



Financing of Renewable Energy at the State Level



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Given that power sector is a major contributor to Greenhouse Gas (GHG) emissions in India (with 43 percent share)¹, faster infusion of Renewable Energy into the sector can be expected to have a significant impact in terms of promoting sustainable development and mitigating climate change.

CBGA has developed two policy briefs to assess policy priorities and public spending for the Renewable Energy sector in a comprehensive manner. The previous policy brief, *Public Spending Towards Harnessing Renewable Energy in India*, provides an assessment of policy and budgetary priority for this sector at the level of the Union Government. The current policy brief focusses on assessing public expenditure on Renewable Energy at the level of State Governments².

The issues and recommendations presented here are based on an in depth analysis of the detailed State Budget documents of four States for the development of Renewable Energy, viz. Gujarat, Maharashtra, Meghalaya and Orissa, and, information on funds available at the Union Government level such as the National Clean Energy Fund (NCEF), and loans provided to States by the Indian Renewable Energy Development Agency (IREDA). It attempts to identify some of the major barriers to development of this sector at the sub-national level (focusing mainly on State Governments) and suggest policy measures for addressing those.

Context

Development of Renewable Energy (RE) in a State is expected to play an increasingly important role in alleviating power shortages, enhancing energy security and, contributing towards sustainable and environmentally efficient growth. The onus of developing Renewable Energy lies both on the Union Government as well as the States as Power Sector is in the Concurrent List of articles in the Indian Constitution. Moreover, under Schedule 11, Article 243G of Constitution (73rd Amendment) Act, 1992, local bodies and Panchayati Raj Institutions (PRIs) also have the responsibility for promoting Renewable Energy. This mandate allows the PRIs to promote local (rural) applications of Renewable Energy technologies. However, given the very bleak condition of their own revenue sources, PRIs would need adequate financial support from Union and State Governments to encourage Renewable Energy applications at the local level.

Inequities in terms of energy access have been widening over the years between urban and rural areas as well as across States. The number of households without

electricity has decreased only marginally from 78 million in 2001 to 75 million in 2011 as per the Census data. In this context, we should note that development of Renewable Energy is an important precondition for improving energy access for people in rural areas. Renewable Energy can be harnessed as a locally available and scalable resource in the rural areas in India.

The State-wise distribution of the estimated potential of Renewable Energy for the entire country shows that Gujarat has the highest share in RE potential of 25 percent followed by Karnataka at 13 percent, Tamil Nadu at 11 percent, and Andhra Pradesh at 11 percent of the national RE potential³ (see Figure 1). There is a huge gap between the estimated RE potential and capacity for RE installed by the States. It indicates that there is a need to promote measures for harnessing this untapped RE potential in most States.

Currently, the private sector accounts for 86 percent of ownership of RE capacity installed across the country while the public sector owns the remaining 14 percent⁴. There is a need for stronger interventions from the public sector in order to ensure that there is greater

¹ Power sector contributes 43 percent in total GHG emissions in India. Source: Indian Network for Climate Change Assessment (INCCA) Report: India's GHG Emissions 2007, May 2010.

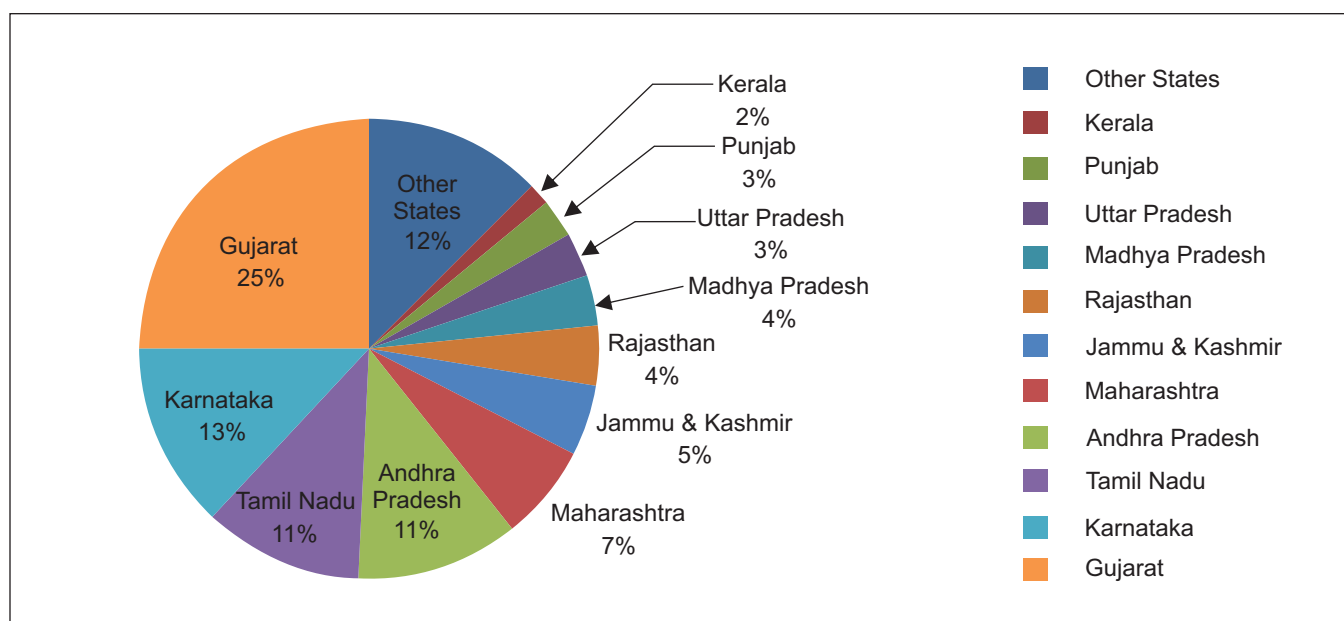
² CBGA had shared its policy recommendations on Financing of Renewable Energy at the State Level with the Office of the Fourteenth Finance Commission in September 2014; this Policy Brief captures those recommendations.

³ Annexure-I referred to in reply by MNRE to part (c) of Lok Sabha Starred Question No.31 for 06.12.2013 regarding Power Generation from various Renewable Energy Sources. Available at <http://164.100.47.132/Annexure/lsq15/15/as31.htm>

⁴ Central Electricity Authority (CEA), Annual Report 2012-13



Figure1: State wise share of RE potential in India as on 31.03.2013 (in MW)



Source: Ministry of New and Renewable Energy (MNRE), 2013

Note: RE potential includes RE sources such as wind power, small hydro, biomass power, cogeneration bagasse and waste to energy.

equity in access to energy in the country (especially for people in rural areas who would benefit more from development of RE), the potential for RE is tapped adequately in most States (including those where the private players might not be interested, such as in the remote areas where the business potential for RE is less), grid connectivity for RE generated is enhanced (intra state grid connectivity being the sole responsibility of the State Governments' power utilities), and there is a significant improvement in the financial health of State Governments' power utilities by generating revenue through RE. However, stronger public sector interventions at the sub-national level would require greater magnitudes of budgetary investments for RE to be made both by the Union Government and the States.

Analysis & Policy Recommendations

(1) Need to Increase Public Spending on RE at the State Level

The State Budget Document of four select states were analyzed in order to compare the spending pattern between the States with high achievement in harnessing Renewable Energy Resources (RES) viz. Gujarat and Maharashtra and States with low achievement in tapping their RES viz. Meghalaya and Orissa. We

compiled data on total expenditure made by the State Government on New and Renewable Energy from the Detailed Demand for Grants in the State Budget Document for Various State Government Departments. Expenditure on RE is incurred by various departments at the State Government level such as, Energy and Petrochemical, Power, Climate change, Agriculture & Cooperation, Science & Technology, Tribal Development, Rural Development, Planning, Labour, Planning and Social Justice & Empowerment.

It was observed that there is huge variation in spending pattern on RE between the 4 selected states ranging from few crore for Meghalaya & Orissa to hundreds of crore for Gujarat & Maharashtra.

Even after considerable increase in spending on RE in last two years by Gujarat & Maharashtra, these states still need huge impetus of financial and policy level support to meet their unachieved potential of Renewable Energy which is 89 and 53 percent of the total RE potential respectively for these states.⁵

In order to step up their spending on RE, various departments of State Government governing this sector should take appropriate actions. There is need of cohesive efforts by various Departments of State Government for providing confidence to the project

⁵ Source for Data on Unachieved Potential of RE: Annexure-I referred to in reply by MNRE to part (c) of Lok Sabha Starred Question No.31 for 06.12.2013 regarding Power Generation from various Renewable Energy Sources. Available at: <http://164.100.47.132/Annexure/lsg15/15/as31.htm>. Unachieved potential is estimated based on figures of total estimated RE potential of States and installed capacity of RE by States as on 31.02.2013.

Table 1: Budgetary Expenditure on New and Renewable Energy by various Departments in the State Government: A Comparison for Select States
(Figures in Rs. Crore)

States	2010-11 Actuals		2011-12 Actuals		2012-13 Actuals		2013-14 Revised Estimates		2014-15 Budget Estimates	
	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	Plan
Meghalaya	0.0	2.3	0.0	2.4	0.0	4.2	0.0	4.65	0.0	4.65
Orissa	0.3	8.7	0.3	6.3	4.0	3.0	0.0	2.3	0.0	34.7
Maharashtra	0.0	40.2	1.6	90.9	0.0	20.1	0.2	89.6	0.0	74.10
Gujarat	0.0	77.6	0.0	29.1	0.0	64.3	0.0	220.1	0.0	229.2

Source: State Budget Documents (Detailed Demands for Grants), various years for Meghalaya, Orissa, Maharashtra and Gujarat

Note: Please See Background Information Note available on CBGA website for Department wise Spending on RE for four Select states

developers and investors. Their efforts should include timely payments and revision of Tariffs for RE projects by State Electricity Regulation Commission, quick addressing of the specific issues pertaining to non-availability of land & water by the State Nodal Agency for RE, setting up long term plan and budget allocation for intra state transmission of generated RE by the State Transmission Utilities.

On the part of Union Government level, there is need for policy and regulatory support for RE for aligning the national targets with state targets and for making framework for robust monitoring and verification of various Centrally Sponsored programmes and schemes.

Recommendation: Stronger public sector interventions for RE at the sub-national level would require greater magnitudes of budgetary investments for the sector by the States; hence, there is a need to increase public spending on RE at the State level. There is also need of cohesive efforts by various Departments of State Government for development of this sector.

(2) Need to Prioritize Financial Resources Available for Renewable Energy viz. NCEF and Incentive announced by the Finance Commission

Budget for the Union Ministry of New and Renewable Energy (MNRE), which amounts to a little over 0.1 percent of the total allocations of the Union Budget 2014-15, is considered grossly inadequate vis-à-vis the need for harnessing RE potential in the country.

Union Ministry of New and Renewable Energy provides Central Finance Assistance to the State Government for

implementation of various programmes and schemes namely, Grid Interactive and Distributed Renewable Power, RE for Urban, Industrial and Commercial Applications and RE for Rural Applications. Hence, inadequate availability of funds for the Union Ministry of New and Renewable Energy constrains the expenditure on RE at the State level.

The share of MNRE in NCEF transfers to various ministers was 80 percent in Union Budget 2013-14 Revised Estimates. This share was reduced to 34 percent in Union Budget 2014-15. This decline is largely due to transfer of Rs. 1500 crore of NCEF to support National Ganga Plan under the Ministry of Water Resources. This raises a concern as to whether there could be a further decline in allocation for MNRE from the NCEF because of the financial requirements to address other pressing issues. (see Table 2)

The erstwhile Thirteenth Finance Commission had recommended performance based incentive grants of Rs. 5000 crore for promotion of Renewable Energy in consideration of the need for managing ecology, environment and climate change as per its Terms of Reference. This grant has not been utilized by the State Governments despite an opportunity been provided. It raises the concern that whether there has been lack of communication between the Central and State Governments or the State Government has poor capacity in developing proposal and implementing RE projects.

Recommendation: MNRE need to priorities the utilization of NCEF and other financial resources such

Table 2: Transfers of Funds from NCEF to Various Ministries
(Figures in Rs. Crore)

Year	Tax Revenue from Clean Energy Cess*	Transfer to NCEF #	Amount provided from NCEF to various Ministries®				
			MNRE	MOEF & CC	MoDW& S	MoWR	MoUD
2010-11	1066.46						
2011-12	2579.55	1059.60	160.80	—	—	—	—
2012-13	3053.19	1500.00	125.78	10.00	110.70	—	1.45
2013-14 (Revised Estimates)	3527.57	1650.00	1313.16	—	—	—	2.00
2014-15 (Budget Estimates)	6857.50	4700.00	1578.00	—	—	1500.00	—

Source: * Receipt Budget, Union Budget, Government of India, various years

Demand No.33, Expenditure Budget Vol. II, Union Budget, Government of India, various year

® Expenditure Budget Vol. II, Union Budget, Government of India, various Ministries

incentives announced by the Finance Commission to ensure that adequate funding is available for development of the RE sector. At the Union Government level, there is need to instigate an overall monitoring and communication program with the State Governments for efficient and effective delivery for this sector.

(3) States should promote Rural Applications of RE with installation of Micro-Grids

Inequities in terms of energy access have been widening across States as well as between urban and rural areas within States. As on 31st of August 2013, out of the 29 States in the country, only nine States had achieved 100 percent 'village electrification'⁶. However, as per the new definition of 'electrified villages' which came into effect from the year 2004-05, a village is deemed electrified if at least 10 percent of all the households of the village have electricity access and electricity is provided to public buildings such as schools, panchayat offices, health centres, community centres and dispensaries. Clearly, the new definition of 'electrified villages' is not comprehensive. Moreover, a large proportion of the country's population living in remote areas does not have access to grids and faces deficiency of electricity for economic activities.

In such a scenario, off-grid application of RE offers a scalable solution. However, some of the major barriers

to the development of off-grid RE applications are the relatively low rate of return for project developers and lack of grid connectivity. These barriers can be overcome by installation of micro-grids⁷ over a cluster of un-electrified, under-electrified and even electrified villages or hamlets with high demand for electricity, where energy can be generated by various sources of RE (depending on the abundance of specific RE source type in a State) through rural applications of RE technologies. Installation of micro-grids can provide adequate grid connectivity to the RE generated through off-grid applications. Installation of micro grids also work on overcoming switching costs before full-scale grid connections are attempted.

Non-availability of trained manpower and inaccessibility of locations are the major barriers in rapid installation of RE technologies at the rural level. These issues should be resolved at the contract bidding and negotiations process with the investors.

Recently announced Pradhan Mantri Adarsh Gram Yojana (PMAGY) could be one of the opportunity to involve PRIs and electrifying village with RE.

Recommendation: States can lead the investments in off-grid applications as part of meeting their electrification targets. Installation of micro-grids can be promoted to provide grid connectivity and business potential to the RE generated through rural applications.

⁶ Central Electricity Authority, Progress Report of Village Electrification as on 31.01.2014. See link http://www.cea.nic.in/reports/monthly/dpd_div_rep/village_electrification.pdf

⁷ Micro-grid refers to mini-power plants that supply 220 volts 50 Hz three-phase AC electricity through low-tension distribution networks to households for domestic use, commercial activities (such as shops, cycle repair shops, flour mills etc.), and community requirements such as drinking water supply and street lighting. For details, please see the Chapter on Electrification and Bio Energy Options in Rural India, India Infrastructure Report, 2007.

(4) Need for Improving Disbursement of IREDA Loans for Rural Applications of RE

The Indian Renewable Energy Development Agency (IREDA) is the nodal agency for implementing Union Min. of New and Renewable Energy's soft-loan financing mechanism and provides capital subsidies to project developers. These are often administered at the State level through State Nodal Agency (SNA) that administers the loan.

MNRE provides subsidized debt at a five percent interest rate for off-grid solar applications through IREDA. Most of these projects are developed by local developers, who approach local banks for debt financing. However, the

subsidized debt is only available through IREDA and is not accessible to local banks in rural areas. There is relatively lesser penetration of IREDA loan for local developers working in rural areas.⁸

There is a need for making sufficient loan provisions for promotion of RE technologies application in remote rural areas. IREDA loan reimbursement is relatively lower for States with high proportion of un-electrified villages such as Jharkhand, Uttar Pradesh, Odisha, Bihar and North Eastern States. The IREDA loan for these states are less than Rs. 100 crore each (cumulative amounts for the years 2010-11 to 2012-13). Table 3 below provides data on disbursements of Loans by IREDA to various State Nodal Agencies during 2010-11 to 2012-13.

Table 3: Disbursement of Loans by IREDA to various State Nodal Agencies during 2010-11 to 2012-13
(Figures in Rs. Crore)

S. No.	States	2010-11	2011-12	2012-13
1	Andhra Pradesh	41.9	35.2	77.9
2	Arunachal Pradesh	—	—	—
3	Assam	0.0	0.0	0.0
4	Bihar	0.0	0.0	0.0
5	Chhattisgarh	15.0	23.7	21.3
6	Gujarat	102.0	372.5	241.4
7	Haryana	0.0	0.0	1.5
8	Himachal Pradesh	270.8	97.4	208.0
9	Jammu and Kashmir	—	—	—
10	Jharkhand	0.0	31.8	36.4
11	Karnataka	109.8	327.9	530.8
12	Kerala	0.0	0.0	0.0
13	Madhya Pradesh	60.6	45.3	10.2
14	Maharashtra	330.3	393.4	437.3
15	Manipur	—	—	—
16	Meghalaya	—	—	—
17	Mizoram	—	—	—
18	Nagaland	0.0	0.0	0.0
19	Orissa	4.0	0.0	104.0
20	Punjab	0.0	10.3	0.5
21	Rajasthan	180.2	114.2	266.3
22	Sikkim	—	—	—
23	Tamil Nadu	107.0	401.5	89.1
24	Tripura	—	—	—
25	Uttar Pradesh	0.0	0.0	100.9
26	Uttarakhand	2.7	1.9	0.0
27	West Bengal	0.0	0.0	0.0

Note: — Indicates that information is not available

Source: Annual Report of IREDA, 2012-13

⁸ PACE-D Technical Assistance Program, USAID, October 2013, Financing Renewable Energy in India: A review of current status and recommendations for innovative mechanisms

Recommendation: The loan provided by IREDA need to be made available for the local project developers for installation of rural application of RE. Monitoring and verification framework need to developed to improve outreach of State Nodal Agencies at the local level and to accelerate this process.

(5) Need for Higher Expenditure by Power Department of States for Creating RE Evacuation Infrastructure and Intra State Grid Connectivity

Presently, the responsibility of distribution of the power generated lies mainly with the State Governments. Although the private sector developers currently own as much as 86 percent of the installed RE capacity in the country, they depend on the State Governments for adequate evacuation infrastructure and intra state grid connectivity for the RE generated.

The development of evacuation infrastructure and provisioning of measures for grid connectivity for RE sources are considered the responsibility of the State Transmission Utility (STU) or State Electricity Board (SEB). We have analyzed in detail the budgets of four States viz. Gujarat, Meghalaya, Orissa and Maharashtra by Power Department of States.

Through our detailed analysis of States budget documents of four States (viz. Gujarat, Maharashtra, Orissa and Meghalaya), it has been observed that Gujarat had noticeable levels of budgetary spending on installation of Smart Grids, Green Energy Corridors and Transmission and Evacuation Infrastructure for the RE generated⁹; but States like Meghalaya and Orissa have not made any spending on creation of Evacuation Infrastructure for RE.

⁹ In case of Gujarat, State Budget Documents reflect spending on development of Evacuation Infrastructure and Transmission and Distribution System under - "Assistance to GUVNL for establishment of smart village distributed RE with Smart Grid Concept", "Capital Contribution to Gujarat Power Corporation Limited for Establishment of Solar Park in the State" and "Loans to Gujarat Energy Transmission Corporation Limited for Gujarat Solar Power Transmission Project etc."

Given that RE generation requires large amounts of capital expenditure; adequate financial resources need to be considered for incentivising the capital expenditure plans of State Transmission Utilities for installing evacuation infrastructure and grid connectivity for the RE generated.

Recommendation: State transmission utilities should include evacuation infrastructure and intra state grid connectivity for the RE generated from projects as part of their overall Transmission plan and provide budget allocation for same. Clear allocation of responsibility to set up the evacuation system along with ownership and maintenance of installed capacity need to be clearly marked while preparing agreements with developers.

(6) Need to Strengthen the State Nodal Agencies for Renewable Energy

Since the actual implementation of the programmes of the Union Ministry of New and Renewable Energy is taking place through the State nodal agencies, it is important that these agencies are strengthened adequately in terms of human resources and skills. There is a need to facilitate the strengthening of the State nodal agencies for RE in the areas of – assessment of RE sources, database management, their local administrative setup and getting local self-government institutions (such as local Panchayats and Municipalities) involved in planning and implementation of RE projects.

Recommendation: There is need to consider for incentivising State nodal agencies for RE in terms of building their human resources and technical skills.

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