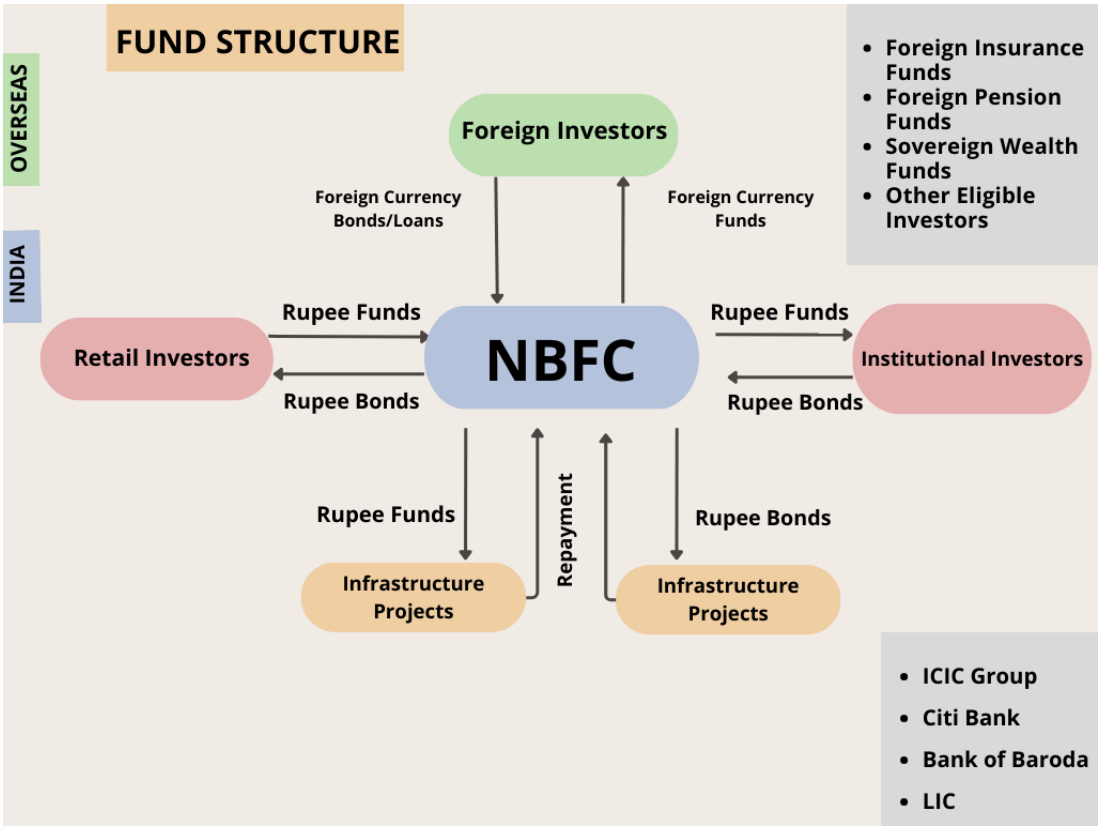
5.2.3 Infrastructure Debt Fund

Additionally, an Infrastructure Debt Funds (IDF) may also be established. IDFs are important innovation in the infrastructure finance space, notified in 2011. An IDF in India may be listed as a Non-bank Finance Company or a mutual fund (RBI, 2022). Whereas IDF-NBFC is regulated by RBI, IDF-MF is regulated by SEBI. One of the benefits of the IDF listed under the NBFC route is the possibility of long-term fixed loans, which could be well suited for projects with long horizon[19].

An IDF-NBFC would be a non-deposit taking NBFC which is permitted to refinance post commencement operations date (COD) infrastructure projects that have completed at least one year of satisfactory n operations; and finance toll operate transfer (TOT) projects as the direct lender.

The debt fund means a pool of investment comprising of several fixed-income instruments, such as bonds or debentures. They are, in essence, take-out finance. Take out finance, as a business model, had not developed in the country till the introduction of the IDFs.

[19] Roultledge, "The role of Coal in a Sustainable Energy Mix for India", 'Financing India's 2030 targets and Beyond'. *Vaibhav Pratap Singh & Neha Kumar*



Source: IJGlobal (2013): Graphic Recreated by Indicc to reflect amendment in regulation

Due to heavy reliance on institutional finance, mostly from commercial banks, financial structure of infrastructure projects become risky. Banks, due to asset liability mismatch, lend for a shorter tenure, say 5-7 years, whereas the life cycle of most infrastructure projects could run up to 25 years plus. The revenues of such projects build up towards the tail whereas the entire debt service burden is upfront. This makes the financial structuring risky and even a slight variation in the revenue growth projections could result in financial stress building up. IDFs permit risk rated interest reset and also elongation of loan repayment period making the projects financially more stable.

In order to enable IDF-NBFCs to play a greater role in the financing of the infrastructure sector and to harmonise the regulations governing financing of infrastructure sector by the NBFCs, a review of the guidelines applicable to IDF-NBFCs was undertaken, in consultation with the Government of India. As a consequence, a revised regulatory framework for IDF-NBFCs was introduced in August 2023[20].

An IDF-NBFC shall be required to have an Net Owned Fund (NOF) of at least ₹300 crore and capital-to-risk weighted assets ratio (CRAR) of minimum 15 per cent (with minimum Tier 1 capital of 10 per cent).

[20] https://rbi.org.in/Scripts/NotificationUser.aspx?Id=12528&Mode=0

It can raise funds through issue of either rupee or dollar denominated bonds of minimum five-year maturity. With a view to facilitate better asset-liability management (ALM), IDF-NBFCs can raise funds through shorter tenor bonds and commercial papers (CPs) from the domestic market to the extent of up to 10 per cent of their total outstanding borrowings. In addition to the bond route, IDF-NBFCs can also raise funds through loan route under external commercial borrowings (ECBs). However, such borrowings shall be subject to minimum tenor of five years and the ECB loans should not be sourced from foreign branches of Indian banks.

The exposure limits for IDF-NBFCs shall be 30% of their Tier 1 capital for single borrower/ party and 50% of their Tier 1 capital for single group of borrowers/ parties. For computing CRAR of the IDF-NBFCs, their assets shall be risk-weighted as per risk-weights applicable to NBFC-Investment and Credit Companies (NBFC-ICCs).

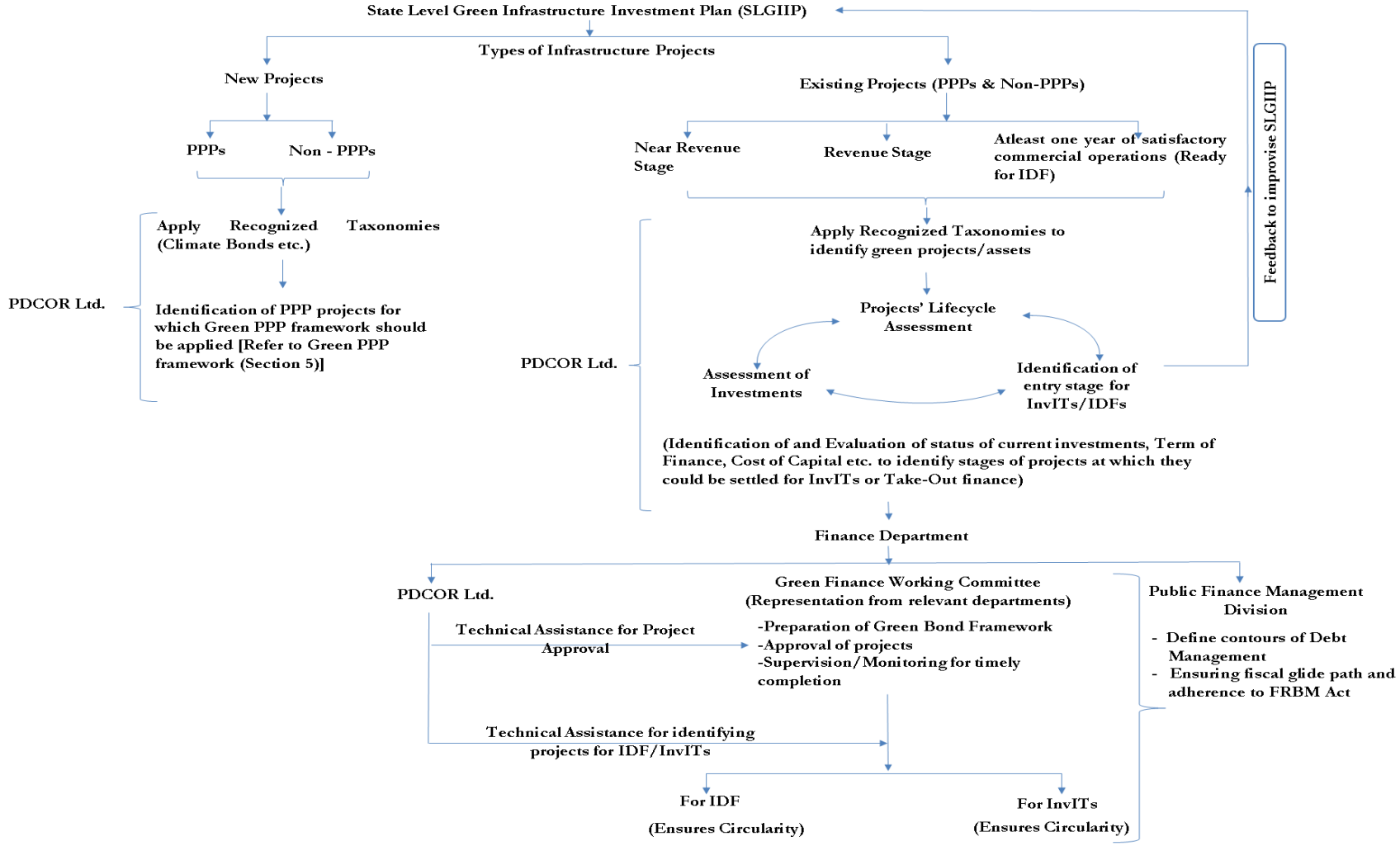
Finally, under the earlier guidelines, an IDF-NBFC was required to be sponsored by a bank or an NBFC-Infrastructure Finance Company (NBFC-IFC). The requirement of a sponsor for an IDF-NBFC has now been withdrawn and shareholders of IDF-NBFCs shall be subjected to scrutiny as applicable to other NBFCs, including NBFC-IFCs.

Further, earlier IDF-NBFCs were required to enter into a tripartite agreement with the concessionaire and the project authority for investments in the Public Private Partnership (PPP) infrastructure projects having a project authority. The requirement of the tripartite agreement has now been made optional.

Given the above, an IDF can be useful to transfer the loan of long term infrastructure project from the books of the bank at lower interest rate (after construction risk is over). This would free up part the locked value which could be ploughed back for more infrastructure creation, thus ensuring circularity. Additionally, IDF's can also actively be used for PPPs, which in the current circumstances appear to be the most plausible route to create new infrastructure without a fiscal overhang.

Therefore, in order to structure a calibrated glide path for fiscal management while financing long term 'Green Infrastructure' an IDF in the short to medium term may be set up as an IDF-NBFC.

5.2.4 Institutional Framework to Attract Private Capital for Green Infrastructure Financing



Source: Indicc Analysis

To operationalize the use of above strategies/instruments/structures, Rajasthan may commence an immediate process of putting together a State Level Green Infrastructure Investment Plan. While such a plan requires an exhaustive process that may take time, the contours of the plan can be sketched out and implemented immediately through a top down and bottom-up approach deployed simultaneously.

For this purpose, as a first step the state may task PDCOR Ltd. as an exclusive agency to provide consulting and advisory support to the government on identification and implementation of Green Infrastructure. Necessary changes in PDCOR's mandate may need to be carried out for the same[21].
To ensure this, PDCOR Ltd. itself would need to be capacitated in Green Taxonomy as well as Green Bond Framework. Such trainings should be for dedicated PDCOR staff as well as technical officers from relevant departments. The frequency of the training should be half-yearly for the first two years. As deeper understanding and familiarity with technical concepts and their applicability is developed, the refresher training could be held annually.

Simultaneously, PDCOR Ltd., assisted by departments, should carry out an exhaustive stock taking of all infrastructure projects. These could be divided into two categories – new projects as well as existing projects. These projects could be in PPP or non PPP mode, managed by different entities including Public Sector Companies, Public Finance Institutions et al.

As a next step, internationally recognized taxonomy should be used for Green classification. Thereafter, each project could be evaluated using following filters:

- Near Revenue Stage
- Revenue Stage Projects
- At least one year of satisfactory commercial operation

Such a classification helps to determine the degree of risk from finance perspective. Since the projects are likely to have different lifecycle and investors, it is also important to assess 'investments-risk-duration' dynamics. This is likely to reveal asset-liability mismatch and hence can provide an informed idea of that stage of the project where new and cheaper sources of finance can come in through Infrastructure

[21] PDCOR Limited an ISO 9001:2015 certified Company is jointly promoted by the Government of Rajasthan (GoR) and Infrastructure Leasing & Financial Services Limited (IL&FS) to facilitate private sector investment in the infrastructure sector in the State of Rajasthan. The company was incorporated in December 1997 and commenced its operations in May 1998. PDCOR has the capability to provide institutional support to the Government in successfully structuring and implementing infrastructure projects on a public-private partnership format. The company is uniquely positioned to provide policy advisory and institutional restructuring services to the Government. The management team of the company consists of professionals with multidisciplinary backgrounds and experience in development, implementation and financing of projects. The core team consists of MBA's, Engineers, Planners and CAs from institutes of national and international repute like the IIM, MNIT, SPA, CEPT, Podar, MKU and ICAI, and is supported by competent professionals of its parent organizations i.e., IL&FS and IIDC Limited.

Debt Funds or where projects can be hived off in a de-risked special purpose vehicle for market financing through InvITs.

This will not only help in unlocking public finance to crowd in more private capital for new infrastructure projects but may also substantially reduce fiscal overhang by introducing circularity of finance.

The only downside risk, however, is that attractive projects are also attractive for banks and without a disincentive for banks to pass on the loans to instruments like IDFs, the banks may like to hold on to the projects longer than necessary.

In the absence of any such regulation that may enable IDF to smoothly take over bank loans, it becomes extremely important for projects to be conceived in such a way that their financing tenure with respect to different kinds of investors can be pre-determined. This requires a high project development caliber, an aspect that can again be ensured by PDCOR Ltd.

That said, Finance Department of the state government, can thereafter set up a Green Finance Working Committee, essentially for the issuance of Green Bonds and approval of projects. Such a committee can again benefit from PDCOR's expertise while a dedicated Public Finance Management division (presently funded by the World Bank in Rajasthan) can simultaneously keep a track on debt levels and public debt management.

6 Medium to Long Term Strategies

The above stated processes, instruments and structures are essentially geared towards debt management while creating 'Green' infrastructure. At a larger level, debt management is essentially a part of the macroeconomic stability guaranteed by macroeconomic policy whose objective is to achieve sustainable economic growth in the context of price stability.

This requires close degree of coordination between monetary and fiscal policies (Union and States). Without such coordination, financial instability could ensue, leading to high interest rates, exchange rate pressures, rapid inflation, and an adverse impact on economic growth. On the other hand, effective coordination ensures the commitment of decision makers responsible for the two policy areas to mutually agreed objectives.

An important reason to highlight this interconnection is because Reserve Bank of India (RBI), which is a member of Network of Central Banks and Regulators for

Greening the Financial System (NGFS), has set up a Sustainable Finance Group (SFG) to effectively counter climate risks. Accordingly, it has come out with a guidance note on scenario analysis and stress tests for regulated entities, amongst other things.

This necessitates not only a concerted action on fiscal and monetary policy coordination involving states and center but also a framework for fiscal stress test for states. As RBI is also the debt manager for states, this will help in better overall policy planning in the context of climate action.

An IMF paper suggests that the main area of focus under policy coordination should be monetary policy and public debt management.[22] Thus, in the backdrop of climate action the need for monetary and fiscal policy coordination assumes special significance. As more states and central government embark upon accessing greater quantum of private capital for Green infrastructure creation, there would be a requirement for systematic stock taking of public debt at the sub-national and national level in order to better align overall public debt with monetary policy.

Going forward both state and national governments could adopt a comprehensive framework on Green public finance management. The need for the same is also highlighted by institutions like the IMF.

[22] https://www.imf.org/external/pubs/ft/wp/wp9825.pdf

SECTION 2

FINANCING GREEN INFRASTRUCTURE IN RAJASTHAN – POLICY OPTIONS FOR STATE POWER GENERATION COMPANY IN THE SHORT TERM

1 INTRODUCTION

There are efforts underway in Rajasthan and progress is made in the case of Renewable Energy (RE) capacity installation. In 2022, Rajasthan became the state with the largest installed capacity of RE by surpassing Gujarat while as on March 2023 the state boasts an impressive 22 GW of non-hydro renewable energy capacity (achieving 15% of its 142GW assessed potential).

This achievement has largely been driven by private-sector investments, accounting for 98% of the capacity (CEA 2023). Furthermore, an additional 25 GW of RE projects are in various stages of development in the state[23]. Although interestingly, of the 22 GW installed RE capacity, 16 GW is exported to other regions and only 6 GW is used to meet Rajasthan's RPOs. Therefore, Rajasthan's importance in the power sector underscores the importance of flow of transition supporting finance to the state.

2 INVESTMENT REQUIREMENT AND FISCAL SPACE

In order to address the above, the report uses an example of State Generation Utility, namely Rajasthan Rajya Vidyut Utpadan Nigam Limited (RVUN) to demonstrate the investment requirement associated with three scenarious namely - Business As Usual, Redirecting Capital from Accelerated Transition and Accelerated De-carbonization.[24]

As on 2022, Rajasthan has a domestic energy demand of 15.5 GW. The states only public sector generation company, RVUN, supplies 50% of present energy demand. Coal has a significant role in the utility's generation portfolio with more than 90% share in power generation, with minor contributions from gas and hydro. The utility currently does not have any investment in Solar, despite Rajasthan's unmatched potential in the sector.

[23] Interaction with RRECL, August 2023

[24] For more on the case study of RVUN, see: Energy Transition Guide for State Utilities- Opportunities, Challenges and Strategies Link: http://bit.ly/3ZApyY0 and Transition Roadmap for a Generation Utility (A Case Study of RRVUNL) Link: https://bit.ly/3ZEQ3LU

Table 2.1: The fuel wise generation mix of RVUNL in FY2125

Fuel	Generation capacity		Generation (MU)	
	MW	%	Rated[26]	Actual
Coal	7,830	91%	42,621	22,933
Gas	603	7%	2,516	654
Hydro	164	2%	202	202
Solar	0	0%	-	-
Total	**8,597**	**100%**	**45,340**	**23,790**

Given that the RVUN holds the majority share in power generation, accounting for 50.4% of the state's peak load, its role in ensuring 'equity and energy security' within the state becomes pivotal. RVUN's decisions directly impact availability and affordability of electricity, making it essential to prioritize equitable distribution and pricing. In light of this, it is imperative to explore the potential implications of greening the state's generation portfolio in terms of economic and developmental aspects.

It is noteworthy that RVUN already has plans to install 810 MW of RE capacity in the coming years. However, there is a larger scope for greening the portfolio. Other State Gencos in Andhra Pradesh (AP), Tamil Nadu (TN), and Gujarat have taken steps to increase their green portfolio within state generation, serving as examples to learn from (Figure 2.2).

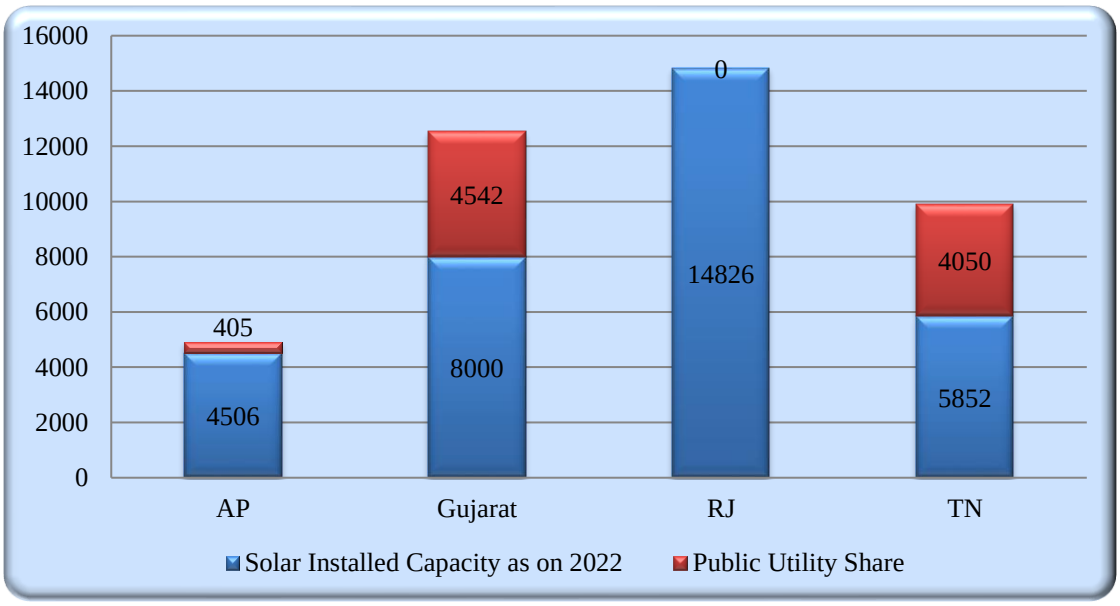


Figure 2.1: Share of State Gencos in Total Solar Power Generation (as of September 2022)

Source: Data extracted from the official websites of State specific Public Utility

[25] Table 4.1 shows the current generation capacity mix (MW) and generation (MU) of RVUNL.

[26] Rated generation for thermal power is computed based on normative PLF and availability, adjusted for auxiliary consumption. For Hydro it is based on actual generation of the FY21 and for solar is based on 20% Annual CUF.

By increasing the share of renewable energy sources in RVUN's generation mix, Rajasthan can unlock several benefits. Firstly, it would contribute significantly to reducing carbon emissions and mitigating climate change. Additionally, a diversified energy mix would enhance the state's energy security by reducing dependence on fossil fuels and volatile fuel prices.

Analysis indicates that integrating solar power into RVUN's energy mix would lead to a substantial reduction in fuel costs for an equivalent amount of power generation. A case study argues that replacing a coal-based power plant with solar power at STPS (Suratgarh Thermal Power Station) could result in a reduction of approximately 1,043,053 tonnes of coal consumption per year, leading to significant savings of around Rs. 557.09 crore annually in fuel costs[27].

With greater RE integration in RVUN portfolio, Rajasthan can also improve its Renewable Purchase Obligation (RPO) compliance. Pertinent to note that Rajasthan has not been able to meet RPO obligations, which are already below the national standard of 25%. In FY 2020-21 and FY 2021-22, RPO was fixed at 16.65% and 18.30% respectively. The state was able to achieve an RPO of 12.5% and 14.1% in the respective years[28].

All the existing Power Purchase Agreements (PPAs) of RVUN are with the three state discoms. If RVUN adds RE in its portfolio, Rajasthan may be able achieve RPO targets effectively. Under the Tariff Rules 2016 (notification 12.04.2022), gencos are allowed to utilise RE for supplying power against their existing commitments/PPAs. Furthermore, greener the portfolio of genco over the next few years, easier it will be for the state to meet the projected RPO of around 40.53% by 2030 as projected and proposed by the Ministry of Power[29] (MoP).

In addition to RPO obligation, there is a likelihood of a new mandate of ensuring certain RE generation in the generation portfolio for all generation companies[30]. In other words, in addition to RPOs there may be Renewable Generation Obligation (RGOs) as well in the foreseeable future. The trajectory for RGO may well evolve on the same lines as RPO i.e. steady but certain increase over a period of time.

27 https://www.saurenergy.com/solar-energy-news/prioritising-rajasthans-energy-sufficiency-sustainably-requires-incentivising-state-genco
28 Report on Progress of Distribution Companies, August 2022
29 https://powermin.gov.in/sites/default/files/Renewable_Purchase_Obligation_and_Energy_Storage_Obligation_Trajectory_till_2029_30.pdf
30 Renewable Generation Obligation (RGO): MoP notification: Gencos, w.e.f. 1st April.2024, may have to establish minimum 25% of RE of the capacity of new coal/lignite based thermal plants

RVUN's future roadmap is pertinent to the interests of the people of Rajasthan, the competitive landscape in a new energy era, and the energy security of Rajasthan. RVUN's clean energy transition shall accelerate the energy transition of Rajasthan, create new opportunities for investments and jobs, facilitate competition through healthy public and private sector participation, and strengthen Rajasthan's energy security. The utility can take advantage of the immense RE potential in the state and harness opportunities such as global finance, local manufacturing and services industry, and high-value green jobs.

To tap into this potential, Rajasthan requires adequate policy support and market incentives to enable RVUN towards its energy transition journey. The proactive leadership and adaptation of RVUN to the new energy landscape will accelerate the state's renewable energy objectives and allow it to capitalize on the benefits of the shift towards clean energy.

3 RVUN’s TRANSITION SCENARIOS AND INVESTMENT REQUIREMENT

The quantum of solar generation capacity that will be required by RVUN to retain a significant portfolio in supplying electricity to state discoms by 2030 (i.e. 33% share is retained by RVUN) has been calculated. Generation capacity factors in the impact of decommissioning RVUN’s existing coal assets that are eligible for retirement based on some selected parameters along with the announcement of incremental capacity addition through solar and coal.

- **Scenario 1 - Business as Usual (BAU):** Here, the proposed coal power capacity (2.2GW) is considered to be commissioned by 2027, with an addition of 810 MW of Solar capacity in 2024 (announced in the FY22 budget). At the same time, considering a realistic decommissioning trajectory based on historical trends, existing coal assets past 35 years are considered for retirement.
- **Scenario 2 - Redirecting Capital for Accelerated Transition (RCAT):** Here, the retirement of coal assets past the age of 30 years is considered. Further, we assume zero capacity addition for the concerned period. We also assume that the equity capital budgeted by Government of Rajasthan is redirected towards solar PV capacity addition. The solar PV capacity addition in this scenario shall be in addition to the capacity simulated in Scenario 1.

- **Scenario 3 - Accelerated De-carbonization (AD):** This scenario involves aggressive de-carbonizing by retiring the existing coal plants at 25 years and shelving the current plans to add new coal capacity. We have considered that the share of Rajasthan's energy requirement met through RVUN's generation in 2030 shall remain at 33%, which is achieved through an accelerated addition of solar PV capacity by the utility.

Table 3.1: Transition Scenarios for RVUN

	Solar Addition (MW)	Coal Addition (MW)	Coal Retirement (MW)
Business as Usual (BAU)	810	2245	640
Redirecting Capital for Accelerated Transition (RCAT)	4842	0	1100
Accelerated Decarbonisation (AD)	24151	0	2295

The transition to a low-carbon economy necessitates substantial capital investment to support new technologies, infrastructure development, and the phase-out of fossil fuel-related infrastructure. In the case of RVUN, the finance requirements outlined in this report primarily encompass upfront capital costs and associated infrastructure expenses, such as transmission and storage costs. Ensuring adequate financial planning is essential for a successful and sustainable transition of the utility.

Total investment cost in BAU is Rs 23,303.08 Cr (Generation – Rs 19,070.95 Cr; Transmission- Rs 775 Cr and BESS – Rs 3,457.13 Cr); RCAT is Rs 27,878.90 Cr (Generation – Rs 19,659.27 Cr; Transmission- Rs 775 Cr and BESS – Rs 4,762.50 Cr); and AD is Rs 50,475.96 Cr (Generation – Rs 37,881.33 Cr; Transmission- Rs 9,137.50 Cr and BESS – Rs 3,457.13 Cr). It is seen that the investment requirements can vary between INR 23,303 crore to INR 50,475 crore until 2030 and the annual investment requirements would also depend on the adopted policy.

Table 3.2: Details of Benchmark Costs for Estimating Financing Requirements of RVUN

Particulars	Costs	Unit	Source
Capital cost of Coal power plant	7.3	Cr/MW	Compiled from the data presented in Rajasthan state budget FY2023
Capital Cost of Solar power plant	4.1	Cr/MW	IEEEFA, 2022[31]
Benchmark price of BESS	1,757	Cr/GWh	Estimating energy storage requirements for Rajasthan Grid, Bask Research Foundation, 2023

Table 3.3: Investment Requirement for RVUNL by 2030

Scenarios/ Cost	Capital Cost for Coal Generation (Rs in Cr)	Capital Cost for Solar Generation (Rs in Cr)	Capital Cost for BESS (Rs in Cr)	Capital Cost Transmission Infrastructure (Rs in Cr)	Total Cost (Rs in Cr)
Business as Usual (BAU)	15,782.35	3,288.60	3,457.13	775.00	**23,303.08**
Redirecting Capital for Accelerated Transition (RCAT)	NIL	19,659.27	3,457.13	4,762.50	**27,878.90**
Accelerated Decarbonisation (AD)	NIL	37,881.33	3,457.13	9,137.50	**50,475.96**

[31] https://ieefa.org/sites/default/files/2022-05/Solar%20Tariffs%20to%20Rise%20by%20_21%25%20in%20the%20Next%2012%20Months_May%202022.pdf

Table 3.4: Portfolio Mix of RVUNL under different Scenarios by 2030

S. No	Fuel	2022	%	BAU2030 (MW)	%	RCAT2030 (MW)	%	AD2030 (MW)	%
1	**Coal**	7,830	91%	9,435	86%	6,730	55%	5,535	35%
2	**Gas**	604	7%	604	5%	604	5%	604	4%
3	**Hydro**	164	2%	164	1%	164	1%	164	1%
4	**Solar**	0	0%	810	7%	4,842	39%	9,330	60%
	Total	**8,597**	**100%**	**11,012**	**100%**	**12,340**	**100%**	**15,633**	**100%**

Detailed Investment Analysis

Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030
Rajasthan Electricity Demand (MW)		16,291	17,841	18,753	19,648	20,590	21,537	22,500	23,534
Rajasthan Electricity Demand (MUs)		1,01,757	1,11,955	1,17,849	1,23,668	1,29,797	1,35,979	1,42,286	1,49,063
Energy Share of RVUN (% MUs)	50.0 %								33.0%
SCENARIO III (INR 50,475.96 Crore)									
Estimation of Public Investments in RVUNL (Rajasthan GenCo) - Scenario III	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Coal Power Retired in the year (@ 25 years)		-	-	1,350	-	500	250	195	-
Solar Photovoltaic Investments for RVUN									
Solar Power Addition in the year (MW)		-	810	407	612	920	1,382	2,077	3,122

Cumulative Solar Capacity (MW)		-	810	1,217	1,829	2,749	4,131	6,209	**9,330**
Yearly Investments for Solar PV - RVUN (Cr)		3288.6	1654	2485	3734	5612	8434	12674	
ESS Investments for RVUN			1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%
ESS capacity addition (GWh)		-	0.37	0.58	0.82	1.07	1.35	1.64	1.97
Yearly Investments for BESS - RVUN (Cr)		649.13	375.82	409.13	447.36	483.82	522.20	569.67	
Estimation of Public Investment in RVPN (Rajasthan TrasCo)									
Required intra-state transmission infrastructure capacity addition in the year (GW)		0.00	0.63	0.32	0.48	0.72	1.08	1.63	2.45
Annual investments by RVPN		793.26	398.85	599.40	900.78	1,353.69	2,034.33	3,057.20	
Yearly Investments in RVUN and RVPN (Rs. Cr)		**4,730.98**	**2,428.20**	**3,493.44**	**5,082.48**	**7,449.50**	**10,990.25**	**16,301.10**	**-**
Investments by GoR assuming 20% equity contribution (Rs. Cr)		**946.20**	**485.64**	**698.69**	**1,016.50**	**1,489.90**	**2,198.05**	**3,260.22**	
SCENARIO II (INR 27,878.90 Crore)									
Estimation of Public Investments in RVUNL (Rajasthan GenCo) - Scenario II	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Coal Power Retired in the year (@ 30 years)		-	-	850	-	-	-	250	-
Solar Photovoltaic Investments for RVUN									
Solar Power Addition in the year (MW)		-	810	281	379	510	688	926	1,248

Cumulative Solar Capacity (MW)		-	810	1,091	1,470	1,980	2,668	3,594	**4,842**
Yearly Investments for Solar PV - RVUN (Cr)		3288.6	1142	1538	2072	2792	3761	5066	
ESS Investments for RVUN			1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%
ESS capacity addition (GWh)			0.37	0.58	0.82	1.07	1.35	1.64	1.97
Yearly Investments for BESS - RVUN (Cr)		649.13	375.82	409.13	447.36	483.82	522.20	569.67	
Estimation of Public Investment in RVPN (Rajasthan TrasCo)									
Required intra-state transmission infrastructure capacity addition in the year (GW)		0.00	0.64	0.22	0.30	0.40	0.54	0.73	0.98
Annual investments by RVPN		796.67	276.59	372.62	501.98	676.26	911.04	1,227.34	
Yearly Investments in RVUN and RVPN (Rs. Cr)		**4,734.40**	**1,794.15**	**2,319.88**	**3,021.48**	**3,951.63**	**5,193.97**	**6,863.39**	**-**
Investments by GoR assuming 20% equity contribution (Rs. Cr)		**946.88**	**358.83**	**463.98**	**604.30**	**790.33**	**1,038.79**	**1,372.68**	
SCENARIO I (INR 23,303.08 Crore)									
Estimation of Public Investments in RVUNL (Rajasthan GenCo) - Scenario I	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Coal Power Capacity Addition in the year (New)						2,245			
Coal Power Retired in the year (@ 35 years)		-	-	640	-	-	-	-	-
Yearly Investments for Coal - RVUN (Cr)									

Coal Capacity Investments for RVUN						15,782			
Coal Power Addition in the year						2,245			
Yearly Investments for Coal Power - RVUN (Cr)		3,946	3,946	3,946	3,946				
Solar Photovoltaic Investments for RVUN									
Solar Power Addition in the year (MW)		-	810						
Cumulative Solar Capacity (MW)		-	810	810	810	810	810	810	810
Yearly Investments for Solar PV - RVUN (Cr)		3288.6	0	0	0	0	0	0	
ESS Investments for RVUN			1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%
ESS capacity addition (GWh)		-	0.37	0.58	0.82	1.07	1.35	1.64	1.97
Yearly Investments for BESS - RVUN (Cr)		649.13	375.82	409.13	447.36	483.82	522.20	569.67	
Estimation of Public Investment in RVPN (Rajasthan TrasCo)									
Required intra-state transmission infrastructure capacity addition in the year (GW)		0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00
Annual investments by RVPN		-	775.00	-	-	-	-	-	
Yearly Investments in RVUN and RVPN (Rs. Cr)		**7,883.31**	**5,096.41**	**4,354.72**	**4,392.95**	**483.82**	**522.20**	**569.67**	**-**
Investments by GoR assuming 20% equity contribution (Rs. Cr)		**1,576.66**	**1,019.28**	**870.94**	**878.59**	**96.76**	**104.44**	**113.93**	

4 FISCAL IMPLICATIONS

For being able to identify private capital or innovative financing, it is essential to first map the fiscal space available. Rajasthan's fiscal deficit expanded sharply during the outbreak of Covid-19 and the MTFP released by the state projects fiscal consolidation. This is to be achieved through an expansion in tax revenues, with an expected buoyancy of 1.5 for own tax revenues. Using the projections of the MTFP, we assume that the state's fiscal deficit will contract as per projections of MTFP 2024-25 (i.e. the last year for which the information is available)[32]. As per the estimates, Rajasthan will meet its 3% FD target by 2026.

In Table 4.1, the fiscal impact is projected based on the assumptions mentioned above. The growth rates assumed here are nominal and include the impact of inflation, however in the projections the previous period's uptick in inflation is not adjusted and would therefore be lower bound estimates of revenue and expenditure growth. The fiscal space is determined not just by the limits on fiscal deficit but the debt to GDP is also capped. Rajasthan's debt to GSDP has been within the FRBM limits prescribed by the state. Covid-19 however has stretched the State's borrowing capacity.

Table 4.1: Fiscal Impact of Investment Requirements by 2030

	Year	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
MTFP Projections	**Scenario 1 (BAU)**	0.113	0.066	0.050	0.046	0.005	0.004	0.004
	Scenario 2 (RCAT)	0.068	0.023	0.027	0.032	0.037	0.044	0.052
	Scenario 3 (AD)	0.068	0.031	0.040	0.053	0.070	0.093	0.124
	Fiscal Deficit	**-3.74**	**-3.25**	**-2.83**	**-2.47**	**-2.15**	**-1.87**	**-1.63**
Past Trend Projections	**Scenario 1 (BAU)**	0.136	0.084	0.068	0.066	0.007	0.007	0.008
	Scenario 2 (RCAT)	0.082	0.030	0.036	0.045	0.057	0.071	0.090
	Scenario 3 (AD)	0.082	0.040	0.055	0.076	0.107	0.151	0.215
	Fiscal Deficit	**-3.48**	**-3.42**	**-3.37**	**-3.33**	**-3.28**	**-3.25**	**-3.21**

[32] For MTFP: The rate of decline in fiscal deficit is 4.03% in 203-24 and 3.18% in 2024-25 and thereafter an average of 3.61% is applied in the rest of the period, GDP projections 11% is applied. As for projections based on past trend, the fiscal deficit is expected to expand at different rates averaging at 3.21% and growth in nominal GDP is about 5%.

Table 4.2: Outstanding debt

Year	Outstanding Debt (% of GSDP)	Targets (FRBM)
2015-16	30.73	36.5
2016-17	33.52	36.5
2017-18	33.67	35.5
2018-19	33.03	35
2019-20	34.55	34
2020-21	42.37	38.2

Source: State Finance Audit Report of CAG for the year ended 2020

Other than the debt that the state undertakes, it can also issue implicit or explicit guarantees. The off-budget borrowing in the last two years will (as per the central government) have to be adjusted against the borrowing ceiling until 2026[33]. In recent years it is observed that Off-balance-sheet borrowings of states are estimated to have reached a decadal high of ~4.5% of gross state domestic product (GSDP) in FY 2022.[34] The power sector, primarily DISCOMs, account for almost 40% of the outstanding state guarantees.

It is also seen that the outstanding guarantee to GSDP has been above 7% in the years after 2018. As per FRBM Act, 2005 (amended in April 2016) total outstanding Government guarantee on 31st March 2017 shall not exceed 70 per cent of estimated receipts in the Consolidated Fund of the State in financial year 2016-17 and thereafter total outstanding government guarantee at the end of each financial year shall not exceed 60 per cent of estimated receipts in the Consolidated Fund of the State in that financial year.

Table 4.3: Guarantees given by the Government of Rajasthan in INR crore

	2015-16	2016-17	2017-18	2018-19	2019-20
Maximum amount guaranteed including interest	1,61,236	1,18,161	1,12,057	1,31,026	1,44,676
Outstanding amount of guarantees including interest	53,620	51,119	61,761	70,430	80,631
Maximum amount guaranteed as a percentage of total Revenue Receipts	160.8	108.4	88	95	103.3
Estimated receipts in the Consolidated Fund	1,34,430	1,67,405	1,77,390	2,08,306	2,24,905
Outstanding guarantee w.r.t. estimated receipts (in *per cent*)	39.9	30.5	34.8	33.8	35.9

Source: State Finance Audit Report of CAG for the year ended 2021

[33] Centre relaxes norms for adjusting states' off-budget borrowings (moneycontrol.com)

[34] https://www.crisil.com/en/home/newsroom/press-releases/2022/05/off-balance-sheet-borrowings-of-states-may-have-reached-a-decadal-high-of-4-point-5-percent-of-gsdp.html

While as per the current rules, the outstanding guarantees seem sustainable however if these liabilities are to be brought on budget, Rajasthan could see a deterioration of its debt-GSDP ratio. If guarantees are added to the current stock of debt it will rise to 47%. Moreover, 79% of the guarantees were to the power sector. 0.55% percent of Rajasthan's GSDP representing the additions to outstanding guarantees in 2020-21 may need to be accounted for, thus, raising the debt ceiling marginally over the next four years. There remains scope for Rajasthan to expand its deficit by 0.5% as the Centre has allowed additional fiscal space tied to power sector reforms.

Table 4.4: Outstanding guarantees as % of GSDP

Year	Outstanding Guarantees (% of GSDP)
2017-18	7.45%
2018-19	7.64%
2019-20	8.07%
2020-21	8.62%

Source: Finance Accounts of various years, CAG State Account Reports; Note: (Implicit guarantees are not reported)

The investment costs built into scenarios for RVUN may be relatively small but there is still little availability of public finance**.** Other financing requirements from the power sector and even other sectors are likely to broaden the financing requirement. Therefore, several channels, in addition to their own resources, will need to be thought out simultaneously and different strategies will need to be worked out for infrastructure creation in Rajasthan while ensuring debt sustainability. The ensuing paragraphs discuss their design and fiscal implications. In other words, they provide policy options for financing.

It is important to note that that these policy options can be exercised in the short term and do not require some of the structural changes discussed in section 1. For medium to long term those structural changes must be incorporated for green infrastructure financing at scale.

5 INSTRUMENTS

5.1 InvITs

Infrastructure investment trusts (InvITs) are important structures gaining traction. For example, Power Grid Corporation of India launched the first ever InVIT by any state-owned entity and consists of less risky transmission assets. There are various parties involved in an InvIT- a sponsor who owns 15% of the InvIT, public unit holders who contribute the rest, trustee, investment manager, and project manager.

To be able to form an InvIT, 80% of the funds are to be invested in finished and revenue generating infrastructure projects. Hence it is possible to bundle assets in such way that there are near completion projects which can comprise 20% of the total InvIT. Another important condition while determining which assets can be monetized through an InvIT is that 90% of the Net Distributable Cash Flow (NDCF) by the trust are to be distributed as dividends semi-annually for public and annually for privately placed InvITs.

As per SEBI, the NDCF is calculated at the SPV level as prescribed[35]. Several adjustments are made to the profit after tax for depreciation, sale of assets and repayment of debt. Therefore, operating expenses are deducted for and determine the returns from InvITs. It is reported that InvITs in India generate returns of 8-10%[36]. The returns generated by the assets are the second important condition for clubbing within the asset.

InvITs and their SPVs can also borrow. Leverage cap for an InvIT is 49% on the net asset value. Public InvITs are listed and provide liquidity. It is suggested that assets with stable cash flows (for example in the transmission sector) may be rated better than those with high variability[37]. Banks are also allowed to invest in units of InvITs subject to certain conditions[38].

Investments in InvITs are a function of the cash flow and returns. The tax treatment can impact the latter. There is different tax treatment applicable to incomes from InvITs. The distribution of interest income earned by InvIT from SPVs is exempt under ITA but is taxable in the hands of the unit holders. The resident unit holder pays the applicable slab rate and the non-resident pays a concessional withholding rate of 5%. The return on net of tax will be higher for foreign investment due to concessional withholding rate and the reduced tax rate can be leveraged to scale up private finance.

35 https://www.sebi.gov.in/sebi_data/attachdocs/1476958899483.pdf
36 https://economictimes.indiatimes.com/markets/stocks/news/with-invits-get-returns-of-8-10-and-good-diversification/articleshow/85468305.cms?from=mdr
37 Rating Methodology for Infrastructure Investment Trusts (InvITs), ICRA
38 https://www.khaitanco.com/thought-leaderships/New-funding-source-for-InvITs-Bank-lending-permitted

Moreover, income distributed in the form of dividend is not taxable where the amount received by InvIT is from SPV.

Some investors may choose to sell their unit prior to end of the InVIT's life cycle. For this capital gains tax is an important determinant of post-tax returns. There are different rates prescribed for resident and non-resident unit holders. The long-term capital gains[39] is taxable at 10% in unlisted units for non-residents whereas 20% applies to residents. The short term capital gains are steep as 30% applies to residents and 40% to non-resident corporates. However, non-residents may claim the treatment under double tax avoidance agreement where the rate is lower.

Moreover, there is no tax at the moment on the loan repayment. It is important to note that since the InvIT lends, the repayment of loans by SPV to InVIT is exempt from taxation. However, as per the Finance Act 2023, the loan repayment component of incomes from REITs and InvITs (which are in excess of the issue price) will be taxed as income from other sources for the individual unitholder. In other cases, when the loan repayment component exceeds the issue price of the InvIT (cost of acquisition) at the time of sale of unit, it becomes taxable as income from other source for the unitholders of InvITs or REITs (taxable as per the slab rate for that financial year). The said tax treatment can complicate the investor's return expectation and can end up imposing a lock in by investors, if they expect to incur taxation (as per the slab rate) on income from loan repayment.

In order to use InvITs at the state level, it is important to identify the assets that can be separated and asset level information is available to estimate cash flows so as to project their revenue generation potential. Moreover, given that there is market interest at returns of 7-8 per cent, Rajasthan will have to understand which among RVUN assets can deliver such returns. In all this computation, a macroeconomic assessment would be necessary to understand the impact of rising interest rates on expected returns and cash flows from InvITs. The use of such structures can help raise cash that can be used for the purpose of greening the assets of functional units.

5.2 Development Finance Institutions

There are multiple types of development finance institutions that operate at the national level. Presently there are development banks such as IDBI, SIDBI, IFCI, then there are specialized financial institutions such as NABARD, PFC, REC, EXIM bank and finally there are state finance corporations. For energy transition within the state, each of these can be important for meeting the state's long-term financing requirements. The idea of setting up DFIs that are fully backed by the government are

[39] That is, held for more than 36 months

seen as difficult propositions[40], as these would require additional fiscal resources which are limited in the case of states such as Rajasthan. There are recommendations that equity structures be created with the support of multilateral development banks, LIC, IFCI and sovereign wealth funds[41]. However, at the national level the introduction of NaBFID is a good example of government DFI. Government ownership will allow the institution to access funds at better rates due to higher ratings. In terms of the scalability of the funding, it is suggested that in the case of NaBFID an initial capital of INR 20,000 crore along with grant and hybrid instruments would be sufficient to achieve a lending of INR 300,000 crore within a time frame of 2-3 years.

NaBFID-national level DFI was launched to promote take-out financing in infrastructure projects. It is regulated as AIFI which implies that, it helps support lending by commercial banks in the short-term phase of the project finance and these loans will then be taken over by NaBFID. It is also possible to use a combination of instruments. For example, NaBFID raised INR 10,000 crore through listed unsecured and non-convertible bonds (AAA rated) at 7.43%, subscribed largely by AIFI alongside the equity on INR 20,000 crore from government[42].

NaBFID seeks to expand to bond and derivative market in infrastructure financing. It will provide guarantee at concessional rate of 0.1% for borrowings extended from multilateral institutions, sovereign wealth funds, and foreign institutions[43]. Further, hedging costs in connection with any borrowing of foreign currency by the Institution for the purposes of granting loans and advances or its repayment (to insulate the Institution from any fluctuations in the rates of exchange) may be reimbursed by the Central Government in part or in full[44].

While imagining a new or repurposed state level financial institution, another method for interim financing is through callable capital. For example, the World Bank has only 15-20 per cent of paid in capital and rest is callable capital[45]. The Inter-American Development Bank has 96% callable capital[46]. This allows MDBs to borrow against such capital. However, the callable capital ratio for the state level institution may be different and needs to be estimated to know to what extent capital can be scaled up. There has been no experience of capital being called and so therefore the risks to the

[40] https://www.ris.org.in/sites/default/files/Publication/DFI%20Report_0.pdf
[41] https://www.ris.org.in/sites/default/files/Publication/DFI%20Report_0.pdf
[42] https://eacpm.gov.in/wp-content/uploads/2023/07/8-National-Bank-for-Financing-Infrastructure-and-Development.pdf
[43] Section 21 (2) of NaBFID Act 2021, https://financialservices.gov.in/sites/default/files/National%20Bank%20for%20Financing%20Infrastructure%20and%20Development%20Act%2C%202021%20for%20establishing%20NaBFID.pdf
[44] Section 23 NaBFID Act, 2021
[45] Page 3, https://www.ris.org.in/sites/default/files/Publication/DFI%20Report_0.pdf
[46] https://www.iadb.org/en/about-us/idb-financing/ordinary-capita-resource-callable-capital-and-paid-capital-idb-member

bondholders need to be properly assessed. The ability to raise this kind of capital through a state owned DFI may also need to be explored. That is, a part of the total investment costs may be made to the DFI, and the rest may be either take out finance, callable capital or through issue of bonds. The fiscal implications of these will be to the extent of government's equity contribution and commitment of callable capital that may need to be accounted for in the contingent liabilities. Further, any interest payments on debt issued will be supported from projects.

Another potential source can be the setting up of JV or a separate state level subsidiary of NaBFID to promote investments in the power sector. As per the Act NaBFID may *"i) form subsidiaries or joint ventures or branches, in India or outside India, for carrying out its functions; and enter into any arrangement with such subsidiary company or joint venture or branch including for financing any such subsidiary company or joint venture or branch or guaranteeing any of their liabilities or make any other arrangement which may seem desirable to the Board*"[47].

It is possible to explore if state level development finance corporations such as Rajasthan Finance Corporation (although it lends to MSMEs) or Rajasthan State Industrial Development and Investment Corporation or Rajasthan Power Finance Corporation can be repurposed. This may also allow state entities to access capital at better terms as the ratings would be in line with the national level.

As mentioned earlier, to the extent that the initial contribution is to be made by the state, this will be an outgo from the budget and will be considered as capital expenditure by the state. Rajasthan in its MTFP anticipates an expansion in the capex and it is possible to include the contribution under the said budget head.

5.3 Green Bonds

With the issuance of the sovereign green bond, there is interest in the use of the instrument to fund energy transition at the sub-national level. The green bond issuance by the Government of India is earmarked for expenditures on grid scale solar and wind, decentralized solar such as solar pumps in agriculture, green hydrogen, metro lines and afforestation. The issuance was able to obtain a greenium of about 0.1% making the cost cheaper. The cut off price or yield for the 2028 bond was 7.1% and that of 2032 bond was 7.29%[48]. In 2023, Indore Municipal Corporation issued green bonds worth INR 720 crore listed on NSE. The overall subscription was 5.91 times the issue size[49]. The tenor of the bonds was 3, 5, 7 and 9 with a coupon rate of

[47] Section 17(1) NaBFID Act 2021
[48] https://rbidocs.rbi.org.in/rdocs/PressRelease/PDFs/PR1609D41A394A9C7C46088DDCFD284D5A8BE9.PDF
[49] https://economictimes.indiatimes.com/markets/stocks/news/indore-municipal-corporation-green-bonds-listed-on-nse/articleshow/98127096.cms?from=mdr

8.25%[50] and the proceeds will be used in a solar power project. The solar power project is meant to reduce the dependency on grid energy and is also registered under Verified Carbon Standard Association to avail benefits of carbon credits.

While there is the story of cheaper finance available through the green bonds at the national level the question to consider is if the greenium will be available to the sub-national governments through SDLs. A more important question is how the green bond issuance reflects on the government's borrowings. Referring to the limited fiscal space it may not be feasible to expand current borrowings of the states using such instruments. In case where a state raises the finance for specific projects directly through its budget these dated securities with interest paid half yearly may carry an interest rate that is higher than central government securities (25-50 bps) and with higher interest rates it is expected that the cost of borrowing will increase. Although, RBI finds little or no correlation between the fiscal position and the yields on the SDLs[51], there are limits prescribed for the extent of borrowing through this channel. However, it is possible to explore the refinancing or restructuring of state debt where the relatively short-term debt due is replaced with such issuance, to the extent permissible by FRBM limits.

Major participants in the G-Secs market include commercial banks and Primary Dealers (PDs) besides institutional investors like insurance companies. PDs play an important role as market makers in G-Secs market. A market maker provides firm two-way quotes in the market i.e. both buy and sell executable quotes for the concerned securities. Other participants include co-operative banks, regional rural banks, mutual funds, provident and pension funds. Foreign Portfolio Investors (FPIs) are allowed to participate in the G-Secs market within the quantitative limits prescribed from time to time. Corporates also buy/ sell the G-Secs to manage their overall portfolio[52]. Therefore, green bonds can attract different kinds of investors in the domestic and international markets.

Alternatively, where there is limited fiscal space, green bond can be issued by the state-owned entity for the specified project. In the past, REC- a subsidiary of PFC has raised money through the green bond issuance. The capital raised through the bonds was US$750 million at 5.625% that will be used to fund green projects[53]. Such lending can be directed to states for reforms as for this purpose additional borrowing space made available to states to the tune of 0.5% of the GSDP which is approximately INR 80,000 crore. The proposal by Rajasthan is under consideration. This additional borrowing would be coordinated by nodal agency established by REC

50 https://www.mercomindia.com/indore-municipal-corporation-%E2%82%B93-billion-green-bonds
51 https://m.rbi.org.in/scripts/PublicationsView.aspx?id=20995
52 https://www.rbi.org.in/commonperson/English/Scripts/FAQs.aspx?Id=711
53 https://www.psuconnect.in/news/rec-limited-to-issue-of-usd-750-million-5.625-percent-green-bonds/37144/

Ltd[54]. Such a loan that is passed on to states would be counted towards the state's borrowings. However, it may be possible for PFC to on lend the proceeds, where the funds are available at better terms such as higher ratings of the borrowing to a state entity. There are prescribed limits to the funding via PFC i.e. 50% of identifiable free cash flows available which include dividend, royalty, etc[55].

In terms of the tax treatment of the investment, interest on green bonds will be taxed at the rate of tax applicable to income of the investors with no specific exemption for capital gains and for foreign investors on interest will be as per the treaty rates applicable. However, if the bonds are listed in IFSC the foreign investors will receive a withholding tax benefit of a lower rate of 4%[56]. There have been reports suggesting proposals by PFC and IREDA to raise funds through tax paid bonds which would ensure that the investor receives higher returns[57]. There is also the option of state-owned entities or PSUs of issuing tax saving bonds to raise capital.

The proceeds of the bonds are used to fund specific development or infrastructure projects initiated by the government which include power. The interest payouts on these bonds are tax free[58]. There are also exemptions to pension funds, sovereign wealth funds for putting money either directly or through companies, trusts, Alternative Investment Funds, infrastructure finance companies or infrastructure debt. As per Section 10(23 FE) of the Income Tax Act income earned by the investments channeled to Infrastructure through such entities are exempted. The income includes dividend, interest or long-term capital gains made between 1 April 2020 and 31 March 2024. The SWF or PF must meet specific conditions and there is an investment lock in necessary for a period of 3 years. There are experiments such as 'green grant scheme' in Singapore and Hong Kong that cover costs of review[59]. The benefits from better terms and access to funds can then be passed on to state entities.

6 NEXT STEPS

As demonstrated in this section, there has been growing reliance of state governments on market borrowing. Green bonds are an attractive alternative, given the recent success of the sovereign issuance. Implicit sovereign guarantees, lower yields, unlocking pension and insurance funds for green investment, and their domestic nature make such source of finance attractive. While there have been other concerns

[54] https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1790714
[55] https://www.pfcindia.com/Default/ViewFile/?id=1472487142757_Corporate%20Loan%20Policy.pdf&path=Page&Name=Corporate%20Loan
[56] https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1921755
[57] https://www.business-standard.com/article/economy-policy/power-ministry-proposes-tax-paid-green-bonds-issuance-says-report-123012501682_1.html
[58] Section 10(15) of the Income Tax Act 1961
[59] https://indiacorplaw.in/2021/09/green-bonds-in-india-the-present-and-what-next.html

such as narrow investor base, limited Foreign Portfolio Investment (FPI), and the impact on trading and liquidity needed for a robust secondary market for SDLs, a more important determinant of the manner in which these are issued i.e. directly by states or by state owned entities, is the availability of fiscal space.

Therefore, in the short term (should the Government of Rajasthan decides to pick more ambitious transition scenario for RVUN), raising capital through InvITs and specialized DFIs through partnerships with NaBFID can be important steps forward. Considerations for state-backed entities or Special Purpose Vehicles (SPVs) are rating requirements, sovereign guarantee extensions for better financing terms, governance requirements, and international considerations.

SECTION 3

RECOMMENDATIONS

In light of the above, key recommendations from the report are as follows:

With respect to State Level Climate Action Plan

- State level climate action plan highlights the need for high focus on both mitigation as well as adaptation measures while most studies highlighting financing gaps at the national level have preponderance on mitigation strategies. This necessitates the need for Rajasthan to carry out its own assessment of finance requirement for Green infrastructure over the long term.
- The regional or district level infrastructure planning in the state needs greater focus. The current climate action plan does not contain specific action agenda even though there are thoughtful yet disparate steps being taken by several state entities. Therefore, as an immediate step the state should carry out a consolidation exercise to identify projects that may be eligible for Green finance.

Financing Green Infrastructure

- Given limited fiscal headroom, the state should deploy simultaneous options which include use of internationally recognized taxonomy to identify Green assets. The taxonomy may also be used for Green tagging of assets for the preparation of Green budget and fiscal risk statement. For this purpose, a dedicated body may be setup as suggested in the report. This will enable easier flow of private capital and better monitoring of financial resources
- In the short term, earmarking of 'pure play' green assets for a Green SDL will be useful. This will have a positive impact on Quality of Expenditure. Once a comprehensive, Green classification of assets is done, the state may enlarge the quantum of financing through Green SDL as well. A Green SDL category could also be built into the composite index prepared by RBI which could potentially bring down the cost of finance through SDL. This however will be outside the realm of the state government
- For expanding the finance envelop, the state should embark on a State Level Green Infrastructure Finance Plan and institutionalize the framework for PPPs in Green Infrastructure, set up an IDF and increase the use of InvITS for ensuring circularity of finance and managing debt. For these purposes, PDCOR Ltd. could be recalibrated to provide necessary technical assistance. The detail framework presented in the report could be used for the same

- The Public Finance Management Division under Department of Finance could work in tandem with PDCOR Ltd to ensure a sustainable glide path to fiscal deficit over a time bound horizon

State Readiness Framework

S No	Indicator	Readiness	Proposed Action	Feasibility of Action	Proposed Time Horizon
1	Availability of CAP[60]	Y	Revision of CAP for Granular Action	High	Short Term
	Granularity of Actionable Strategy	N			
2	Articulation of National Pathways for NDCs (LT-LEDS)	Y	Several state sectoral policies need alignment	High	Short Term
	Alignment of State Strategies with National Pathways	N			
3	Institutionalized System to Avoid Green Washing at National Level	Partial[61]	Use of Internationally Recognized Taxonomy to avoid Green Washing and enable inflow of Private Capital	High	Short Term
	At state level (Rajasthan)	N			
4	Green Budget at National Level/other states	National Level – No Other States[62] - Yes		-	-
	At State Level (Rajasthan)	No	State may undertake Green Budget Exercise as per the recommended Framework in the Report	High	Medium Term

[60] Climate Action Plan

[61] Sovereign Green Bond Issuance relies on Taxonomy. Draft Taxonomy has also been prepared by Ministry of Finance, Government of India

[62] Some states have adopted Green Budget Practice methodologies are not harmonized. This can be resolved through use of recognized taxonomies

S No	Indicator	Readiness	Proposed Action	Feasibility of Action	Proposed Time Horizon
5	Green Market Borrowing Via RBI at National Level	Yes	State May undertake a sovereign Green Bond Issuance similar to National Level	High	Short Term
	Green Market Borrowing Via RBI at State Level[63] (Rajasthan)	No			
6	Framework for PPPs in Green Infrastructure at National Level	No	Green PPP framework may be created and institutionalized at national and state level	-	-
	At the state Level (Rajasthan)	Yes	Broad Framework is articulated in the report. Finalization and Institutionalization would be necessary steps	High	Short Term
7	Institutions for Takeout Finance and Circularity at National Level (InVITS and IDF)	Yes	Already exists. Can assist states as well	-	Short Term
	At State Level (Rajasthan)	No	Creation of IDF would be crucial	Moderate	Short To Medium Term
8	Dedicated Climate Development Finance Institution (DFI) at National Level	No[64]	PFC and REC could be potentially accorded the DFI status	Remote[65]	Medium Term
	At state Level (Rajasthan)	No	Need to create state DFI as well to meet Green Infrastructure needs. Regulatory provision would need to be checked	Moderate	

[63] Amongst states, Maharashtra has issued a Green SDL

[64] DFIs like NABFID exists which can aid state action on Climate aligned Infrastructure

[65] Recently, Ministry of Finance turned down the request from Power Finance Corporation and Rural Electrification Corporation to be accorded a DFI status

S No	Indicator	Readiness	Proposed Action	Feasibility of Action	Proposed Time Horizon
9	Availability of Technical Body for Project and Transaction Advisory at National Level	Yes	Bodies like NIIF exist	-	-
	At the State Level (Rajasthan)	Yes	PDCOR Ltd exists. Mandate may need to be revisited to cover non-PPP projects as well	High	Short Term
10	Green Public Finance Management Division for maintaining fiscal prudence in the context of meeting NDCs and Net Zero	-	-	-	-
	At the state level (Rajasthan)	No	PFM division exists which can be recalibrated to assist state in charting fiscal glide path while greening the infrastructure	High	Short Term
11	Coordination between Fiscal and Monetary Policy in the context of Climate Action	No	RBI is however proactive. States and Centre would need to align debt management with monetary policy objectives in the long term	Moderate	Long term

Financing the Power Sector in Rajasthan

- While substantial progress has been made in the state on Green power, most of it is meant for export purposes and is led by the private sector. The state power generation company may also embark on a diversification path incorporating greater share of renewables, much on the same lines as some other states like Andhra Pradesh, Tamil Nadu and Gujarat. For this purpose, policy options highlighted in the report (subject to applicable regulations) may be exercised and a detailed design could be adopted using relevant technical assistance. Broadly, this transition should be part of overall state financing strategy on Green infrastructure so that a cogent approach to public finance and its use to crowd in private capital can be systematically structured
- For detail planning on Green infrastructure creation, its impact on public finance and role of private capital, the state should not only recalibrate Public Finance Management Division and PDCOR Ltd. (as discussed above) but may also setup a Green Transition Committee (GTC) under the Chairmanship of the Chief Minister which shall supervise all Green transition activities. These may include Green infrastructure creation, Green financing and formulate strategies to address other costs that would be entailed in additionalities that come with delinking from the carbon economy. An indicative list of those additionalities has been provided in this report. For detailed assessment of those costs, a separate study or set of studies would need to be carried-out. In addition, it is also important to develop a framework of quantification of direct and indirect benefits that can accrue across various sectors during climate transition. Quantification of such benefits and escrowing them for debt servicing could lead to lower cost of finance. Details of GTC composition may evolve after detail deliberation.

ANNEXURE 1

TAXONOMY AND ISSUANCE PROCESS OF GREEN BONDS

1 Taxonomy

Taxonomy is a classification system, establishing a list of environmentally sustainable economic activities, assets or projects that deliver on key climate, green, social or sustainable objectives with reference to identified thresholds and/or targets. In other words, taxonomy typically establishes clear definitions and criteria for eligible sustainable activities across the economy.

India does not yet have taxonomy but nearly half the green issuances (by volume) out of India follow the international certification scheme based on Climate Bonds' standard which is built upon the taxonomy. Robust taxonomies are preferred by investors as they are:

- **Clear:** They clearly lay out what constitutes a sustainable activity
- **Credible:** They are science and evidence-based, and developed by independent experts. This allows investors to make sensible and credible decisions without worrying about reputational fallout
- **Usable:** They are granular enough to be usable to investor/service providers to identify sustainable investments

To elaborate more:

- Taxonomy acts as guidance for investors, policymakers, regulators i.e. blue print for greening the economy
- Translate climate objectives into measurable goals
- Reduced due diligence for investors and issuers
- Help avoid reputational risks i.e. avoid green washing
- Put environmental data into economic context
- Key instrument in directing the flow of capital
- Facilitate cross border flow of preferential capital for green projects

The taxonomy of science- based definitions of sustainable investments was first developed as an approach by Climate Bonds in 2012 to help push the nascent green bonds market towards ambitious climate investments. The Climate Bonds Taxonomy then became the model for approaches in China, the EU and other economies as top-down regulatory guidance on what constitutes a green investment. Over 20 countries around the world have taxonomies complete or in development, with more being

added all the time, including in India, which is in draft stage and assisted by Climate Bonds Initiative.
Climate Bonds Taxonomy identifies assets, activities and projects needed to deliver a low-carbon economy. Consistent with the goals of the Paris Agreement, the Taxonomy is based on the latest climate science, including research from the IPCC and the International Energy Agency (IEA). The Taxonomy is used to screen bonds to determine whether assets or projects underlying an investment are eligible for green or climate finance.

Where detailed analysis of a sector has been undertaken, and specific eligibility criteria have been developed, bonds in that sector can be Climate Bonds Certified. This following section includes the advantages and considerations with respect to using thematic debt instruments like green bonds to widen the pool of resource base for financing green transition at the state level.

2 Green Bonds: The Indian experience

2.1 New, Broadened Pool of Investors

Green Bond issuance attracts new investors looking for climate change, mitigation and adaptation and other environmentally sound projects. Indian public sector issuers like NTPC, REC, EXIM Bank, SBI, IREDA, IRFC have already tapped this pool and are inclined to do so on a repeated basis. Among the private sector players, entities such as Yes Bank, Axis Bank, Azure Power, and Greenko have also issued green bonds**.** Estimates suggest that the final subscription of the offshore green funds into Indian issuances has ranged from 14 to 24 percent of the total issuance size.

2.2 Pricing Advantage

While a greater investor diversification leads to a pricing advantage, a mathematically conclusive result establishing this assessment is not available mainly due to limited availability of data. However, most CFO/ treasurers of issuers estimate that the pricing advantage derived from investor diversification varies between 7 to 16 basis points. This advantage however is best gained on labelled or certified green bonds.

2.3 Oversubscription and Upsizing

Oversubscription in green bonds space is common. This is also true for the green bonds issued by Indian entities. It reflects high demand, and provides an opportunity to adjust the price of the bond upward as well as the issuance size. Some notable examples of corporates upsizing the issuance include EXIM bank (USD denominated - upsized from USD 250 to 500 million, Azure (upsized from USD 350 million to 500 million).

NTPC on the other hand was able to revise its price upward in its issuance in August 2016, and executed its transaction at the tighter end of the final price guidance of 7.48 percent for INR 20bn. Axis Bank too managed to tighten the price by 15 basis points during execution of its transaction.

In addition to the above, Green Bonds also enable more comprehensive risk identification, including climate considerations, in context of capital flows.

3 Reasons and Considerations for Green Bonds issuance by States

1.	**Reasons for issuance**	Diversification of investors	Labelling/certification needed to gain visibility	External review/independent verification required
		Mobilisation of additional capital on better terms	Benefit of sovereign guarantee (Green SDLs)	Rating requirements for state backed entities/SPV; extension of guarantee
		Creation of domestic green finance market	Local green bond market will drive down the cost of borrowing	Additional liquidity, new asset class, new class of investors for green like pension and insurance funds, transparency on the use of funds
		Funding NDC, SDG and development targets	Scale up funding for mitigation projects and activities across sectors	Mobilise funds at scale for adaptation and resilience, as private sector participation is not forthcoming
		Making long term capital available	Better economic, environmental and social returns	Successful and transparent reallocation of capital towards priority sectors
2.	**Location of issuance** Allow sufficient	Domestic markets	Additional awareness creation and marketing will be needed - Depending on the nature and mix of current domestic investors, green bonds can provide an	Routes - Green SDLs, State backed entities, SPVs

	time in calendar to identify expenditures/ explain the green bond to investors		attractive proposition to them. Sovereign green issuance has demonstrated demand from local investors.	
	Allow sufficient time in calendar to explain the green bond to investors	Offshore issuance	Additional regulatory compliance, disclosure requirements and currency considerations. transaction costs will vary	Routes - State backed entities, SPVs
3.	**Capacity to deploy funds**	Identification of End uses	Mitigation Example: RE - planned investments in green transmission infrastructure, financial assistance to discoms to meet their Renewable Purchase Obligations (RPOs).	Adaptation Examples- Soil remediation, early warning systems, afforestation
4.	**Bankable pipelines and cash flow generation**	Identifying potentially eligible green projects	It will help determine the structure of the bond, which must also suit the overall debt profile of the state	Cash flow to service debt needs to be ascertained
5.	**Listing**	Can assist in pricing transparency, encourage secondary trading and improve global exposure of the bond,	Caveat: trading volumes are typically low.	BSE's India INX – IRFC bond has been listed here besides on London Stock Exchange
6.	**Enabling fiscal parameters and investment ecosystem**	All expenditures need to be budgeted for in accordance with public financial management principles, so that proceeds can be legally	Whether the issuance will be one or multiple tranches, and whether it will form part of an ongoing program of issuances.	Ease of doing business, regulatory ease etc

		allocated.		

4 The Issuance Process and Recommendations

The following steps underline the typical sovereign/sub-sovereign issuance process

4.1 Establish a Green Bond Working Group

A green bond working group should be convened after a clear mandate from the government to issue the green bond is in place. The Working Group gets the support of various departments and establishes and socializes the objectives of the green bond. This process catalyzes collaboration between relevant deplanements which could include those of Finance, the Environment, Energy, Transport, and Agriculture, amongst others.

4.2 Selection of eligible expenditures the green bond framework

A green bond framework is a document created by the issuer that clearly describes the sustainability objectives of the issuer, and the salient features of the bond. Most green bond frameworks include information structured according to the four pillars of the ICMA green bond principles (GBP) which are described below:

4.2.1 Use of Proceeds

This describes the eligible project categories for determining project inclusion in the green bond

Recommendations

- Align project categories with the Indian Taxonomy (when available), Climate Bonds Standard (prevalent gold standard) to ensure maximum integrity on selected projects and expenditures
- Determine the types of eligible expenditures in budget, which may include direct investment. List of for India's debut sovereign green bond can be a useful reference. It can also extend to tax exemptions, subsidies, etc. The financing of current and past expenditures is acceptable, normally with a lookback period extending to two years.

4.2.2 Evaluation and Selection of Projects

The green bond framework should include clear communication regarding the environmental sustainability objectives of the eligible green expenditures, the process used to establish eligibility, and the mechanisms used by the issuer to identify and manage potential social and environmental risks associated with the chosen projects.

Ideally, a governance process can be set up for the selection of projects and assets. For instance, the relevant projects and assets could be screened by the budget department of the state backed by a joint inter-departmental committee set up by the State Department of Finance which coordinates the process. Once the underlying projects and assets have been selected, they are referred to as "Nominated Projects and Assets" that typically needs to be formally approved.

Recommendation

Department of Finance should set up a decision-making process for the selection of eligible green projects. A green tagging system can be established to identify, classify, and monitor any expenditures from the state budget/line departments' budgets which could be suitable for inclusion in the green bond. A systematic approach to green tagging (based on taxonomy) will lend additional transparency to the exercise.

4.2.3 Management of Proceeds

The green bond framework should describe the mechanisms for managing the net proceeds from the sale of the green bond. This should include a description of the process used to track the proceeds, the disbursement of the funds, and the treatment of unallocated proceeds. Total value of eligible projects should be higher than the amount of issuance, to avoid the necessity to include new projects in event of projects no longer eligible and could include previous year and current year expenditures and, if necessary, future expenditures.

Recommendations

- To ensure the integrity of the green bond, and the confidence of investors, the MOF/RBI could appoint an independent auditor to verify the tracking methods used, the split between financing and refinancing of expenditures (with a lookback period of two years for refinancing) and the allocations of funds.
- Market best practice is for the issuer to clarify that the proceeds will not be used to fund carbon intensive projects while they remain unallocated.

Both the ICMA GBP and the Climate Bonds Standard recommend that all proceeds are allocated within 24 months

4.2.4 Reporting

The issuer should report annually on the UoP until full allocation has been achieved. The annual report should include a list of projects to which the proceeds have been allocated, as well as a description of the projects the amount allocated, and their expected impact.

Allocation report could include

- The percentage of an amount equal to the net proceeds allocated to Eligible Green projects
- The percentage of financing/refinancing of projects
- A breakdown of allocated amounts to eligible green project categories,
- The relevant departments responsible for the projects financed

The impact reporting can provide information on the methodology and assumptions used for calculation of the impact metrics.

Recommendation

As part of the pre-issuance, it is suggested that all reporting requirements, including assigning responsibility, and determining the structure, content, and frequency of reporting are established.

Impact reporting is a good practice norm and can be done following the recognised, globally accepted guidelines such at that from ICMA. SEBI's green debt issuance guidelines also lay out the requirement of impact reporting.

5 Obtain an External Review

The four types of external review are described in the table below. Most Certified deals also obtain an SPO as a pre-emptive signalling exercise should there be any unforeseen hurdles with the Certification.

Types of External Review	
Second Party Opinion (SPO) An issuer can seek advice from independent consultants and/or institutions with environmental expertise. This is normally an assessment of alignment with the ICMA GBP, and the issuer's overarching objectives, strategy, policy, and/or processes relating to environmental sustainability. It may also include an evaluation of the environmental features of the eligible projects.	**Verification/Assurance** An issuer can obtain independent verification against a designated set of criteria, typically pertaining to business processes and/or environmental criteria. Verification may focus on alignment with internal or external standards or claims made by the issuer. Evaluation of the environmentally sustainable features of underlying assets may be termed verification and may reference external criteria.
Certification An issuer can obtain certification of its green bond, framework, or UoP against a recognised standard or label which defines specific criteria.	**Scoring/Rating** An issuer can have its green bond or green bond framework rated by a qualified third party such as a specialist research provider or credit rating agency, according to established

Alignment is normally verified by qualified, accredited, third parties.	scoring or methodology. Green bond ratings are distinct from credit ratings which may also include environmental risk considerations.

The key difference between an SPO and Certification is that the former is a one-time opinion against principles such as ICMA etc, and the certification takes a step further in ensuring alignment to Paris Agreement and science-based pathways. Certification also requires ongoing compliance during the life of the bond, which is regarded very valuable by investors.

5.1 Certification

Certification is regarded as the gold standard by the market. The ultimate goal of certification is to establish that the issuance robust in its alignment to Paris targets through scientific metrics recognized by industry and experts across all jurisdictions and geographic regions. While Certification under the Climate Bonds Standard does not provide any assurance regarding credit risks or returns, it enables investors to save resources in analyzing the low-carbon credentials of investments across sectors and asset classes. The transparency of the Certification scheme allows investors to limit the due diligence required for screening the bonds.

A few additional benefits of certification are:

- It is the global gold standard, and is regarded as the best protection against greenwashing
- The certification scheme is easy to use tool and fully in line with ICMA green bond principles
- It follows a rigorous process which includes independent verification plus Climate Bonds' oversight
- Certification guarantees inclusion in Climate Bonds Green Bond Database, used to inform inclusion in most of the major green bond indices

5.2 Process of Climate Bonds' Certification

Climate Bonds Certification entails an external review prior to the issuance of the green bond and at least one external review after the green bond has been issued. The issuer has an annual obligation to provide an update report of compliance for the life of the bond. This sets it apart from a one off SPO (that is provided against principles). The adherence through the life of the bond drives inclusion into indices.

External reviewers are generally engaged while or soon after the issuer has established a green bond framework, and the review is normally made public before the road show. The issuer can use the independent review to promote the green credentials of the bond during the road show and it is now common practice for the

review to accompany the bond's prospectus when it is sent to potential investors. External reviewers are generally recruited via a procurement process.

5.3 Cost of Climate Bonds' Certification

Certification incurs both internal and external costs, but issuers repeatedly state that the benefits outweigh those costs. Internal costs are incurred by the issuer when they establish the required internal processes and controls to meet the requirements of Certification. There may also be costs associated with tracking the performance of the projects and assets tied to the green bond.

External costs include

- Pre-issuance and post-issuance assurance/verification procedures and reports and, possibly, periodic assurance as well. The cost of engaging a verifier can vary depending on the variety of assets included in the portfolio. Costs can be as low as USD7-10k for pure solar assets and up to USD40-45k for portfolio of assets under several Technical Criteria. The cost is a matter of negotiation between the verifier/Second Party Opinion provider. In India, this ranges in the region of USD 25k.
- A Certification fee equivalent to 1/10th of a basis point of the bond principal. For example, on a USD500m bond, the certification fee is USD5k. Certification fees contribute to funding the development of the Climate Bonds Standard and the operation of the Certification Scheme. This is paid once, immediately after the bond has been issued.

For benchmark deals, these costs are relatively easily justified and absorbed, especially when they achieve economies of scale for repeat issuers. For the sub-sovereign green bond, both these conditions will get satisfied.

5.4 Case for Programmatic Certification

Programmatic certification is intended to simplify the certification process as well as to reduce the costs to the Issuer. The main cost saving relates to the reduced verification costs. Where the certification program shares a common green asset pool, the verifier initially charges for a single pre-issuance verification report and subsequently for each annual post issuance verification engagement for all the bonds issued in the prior year. This has multiple benefits (i) fewer verification reports are issued for the duration of the program offering synergies to the verifier and a reduced cost to the issuer (ii) there is greater scope for negotiating with prospective verifiers.

The steps which do not need to be repeated in a programmatic process are:

- Signing a new Certification Agreement with the Climate Bonds Initiative, and

- Engaging the verifier again to conduct a pre-issuance verification (unless the nominated assets change during the course of the program).

5.5 Turnaround Time

Climate Bonds usually takes from 2-5 working days for the certification. In case of a programmatic issuance, subsequent certifications are usually turned around within 24hours since there are no new documents to be reviewed. It depends, of course, on the completeness of the submitted documents and the complexity of the sectors[66].

5.6 Verifiers and SPO providers active in India

The verifiers active in the Indian market are KPMG, DNVGL, Sustainalytics, Emergent Ventures India and EPIC Sustainability. KPMG, DNVGL and Sustainalytics also provide SPO.

It is possible that the verifiers providing both the SPO and verification services for certification could charge only a nominal fee on the SPO in case the sovereign issuance is certified.

6 Issuing the green bond (through a state backed entity)

Green bond issuers normally organise a roadshow, or bilateral calls with investors even if that is not their standard procedure. Representatives from involved departments should be available to answer questions on the UoP, and the alignment of the green bond with government policy.

This is a very informative step in the process in terms of making sure the bond meets investor expectations, providing reassurance and transparency on the UoP, and engaging with new investors.

Supporting materials should be prepared and circulated to publicise the transaction including a green bond prospectus, investor presentation, and an FAQ on green bonds.

Additional marketing material can be developed to promote the issuance, showcasing the projects financed, the main elements of the green bond framework (eligible sectors, the guidelines/standards of reference, management of proceeds, reporting), and the alignment with the government strategy for economic growth/ job creation/poverty alleviation/transition to a low-carbon economy.

[66] Climate Bonds has Certified the sovereign green bonds of Chile, the Netherlands, Nigeria, and the green component of Thailand's sustainability bond. The scheme can be used for green SDL as well as green issuance by a state backed entity, including an INVIT.

The usual steps in the bond issuance process are applied to green bonds, however, the state backed entity could engage a syndicate to execute the sale of at least their first green bond, instead of managing the transaction in house. The syndicate generates more visibility for, and interest in, the transaction, among a broader range of investors.

The green bond issued by a state backed entity can obtain listings on green segments of local and/or international stock exchanges. Stock Exchanges provide guidance to issuers to ensure that their green bond meets the required standards of transparency, disclosure, and credibility and issuers must report periodically. A stock exchange listing will also provide enhanced visibility for the issuer and the bond will be added to the green bond platform or database along with salient information about the transaction. Climate Bonds also regularly supports in raising the profile of an issuer through panels with investors, other issuers et al.

6.1 Reporting

Post issuance reporting refers to the allocation and monitoring of the proceeds of the bond. Investors are increasingly demanding some form of impact reporting which measures the impact of the projects financed by the deal. Impact reporting should be done against pre-defined impact indicators or performance metrics, for which clear base lines should be established up front. Climate Bonds *Post Issuance Reporting in the Green Bond Market, 2021* observed that 59% of green bonds issued between 2017 and 2019 had provided some form of impact reporting. [i] Climate Bonds Certified green bonds require annual reporting against the Climate Bonds Standard.

As a minimum requirement, the reports should be made available to the bond's investors, but most issuers publish them on their website as standard, to enhance the visibility and transparency of their green bond. On shore issuance and listing of the bond by the state backed entity will require compliance with the SEBI Green Bonds disclosure guidelines (2017) now amended.

An issuer may appoint an external auditor to verify the UoP annually until full disbursement; this is known as a post-issuance audit. These add greater credibility to overall post-issuance reporting. These are recommended, but are not mandatory under the Green Bond Principles, and Climate Bond Standards

6.2 Repeat Issuance

Debut green bonds may not include every eligible expenditure. The presence of a programmatic view involves a pool of assets to draw on that are "on tap" for future/ongoing issuances, and this gives investors a feel of the long-term strategy of

the issuer. From India, the State Bank of India, Indian Railway Finance Corporation are among programmatic certified issuers.

It helps to embed green tagging into the standard budgeting process to facilitate a steady stream of eligible expenditures suitable for inclusion in green bonds.

Recommendation

The Government of Rajasthan or a state backed entity/invit could become a programmatic issuer, by issuing green bonds regularly. The Climate Bonds Standard and Certification Scheme accommodates programmatic certification, requiring one pre-issuance review and one annual post-issuance review for all bonds issued during a single year.

ANNEXURE 2

HIGH LEVEL ANALYSIS OF RAJASTHAN'S EV SECTOR

Rajasthan state has shown pro-active approach towards green transition as reflected in its **EV Policy 2022** and **CNG Policy 2022.**

Rajasthan EV Policy, 2022

The policy formulated by the Transport Department has been envisaged to promote EV adoption in both public and private mobility segments, to create a robust network of charging infrastructure and to enable conducive regulatory environment for the manufacturing of EV and batteries in the state. The policy entails financial incentives like SGST reimbursement, tax exemptions, power tariff rationalization, etc.

Policy targets

Category	Target (at the end of five years i.e 2027-28)
e Two wheelers	15% EV share in new vehicle registrations
e Three wheelers	30% EV share in new vehicle registrations
e Four wheelers	5 % share in new vehicle registrations
E Buses	Phased Transition to e buses used in the routes connecting priority cities

Growth Forecast for EV in Rajasthan for next 5 Years as per policy targets

Based on the data of registered vehicle sales (two wheelers, three wheelers and four wheelers) in Rajasthan for the period between 2015 - 2019 (Vahaan Dashboard), following are the CAGRs (compounded annual growth rates) of the respective categories:

- Two wheelers (NT) – 3.18%
- Three wheelers (T) – 8.51%
- Four wheelers (LMV) – 2.27

Using the CAGR for each categories, following are the total registered vehicle sales and EV sales as per the stated policy for the year 2027-28

Vehicle category	Total sales in the year 2027-28	EV target sales (as per the policy)	Total EV sales for the year 2027-28
Two wheeler	1.1 million	15%	1.6 lakhs
Three wheeler	60,000	30%	18,000
Four wheeler	3,20,000	5%	16,000

Given the above, total EV vehicles in the year 2027-28 will be as follows

- Two Wheelers - 7,00,000
- Three - wheelers - 1.5 lakhs
- Four wheelers - 50,000

Total Electric vehicles as on 2027 - 28 = 9 lakhs (approx.)

- In the Budget 2023-24, Government of Rajasthan has allocated **Rs. 75 crore** for setting up **250 charging station** in Rajasthan, which means roughly **Rs. 30 lakh** is required to set up a public charging station in Rajasthan.
- According to a white paper by Alvarez and Marsal, the global ideal EV/public chargers ratio is also around 6-20 EVs per public charger. In that case, number of public charging stations required for meeting the demand in Rajasthan for 9 lakh EVs amounts to roughly 30000-40000 publicly charging access points (roughly 6000 - 7000 charging stations) in the next 5 - 7 years.
- This will result in the investment opportunity of around Rs. 6000-7000 crore by 2030 for public and private sector organizations. This will result in increased demand for both electricity and associated grid infrastructure.

Rajasthan EV Policy 2022 - Analysis

As per the policy objectives and targets, it is estimated that around **1 million EVs (approx)** will get registered in the next 5 years (by 2027 - 2028).The aforementioned targets appear to exhibit a lower degree of policy ambitions in comparison to the progressive targets articulated at the national level.

As per the report prepared by the Energy Transition Advisory Committee (***The Green shift***, 2023), it is estimated that approximately **80 million EVs** will be sold by 2030, of those, 70% are expected to be two and three wheelers, and the rest will be cars and buses. The **20th Electric Power Survey** (Central Electricity Authority), released in November 2022 also envisages roughly 60 million EVs on road by 2030. The optimistic targets presented at the National Level should be congruent with the targets at the sub - national level. Rajasthan's contribution to the National GDP is around 5 - 6%, equating it with the EV sales by 2030, around **3.5 - 4 million EVs** sales should be registered by 2030. This highlights the need for Rajasthan state to recalibrate its policy targets so as to provide the necessary policy nudge and regulatory environment towards rapid EV adoption.

E-Buses Adoption in Rajasthan - Critical for Clean energy transition and Electrification of public transportation system

Increased share of public transport and electrification of public transport are two key policy priorities of Government of India (GoI) towards meeting mobility needs and

reducing oil demand, thereby mitigating the sector's air-pollution, Green House Gas (GHG) emissions and import dependence (NITI Aayog, 2017). Instead of growing with passenger demand, bus service levels in India in general and Rajasthan in particular have stayed relatively stagnant over the years due to the poor financial situation of State Transport Undertakings (STUs).

In Rajasthan, **Rajasthan State Road Transport Corporation** and other city level transport require viability gap funding to cover cost of service delivery, rising fuel and staff costs et al. In this context, electric buses offer a lower operating cost alternative with energy cost at least 50% lower than that of a diesel or Compressed Natural Gas (CNG) buses and benefit from relatively stable electricity prices.

Current scenario of e- buses deployment in Rajasthan

- **Public sector -** Transport Department, GoR has initiated tender procedures for procuring 10 e buses in the near future along with rapid deployment of BS - VI and CNG buses.
- JCTSL has proposed expansion of the fleet which consists of 300 e - buses procurement in the next 2-3 years by outsourcing CESL (Convergence Energy Services Limited), a PSU of Power Ministry to bid for these procurements based on GCC (Gross cost contracting) model.
- Private sector - Private companies such as NueGo are providing intercity e-bus services on the major routes such as Jaipur - Delhi, Jaipur - Agra, etc.

Policy intervention for rapid e - bus deployment in Rajasthan

Government of Rajasthan should shift its complete focus towards e-bus service contracting at scale, focused on service delivery rather than bus purchase (**Mobility as a service concept**). The successful example of this type of model has been the recently (April 2022) concluded bidding process for services of 5,450 electric buses in 5 cities (Delhi, Mumbai, Bangalore, Hyderabad, Surat). **NITI Aayog** and **Convergence Energy Services Limited (CESL)**, a public sector undertaking, have concluded the largest global tender for electric bus procurement through a **Grand Challenge (GC) process**. The GC **aggregated demand** across cities, **homogenised their procurement specifications** and carried out the tendering process to procure buses on a **Gross Cost Contract (GCC) basis**. Given the significantly lower costs of electric buses discovered by the GC when compared to the current cost of diesel and CNG buses, electric buses should become the priority for intra city and inter-city transport entities in Rajasthan. Alignment of States' e - bus procurement policy with the **National E Bus Programme** (50,000 e buses by 2030) will enable rapid advancement of electric buses in India.

ANNEXURE 3

HIGH LEVEL (PRELIMINARY) POTENTIAL CONVERGENCE BETWEEN LONG TERM- LOW CARBON DEVELOPMENT STRATEGIES & RAJASTHAN'S POLICY LANDSCAPE

India's Long-term Low-Emissions Development Strategies (LT-LEDS) present seven distinct transition pathways towards low-carbon development, each accompanied by specific objectives and elements required to achieve these pathways. At the national level, India has initiated several significant policies, programs, and initiatives aligned with these pathways, demonstrating its commitment to combating climate change and promoting sustainable development.

LT-LEDS document does explicitly emphasize the crucial role of coordinated efforts and actions at the sub-national level to successfully accomplish the transition pathways.

In light of this, we attempted to identify convergence between the LT-LEDS pathways and sub-national policies, schemes, and initiatives in Rajasthan. By mapping the state-specific implementation frameworks, we can gain insights into current alignment between National and Subnational action on a common objective as articulated under LT-LEDS. In addition, there is also an attempt to identify the relevant state level SDG indicator to which each LT –LEDs pathway aligns. The presence of the State Indicator Framework on SDGs makes it an ideal tool to assess the state's progress towards achieving the objectives outlined in the seven transition pathways of LT-LEDS. Moreover, by identifying indicators that may be missing at the state level, relevant interventions can be identified.

In other words, the above alignment helps in not only mapping state policies to LT-LEDS but also helps in identifying action that the state may already be underway at the state level and which aligns with LT-LEDS. The state SDG indicator establishes is an indication of this fact. Lastly, a missing State SDG indicator shows that there is a possibility to intervene with specific action on a specific parameter of LT-LEDS. It is also pertinent to mention, that this exercise is only a preliminary and high level exercise. A detailed mapping may be done by state level authorizes for comprehensive reporting and action.

ES2.1 Low Carbon Development of Electricity Systems Consistent with Enhanced Development Benefits	
Elements of a India's Long-Term Low-Carbon Development Strategy	**Alignment with State SDG Goal and Indicator**
1. Expanding renewables and strengthening the grid	Goal 7 : Ensure access to affordable, reliable, sustainable and modern energy for all Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix. **7.2.1 Renewable energy share in the total installed electricity generation** **7.2.R1 Solar energy share in the total final energy mix** **7.2.R2 Total no. of solar pump installed** Target 7.b: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support 7.b.1 Installed renewable energy per capita generating capacity
2. Explore a greater role for nuclear energy and enhance support for R&D into future technologies such as green hydrogen, fuel cells, and biofuels	Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all Target 7.a: By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology ***Indicator not available*** Goal 12: Ensure sustainable consumption and production patterns Target 12.a: Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production. 12.a.1 Installed renewable energy generating capacity in State (Similar to 7.b.1)

3. Strong energy efficiency measures can help meet the growing demand for energy services using less energy, while energy supply to the bulk of the population will increase	Target 7.3: By 2030, double the global rate of improvement in energy efficiency ***Indicator not available***
4. Rational utilization of fossil fuel resources: While the share of coal in installed capacity and supply of power will decline, coal will be needed for power and energy, including, inter alia, for grid stabilisation, supply to industry and to guarantee India's energy security.	Goal 1 : End Poverty In all its forms everywhere Target 1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance. 1.4.3 Percentage of households electrified (similar to 7.1.1) Goal 7 : Ensure access to affordable, reliable, sustainable and modern energy for all Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services 7.1.1 Percentage of households electrified
5. Enablers for a National Development friendly transition: Enabling measures for a development focused transition include promoting local manufacturing, and fostering capable, agile, and responsive institutions at all levels.	Goal 13: Take urgent action to combat climate change and its impacts Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning ***Indicator not available***

6. Optimum energy mix (complimenting National development scenarios): The role of all non-fossil and fossil fuel sources will be key to supporting the long-term low carbon development strategy in different sectors.	Goal 7 : Ensure access to affordable, reliable, sustainable and modern energy for all Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix. 7.2.1 Renewable energy share in the total installed electricity generation

ES2.1 Low Carbon Development of Electricity Systems Consistent with Enhanced Development Benefits		
National Targets	**Alignment with state's Policy/Schemes/Regulations**	**Policy/Regulation/Scheme Overview & Gap Analysis**
1. Ambitious RE targets	• Rajasthan's Solar Energy Policy 2019 states achieving 30 GW of solar capacity by 2024-25 • Rajasthan Wind and Hybrid Energy Policy, 2019 states achieving 20GW wind power up to 2024-25 Rajasthan Renewable Energy Corporation Limited (RRECL) and Rajasthan Solar Park Development Company Limited (RSDCL) are dedicated agencies for facilitation of greater private investment into RE in Rajasthan.	Rajasthan became the state with the largest installed capacity of RE by surpassing Gujarat while as on March 2023 the state has an impressive 22 GW of non-hydro renewable energy capacity (achieving 15% of its 142GW assessed potential). This achievement has largely been driven by private-sector investments, accounting for 98% of the capacity (CEA 2023). Furthermore, an additional 25 GW of RE projects are in various stages of development in the state[67]. Although interestingly, of the 22 GW installed RE capacity, 16 GW is exported to other regions and only 6 GW is used to meet Rajasthan's RPOs.
2. 'Must-run' priority dispatch status for renewables	Rajasthan Electricity Regulatory Commission (RERC) has regulations on Must run priority dispatch status for renewables	

[67] Interaction with RRECL, August 2023

<table>
<tr><td>3. Renewable Purchase Obligations</td><td>Rajasthan Electricity Regulatory Commission (Renewable Purchase Obligation) Regulations, 2023[68]</td><td rowspan="2"><table><tr><th>S.No.</th><th>Year</th><th>Wind RPO</th><th>HPO</th><th>Other RPO</th><th>Total RPO</th></tr><tr><td>1</td><td>2024-25</td><td>2.46%</td><td>1.08%</td><td>26.37%</td><td>29.91%</td></tr><tr><td>2</td><td>2025-26</td><td>3.36%</td><td>1.48%</td><td>28.17%</td><td>33.01%</td></tr><tr><td>3</td><td>2026-27</td><td>4.29%</td><td>1.80%</td><td>29.86%</td><td>35.95%</td></tr><tr><td>4</td><td>2027-28</td><td>5.23%</td><td>2.15%</td><td>31.43%</td><td>38.81%</td></tr><tr><td>5</td><td>2028-29</td><td>6.16%</td><td>2.51%</td><td>32.69%</td><td>41.36%</td></tr><tr><td>6</td><td>2029-30</td><td>6.94%</td><td>2.82%</td><td>33.57%</td><td>43.33%</td></tr></table>
Wind RPO must be fulfilled by energy from Wind Power Projects (WPPs) commissioned after 31.03.2022 and wind energy usage beyond 7% from WPPs commissioned by 31.03.2022.
Hydro Power Purchase Obligation (HPO) met by energy from Hydro Power Projects (including PSPs and SHPs) commissioned after 8th March 2019.
Other RPO can be satisfied by energy from any RE/green energy project not covered in Wind RPO and HPO.
Starting FY 2024-25, all Hydro Power Projects' energy is part of RPO.</td></tr>
<tr><td>4. Hydro Purchase Obligation</td><td>Rajasthan Electricity Regulatory Commission (Renewable Purchase Obligation) Regulations, 2023 has mandate on HPO</td></tr>
<tr><td>5. Energy Storage Obligations</td><td>Rajasthan Electricity Regulatory Commission (Renewable Purchase Obligation) Regulations, 2023 has mandate on ESO</td><td>FY 2024-25 1.5% FY 2025-26 2% FY 2026-27 2.5% FY 2027-28 3% FY 2028-29 3.5% FY 2029-30 4%
Energy Storage Obligation is calculated as a percentage of electricity consumption. To fulfil it, at least 85% of yearly energy stored in an Energy Storage System (ESS) must come from renewables.
Fulfilling ESS obligation with RE-sourced energy counts toward total RPO.
ESS obligation reviewed periodically for new PSP capacity, viable storage tech, and changes in BESS cost.</td></tr>
</table>

[68] https://rerc.rajasthan.gov.in/rerc-user-files/regulations

6. Green energy corridors	The Intra-State Transmission System Phase-II (InSTS GEC-II) scheme, approved in January 2022, aims for 10750 km intra-state lines and 27500 MVA sub-stations. It costs Rs. 12031.33 crore, with 33% CFA from MNRE (Rs. 3970.34 crore), and 67% as loan from KfW/REC/PFC. STUs of seven states—Gujarat, Himachal Pradesh, Karnataka, Kerala, Rajasthan, Tamil Nadu, and Uttar Pradesh—will execute the schemes for around 20 GW RE power evacuation. STUs are preparing packages, with project commissioning set for March 2026.	GEC II falls under the purview of the central government, and its fiscal impact on the state can also be reviewed by RVPN **Rajasthan**[69] Estimated project cost: Rs 880.92 cr Length of transmission lines envisaged: 1170 km Capacity of substations envisaged: 1580 MVA RE addition envisaged: 4023MW **RVPN Annual Investment Plan 2023-24 (Proposed)**[70] **2022-23** Revised Plan size: Rs 1267.50 cr (Rs 1147.5 Cr transmission work with SLDC + Rs 50 cr shared generation projects + Rs 70 cr for Indian Acc Standard) **2023-24** Proposed Plan size: Rs 3140 cr (Rs 3000 Cr transmission work with SLDC + Rs 70 cr shared generation projects + Rs 70 cr for Indian Acc Standard) **Green energy corridor** Committed investment for uprating, upgrading & strengthening RE evacuation systems in Rajasthan Rs 11000 cr upto 2027

[69] https://powermin.gov.in/en/content/green-energy-corridor
[70] http://103.122.36.131/content/dam/raj/energy/corporate-one-lines-viewer/pdf/ap2223.pdf

7. Policy and financial incentives include solar park development, accelerated depreciation on investment, waiver on transmission charges, and capital subsidy for residential solar roof-top and agricultural solar pumps	Rajasthan's Solar Energy Policy 2019 offers financial incentives, including exemptions on solar equipment manufacturing, utility-scale plants, and rooftop solar. Security deposit refund, land allotment at 50% concessional rate, and penalty waivers for delays are included. Stamp duty, land tax exemption, and transmission/wheeling charge exemptions are available. Central financial assistance for rooftop solar projects is accessible.	• Kusum Component 'C' has capital subsidy in the ratio 30:30 (Centre:State) – originally designed for pump level solarisation but this scheme failed due to non-participation of farmers. • This scheme was revamped to feeder-level solarisation. MNRE has dissolved 30% state share in capital subsidy and have asked the state to implement the scheme with remaining 30% capital subsidy received from the centre. • Rajasthan is in the process of implementing this scheme and state Discom is the implementing agency. They have envisaged 10-12 GW of power can be bought by them through these solar feeders. Maximum Central Finance Assistance is to the tune of Rs 1.05 cr per MW (for 7.5 hp of pump) and this assistance further depends upon the pumps connected to the particular solar feeder system. • Subsidy component under CFA decreases if the pumps connected to a solar feeder are larger than 7.5 hp. Thus, non-uniformity of subsidy component is a barrier in uniform implementation of this scheme in the state of Rajasthan • RJ is giving interest subsidy on loan under Kusum Component A under Mukhyamantri Laghu Udhyog Protsahan Yojana 2023 • State solar policy has an important role in getting investments for solar power development due to subsidies and incentives • Over the last four-five years many RE customised packages have been approved in Rajasthan.
8. A three-fold rise in nuclear installed capacity by 2032	• Centre Subject Centre has accorded administrative approval and financial sanction for 10 indigenous Pressurized Heavy Water Reactors of 700 MW each in fleet mode. The 10 reactors will come up in Karnataka, Haryana, Madhya Pradesh, and Rajasthan.	

9. Promoting competition and markets for green electricity and smoother grid integration of Renewable Energy	• Rajasthan's solar policy stimulates market competition by incentivizing solar PV and thermal installations. It extends benefits to non-consumer solar projects, granting a 50% exemption on transmission charges for 7 years. • Rajasthan Investment Promotion Scheme 2022 offers incentives such as a 75% investment subsidy on state tax and a 7-year exemption from electricity duty. The state promotes solar joint ventures with private developers, investing up to 50% equity and including allocated land as equity. • Green Energy Open Access Rules 2022, Rajasthan Electricity Regulatory Commission introduced new regulations covering tariffs, certificates, and ratings through the draft 'Terms and Conditions for Tariff Determination from Renewable Energy Sources (First Amendment) Regulations, 2023'.
10. Energy management at household level, including star rating of appliances	• Rajasthan falls in category of Front Runner in State Energy Efficiency Index 2020 (SEEI) across all states and UTs, and has shown improvement in its progress from 2019 to 2020 • Rajasthan Renewable Energy Corporation limited (RRECL) is the State Designated Agency (SDA) for Energy Efficiency. It has programs for driving energy efficiency (EE) in all sectors, i.e. buildings, industry, municipalities, transport DISCOMs and cross-sectors • Building: ECBC notification is in process. ECBC has already been incorporated in the unified building bye laws • Industry: State has mandates for use of EE equipment in industries • Municipality: The state has various programs to promote EE in Street lighting, water pumping and sewage treatment. Program for EE Street lighting: RRECL has programme in association with EESL and REIL Jaipur for the street lighting. • Program for EE Municipal water pumping and Sewage treatment: RUIDP (Rajasthan Rrban Infrastructure development Project) is managing state level programmes for water supply/pumping & waste water treatment
11. India has been proactively shutting down inefficient thermal units	• Rajasthan does not have any policy on decommissioning of old thermal plants yet • Also the state does not have an explicit Just Transition framework

ES2.2 Develop an Integrated, Efficient, Inclusive Low-Carbon Transport System	
Elements of a India's Long-Term Low-Carbon Development Strategy	**Alignment with state SDG indicator**
1. Reducing fuel demand and GHG emissions through improved fuel efficiency: India will achieve this through raised standards, optimized networks, improved technologies, and fleet modernization.	**Goal 7 :** Ensure access to affordable, reliable, sustainable and modern energy for all **Target 7.a:** By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology ***Indicator not available***
2. Phased adoption of cleaner fuels: There will be continuation of a gradually increased blending of cleaner fuels while managing socio-economic and development of the skilling aspects required for the same. Hydrogen will be used as an energy carrier and alternate fuel in the transportation sector.	
3. Modal shift towards public and less polluting modes of transport: India will seek to integrate transport with urban planning, multi-modal connectivity, and enhanced railway capacity.	**Goal 9:** Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation **Target 9.4:** By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.
4. Electrification across multiple modes: A comprehensive package of programmes, policies, and measures for the domestic manufacturing of electric vehicles and batteries and the electrification of railways will be taken up.	

ES2.2 Develop an Integrated, Efficient, Inclusive Low-Carbon Transport System	
National Targets	**Alignment with State Policy/Schemes/Regulations**
1. Indicative 2025 target: 20% ethanol blending in petrol, with a savings potential of approximately INR 30,000 crore/yr	Centre subject RJ has not proposed any state level target in this regards
2. Leapfrogging Bharat Stage V emissions to directly reach Bharat Stage VI emissions	• While developing policy for Rajasthan it is important to keep the NCR implications for pollution reduction. Alwar-Bharatpur alignment with NCR plan is required • Inter-state buses that are beyond their scrap period have not been discarded yet. • Share of state's public transport buses adhering to BSVI is almost negligible
3. Comprehensive package for electric vehicles, including domestic manufacturing in auto parts and batteries, investments in charging infrastructure and demand aggregation	Rajasthan has recently launched Electric Vehicle Policy 2022 however the targets in this policy are not ambitious • **Incentives for Domestic Manufacturing:** The Rajasthan EV Policy aims to promote domestic manufacturing of EV components, including auto parts and batteries • **Charging Infrastructure:** The policy emphasizes the development of a robust charging infrastructure across the state. It aims to establish a network of charging stations at strategic locations, including highways, cities, and public parking spaces, to ensure convenient access to charging facilities for EV owners • **Demand Aggregation:** The policy focuses on demand aggregation to promote the adoption of electric vehicles. It includes incentives and subsidies for electric two-wheelers, three-wheelers, and other electric vehicles. The incentives are based on the battery capacity of the vehicle, with different subsidy amounts for different battery capacities

	• **Financial Incentives:** The policy provides financial incentives to promote the adoption of electric vehicles. It includes reimbursement of State Goods and Services Tax (SGST) for electric two-wheelers and motorcycles purchased and registered in the state within a specified time period
4. Multiple policies to enhance the share of public, non-motorized transport	• Rajasthan Unified Metropolitan Transport Authority Bill aims to establish institutional mechanisms for strategic planning of all transport and mobility needs of the residents of the city • Jaipur Development Authority has developed a Comprehensive Mobility Plan (CMP) for Jaipur, which focuses on integrating land use and transport planning, prioritizing public transport, and developing an integrated public transit system • This plan incorporates investments in public transportation, such as electric buses and EV-charging stations, among other elements. This plan is being developed as per the broad guidelines under Ministry of Housing and Urban Affairs, GoI • Jaipur City Transport Services Limited has announced deployment of EV buses and an ESG framework
5. A National Master Plan for Multi-modal Connectivity – PM Gati Shakti	-
6. Integrated and optimized freight networks through programmes such as Gati Shakti, Transit-oriented development, Bharatmala, Sagarmala, and dedicated rail freight corridors	Centre subject
7. National Logistic Policy aspires to reduce cost of logistics in India to be comparable to global benchmarks by 2030	• Rajasthan Logistics, Warehousing, and Logistics Park Policy 2021 aims to facilitate the development of sector and product-specific special warehousing and logistic hubs in identified locations,

ES2.3 Promoting Adaptation in Urban Design, Energy and Material-Efficiency in Buildings, and Sustainable Urbanisation	
Elements of a Long-Term Low-Carbon Growth Strategy	**Alignment with State SDG Indicator**
1. Adaptation measures will be mainstreamed in urban planning.	Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable
2. Measures will be promoted for enhancing energy and resource efficiency and low-carbon development within urban planning guidelines, policies, and bylaws.	Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries
3. Climate-responsive and resilient building design, construction and operation in existing and future buildings are to be promoted.	Target 11.5: By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global GDP caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.
4. Low-carbon municipal service delivery through resource efficiency and management of water, solid and liquid waste will be pursued.	Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management Target 11.a: Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning. Target 11.b: By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels

ES2.3 Promoting Adaptation in Urban Design, Energy and Material-Efficiency in Buildings, and Sustainable Urbanisation	
National Policies and Targets	**Alignment with State's Policy/Schemes/Regulations**
1. National Urban Policy Framework (NUPF) 2. Town and country planning act and State planning regulations, local area plans 3. Provision of housing for low- and middle-income groups through the Pradhan Mantri Awaas Yojana (PMAY) 4. National Building Code, Energy Conservation Building Code, Eco-Niwas Samhita (an energy conservation building code for residential buildings). 5. Development Control Regulations (DCR) and model building bylaws 6. India Cooling Action Plan 7. Sustainable public transport including sustainable mobility through national mission on electric mobility and battery storage. 8. National Solar Mission	• Rajasthan has adopted Conservation Building Code (ECBC) and also offers incentives and support for projects that adhere to green building principles • Draft Rajasthan Rural-Urban Transition Support Scheme and Bill have been prepared by Chief Minister's Economic Transformation Advisory Council • Rajasthan Urban Housing and Habitat Policy and Guidelines for Action Plan: The policy focuses on balanced development, promotion of in situ-urbanization, vertical construction, and the use of sustainable development models. It aims to promote sustainable urbanization and improve the living conditions of urban residents • Rajasthan Urban Development Policy 2017 • Rajasthan Urban Improvement Act, 1959 • Rajasthan Spatial Planning and Land Use Management Act, 2019 • Rajasthan Town Planning Service Rules, 1966 • Rajasthan Town Planning Subordinate Service Rules, 1974 • Rajasthan Model Building Bye Laws – 2020 • Rajasthan Urban Development Fund -II • Rajasthan Ecotourism Policy 2021: The mission of the policy is to promote ecotourism in the state while conserving the environment and biodiversity

9. National Mission on Sustainable Habitat 10. National Water Policy, National Environment Policy, National Urban Sanitation Policy 11. Jal Jeevan Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT) 12. Construction and Demolition Waste Management Rules 13. Extended Producer Responsibility 2021, Plastic Waste Management (Amendment) Rules 202	• Rajasthan Forest Policy 2023: The policy emphasizes the importance of conservation of biological diversity and restoring ecological balance within the various forest areas of the state • Rajasthan has set up State Level Committee for implementation of Plastic Waste Management Rules, 2022 • Action Plan for Plastic Waste Management: Rajasthan Tourism has developed an action plan for plastic waste management in the state

ES2.4 Promote Economy-Wide Decoupling of Growth from Emissions and Development of an Efficient, Innovative Low-Emission Industrial System	
Elements of a Long-Term Low-Carbon Growth Strategy	**Alignment with RJ's SDG SIF**
1. Improve energy efficiency: Promotion of energy efficient/low carbon technologies, digitization of processes, and creation of trading schemes and other market-based enablers to achieve these goals will be pursued where relevant.	Goal 7 : Ensure access to affordable, reliable, sustainable and modern energy for all
2. Process and fuel switching, and electrification in manufacturing: These will be pursued, as relevant, based upon availability and access to technology and the provision of climate finance.	Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix.
3. Enhance material efficiency and recycling: Sector-specific material efficiency technologies and strategies will be enhanced through value chains, as material-demand trends shift.	Target 7.a: By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology
4. Promote green hydrogen technology and infrastructure: R&D in technology and infrastructure for green hydrogen will be given a boost, ramping up electrolyser manufacturing capacity.	Target 7.b: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support
5. Explore low carbon options in hard-to-abate sectors: Best available technologies in the steel and cement sectors will be pursued	Target 7.b: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support

6. Low-carbon and Sustainable development of MSMEs: Strengthen financial support, knowledge sharing, and awareness of low carbon options and sustainable technologies	Target 7.b: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support

ES2.4 Promote Economy-Wide Decoupling of Growth from Emissions and Development of an Efficient, Innovative Low-Emission Industrial System	
National Policies and Targets	**Alignment with State Policy/Schemes/Regulations**
• National Missions for Enhanced Energy Efficiency and Sustainable Habitat, Standards and Labelling Scheme, and the Energy Efficiency Financing Platform. • Fuel switching through promotion of natural gas and the National Policy on Biofuels. • Material efficiency through policies on resource efficiency, plastic and e-waste, and steel recycling. • Green hydrogen technology and infrastructure promotion • Decarbonisation of hard-to-abate sectors such as steel and cement through R&D. • National Solar Mission	• Green Rating Scheme for Industries in Rajasthan: The program is aimed at enhancing and motivating the environmental performance of companies in Rajasthan, thereby enabling them to compete globally, in addition to reducing emissions • Rajasthan became the first state in India to implement the National Policy on Biofuels in 2018. The policy aims to promote the use of biofuels in the transportation sector, reduce dependence on fossil fuels, and promote sustainable development. • Rajasthan Biofuel Rules 2019: Rajasthan government has formulated the Rajasthan Biofuel Rules 2019 to regulate the production and supply of biofuels in the state. The Biofuel Authority of Rajasthan has been established to regulate the production and supply of biofuels • Ethanol production has multiple incentives and subsidies but Rajasthan still imports ethanol. • Rajasthan has also implemented a Natural Gas Policy to promote the use of natural gas in the state. The policy aims to promote the use of natural gas as a clean and efficient fuel, reduce dependence on fossil fuels, and promote sustainable development • Rajasthan has drafted the Rajasthan E-Waste Management Policy 2022, which aims to discourage the disposal of e-waste with other scrap and promote the proper

	management and disposal of e-waste. The policy emphasizes the inventorization of e-waste and the establishment of the Rajasthan Resource Recovery Park for effective e-waste management
	• Steel Recycling: There is no specific policy or scheme related to steel recycling in Rajasthan.
	• No specific policy or scheme on decarbonisation of hard-to-abate sectors such as steel and cement
	• Rajasthan has drafted Green Hydrogen Policy
	• Five (05) companies have officially registered with the Rajasthan Renewable Energy Corporation Ltd (RRECL) to establish green hydrogen projects totalling 2610 kilo-tonnes in capacity. Aditya Birla Renewables has signed MoU with RRECL to set up a green hydrogen project for INR 6000 crore
	• Some of the Green Hydrogen Projects in the pipeline are:
	  • Jakson Green Hydrogen Project: Jakson Green has signed an MoU with the government of Rajasthan to invest Rs 22,400 crore in a green hydrogen and green ammonia project in Rajasthan.
	  • ACME Group Green Hydrogen Plant: ACME Group has set up a demonstration-sized green hydrogen and ammonia production plant in Bikaner, Rajasthan, powered by 5 MW of solar panels

ES 2.5 CO2 Removal and Related Engineering Solutions	
Carbon Capture Utilisation and Storage (CCUS) technology	**Goal 7**: Ensure access to affordable, reliable, sustainable and modern energy for all. **Target 7.a**: By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology State specific policy or scheme for promoting CCUS is missing in Rajasthan and in almost all the Indian states

ES2.6 Enhancement of Forest and Vegetative Cover Consistent with Socio-Economic and Ecological Considerations	
Carbon Capture Utilisation and Storage (CCUS) technology	**Goal 7**: Ensure access to affordable, reliable, sustainable and modern energy for all. **Target 7.a**: By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology
Restoration, Conservation and Management of Forest Cover (including mangrove forests) Improving/ enhancing density and quality of forests; Improved protection and restoration of forest and green cover in biodiversity hotspots; Improved health of forest and forest hygiene; Improved climate smart monitoring and forest protection against forest fires.	**Goal 15:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss **Target 15.1:** By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and dry lands, in line with obligations under international agreement. **15.1.1** Forest cover as a percentage of total geographical area **15.1.2** Protected area as percentage of total geographical area
Restoration, Conservation and Management of Trees outside Forests and Green Cover Restoration and increasing area under trees outside forests and green cover; Large scale enhancement of tree/ green cover in urban and peri-urban areas; Rural greening with a focus on One Forest – One Village; Promote agro-forestry to increase farming income and meet wood products demand.	**Goal 15:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss **Target 15.1:** By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and dry lands, in line with obligations under international agreement. **15.1.1** Forest cover as a percentage of total geographical area **15.1.2** Protected area as percentage of total geographical area
Infrastructure development	Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

ES2.6 Enhancement of Forest and Vegetative Cover Consistent with Socio-Economic and Ecological Considerations	
National Policies and Targets	**State Policies and Targets**
• NDC target: to create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent by 2030. • Major policies and institutions: National Mission for a Green India, National Afforestation Programme, Compensatory Afforestation Fund Management and Planning Authority, Nagar Van Yojana, National REDD+ (Reducing Emissions from Deforestation and forest Degradation) Strategy 2018, National Rural Livelihoods Mission, Forest Fire Prevention and Management Scheme and AMRUT (Atal Mission for Rejuvenation and Urban Transformation). • Other voluntary contributions: To restore 26 million ha degraded land by 2030; 12 National Biodiversity Targets, in line with 20 global Aichi biodiversity goals. • Major greening efforts of the National Highways Authority of India (NHAI) and Indian Railways.	• Rajasthan Forest Policy 2023: The policy aims to increase vegetation cover to 20 percent of the geographical area within the next twenty years with a special focus on increasing vegetation cover • Government of Rajasthan and USAID have launched a new initiative to increase tree coverage in Rajasthan, with a focus on improving tree cover outside forest areas • Rajasthan State Climate Change Action Plan proposes using the REDD+ framework for designing and implementing activities in the forestry sector • Rajasthan Rural Livelihoods Project for India is to enhance economic opportunities and empowerment of the rural poor, with a focus on women and marginalised groups, in the 17 targeted districts of Rajasthan. There are five components to the project they include, institution building and social empowerment, community investment support, skills development and employment promotion, climate change adaptation, and project implementation support

ES2.7 Economic and Financial Aspects of Low-Carbon Development	
Assessments of Financial Requirements	Goal 13: Take urgent action to combat climate change and its impacts. Target 13.a: Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible. Rajasthan is one of the few states which has developed a framework for Green Infrastructure Financing and Debt management through Chief Minster Economic Transformation Advisory Council
Mobilizing, accessing, and delivering climate specific finance, especially multilateral climate finance	
Linkages to International Trade	—-

ANNEXURE 4

INDICATIVE LIST OF GREEN ASSETS IN RAJASTHAN

Mitigation	Mitigation Efforts	Invest^{t} Rq^{t} by 2030 (Rs in Cr)	Invest^{t} Rq^{t} by 2030 (Rs in Cr)	Invest^{t} Rq^{t} by 2030 (Rs in Cr)	Total Invest^{t} Rq^{t} (Rs in Cr)	Time Horizon
Power Sector	**Indicc & CEEP Scenario Analysis**	**Scenario 1: BAU**	**Scenario 2: RCAT**	**Scenario 3: AD**		
	1. Generation	4860.95[71]	19,659.27	37,881.33	Scenario Analysis: Green Transition of the State Genco RVPN by Indicc & CEEP	Cumulative Investments by 2030
	2. Transmission	775.00	4,762.50	9,137.50		
	3. BESS	3,457.13	3,457.13	3,457.13		
	Total	**23,303.08**	**27,878.90**	**50,475.96**		
	Approved and Proposed Transmission Investments by RVPN					
	Proposed				**Total Invest^{t} Rq^{t} (Rs in Cr)**	**Time Horizon**
	4. ICB 1	**Proposed Package List of RVPN for GEC -II (KfW funded projects): Estimate cost as per DPR upto**			631.23	
	5. ICB 2				276.38	
	6. ICB 3				115.18	
	A. Subtotal (4+5+6)				**1022.79**	

[71] This includes investment cost for 810 MW of solar addition along with 2245 MW of coal addition by the state genco-RVPN

	7. 400/200 kV Udaipur GSS	**Revised Proposal of RVPN for inclusion of the transmission schemes under GEC –II**	466.05	
	8. 220/132kV Dungarpur		165.18	
	9. 132kV Dalot GSS		115.18	
	B. Subtotal (7+8+9)		**746.41**	
	Approved			
	10. 765/400kV Jodhpur	**Financial sanction for RVPN transmission system uprating, upgrade and strengthening scheme for RE evacuation in Western Rajasthan**	3089.93	
	711. 65/400Kv Jaisalmer		3060.89	
	12. 400kV Bhadla	**Administrative & Financial Sanction for transmission system for RE Evacuation from Bhadla-Bikaner Regions**	1678.20	
	13. 400kV Bikaner		699.86	
	C. Subtotal (10+11+12+13)		**8528.89**	
	Total (A+B+C)		**10298.09**	
Mobility	13. 250 EV Charging Station	**Approved in the Budget 2023-24**	**75**	Annual Investments by 2023-24
	1000 Electric Buses by JCTSL: Procurement Plan of 1000 Electric buses by 2025 by Jaipur City Transport Services Limited (JCTSL)			
	14. Procurement of 300 buses for 2023-24		59	Annual Investments by 2023-24

	15. Procurement of 300 buses for 2023-24	**Required VGF**	130	Annual Investments by 2024-25
	16. Procurement of 400 buses for 2023-24		240	Annual Investments by 2025-26
	17. Construction of Depot for E- Buses		60	
	18. Electricity connection for charging infra		30	
	Subtotal (14+15+16+17+18)		**519**	
	19. 40000 EV Charging Stations by 2030	**Scenario Analysis for estimation of EV charging station by Indicc** **Estimated EVs in RJ by 2030: 9 lakh EV** **Requirements of EV Charging Stations – 30000 to 40000**	**7000**	Cumulative Investments by 2030
Adaptation	**Adaptation Efforts**		**Total Investᵗ Rqᵗ (Rs in Cr)**	**Time Horizon**
	Sustainable Agriculture	**Scaling up of Natural Farming in Rajasthan** **Budget 2022-23 has approved Rs 600 cr for scaling up NFM with Centre : State share in the ratio 60:40**	**240**	