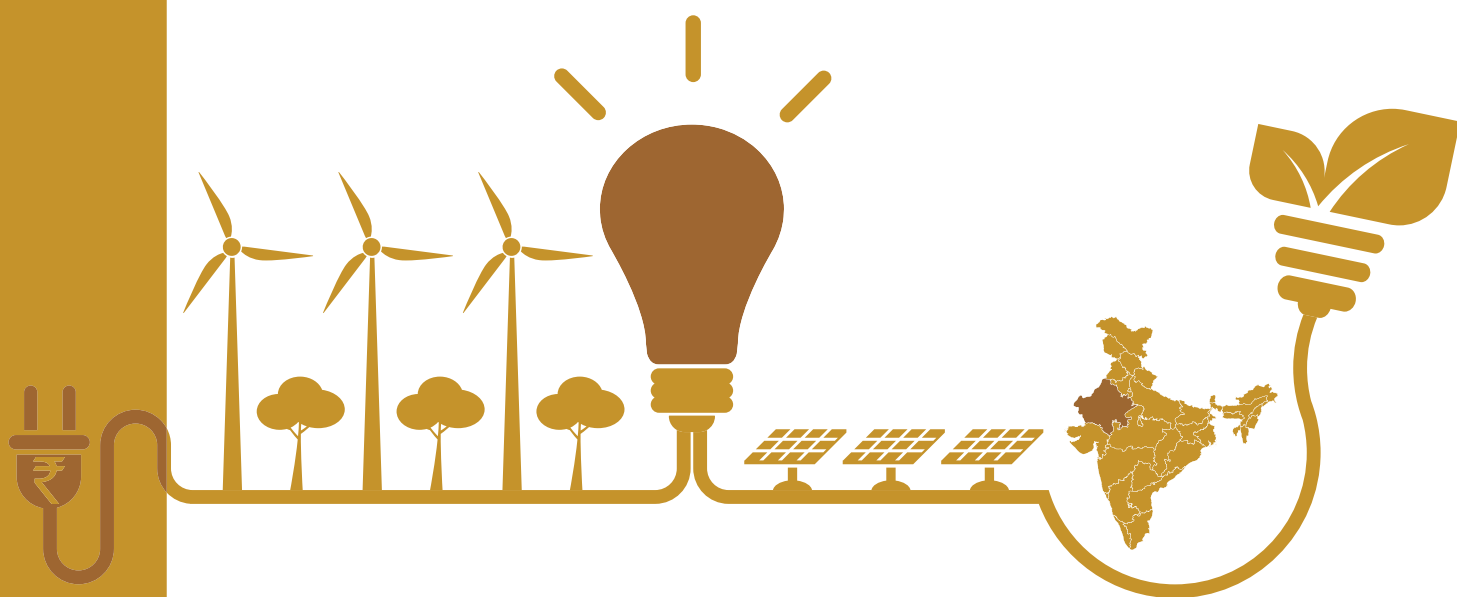


# Climate Mitigation Financing Framework in Rajasthan

2020



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# Context

In a world where climate change is one of the biggest challenges facing humanity, India has emerged as a major player internationally in terms of its efforts to take climate-positive actions. As the country attempts to mitigate climate change and reduce its dependence on fossil fuels, the energy sector is acquiring increasing prominence with actions being taken to decarbonise both its demand and supply side. While the first objective is being realised through efforts aimed at increasing Renewable Energy (RE) generation in the country, the latter objective is being sought through measures aimed at improving the efficiency with which energy is used across various sectors.

India has committed to a five-fold increase in its RE targets and promised to establish 175 GW of RE capacity in the country by 2022. This will comprise of 100 GW of solar, 60 GW of wind, 10 GW of biomass and 5 GW of small hydro power capacity. This endeavour has been supported through an increase in the budgetary allocations for RE in the 2015-16 Union budget.<sup>1</sup> At present, energy generation in India is dominated by traditional coal-fired thermal plants. Focusing on RE has become an imperative to meet the energy demand spurred by fast economic growth, rapid industrialisation, increasing urbanisation and the need to provide energy access to one of the most energy deprived populations in the world, while at the same time refraining from

contributing to increasing carbon emissions. As renewables get added to the energy mix in India, emphasis is also being laid on the promotion of Energy Efficiency (EE) measures in the various energy intensive sectors, anticipating likely reductions in energy consumption and dependence on fossil fuels.

Initially the RE and EE interventions were formulated and implemented at the national level, with only demonstration projects being implemented at the state level. Over the years, however, there has been a gradual recognition of the potentially important role to be played by the states, with national agencies emphasising a vertical integration of the RE policy and a strengthening of state capacities. The Electricity Act 2003 specified the division of tasks between the national level and state governments and provided for a supportive framework for state action. The generation of electricity from renewable sources was to be promoted by the State Electricity Regulatory Commissions (SERCs). At present, states policies play a central role in the implementation of India's RE and EE policies. The states are not merely implementing national RE policies, but have their own exclusive policies promoting the generation of electricity from solar, wind and biomass. Ten out of 28 Indian states, which include Andhra Pradesh, Karnataka, Gujarat, Maharashtra and Rajasthan, have been implementing their own wind energy programmes since 2009.<sup>2</sup> Another significant

1 Centre for Budget and Governance Accountability, 2020. Consolidated Report on Climate Mitigation Financing Framework in Select States, New Delhi.

2 Rao, K.U. and Kishore, V.V.N., 2009. Wind power technology diffusion analysis in selected states of India. *Renewable Energy*, 34(4), pp.983-988

action by states has been the setting of their Renewable Purchase Obligation (RPO) targets and feed-in-tariffs to boost RE production. While state EE measures have not seen the kind of expansion that is necessary, there are nascent attempts being made by them to formulate policies and programmes that aim at improving EE in various states.

The present study is focused on climate mitigation actions undertaken in the western Indian state of Rajasthan. However, before we begin to analyse the policy, and the institutional and fiscal measures that Rajasthan is undertaking to mitigate climate change, or reflect on the suitability and adequacy of those measures, we need to assess the sectors that the state must concentrate its efforts on. This can be based on the state's Greenhouse Gas (GHG) inventory, which can enable identification of the major GHG producing sectors. The discussion on the GHG intensive sectors in Rajasthan will be undertaken in the first section based on the information drawn from the Rajasthan Action Plan on Climate Change (RAPCC). The next section of the report will delve briefly into the RE financing framework at the national level. The various sources of RE finance, institutions involved,

and financing instruments used to deliver RE finance will be considered in this section. This will give us a context for discussing the RE financing framework at the state level since a large part of the finances for RE initiatives come from the sources and instruments discussed here. The state governments in various Indian states, including Rajasthan, allocate funds for climate action (mitigation and adaptation) via the state budget. This forms a critical part of the RE financing framework at the state level and supplements the finances from the sources discussed in the previous section. A complex policy, institutional and fiscal structure ensures RE financing at the national level. It will, therefore, be instructive to develop a comprehensive understanding of these aspects to understand the RE financing framework at the state level. The subsequent sections will discuss the policies and interventions aimed at climate mitigation being implemented in Rajasthan across sectors (primarily RE and EE interventions). This will be followed by a discussion on the climate mitigation financing framework in the state. Based on the evidence presented in the report, policy recommendations will be made in the last section.



## Section I

# Greenhouse Intensive Sectors in Rajasthan

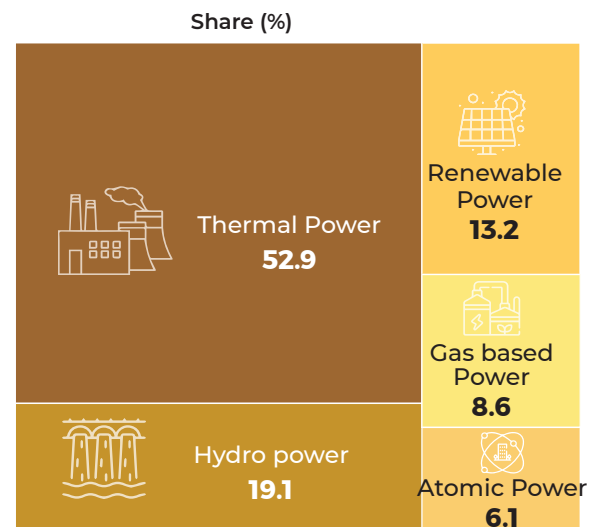
The energy sector in Rajasthan is the primary contributor to the GHG emissions in the state (TERI, 2010).<sup>3</sup> Of the total installed capacity of 7716.63 MW around 52.97 per cent is thermal, 19.14 per cent is hydel, 8.61 per cent is gas, 6.08 per cent is atomic and approximately 13.19 per cent is renewable (wind and biomass). Energy in the state is primarily generated through coal, i.e., fired thermal power plants, and while RE capacity addition is occurring, the pace at which this is happening is not ideal. The usage of low EE appliances is another major concern in the state that needs to be addressed to reduce energy consumption, and thereby the GHG emissions. The electricity demand is growing and is likely to continue to do so in the coming years, owing to rapid urbanisation in many areas as also rising temperatures due to climate change. The Rajasthan Power Corporation (RPC) has identified new power plants with coal as a major source of power generation in the state.

Another major source of GHG emissions in the state is the Transport Sector. There is a rise in transportation services due to advancing urbanisation, increased economic growth and tourism. Due to the absence of an efficient public transport system, people rely largely on private vehicles, which consume non-renewable fossil fuels such as diesel and petrol. Energy used in the commercial and residential sector is largely for cooking, heating, lighting etc. The major sources of energy used in this sector include grid-based electricity (produced by coal-based thermal plants), LPG, Kerosene, Coal, Diesel, Charcoal and Firewood, all of which

produce copious GHG emissions.

Industry is yet another sector, which contributes significantly to fossil fuel combustion and GHG emissions through its manufacturing processes. The important industries of the state include cement, mineral based industries, steel rolling, textile dyeing and printing, brick and lime kilns and chemical. The industrial growth in the state is dominated by small and medium scale industries. The MSME sector in the state is especially polluting as it uses diesel, furnace oil or woody biomass in an inefficient manner. While the larger industries are addressed under the Energy Conservation Act (EC), 2001 as designated consumers, the SME segment is addressed through cluster-based initiatives

**Figure 1: Greenhouse Intensive Sectors in Rajasthan**



Source: The Energy Research Institute (2010)

<sup>3</sup> The Energy Research Institute (2010) Draft Rajasthan State Action Plan on Climate Change, TERI, New Delhi. Available at : [http://www.nicra-icar.in/nicrarevised/images/State%20Action%20Plan/Rajasthan-SAPCC.pdf\\_\(Accessed on 23 January, 2020\)](http://www.nicra-icar.in/nicrarevised/images/State%20Action%20Plan/Rajasthan-SAPCC.pdf_(Accessed%20on%2023%20January,%202020))

of the Bureau of Energy Efficiency (BEE). According to BEE, four energy intensive clusters have been identified in Rajasthan, namely, rolling mills, bearing clusters, marble clusters and textile clusters for energy consumption, and an energy savings assessment to promote EE measures. It has been recognised by the Rajasthan Climate Action Plan (RCAP) that there is high energy efficiency potential in commercial buildings and the SME sector. For effective climate mitigation, it is important for the state to develop GHG management measures across all these sectors.

Climate change mitigation presents an enormous opportunity to the state to exploit its RE potential as it has a vast power generation potential from RE sources such as wind, power and biomass. The Government of Rajasthan (GoR) has begun its efforts to decarbonise the energy sector through a more efficient addition of the RE capacity in various sectors. The government has also initiated efforts towards developing an efficient rapid mass transit system,

and introducing electric vehicles (EVs), which will help in reducing vehicular pollution (and GHG emissions) emanating from them. While the eventual reduction in carbon emissions through these modal shifts in the transport sector will be determined by the source of electricity used by these systems, it will certainly help in reducing the number of private vehicles on the road. In order to promote RE generation, the government has formulated a generic 'Policy for Promoting Generation of Electricity through Non-Conventional Energy Sources, 2004' and exclusive policies for promoting RE generation from solar, wind and biomass. The GoR also incentivises RE generation through inducements, such as exemption from electricity duty, special incentives for industries, single window clearance, allotment of land on concessional rates etc.



## Section II

# Renewable Energy Financing Framework in India

The RE sector in India is largely private sector driven and commercially focused, which is why mobilising cheap and adequate finance for the sector is an important challenge (Sarangi, 2018).<sup>4</sup> The Government of India (GoI) has been supporting the growth of this sector through a series of policy and regulatory measures. The recent policy thrust has come in the form of the government's transformative vision of producing 175 GW of RE by 2022. India's Intended Nationally Determined Contributions (INDCs), which reiterate many of these promises, are also indicative of the priority accorded to RE in the country.

Due to the limited availability of a public budget for the sector, it is important to mobilise private finance at a pace required to meet India's RE goals in the stipulated time period. The limited public funding available for the sector is largely used to promote and incentivise private finance flow to the sector. It has been argued that there is enough private finance available and that the need of the hour is to create an enabling framework. The commercial banks and financial institutions rarely come forward to provide the requisite financing because of the risks and uncertainties associated with the sector.

The funding for the RE sector comes majorly in the form of debt-equity financing.<sup>4</sup> The RE

financial landscape in India is dominated by a range of players including commercial banks (Private/ Public and Foreign banks), equity investors (Private Equity and Venture Capital), Institutional Investors (state-owned, bilateral and multilateral institutions), and Development Banks (Development Financial Institutions) such as the IREDA and the Small Industrial Development Bank of India (SIDBI). Various incentives have been provided by the Government from time to time to mobilise private finance for the sector. The most prominent instruments used by the GoI include Accelerated Depreciation (AD), Generation Based Incentives (GBI) and Viability Gap Funding (VGF) (2018).<sup>5</sup> In addition, there are other policy instruments such as the Renewable Purchase Obligations (RPOs), Renewable Energy Certificates (RECs) and feed-in-tariff schemes to finance RE. These are regulatory instruments for promoting the RE sector in the country. The federal policies typically cover only some of the viability gap and the rest is eventually supported by state governments entering Power Purchase Agreements with renewable energy developers, agreeing to pay feed-in tariffs for 20-25 years<sup>6</sup>. The Government has also created dedicated agencies and institutions for financing RE in India.

While the financing support for the RE sector is available in forms discussed above, it is still largely limited in size, reach and impact. It has

4 Sarangi, G.K., 2018. Green Energy Finance in India: Challenges and Solutions (No. 863). ADBI Working Paper Series

5 Government of Rajasthan, 2018. Economic Review 2018 - 19. Available at <https://www.rajras.in/index.php/rajasthan-economic-review-2018-19-download-pdf-english-hindi/> (Accessed on 23 January 2020)

6 There are other debt related financing instruments too that are used by the Central government such as interest rate subsidy, reduced capital loan and extended tenor debt.



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been argued that to incentivise private finance, the state governments need to provide fiscal incentives to the RE sector as well. This is possible since electricity is a concurrent subject of legislation and both the centre and states can legislate on the subject. The states are incentivising the RE sector by providing fiscal support

through the budget, but a lot more needs to be done. It has also been highlighted that there is a need to achieve synergy between national priorities and state level strategies for more comprehensive action on RE and, concomitantly on climate mitigation in India.



## Section III

# Renewable Energy Programme in Rajasthan

Rajasthan has an overarching “Policy for Promoting Generation of Power through Non-Conventional Energy Sources”. This Policy was promulgated in 1999 (modified later in 2004) and under its rubric exclusive policies for promoting the generation of electricity from solar, wind and biomass have been promulgated over the years. These policies have been modified and even superseded over time to make room for changes in technology and innovation, to expand the mandate of the policies and to introduce new forms of state financing for them. The modifications of policies have led to a greater alignment of the Rajasthan RE programme with the national missions and policies on the subject, the most prominent being the Jawaharlal Nehru National Solar Mission (JNNSM). The Rajasthan Renewable Energy Corporation Limited (RRECL)<sup>7</sup> is the state nodal agency for implementing the RE policies and projects of the Ministry of New and Renewable Energy (MNRE) and the State Designated Agency (SDA) for promoting EE. Apart from implementation of RE interventions, RRECL is also responsible for the implementation and management of EE programmes under the Bureau of Energy Efficiency (BEE), Ministry of Power (MoP), including those that facilitate the development of an energy efficiency market. These include the Energy Efficiency Services Limited (EESL), which is a joint venture of the National Thermal Power Corporation Limited (NTPC Limited), the Power Finance Corporation (PFC), the Rural Electrification Corporation Limited (REC) and the Power Grid Corporation of India

Limited, which facilitate implementation of energy efficiency projects. EESL also undertakes capacity building of SDAs, the funds for which come from the GoI, equipping them to undertake EE measures more effectively. Rajasthan has also set RPO targets, as mandated by the Union government. The Rajasthan Electricity Regulatory Commission (RERC) has issued a fifth amendment to its regulations for renewable energy obligation (RPO), under which it has revised this to 4.75 per cent for the financial year 2018-19 from its earlier figure of 6.75 per cent. According to the RERC, the revised RPO for FY 2018-19 will be applied retroactively from April 1, 2018.

### (a) Rajasthan Solar Energy Policy, 2014 and 2019

The Rajasthan Solar Energy Policy (RSEP) was put in place in 2014, and while a new policy was proposed in 2019 to further facilitate the generation, and distribution of RE in the state, its broad contours remain the same. Both versions of the policy (2014 and 2019) have largely similar objectives, which are closely aligned to the national policy on solar energy articulated through the JNNSM. The objectives of the policy include: (1) Developing Rajasthan as a solar hub to produce 25000 MW of solar energy to meet the energy requirements of the country as well as the state of Rajasthan in the next 5-6 years; (2) Providing a long term and sustainable solution for meeting the energy needs of the

<sup>7</sup> RRECL was formed by merging erstwhile REDA (Rajasthan Energy Development Agency) and the Rajasthan State Power Corporation Ltd (RSPCL) in August 2002 and is registered under Companies Act 1956

people of Rajasthan, while simultaneously reducing the dependence on fossil fuels; (3) Generating employment opportunities for the people of Rajasthan; and (4) Facilitating research and development to help innovation in the field of solar energy to achieve grid parity.<sup>8,9</sup>

RRECL is the state nodal agency under the policy, and its responsibilities include: registering the RE projects; approving them; facilitating the allotment of government land; facilitating water allocation for the production in solar energy plants; facilitating the approval of power evacuation plans; and facilitating the execution of Power Purchase Agreements (PPAs) with the state DISCOMS and other stakeholders.

The objectives laid down by the RSP are to be achieved through a range of projects, which would facilitate the establishment of both grid-connected and off-grid solar energy power plants. Under the grid-interactive solar power projects, the state government seeks to facilitate and support the establishment of solar power plants (1) sanctioned under the guidelines of the MNRE; (2) for the sale of power to Rajasthan state distribution companies or DISCOMS; (3) for the sale of power through RECs; and (4) for captive use of power/ for third party sale of power and for sale of power outside Rajasthan. The state government will also promote the establishment of rooftop solar PV power plants connected to the LT grid under the net metering scheme. This policy entails crediting the customers for the power they generate through the rooftop solar plants.

RRECL is also implementing the programme for the installation of the SPV grid-connected power plants to promote solar rooftop power generation, which has been promoted by the MNRE. This programme will be implemented with the help of the Central Financial Assis-



tance (CFA) from the Union Government and a matching grant by the state government. The MNRE has also sanctioned CFA of up to 30 per cent of the total project cost for the establishment of 18MW solar rooftop power plants in residential and institutional areas. Rooftop solar power projects of a total capacity of 126 MW were commissioned till 30th March 2019, and out of this, projects amounting to 37MW capacity are being implemented under the various subsidy schemes of MNRE via the RREC.

The Solar Energy Policy of 2014 and 2019 both facilitate the alignment of the Rajasthan Solar Programme with the JNNSM. Under the Rajasthan Solar Energy Policy, RREC is appointed as the nodal agency for the establishment of solar parks under the Central scheme, “Development of Solar Parks and Ultra Mega Solar Power Projects”. A subsidiary company of the RREC is established as a special purpose vehicle (SPV) for the management and development of infrastructure in the solar parks. The policy also seeks to promote and incentivise the development of solar parks by private solar power developers, who along with the RREC manage them. The private power developers can develop common infrastructure in the solar parks such as roads, power evacuation systems etc. The state government through the Solar Energy Policy also seeks to promote the development of solar parks by contributing up to 50 per cent equity (including the cost of land) in a Joint Venture Company (JVCs) established for the development of solar parks. For instance, the state government has established JVCs with the Essel Group and the Adani Group for the development of solar parks, and in both cases the GoR and the private partners have a 50:50 stake (see Table 1).

8 Rajasthan Renewable Energy Corporation Limited, Government of Rajasthan (2019) Rajasthan Solar Energy Policy, Jaipur. Available at : <https://energy.rajasthan.gov.in/content/dam/raj/energy/rrecl/pdf/Common/Rajasthan%20Solar%20Energy%20Policy%202019%20.pdf> (Accessed on 23 January, 2020)

9 Rajasthan Renewable Energy Corporation Limited, Government of Rajasthan (2014) Rajasthan Solar Energy Policy, Jaipur. Available at <http://rips.rajasthan.gov.in/menu/pdf/Rajasthan-Solar-Energy-Policy-2014-10.pdf> (Accessed on 23 January, 2020)

## Table 1: Solar Parks in Rajasthan

Solar Park 	Developer 
<b>Bhadla Solar Park II (680 MW)</b>	Rajasthan Solarpark Development Company Limited (RSDCL), a subsidiary of RRECL. 680 MW has been commissioned.
<b>Bhadla Solar Park III (1000 MW)</b>	M/s Saurya Urja Company of Rajasthan Limited (SURAJ). 500 MW has been commissioned.
<b>Bhadla Solar Park IV (1000 MW)</b>	M/s Adani Renewable Energy Park Rajasthan Limited (AREPRL). 250 MW has been commissioned.
<b>Phalodi – Pokaran (750 MW)</b>	M/s Essar Saurya Urja Company of Rajasthan Limited.
<b>Fatehgarh – Phase 1B (1500 MW)</b>	M/s Adani Renewable Energy Park Rajasthan Limited.
<b>Nokh Solar Park (980 MW)</b>	Rajasthan Solar Park Development Company Limited along with NTPC (a subsidiary of the RRECL).

Source: Solar Energy Corporation of India

Also, several incentives/ facilities are being made available to the solar power projects. These include those available to the industries under the Rajasthan Investment Promotional Scheme, which comprises the allocation of water required for the operation of power plants by the Water Resource Department from the nearest canal as also an expeditious grant of consent by the Rajasthan State Pollution Control Board (RSPCB). Solar power plants of capacity 3074 MW have been commissioned in the state up to March 2019. For the development of solar parks and mega solar power projects in the state, three joint venture companies (JVCs) have already been incorporated. These are M/s Saurya Urja Company of Rajasthan Limited (SURAJ), M/s Adani Renewable Energy Park Rajasthan Limited and M/s Essar Saurya Urja Company of Rajasthan Limited. Under the Central scheme, “Development of “Solar Parks and Ultra-Mega Solar Power Projects”, 6 solar parks in Rajasthan have been approved for development.

Evidence of budgetary support is available in the budget documents though it is less certain, whether this is purely in the form of equity. The financial support from the GoR has been

consistent over the years with very little change through the years considered under this study. The budgetary support for this can be delineated from budget documents where it has been mentioned as the amount allocated for “appropriation” towards various private companies investing in solar parks. There was no allocation towards this line item in the 2016-17 and 2017-18 budgets. Thereafter, a consistent allocation of Rs .0004 crores has been made under the budgets for subsequent years (See Annexure 1).

Apart from incentives given by the GoI and GoR for the establishment of solar parks and ultra-mega solar projects, funding for the programme is also forthcoming from multilateral climate funds and international development banks. For example from Climate Investment Funds (CIFs), through the Clean Technology Fund, a multi-donor Trust Fund within the CIFs, and the Asian Development Bank.

The state also seeks to promote the establishment of off-grid and decentralised power plants to address energy and thermal requirements for commercial and domestic use. This includes the sale of solar plants to individuals through its own distribution system, the establishment of

local solar grid and stand-alone solar plants for the supply of electricity to remote villages, and the installation of SPV water pumping systems. The 2019 Solar Energy Policy has proposed some additional programmes aimed at promoting the setting up of solar power projects with a minimum capacity of 0.5 MW and a maximum capacity of 3 MW in the vicinity of existing 33 kV grid sub-stations for sale of power to DISCOMs. The state will also promote the solarisation of existing grid-connected agricultural pumps as per the provisions/guidelines issued by DISCOMs based on regulations of appropriate Commission/guidelines of the central/state government. The state government, through the new policy, also seeks to promote solar power projects with storage systems to reduce the variability of output of solar power into the grid and to ensure the availability of firm power for a period. The state will promote the setting up of solar-based Electric Vehicle charging stations as per the Guidelines of the MoP/MNRE/State Government/RERC. These are some of the additional features of the 2019 Solar Energy Policy. The measures towards the promotion of EVs, so far, have been undertaken under FAME II. While there are plans for the state government to take up these initiatives independently under the new draft Industrial Policy of Rajasthan, these are yet to materialise.

## **(b) Rajasthan's Policy for Promoting Generation of Electricity from Biomass, 2010**

Rajasthan has a comprehensive policy for the generation of electricity from biomass called the "Policy for Promoting Generation of Electricity from Biomass, 2010".<sup>10</sup> RRECL is the state nodal agency responsible for the execution of the policy. Its responsibilities are manifold and

include: acting as a facilitator for the execution of PPAs between the power producers and DISCOMs; loans from IREDA/ financial institutions/ commercial banks etc.; allotment of land for the projects; allotment of water required in the power plants; and approval of power evacuation plans etc. This policy has been in operation since 2010 and will remain so, till it is modified or superseded. Under the policy, power producers can generate electricity for captive use or sale to third party/licence holders including DISCOMs. The RPO of the state DISCOMs for the purchase of electricity produced by biomass will be as per the guidelines issued by the Rajasthan Electricity Regulatory Commission (RERC). Also, the sale of power by the power producer will be according to the PPAs entered by the two parties as per the rules and guidelines issued by the RERC.<sup>11</sup> The incentives offered by the state government are in the form of revenue foregone, including exemption from electricity duty at the rate of 50 per cent for 7 years from the commencement of operation for power developers with power plants producing electricity for captive use. The power plants under the scheme are also allotted land at concessional rates and given the incentives available to industries under the Rajasthan Investment Promotion Scheme administered by the Department of Industries. The private developers are also given an exemption from stamp duty, sometimes up to 100 per cent. As of March 2019, a total of 13 Biomass plants with a capacity of 120.45 MW had been established while 3 more were underway.

## **(c) Rajasthan Wind Policy, 2012**

The "Policy for Promoting Generation of Electricity from Wind" was promulgated in 2000 and then later in 2003 and 2012.<sup>12</sup> Under this,

10 Department of Energy, Government of Rajasthan (2010) Policy for Promoting Generation of Electricity from Biomass 2010, Jaipur. Available at [https://energy.rajasthan.gov.in/content/dam/raj/energy/corporate-one-lines-viewer/pdf/SolarPolicy/Policy\\_Promoting\\_Generation\\_Electricity\\_Biomass\\_2010\(Web\).pdf](https://energy.rajasthan.gov.in/content/dam/raj/energy/corporate-one-lines-viewer/pdf/SolarPolicy/Policy_Promoting_Generation_Electricity_Biomass_2010(Web).pdf) (Accessed in January 2020)

11 Department of Energy, Government of Rajasthan (2010) Policy for Promoting Generation of Electricity from Biomass 2010, Jaipur. Available at [https://energy.rajasthan.gov.in/content/dam/raj/energy/corporate-one-lines-viewer/pdf/SolarPolicy/Policy\\_Promoting\\_Generation\\_Electricity\\_Biomass\\_2010\(Web\).pdf](https://energy.rajasthan.gov.in/content/dam/raj/energy/corporate-one-lines-viewer/pdf/SolarPolicy/Policy_Promoting_Generation_Electricity_Biomass_2010(Web).pdf) (Accessed in January 2020)

12 Department of Energy, Government of Rajasthan (2012) Policy for Promoting Generation of Electricity from Wind 2012, Jaipur. Available at [https://energy.rajasthan.gov.in/content/dam/raj/energy/corporate-one-lines-viewer/pdf/SolarPolicy/wind\\_pol.pdf](https://energy.rajasthan.gov.in/content/dam/raj/energy/corporate-one-lines-viewer/pdf/SolarPolicy/wind_pol.pdf) (Accessed on 23rd January 2020)

the state government supports and incentivises the setting up of wind power plants of unlimited capacity on preferential tariff for direct sale of power to the DISCOMs of Rajasthan for years 2013-14 to 2015-16. This tariff was determined by the RERC. The state government, through this policy, also promotes utility grid projects for the sale of power to a third party within the state or for captive use through incentives which are similar to the ones offered under the Solar Energy Policy. The policy also seeks to promote the setting up of wind power plants by private developers for the sale of power through the REC mechanism. The power generated from these plants will be purchased by the DISCOMs of Rajasthan as per the guidelines laid down by the RERC. The minimum RPO for Rajasthan DISCOMs shall be governed by the RERC. The state government incentivises the setting up of the power plants through exemptions from electricity duty given to the energy produced by the private developers for captive use, concessional allotment of land for establishing power plants, and incentives available to industries under the Rajasthan Industrial Investment Programme.

### **(d) Solar Energy Rural Electrification Schemes**

The electrification of rural areas through various initiatives of the state government of Rajasthan and the Union government has led to significant strides in the field (GoR, 2018). The Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and the Pradhan Mantri Sahaj Bijli Har Ghar Yojana are two prominent schemes in this regard. An important intervention has been undertaken by the RRECL seeking to electrify the un-electrified villages and hamlets in the state through the establishment of off-grid SPV Home Lighting Systems (HLS). This scheme is being implemented with the help of subsidy support by the GoI and GoR. Under this scheme, 50,142 HLS had been established in the un-electrified villages and hamlets of Rajasthan till March 2019.

### **(e) Solar Water Pump Programme**

The SPV Pumping System installation programme is being implemented in Rajasthan for the solarisation of the irrigation system.<sup>13</sup> This scheme is being implemented by the Rajasthan Horticulture Development Society (RHDS) with technical support from the RRECL. Till March 2019, 40,251 SPV water pumps had been installed. This scheme was implemented after studying several GoI schemes being implemented by the Horticulture Department and then combining it with JNNSM, and the Rashtriya Krishi Vikas Yojana (RKVY), along with state resources. Thus, while functionally, the base was JNNSM as also other schemes (and resources for them), these were combined with it in the programme. Financially, the scheme received 30 per cent subsidy under the MNRE and 56 per cent subsidy from RKVY. If the RKVY support dwindled, the state government was required to fill the gap to provide a total subsidy of 86 per cent. Presuming that the cost of a solar water pump system is about Rs. 5,00,000, the farmer would need to pay only Rs. 70,000 (14 per cent of the solar water pump system cost), equivalent to the cost of the pump. This, therefore, leads us to the figure of a subsidy of 86 per cent.

The GoR has also begun the implementation of the GoI's Kisan Urja Suraksha evam Utthaan Mahabhiyan (KUSUM) scheme to enable the farmers to install solar water pump sets on their farms. While they can use the electricity generated by the solar water pumps, they will also be allowed to sell the surplus energy generated, which can then be transmitted to the power grid. A new feature that has been added to this scheme, allows the farmers to lease their lands to private developers for the establishment of solar power plants with a capacity of 0.5 to 2 MW. These plants will be established within close distance of power stations so that the power can then be fed into the grid with

<sup>13</sup> Goyal, Dinesh. 2013. Rajasthan Solar Water Pump Programme. Akshay Urja Renewable Energy, Vol 7, Issues 2 and 3.

## Box 1: Projects Covered under Tranche-1

There are a total of seven projects covered under Tranche-1 as shown below:

1. Construction of 400 KV Substation in Ramgarh and augmentation works at Akal under ICB-1
2. Construction of 400 KV Substation in Bhadla & augmentation works at Bikaner under ICB-2
3. Transformer packages for Ramgarh & Bhadla under ICB-3
4. Shunt reactor packages for Ramgarh, Bhadla, Bikaner & Akal under ICB-4
5. Construction of 400 KV for Ramgarh - Akal line under ICB-5
6. Construction of 400 KV at Bhadla-LILO point of Jodhpur-Merta line under ICB-6
7. Purchase of Conductors for Ramgarh-Akal line & Bhadla-LILO point of Jodhpur-Merta line and Jodhpur-Akal line under ICB-7.

Source: Economic Review Rajasthan 2018 - 19.<sup>14</sup>

minimal loss. The farmers can lease their lands for the purpose and receive an annual income in return. This scheme is aimed at helping small solar power developers, who are otherwise excluded from opportunities to generate electricity for the state DISCOMs. The scheme helps in a decentralised generation of solar electricity, which can be fed into the grid without investing massively in the creation of an infrastructure for the purpose.

### (f) Rajasthan Renewable Energy Transmission Investment Program - ADB

The Asian Development Bank (ADB) has approved a loan proposal under the Multitranchise Financing Facility (MFF) amounting to US\$500 million on 26th September 2013. Of this loan, US\$300 million is to be provided from the

ADB's Ordinary Capital Resources (OCR) and US\$200 million from its Clean Technology Fund (CTF) including US\$2 million for technical assistance. The main objective of the investment programme is to develop public sector transmission infrastructure capacity to support private sector-led renewable energy generation in Western Rajasthan. The US\$150 million loan for Tranche-1 was approved and signed on 12th September 2014, which consists of US\$88 million from CTF and US\$62 million from OCR (see Box 1). The project became operational in November 2014 and was to be completed by December 2016. But ADB approved an extension of the project period from December 2016 to December 2018. Out of the US\$150 million (Rs.1142.5 crore) loan, US\$18 million (Rs. 138.1 crore) has been surrendered and cancelled by ADB.

<sup>14</sup> Government of Rajasthan (2018) Economic Review 2018 - 19. Available at <https://www.rajras.in/index.php/rajasthan-economic-review-2018-19-download-pdf-english-hindi/> (Accessed on 23 January 2020)

## Section IV

# Energy Efficiency Schemes and Programmes in Rajasthan

While promoting energy generation from non-conventional energy sources and adding renewables to the energy mix, the GoI and the GoR are also making efforts to promote a more efficient usage of energy through innovative mechanisms. These efforts are being undertaken under the overall ambit of the Energy Conservation (EC) Act 2001, which was enacted to reduce the emissions intensity of the economy by 33-35 per cent by 2030 over the 2005 levels. The Bureau of Energy Efficiency (BEE) was established to implement the EC Act, which has laid down regulatory guidelines for energy conservation. This includes, the standards and labelling programme for energy efficient appliances, energy conservation codes for residential and commercial buildings, and an energy efficiency programme called Perform, Achieve and Trade (PAT) for energy intensive industries. Within the larger framework of cooperative federalism, the states in India have an important role to play in implementing EE measures. The SDAs are the counterparts of BEE in states and play an important role in implementing the programmes of BEE. The states with strong SDAs and robust EE initiatives have a greater scope to attract investments on EE projects.

Rajasthan has been ranked as one of the 'front runner' states by the State Energy Efficiency Preparedness Index, 2018 of the NITI Aayog and has implemented the UJALA scheme for energy efficient lighting. The State Energy Department has notified mandated obligatory compliance with the Energy Conservation Building

Code (ECBC) and has also incorporated ECBC codes in their municipal by laws.<sup>15</sup> When a state demands ECBC compliance, it is required that all new buildings above a certain load demand, have a specified contract, wherein the built up area must comply with the minimum energy requirements of the ECBC. Rajasthan has also mandated energy audits for certain categories of buildings, based on the size or connected load of the building.

With the increasing ownership of appliances, it is very important to ensure that EE appliances are available and affordable in the market. The GoI's UJALA scheme, which aims at ensuring that EE lighting and fans are both accessible and nominally priced is an important intervention in this regard. The GoR is implementing this scheme along with EESL. It has also mandated the usage of BEE star rated appliances for all public buildings in the state. RRECL works as the SDA in Rajasthan and undertakes energy audits and ensures compliance of EE regulations for buildings. There is a budget allocated in the Rajasthan State Budget, usually in the form of subsidies to ensure that RERC can undertake these activities effectively. However, it is less certain if the budget is adequate for the RERC to undertake the range of activities that it needs to, to manage and administer both as an SNA and SDA.

For energy conservation in industries, the GoR has focused on setting energy saving targets for PAT with designated consumers, mandating

<sup>15</sup> Alliance for Energy Efficient Economy (2018) State Energy Efficiency Preparedness Index 2018. Available at [https://www.aeee.in/wp-content/uploads/2018/09/State-EE-Preparedness-Index-FINAL\\_July2018.pdf](https://www.aeee.in/wp-content/uploads/2018/09/State-EE-Preparedness-Index-FINAL_July2018.pdf) (Accessed on 23 January, 2020)



regular energy audits to monitor compliance with the targets set. The RERC is responsible for ensuring and reviewing that mandated energy audits are completed. The MSME sector in India accounts for about 45 per cent of the manufacturing output and is a significant part of the industrial sector in most states. Close to 200 energy-intensive MSME clusters account for about 25 per cent of India's energy consumption.<sup>16</sup> The state has also undertaken several steps, along with the BEE, to advance EE in the MSME sector, which includes holding workshops, undertaking demonstration projects and providing subsidy for energy audits. For many of the activities, the MoP via the BEE transfers funds to the SDA. The CFA is also allocated for capacity building of the SDAs to enable them to undertake the activities. Rajasthan has also implemented fuel saving projects in five small scale industries with the assistance of BEE.

The state of Rajasthan is implementing its own exclusive programmes for EE street lighting and EE water pumping and has a dedicated budget for them.<sup>17</sup> These programmes are over and above the EESL's programmes for EE street lighting (Street Lighting National Programme or SLNP) and EE water pumping (Municipal Energy Efficient Programme or MEEP) being implemented in the state. The state government has initiated the "Street Light Project". The aim of the project is not only to spread illumination, but also to reduce the energy consumption by making the street lighting system energy efficient. The project entails the setting up of LED street lights and has been completed in 188 urban local bodies (ULBs). The funding for the project comes from the EESL, a GoI undertaking, under the SLNP, without any cost incurred by the state government or the ULBs. In a similar endeavour, the Rajasthan State Industrial Development and Investment Corporation (RIICO) has undertaken some significant policy decisions towards the promotion of non-conventional sources of energy and reducing energy consumption.<sup>18</sup> About 18,000 LED street lights have been installed or changed in

industrial areas and roof top solar plants have been established in the 25-unit offices of the Corporation. To promote the usage of energy efficient appliances, the state government along with the EESL is promoting the usage of energy efficient LED bulbs, tube-lights and fans. This is being taken up under the Centre's 'Unnat Jyoti by Affordable LEDs for All' (UJALA) scheme. Under this scheme, 88,257 energy efficient fans, 162 lakh LEDs and 3 lakh tube-lights have been distributed. The GoR is also planning to implement a scheme for the replacement of inefficient irrigation pump sets with 5 star-rated Energy Efficient Pump Sets (EEPS) with an average capacity of 12 HP. This intervention may be implemented by the BEE or the EESL in collaboration with the respective DISCOMs. Alternatively, private energy service companies (ESCOs) may be enlisted for the job. For Demand Side Management (DSM), the state has a dedicated DSM programme in most sectors. The state not only provides financial incentives for DSM programmes in the state, but also has a dedicated DSM cell in the SERC. The state has also established a State Energy Conservation Fund (SECF). The Union government has released funds for the operationalisation of the SECF and the state government has released a matching grant for this. The SDA regularly conducts awareness programmes on energy conservation measures in schools and for the general public, with the help of BEE funding.

The BEE (2018) has also undertaken an ambitious programme of EE improvement and technology upgradation of five SME clusters in India called the "National Programme on Energy Efficiency and Technology Upgradation in SMEs". It is implemented by the BEE with the support of the Ministry of Small and Medium Enterprises (MSME). The scheme has been implemented in Rajasthan as well. This entails conducting baseline energy audits (BEAs) in the operational units of the identified clusters and conducting workshops to raise awareness among the unit owners on the EE technologies available to them. Post workshop audits are also conduct-

16 Bureau of Energy Efficiency (2018) Annual Report 2018.

17 ibid

18 ibid

ed to assess the influence of the programme. The BEE through EESL and the National Power Training Institute (NPTI) has undertaken programmes for building the capacity of DISCOMs on DSM and EE measures and technologies. For this, an MoU is signed between the BEE and state DISCOMs. Under this programme, DSM cells are established in the state DISCOMs, load surveys are undertaken, the DSM action plan is drawn out and capacity building workshops are conducted for DSM officials. Three Rajasthan DISCOMs have signed MoUs with the BEE for this programme, namely, the Jodhpur Vidyut Vitran Nigam Limited, Jaipur Vidyut Vitran Nigam Ltd and Ajmer Vidyut Vitran Nigam Limited. The programme is conducted with funding from the BEE. The Union Government also provides financial assistance to SDAs for

strengthening their institutional capacities and capabilities.

In addition, the RRECL implements energy conservation programmes to promote the use of energy efficient appliances through different promotional activities establishing pilot projects from time to time, to demonstrate energy savings in the state. To recognise sincere efforts towards Energy Conservation, the RRECL has instituted the Rajasthan Energy Conservation Awards (RECA). So far, a total of nine awards have been given.



## Section V

# Schemes aimed at reducing Aggregate Transmission and Commercial Losses and improving the Financial Health of State DISCOMs

The Integrated Power Development Scheme (IPDS) is aimed at reducing the aggregate technical and commercial losses (AT&C) in urban areas. The reduction of losses goes a long way in helping conserve energy, and can be deemed as a climate mitigation measure. A sum of Rs. 1343 crore has been sanctioned for the scheme by the state government. In 2013, the average AT&C losses for Rajasthan's utilities were 26.74 per cent. Under the state's Power for All Plan formed with the Union government, the state's utilities were targeting AT&C losses of 15 per cent on an average in 2019. The utilities have been able to reduce their losses but have not yet achieved their target. The current AT&C loss rate is 21.29 per cent. The GoR is also implementing the Mukhyamantri Bijli Sudhar Yojana, which aims at improving the quality of electricity being supplied alongside efforts to reduce the wastage and loss of electricity through issues of transmission and theft (GoR, 2018).

The Ujwal DISCOM Assurance Yojana (UDAY) was launched by the GoI to improve the financial and operational efficiency of the state DISCOMs. While this may not be considered a direct climate mitigation action, it must howev-

er be seen as one, as one of the biggest factors impeding the uptake of RE in states is the poor financial health of the state DISCOMs. Under UDAY, the GoI and GoR cover the outstanding debts of the state DISCOMs. As per the MoU, the GoR is obliged to cover 75 per cent of the outstanding debts as on 30th September 2015 over a period of two years. Also, under the scheme, Rajasthan has a target of installing approximately 56,000 smart meters for consumers with consumption between 200 - 500-kilowatt-hour (kWh) by December 2019. Till August 2019, the GoR had not installed any smart meter for these consumers. In September 2018, the World Bank announced a US\$250 million loan to the GoR to help improve the performance and financial health of the state's DISCOMs. The terms of the loan included: instituting a performance management system; implementing performance improvement incentives; transferring a major amount of debt from the DISCOMs to the state government; reducing procurement costs; and initiating the use of new information technology systems, among others. The loan has been effective since 2018 and will be disbursed by 2019.

## Section VI

# Electrification of the Transport Sector: Rapid Mass Transit System (Metro)

In the transport sector, the Jaipur Metro Rail Project has been completed, which will go a long way in reducing carbon emissions from vehicular pollution. The metro rail project is a mass rapid transit system. The construction of Phase 1 of the project has been completed, while that of Phase 1B is likely to be completed soon. The Jaipur Metro Rail Corporation Ltd. (JMRC) was established as an undertaking of the state government (special purpose vehicle or SPV) for the management of the metro

project. Phase 1 of the project was to be funded through equity and subordinate debt funding from the GoI and GoR (JMRC Annual Report, 2017).<sup>19,20</sup>

Phase 1B of the project has been funded by a loan of Rs. 960 crore from the ADB, with the state government bearing the cost of Rs 167 crore. The total estimated cost of Phase 2 of the project is estimated to be Rs 10,394 crore and the GoR is seeking to implement this phase us-

**Table 2: Funding for the Jaipur Metro Rail Project (State Government Finance and External Loan)**

Equity	Amount (Rs. Crore)	Percentage
Government of Rajasthan	1,494	54%
RIICO	100	
Rajasthan Housing Board (RHB)	100	
Debt from the Government of Rajasthan	366	12%
Grant from Jaipur Development Authority (JDA)	120	4%
Loan of ADB through GoI/ GoR	969	31%
<b>Total</b>	<b>3,149</b>	

Source: Annual Reports, JMRC

<sup>19</sup> The Ministry of Urban Development, GoI, through a letter, sanctioned a support of Rs. 630 crore to the project. This support was to be matched by the GoR through equity support (Rs. 472 crore), subordinate debt (Rs. 157.50 crore), additional subordinate debt by GoR for land costs other than those owned by the GoR (Rs 108 crore) and debt from GoR and other agencies such as the Jaipur Development Authority (JDA), Rajasthan State Industrial Development and Investment Corporation (RIICO) and Rajasthan Housing Board (Rs. 812 crore). The JMRC was to be converted to joint ownership between the GoI and GoR. The state government, however, did not agree to the terms and conditions laid down by the central government for the creation of JV and, therefore the share of the central government (Rs. 630 crore) was provided by the state government.

<sup>20</sup> Jaipur Metro Rail Corporation (2015) Annual Report 2017 - 18. Available at [http://transport.rajasthan.gov.in/content/dam/transport/metro/RTI/Section%204\(1\)%20\(b\)/17/Annual%20Report%202017-18\\_%209th.pdf](http://transport.rajasthan.gov.in/content/dam/transport/metro/RTI/Section%204(1)%20(b)/17/Annual%20Report%202017-18_%209th.pdf) (Accessed on 23 January 2020)

ing a PPP model. Since its inception till March 2019, an amount of Rs. 793.31 crore had been incurred under the project. During the Financial Year 2018-19, an outlay of Rs. 200 crore was fixed against which Rs. 194.48 crore had been utilised by March 2019.

For promoting Electric Vehicles (EVs), the state government has implemented the GoI scheme (FAME Phase 1) aimed at promoting the uptake of EVs through the State Road Transport Corporation. However, it does not offer any financial incentives for procuring EVs or hybrid vehicles through its own resources (AEEE, 2018). It is also planning to implement Phase 2 for the FAME scheme, which will entail incentivising the manufacture of EVs and the establishment of EV charging stations. Whether the state government is going to allocate resources for them is questionable at the moment. It has mentioned the promotion of solar-based EV charging stations as one of the priority areas in the 2019 Solar Energy Policy, but whether and how much of the state resources will be used to incentivise the process is unclear at present. The draft of the new Industrial Development Policy of Rajasthan, 2019 has articulated the need for a new State Electric Mobility Policy aimed at incentivising the manufacture and uptake of EVs in the state. This, however, has not yet been formulated.

Under the Smart City Mission, the GoI seeks to provide citizens of selected cities with a better quality of life through the provision of world class infrastructure, a clean environment and the deployment of smart energy efficient solutions. The GoI will give a grant of Rs. 100 crore per city over a period of 5 years, with a matching grant to be provided by the state government/ULBs. Four cities in Rajasthan have been short-listed under the Mission, namely, Jaipur, Udaipur, Kota and Ajmer (GoR, 2018).

Phase 1B of the project has been funded by a loan of Rs. 960 crore from the ADB, with the state government bearing the cost of Rs 167

crore. The total estimated cost of Phase 2 of the project is estimated to be Rs 10,394 crore and the GoR is seeking to implement this phase using a PPP model. Since its inception till March 2019, an amount of Rs. 793.31 crore had been incurred under the project. During the Financial Year 2018-19, an outlay of Rs. 200 crore was fixed against which Rs. 194.48 crore had been utilised by March 2019.

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## Section VII

# Rajasthan State financing of CCMAs can be broadly categorised into three components

Component A: State finances routed through the state budget to fund the state RE and EE schemes. **Annexure 1** provides a summary of state finances through budgets.

Component B: State finances received through Central Financial Assistance (CFAs) disbursed from the Central Nodal Ministry or the Central PSUs (e.g. EESL, SECI) as subsidies. These include performance grants transferred as per the recommendations of the Central Finance Commission (CFC) to the state government. These finances are routed through the SNA of the MNRE and the SDA of the BEE, which happens to be RRECL in both cases. The CFA for some of the EE measures such as improving the capacity of the DISCOMs is directly transferred to the DISCOMs after MoUs have been signed with them.

Component C: External aid/loans from bilateral and multilateral banks are routed through the state's budgets; and loans are provided by the Non-Banking Financing Companies (NBFCs) such as IREDA.

### **The findings from the assessment on available state finances are as follows:**

**1.** Most RE Projects in the state are jointly financed by the GoI and the GoR. Rajasthan's RE programme is closely aligned to and draws largely from the Central RE schemes and programmes. In doing so, the GoR ensures that the private developers can benefit from the range of incentives and also avail finances from

both the central and the state government. The large-scale grid connected RE projects under the JNNSM are financed by the state government, external aid, CFA and/ or by loans from NBFCs.

**2.** The combined deployment of central and state finances is also used to finance schemes to support small-scale, decentralised and off-grid projects for electrification of un-electrified villages and areas in the state. An important intervention in this regard has been undertaken by the RRECL to electrify the un-electrified villages and hamlets in Rajasthan through the establishment of off-grid SPV Home Lighting Systems (HLS). This scheme is being implemented with the help of subsidy support by the GoI and the GoR. The scheme, which is funded without Central support is the Mukhyamantri Bijli Sudhar Yojana, which is aimed at improving the quality of electricity being supplied and reducing the AT&C losses. The GoR budgetary support for the various schemes has been fairly consistent with very little variation. Also, the utilisation of the allocated funds has been 100 per cent.

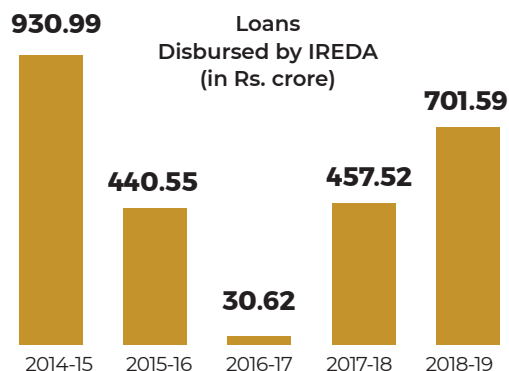
**3.** The GoR has been supporting the low carbon transport sector in the state by aiding the establishment of a mass transit system, through measures such as the setting up of a metro rail network in its Smart Cities. The Jaipur Metro Rail Project is supported by the GoR through equity and subordinate debt and a loan from the ADB.

4. The GoR is partially supporting the GoI schemes aimed at improving the financial health of the state DISCOMs. The GoR will help to cover a part of the debts of the state DISCOMs. Along with the Union government, the state government also supports schemes aimed at reducing transmission and distribution losses (UDAY scheme).

5. State departments responsible for climate change mitigation actions, such as measures for promoting EE and low carbon transportation are channelling the finances through dedicated state owned enterprises (SOEs). The SOEs operate on the basis of the central and state policy frameworks for climate mitigation actions. They have the capacity to blend capital provided by the state and the Union government with external sources of capital and the flexibility to develop financial instruments to meet the needs for policy implementation.

6. Capital investment by Central PSUs such as the EESL for EE programmes is behind the immense progress being made towards energy conservation and EE measures in the state. The state government has its own exclusive programmes for energy efficient street lighting

**Table 3: Loans Disbursed by IREDA (Amount in Rs. crore)**



Source: Annual Report, IREDA

and energy efficient water pumping over and above the EESL programmes that do so. The state government allocates a separate budget for these schemes. Similarly, loans for large scale RE projects through IREDA are in line with the state and the national targets for RE.

Below is a snapshot of the RE and EE finances available in the state of Rajasthan from the range of sources discussed above (See Tables 3 to 5). This summary must not be considered exhaustive due to the lack of availability of data.

**Table 4: External Aid for Climate Mitigation Projects in Rajasthan**

	External Agency	Total Project Cost	Expenditure during 2018-19	Total Expenditure since inception to March, 2019
Jaipur Metro Rail Line - 1B (June 2014 to March 2020)	ADB	1,126.00	194.48	793.31
Rajasthan Renewable Energy Transmission Investment Program (November 2014 to December 2018)	ADB	1,466.16	51.06	1,243.47
Intra-State Transmission System in Rajasthan under Green Energy Corridor Project	KfW	793.90	136.62	387.20
Second Programmatic Electricity Distribution Reform Development Policy Loan (October 2018 to September 2019)	World Bank	1,850.00		

Source: Economic Review Rajasthan 2018-19

**Table 5: Central Financial Assistance (CFA) to the State Government (in Rs. crore)**



Source: EESL's Annual Reports for 2016 -17 to 2018-19

## Section VIII

# Policy Recommendations

**1.** The Rajasthan State Action Plan on Climate Change proposes the setting up of an infrastructure development fund, which would provide the necessary finance for the RE sector. The modality of financing a fund of this nature is not very certain at the moment and needs to be articulated clearly. The state government must make allocations for it through its budget.

**2.** Rajasthan has been able to record the lowest tariff of Rs 2.44 per unit of electricity in the auction carried out by the Solar Energy Corporation of India Limited (SECI) for a capacity of 500 MW in the Bhadla Phase - III Solar Park. The low tariff was made possible by the decision of the GoI to cover solar power by SECI under the ambit of a Tripartite Agreement for payment security against defaults by state distribution companies. This goes to suggest that support

from the GoI to the RE sector through such measures can go a long way in bolstering the state government's RE initiatives.<sup>21</sup>

**3.** Given the huge potential of EE measures in the SME sector, it is rather disconcerting to observe that the GoR is largely implementing EE measures of the BEE. It has neither formulated any state scheme on EE, nor allocated any funding for the promotion of EE technologies in the SME sector. To realise the energy saving potential of the SME sector, the state government must take appropriate and adequate policy, institutional and fiscal measures. A dedicated budget must be allocated towards implementing demonstration projects, organising awareness generation workshops etc. in energy intensive units in the SME sector.

<sup>21</sup> Press Information Bureau, Government of India (2017) "Historic low Tariff of Rs. 2.44 per unit discovered in Bhadla Phase-III Solar Park in auction by SECI", 12 May. Available at <https://pib.gov.in/PressReleaseFramePage.aspx?PRID=1489763> (Accessed on 19 March 2020)



**4.** While there is a policy thrust on introducing EVs in the state to reduce vehicular pollution being caused by a rise in the number of conventional vehicles, the state government has made little or no effort towards the objective, beyond the implementation of the GoI scheme 'FAME'. While the GoR is making efforts towards procuring electric buses, incentivising manufacture and the sale of EVs by offering incentives to the customers and establishing EV charging stations under the Phase I and II of FAME, it has largely proceeded with the help of the Union government's funds, with no allocations through the Rajasthan state budget. Andhra Pradesh is a good example in point. The AP state government has articulated its own Electric Mobility Policy, 2017-18 through which it offers a range of incentives to improve the manufacture and uptake of EVs. The state government has sought to address the situation through its new Industrial Development Policy. The draft of the policy which has been circulated and is available in the public domain indicates that the state government is planning to set up an EV research and manufacturing zone. The state will also offer financial incentives to encourage component manufacturing for EVs and bring in a dedicated policy to provide impetus to the sector. Further, the policy draft also calls for provisions for allotment of land on short-term leases. The government believes that the move will reduce the land cost for the entrepreneurs as the leases would be for three years. Moreover, the GoR needs to ensure their effective implementation with dedicated budgetary allocations towards achieving them. The GoR has also articulated the need for an Electric Mobility Policy but has not formulated it so far.

**5.** While the funding from the centre and the state in the RE sector serves to incentivise production, it is not directed at meeting the entire cost of RE generation, transmission and distribution. The primary responsibility of develop-

ing the sector lies with the private developers, and indeed, all the other sources of funding can help in incentivising this sector. It will be helpful if the state government attempts to bring greater coherence between the state and central policies on RE and EE. Most importantly, it is important that the government should act as a facilitator and should devise innovative policy mechanisms not only in terms of introducing innovative financing instruments, but also in creating a conducive environment which minimises associated risk factors. Such policy-level innovation calls for collaboration and a portfolio of investment arrangements. Collaborative efforts between a variety of stakeholders such as governments - both at the centre as well as in provinces, financial institutions, investors, industrial agencies, and research organisations, can go a long way towards minimising co-related risks. There is also a need to make the approval and clearance system more transparent and reduce the transaction costs associated with the system. The single window clearance system instituted for the sector is a move in the right direction.

**6.** It must be noted that unlike Andhra Pradesh and Kerala, which have two separate agencies for the implementation of RE and EE measures, RRECL in Rajasthan takes care of both sets of interventions. Commentators point out that this leads to a digression from the main mandate of the agency, leaving it in a position whereby it is not able to fulfil either mandate adequately. The state government must appoint dedicated entities for promoting RE and EE in the states and confer them with adequate authority and budgetary resources. The state government is also recommended to formulate and implement the State Energy Conservation Policy. As of now, most EE policies in the state are being implemented with BEE funding, with the state government allocating very little towards meeting its EE objectives.

## Annexure I: State Finances for Climate Mitigation Actions (in Rs. crore)

### Major Head 2810 – New and Renewable Energy

Sub – Minor Head	2016-17 BE	2016-17 RE	2016-17 A	2017-18 BE	2017-18 RE	2017-18 A	2018-19 BE	2018-19 RE	2019-20 BE
The Headquarters	2.6883	1.9852	1.9636	1.8679	1.8700	1.1271	2.0600	1.2025	0.8500
Direction and Administration (Biofuel)	0.0000	0.0000	0.0000	0.7191	0.7552	0.7455	0.8612	1.0930	1.1930
Solar Power Generation in Rural Areas	17.0663	4.4972	4.4972	8.4913	8.4913	5.9450	9.3405	1.9230	1.0591
Assistance to Rajasthan Akshay Urja Corporation Limited	0.0002	0.0002	0.0000	0.0002	0.0002	0.0000	0.0002	0.0002	0.0002
Solar Power Generation in Rural Areas	4.5360	1.1960	1.1960	2.2476	2.2476	1.5736	2.4724	0.3454	0.2804
Biofuel Authority (Special Component Plan for Scheduled Castes)	0.4004	0.2600	0.2600	0.4004	0.4000	0.4000	0.4400	0.2569	0.5500
Headquarters (Tribal Sub-Plan)	0.9817	0.3567	0.3508	0.9817	0.9800	0.9800	1.0800	0.6306	1.1000
Solar Power Generation in Rural Areas	3.3715	0.8890	0.8890	1.7481	1.7481	1.2239	1.9229	0.2687	0.2180
Bio Gas	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

### Major Head 4810 - Capital Outlay on New and Renewable Energy

Solar Energy Electrification in Rural Areas	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Appropriation to Surya Energy Company of Rajasthan Limited	0.0001	0.0001	0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001
Appropriation to Essel Surya Energy Company of Rajasthan Limited	0.0001	0.0001	0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001
Appropriation to Adani Renewable Energy Park Rajasthan Limited	0.0001	0.0001	0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001
Appropriation to Dhirubhai Ambani Solar Park Rajasthan Limited	0.0250	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001

### Major Head 2501 - Special Programmes for Rural Development

Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)	0.0000	56.6489	0.0006	45.7667	96.4167	96.4167	86.8167	2.2600	54.6916
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### Major Head 2801 - Power

Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)	0.0006	0.0006	0.0000	0.0006	0.0006	0.0000	0.0006	0.0006	0.0006
Assistance to DISCOMs under UDAY scheme	9000	9000	9000	12000	12000	12000	12000	12000	13816.4708

## Annexure I: State Finances for Climate Mitigation Actions (in Rs. crore)

### Major Head 2217 - Urban Development

Sub - Minor Head	2016-17 BE	2016-17 RE	2016-17A	2017-18 BE	2017-18 RE	2017-18 A	2018-19 BE	2018-19 RE	2019-20 BE
Jaipur Metro Rail Corporation	10.00	15.71	15.71	25.00	25.00	25.00	29.00	72.83	30.00
04-Jaipur City Transport Limited-(For SC)	9.20	3.10	3.60	1.40	3.40	4.80	2.30	4.00	4.00
06-Jaipur City Transport Limited-(For ST)	11.80	4.80	5.40	2.10	4.50	6.30	3.00	5.30	5.30
03-01-Jaipur City Transport Limited-(From Global Environment Facility) Plan	5.40	5.40	0.00		0.00	0.00	0.00	0.00	0.00
03-01-Jaipur City Transport Limited-(From Global Environment Facility) Central Aid	5.40	5.40	0.00	5.00	4.30	0.00	5.50	5.50	0.00
Total -Jaipur City Transport Services Limited (JCTS)	31.7836	18.6780	8.9117	8.5240	12.1169	11.1105	10.7444	14.8930	9.3931
Smart City	649.999	1950.996	720.8	639.9984	509.7984	205	634.1984	0.0012	60.0008

### Major Head 2225 - Welfare of Scheduled Castes and Scheduled Tribes

Grant for Domestic Solar Lights	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0001
Grant for Solar Lamps			0.0000	0.0000	0.0000	0.0000	10.0000	0.0000	0.0001

Source: Rajasthan State Budgets, Various Years

# Annexure II: Rajasthan Policies, Programmes and Institutional Setup for Climate Mitigation Actions

Policies for CCMAAs	Installation of Renewable Energy (RE) and EE Capacities	Clean Industrial Processes and Product Use	Low Carbon Transport	RETs in Agriculture and Demand side management [Energy Efficiency (EE)]	Sustainable Municipal and Urban Infrastructure
<p><b>Central Policies</b></p> <p>National Action Plan on Climate Change, National Solar Mission, Wind Energy Mission and Coastal Tidal Energy Mission</p>	<p>National Mission on Enhanced Energy Efficiency, National Resource Efficiency Policy (Draft), Perform, Achieve and Trade (PAT) scheme, Policy for the promotion of Energy Efficiency in Small and Medium Enterprises</p>	<p>National Electric Mobility Mission 2020</p>	<p>National Mission for Sustainable Agriculture (with EE &amp; RE component), Rashtriya Krishi Vikas Yojana (RKVY), water harvesting schemes on farm ponds and drip irrigation, Jawaharal Nehru National Solar Mission (JNNSM)</p>	<p>Smart Cities Mission, various central clean energy policies such as the Waste to Energy projects, components under Swachh Bharat Mission, National Mission for Enhanced Energy Efficiency with green rating of buildings, Energy Conservation Building Code</p>	
<p><b>State Policies</b></p> <p>Rajasthan State Inventory, Rajasthan Solar Energy Policy, 2019, Rajasthan Wind and Wind Solar Hybrid Policy 2019 (Draft), Renewable Purchase Obligations and Renewable Energy Certificates (RECs)</p>	<p>Rajasthan Industrial Development Policy 2019, Rajasthan Investment Promotion Scheme</p>	<p>There is no state policy on electric mobility yet but is being proposed through the new Rajasthan Industrial Development Policy 2019, which contains other incentives for promoting EV manufacturing</p>	<p>Agriculture Demand Side Management (DSM)</p>	<p>State RE policies, including those aimed at promoting generation of RE from Biomass</p>	
<p><b>Central Institutions coordinating Policy</b></p> <p>Ministry of New and Renewable Energy (MNRE), Ministry of Power (MOP), Ministry of Environment, Forest &amp; Climate Change (MoEFCC), non-banking financial companies such as IREDA, Solar Energy Corporation of India (SECI), Bureau of Energy Efficiency (BEE), Central Electricity Regulatory Commission (CERC)</p>	<p>Ministry of Heavy Industries &amp; Public Enterprises, Bureau of Energy Efficiency (BEE), Ministry of Power (MOP), Energy Efficiency Services Limited (EESL), Ministry of Micro, Small and Medium Enterprises</p>	<p>Ministry of Heavy Industries &amp; Public Enterprises, Ministry of Environment, Forest &amp; Climate Change (MoEFCC), Ministry of Road Transport and Highways</p>	<p>Ministry of Environment, Forest &amp; Climate Change (MoEFCC), Ministry of Agriculture &amp; Farmers' Welfare (MoA &amp; FW), NABARD, Bureau of Energy Efficiency (BEE), Ministry of Power (MOP), Energy Efficiency Services Limited (EESL)</p>	<p>Ministry of New and Renewable Energy (MNRE), Ministry of Power (MOP), Ministry of Environment, Forest &amp; Climate Change (MoEFCC), Ministry of Urban Development, Bureau of Energy Efficiency (BEE), Energy Efficiency Services Limited (EESL)</p>	
<p><b>Rajasthan State Government Implementing Policy</b></p> <p>State Department of Energy, Rajasthan Renewable Energy Corporation Ltd. (RRECL), State Electricity Regulatory Commission (SERC)</p>	<p>Department of Industries, Rajasthan Department of Energy, Rajasthan, Department of Micro, Small and Medium Enterprises, Rajasthan</p>	<p>Rajasthan State Road Transport Corporation (RSRTC), Municipal Administration, Urban Development and Housing Department, Jaipur Development Authority (JDA), Rajasthan Housing Board (RHB)</p>	<p>Rural Development &amp; Panchayati Raj Department of Rajasthan, Department of Agriculture and Department of Fisheries, Department of Horticulture, Rajasthan, DSM cells</p>	<p>Department of Local Self Government, Urban Development &amp; Housing Department, DSM cells</p>	

## Annexure II: Rajasthan Policies, Programmes and Institutional Setup for Climate Mitigation Actions

Policies for CCMAs	Installation of Renewable Energy (RE) and EE Capacities	Clean Industrial Processes and Product Use	Low Carbon Transport	RETs in Agriculture and Demand side management [Energy Efficiency (EE)]	Sustainable Municipal and Urban Infrastructure
<p><b>State Owned Enterprises &amp; State Designated Agencies</b></p> <p>State PSUs- Rajasthan Vidyut Vitran Nigam Limited (RRVNL, State DISCOM), Ajmer, Jodhpur and Jaipur DISCOMs, Rajasthan Renewable Energy Corporation Ltd. (RRECL, which is a state designated agency for RE projects). Other JVCs are created from time to time for specific projects. Rajasthan Vidyut Utpadan Nigam Limited (RVUNL, Electricity Generation Company)</p>	<p>Dedicated State PSUs – Rajasthan Renewable Energy Corporation Ltd (RREC)</p>	<p>State PSUs - Rajasthan State Road Transport Corporation (RSRTC), Jaipur State Road Transport Corporation, Rajasthan State Industrial Development and Investment Corporation Ltd (RIICO), Jaipur Metro Rail Corporation Ltd (JMRC)</p>	<p>RRECL, State PSUs- Rajasthan Vidyut Vitran Nigam Limited (RRVNL, State DISCOM), Ajmer Vidyut Vitran Nigam Limited (AVVNL), Jodhpur Vidyut Vitran Nigam Limited (JdVVNL) and Jaipur Vidyut Vitran Nigam Limited (JVVNL) DISCOMs. Rajasthan Raja Vidyut Utpadan Nigam Limited (RVUNL, Electricity Generation Company)</p>	<p>State Designated Agency - Rajasthan Renewable Energy Corporation Ltd (RREC)</p>	
<p><b>Central Programmes</b></p> <p>Schemes designed under National Solar Mission - Solar Rooftop Programme, Canal-top Solar Programme etc. UDAY scheme to improve the financial health of state DISCOMs, SAUBHAGYA scheme and Deen Dayal Upadhaya Gram Jyoti Yojana (DDUGJY)</p>	<p>Demand Side Management programmes under National Mission for Enhanced Energy Efficiency (NMEEE), Programmes to enhance EE in industries (large and SMEs)</p>	<p>Faster Adoption and Manufacturing of (Hybrid &amp; Electric Vehicles (FAME-India) Scheme</p>	<p>Solar PV Programme, Energy Efficient Solar Pump Sets, KUSUM Scheme</p>	<p>Domestic Efficiency Lighting Programme (DELP), Energy Conservation Building Code (ECBC), Smart Cities, EESLs Municipal Demand Side Management schemes such as Street Lighting National Programme and Municipal Energy Efficiency Programme (SLNP and MEEP)</p>	
<p><b>State Programmes</b></p> <p>Rural electrification programme using off-grid technologies, Mukhyamantri Bijli Sudhar Yojana to reduce T&amp;D electricity losses</p>	<p>No exclusive state scheme or programme for improving EE in the industrial sector. It is largely done through BEE initiatives only</p>	<p>Mass transit movement programme through buses &amp; Metro Rail projects</p>	<p>Rajasthan Solar Water Pump Programme</p>	<p>State energy efficient street lighting and energy efficient water pumping scheme and Rajasthan ECBC code</p>	
<p><b>Financing Instruments under Policy</b></p> <p>State subsidies, Central loan and subsidy, Tax Exemptions, Setting Tariff for purchase of RE, Renewable Energy Certificates (RECs)</p>	<p>Creation of State Energy Conservation Fund, subsidies</p>	<p>Mass transit programme through buses &amp; Metro Rail projects</p>	<p>The base was the JNNISM on which other schemes were made to ride. Financially, the resources were tied; 30 per cent subsidy under MNRE and 56 per cent subsidy from RKVY; if RKVY support dwindled, the state government was required to fill the gap to arrive at the total subsidy of 86 per cent</p>	<p>Operating under PPP mode with private investment. Both Government of India and Government of Rajasthan contribute to the EE schemes. The BEE schemes are largely funded by BEE itself.</p>	



# Report on Climate Mitigation Financing Framework in Rajasthan

**Author:** Divya Singh

**Research Inputs:** Jyotsna Goel (CBGA), Ajay Pal Singh (CBGA)

**Editorial Inputs:** Pustav Joshi (SSEF), Raghav Anand (SSEF), Jyotsna Goel (CBGA), Nilachala Acharya (CBGA)

**Graphics and Design:** How India Lives ([www.howindialives.com](http://www.howindialives.com))

**For more information, please write to the author at:** [diyasingh.jnu@gmail.com](mailto:diyasingh.jnu@gmail.com)

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## **About the Project**

The project studies policy, institutional and fiscal measures which four select states, viz., Andhra Pradesh, Assam, Odisha and Rajasthan are undertaking to mitigate climate change, along with a reflection on the suitability of the budgetary provisions in meeting their State Action Plan on Climate Change (SAPCC).



## **About CBGA**

CBGA is an independent, non-profit policy research organisation based in New Delhi. It strives to inform public discourse through rigorous analysis of government budgets in India; it also tries to foster people's participation on a range of policy issues by demystifying them.

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## **About SSEF**

Shakti Sustainable Energy Foundation works to facilitate India's transition to a cleaner energy future by aiding the design and implementation of policies that promote clean power, energy efficiency, sustainable transport, climate policy and clean energy finance.

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