

# Public Financing for Renewable Energy Sector Development: Recommendations for the 16th Finance Commission

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# **PUBLIC FINANCING FOR RENEWABLE ENERGY SECTOR DEVELOPMENT: RECOMMENDATIONS FOR THE 16TH FINANCE COMMISSION**

## **NCAER Working Paper**

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### **Abstract**

India has pledged to reach net zero emissions by 2070, and set an ambitious renewable energy (REN) target of 500 GW from non-fossil sources by 2030. At present, total REN-based electricity generation capacity in India is 220.10 GW (31 March 2025). To achieve its climate goals, it is essential for India to strengthen its REN sector at both the national and subnational levels to harness its potential.

In this paper, we analyse public sector expenditure on the REN sector, and discuss the public finance strategies adopted by states, their utilisation rates, and priorities in public expenditure in terms of schemes and subsidies related to REN. Based on our analysis we have formulated recommendations for the 16<sup>th</sup> Finance Commission. We have estimated the amount of green grants for states, taking into account the potential and progress in various REN sectors across states. We also discuss the challenges and list short-term recommendations (the low-hanging fruit) and long-term recommendations to enhance states' performance in achieving the targets of the green transition.

Our analysis shows that while fore-runner states in terms of public expenditure on REN, like Chhattisgarh, prioritise subsidies for solar pumps, Gujarat demonstrates a more diversified approach, investing in large-scale solar-wind hybrid parks, microgrids, and decentralised systems. In contrast, Rajasthan, despite its high renewable potential, spends a very small share of its budget on REN. Tamil Nadu, Andhra Pradesh, Tripura, and Jammu & Kashmir have no identifiable budgeted spending for REN through public finances, while Himachal Pradesh, Madhya Pradesh, Karnataka, Assam, and Telangana spend a miniscule amount from their budgets (less than 0.01%) on REN. The majority of the states spend more on revenue than on capital, resulting in the lack of asset creation and infrastructural support in this sector. States also suffer from poor fiscal planning. Haryana, Gujarat, Uttar Pradesh, and Maharashtra spend significantly on subsidies for renewables, while Chhattisgarh and Jharkhand, though providing subsidies on other components of the energy sector, do not report giving subsidies for REN. These differences underscore the need for strategic, well-targeted financing that aligns state actions with their technical and economic potential.

Renewable energy technologies are highly capital-intensive with substantial upfront costs. Both government entities and other financial lenders have a back-log of non-performing assets (NPAs), and the uncertainty of investments returns in this sector makes long-term financing stressful. The financial health of DISCOMs and the lack of green priority specifications in financial frameworks add to the problem. The REN sector, being at a nascent stage of development, also faces substantial operational and

institutional challenges like land acquisition, technical and regulatory barriers to solar rooftop panels, poor transmission infrastructure, policy misalignments between central and state governments, and so on. A lack of awareness which creates resistance to the adoption of REN and land-use conflicts are also concerns. To overcome these challenges, this study includes a list of recommended financial incentives, and infrastructural and regulatory support, and an approach toward public expenditure on this sector.

Our study suggests that to meet the government REN target of installed capacity of 500GW by 2030, the Finance Commission needs to provide green energy grants to states. We estimate that, considering the potential, installed capacity, and present trend in spending on new energy and REN, the average yearly grant requirement for all states would be around Rs. 14,064 crore over the next five years to reach this target. Given the high risks and low returns in this sector, public investment must lead the way.

**Keywords:** Public Financing of Renewable Energy, Finance Commission, Green Grants, Challenges in Renewable Energy Sector

**JEL Classification:** H30, H61, H71, H72, H77

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## 1. Introduction

India pledged to reach a net zero emission target by 2070, and has set an ambitious renewable energy (REN) target of 500 GW from non-fossil sources by 2030. At present, total REN-based electricity generation capacity in India is 220.10 GW (31 March 2025) (PIB GoI, 2025). To achieve its climate goals, it is essential for the country to strengthen its REN sector so as to harness its potential at both the national and subnational levels. This not only facilitates SDG7, but also boosts employment. It calls for a consistent policy framework and sustained budgetary support, essential to incentivise producers and encourage adoption among consumers; these will enhance energy security, reduce fossil fuel dependency, and promote regional equity and inclusive growth, ensuring a just and efficient transition to a climate-resilient future.

The central government transfers funds to state governments mainly through mechanisms like tax devolution and grants-in-aids, in order to address vertical and horizontal fiscal imbalances and promote cooperative federalism. Though environmental considerations were part of the 15th Finance Commission recommendations, with 10 per cent weight accorded to forest cover and ecology in the devolution formula, it did not consider development of the REN sector; the criterion is thus inadequate to capture the funds requirements of state governments to finance efforts towards a green transition. The 15th Finance Commission had suggested some state-specific grants targeted towards REN for four states, amounting to total Rs. 2,095 crore for five years (Rs. 419 crore per year). However, given the ambitious targets in the REN sector, the allocation is not sufficient. In light of the evolving need to strengthen the green energy sector, the Finance Commission needs to take a proactive role in allocating funds to states specifically for REN. We are suggesting that to meet the government's REN target of installed capacity of 500GW by 2030, the Finance Commission needs to provide a green energy grant to the states. The rationale, analysis, requirements, and estimation of this grant are discussed in this paper.

Section 1 of this paper is an introduction. Section 2 discusses the existing literature on issues related to REN development. Section 3 details our findings. In sub-section 3.1, we first analyse public expenditure for the energy sector as a whole, for both renewable and non-renewable energy. In sub-section 3.2, we look at the REN sector at the state level, and discuss public sector expenditure on the sector. Sub-section 3.3 analyses the potential and progress of the various REN segments across states. In sub-section 3.4, we conduct an in-depth analysis of the public finance strategies adopted by states to develop their REN. It also analyses state revenue and capital expenditures, utilisation rates, priorities in public expenditure on REN, schemes and subsidies. Sub-section 3.5 looks at the financial, operational, and policy hindrances to the growth of the REN sector. In sub-section 3.6, we list our short-term recommendations (the low-hanging fruit) and long-term recommendations to enhance state performance in achieving the target of a green transition. Section 4 highlights recommendations for the 16<sup>th</sup> Finance Commission. Section 5 has the conclusion and policy implications.

## 2. Literature review

The literature shows that there are several challenges for the REN sector in India. Commonly discussed in the literature are: financial obstacles in the form of high initial costs of investing in REN technologies (Luthra et al., 2015), risk and volatility of returns (Gupta, 2020; Sarangi, 2018; Umamaheswaran et al., 2024), high cost of debt capital (Nelson et al., 2012; Shrimali et al., 2013), lack of innovative financing options (Ansari et al., 2013; Gupta, 2020), and DISCOM-related challenges (Government of India, 2022; Raizada, 2024). Operational

challenges include land acquisition (Anand, 2024; Eshbach et al., 2021; Kumar et al., 2020), complexities in technological requirements (Luthra et al., 2015) and in transmission and operations (Kumar et al., 2020) of power systems, the smaller market base, and lack of awareness about REN (Doukas et al., 2009; Reddy & Painuly, 2004). Finally, regulatory and institutional blockages (Chatterjee, 2017; Kumar. J & Majid, 2020) and policy uncertainty (Brito Cedeno & Wei, 2024) have also been listed as challenges.

The transition to REN is vital for India to address climate change and ensure long-term energy security. While private capital plays a key role, existing literature emphasises the critical importance of public finance in enabling, de-risking, and accelerating investments in clean energy technologies. Empirical studies show a positive relationship between public and private finance flows (Corrocher & Cappa, 2020), underlining how well-designed public finance mechanisms can unlock private investment. Public finance is instrumental in correcting market failures, mitigating risks associated with early-stage technologies, and signalling long-term policy commitments. Bhandary, Gallagher, and Zhang (2021) highlight the role of public instruments such as green bonds, concessional loans, and climate funds in bridging investment gaps while catalysing private capital through risk reduction. Similarly, Polzin et al. (2015), based on data from OECD countries, demonstrate that stable public support correlates positively with increased private investment in REN, affirming the need for sustained policy and financial backing.

The importance of targeted financial strategies is illustrated by the Climate Policy Initiative's analysis of Indonesia (Sitorus et al., 2018), which found capital injections into state-owned enterprises and credit guarantees particularly effective in mobilising private sector participation. In the Indian context, sovereign green bonds issued in 2023–24 raised funds for schemes like PM-KUSUM and grid-scale solar projects (Government of India, 2025). However, concerns remain regarding the transparency, impact assessment, and additionality of these instruments (Baldacci & Possamai, 2021). Subsidies continue to play a central role in REN deployment in India and other emerging economies. Nicolini & Tavoni (2017), in the context of Europe, has found a positive correlation between subsidies and the production of incentivised energy, and installed capacity. Internationally, mechanisms like green banks, loan guarantees, renewable energy auctions, and results-based financing (RBF) schemes have proven effective. Public-private partnerships (PPPs) combine state-backed risk-bearing capacity with private sector efficiency and innovation. In India, PPPs with viability gap funding have been effective in solar and wind energy infrastructure (World Bank, 2021). Ensuring success in PPPs depends on sound risk allocation, transparency, and enforceability (Mondal et al., 2023). Tax-subsidy frameworks, like the US Investment Tax Credit (ITC) and India's production-linked incentive (PLI) scheme, are also useful in driving investment. Public R&D investments have a long-term impact by reducing costs and improving the performance of emerging technologies like green hydrogen and advanced solar modules (Hailemariam et al., 2022).

Despite the growing role of public finance, there remains a lack of systematic understanding on the government's spending priorities and the quantum of financial support needed to achieve India's REN targets. This study aims to bridge that gap by estimating funding requirements at the state level to support India's ambition of deploying 500 GW of REN capacity by 2030, while also examining the challenges and enabling conditions for sectoral development.

### 3. Findings

India's power production is heavily concentrated in Maharashtra, Gujarat, Tamil Nadu, Uttar Pradesh, and Chhattisgarh, which host large-scale coal and thermal power plants alongside growing renewable capacity. Fossil fuels, especially coal, continue to dominate India's energy mix, contributing over 56 per cent of the installed power generation capacity. States like Chhattisgarh, Jharkhand, and Odisha serve as key coal mining and thermal generation hubs, playing a vital role in base-load electricity supply for the nation.

The government plays a crucial role in supporting the power sector through targeted policies, financial incentives, and infrastructure investment. Key initiatives in this area include the Ujjwal DISCOM Assurance Yojana (UDAY) to reform power distribution companies, the Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) for rural electrification, and the Revamped Distribution Sector Scheme (RDSS) for modernisation (see Appendix Table 1 for details on major schemes). Additionally, subsidies, tax benefits, green energy corridors, and viability gap funding help drive private and public investment in clean energy, ensuring a more resilient and sustainable power system. To support the fossil-fuel-based power sector, the government provides a range of policy and financial mechanisms like coal-linkage policies, such as the SHAKTI scheme, which ensures fuel supply to thermal plants through transparent auctions. Railway freight rationalisation and coal import substitution policies also help reduce input costs. Financially stressed thermal power plants receive support through debt restructuring schemes and regulatory interventions via the Ministry of Power and RBI. The government also invests in supercritical and ultra-supercritical technologies to improve efficiency and reduce emissions from coal-based plants. India is balancing between promoting clean energy and supporting fossil fuels as part of a gradual and just energy transition.

#### *3.1. Tracing available public finance for the energy sector across states*

The budget data offers insights into how different regions balance energy needs with financial constraints and sustainability goals which can help in energy sector planning. We have collected data and analysed the flow of funds from federal and state-level budgets, demands from grants document, State Finance Accounts, Annual Financial Statements, etc. This analysis examines energy sector budget allocations and actual spending across states and UTs (union territories), highlighting variations in budget proportions in total state-level public expenditure, budget proportions compared to the size of the economy, and policy focus areas. Actual expenditure incurred by states in 2022-23 (22-23 A), has been referred to. In this section, total state budget and budgetary allocations for the energy sector were taken from the State Accounts Report from the Comptroller and Auditor General portal. For UTs, we referred to the detailed demand for grants of the Ministry of Home Affairs.

Budgetary allocations have been divided within the energy sector under the following major heads:

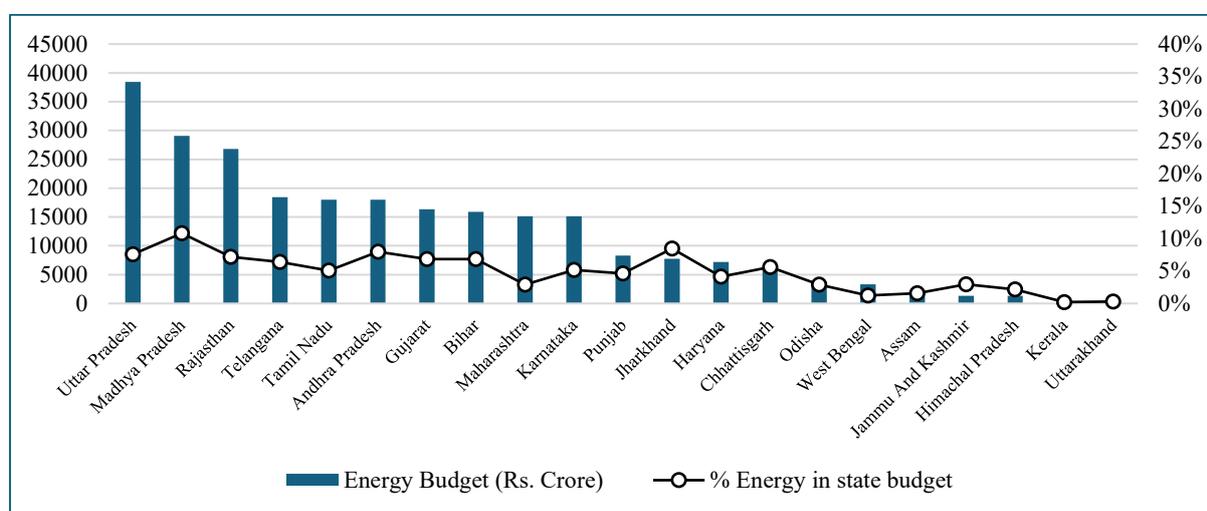
- 2801 (Power)
- 2802 (Petroleum)
- 4801 (Capital Outlay on Power Projects)
- 6801 (Loans for Power Projects)
- 4810 (Capital Outlay on New and Renewable Energy)
- 2810 (New and Renewable Energy)

Based on their net expenditure budget or category they fall into, the states have been divided into two: (a) major states; and (b) minor states and UTs. UTs are analysed along with

small states because the structure and expenditure efficiency of small states vary significantly from larger states.

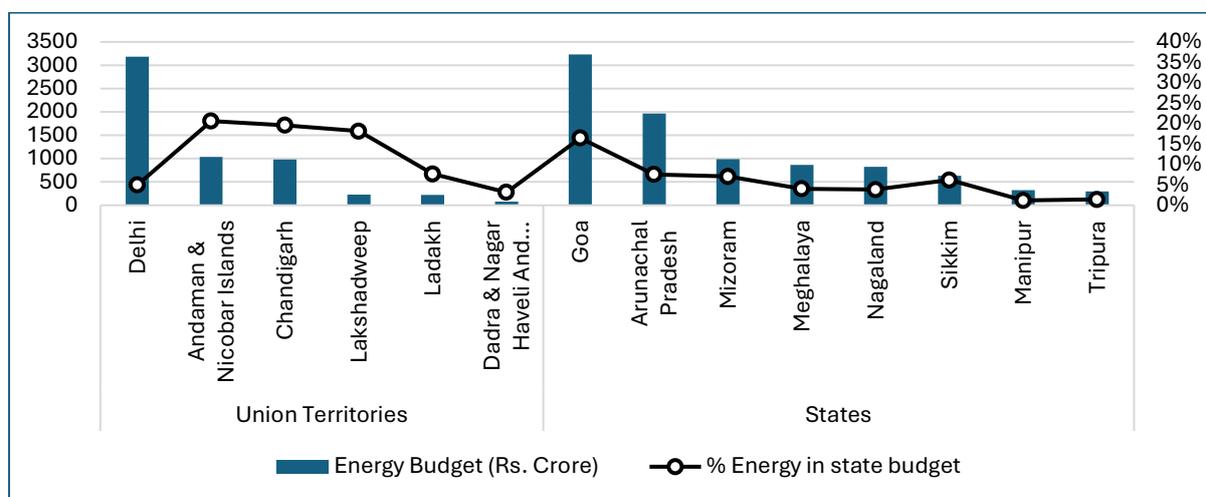
On average, the energy budget, comprising expenditure on all the heads listed above, is 4.8 per cent of the total state budget in the major states, although these allocations vary widely across the states reflecting differing infrastructure needs and energy demands (Figure 1). States like Madhya Pradesh, Jharkhand, Andhra Pradesh, Uttar Pradesh, and Rajasthan spend a high budget share on energy (7-10% of the state budget) indicating their strong focus on meeting electricity demand and expanding energy infrastructure. In terms of volume of actual expenditure on the energy sector, Uttar Pradesh leads with the highest energy budget at Rs. 38,424 crore, but in terms of share of energy in the total budget, Madhya Pradesh is highest, and also second-highest in terms of volume. In contrast, Kerala and Uttarakhand show the lowest allocations, possibly due to the lack of mineral resources like coal mines in those regions.

**Figure 1: State-wise energy sector allocation (2022-23 Actual) for major states**



*Source:* Various finance accounts documents for states.

**Figure 2: State-wise energy sector expenditure allocation for small states and UTs (2022-23 A)**



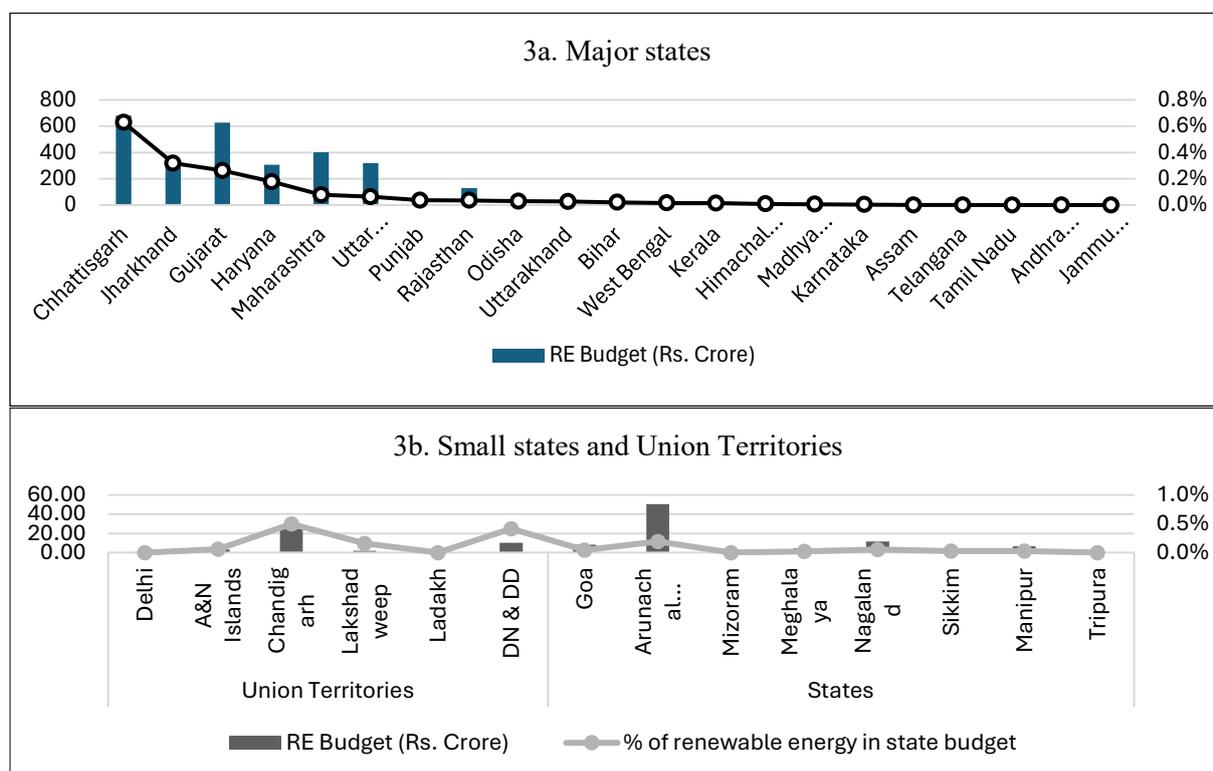
*Source:* Various finance accounts documents for states.

It is perceived that the UTs generally allocate a higher share of their budget on energy compared to the states. The exception is Delhi, which has high expenditure on energy in absolute terms, but a lower share, because overall expenditure in the state is far higher than in other smaller states, as this expenditure is supported by revenue from high economic activity in the region. The Andaman & Nicobar Islands (21%) and Chandigarh (20%) allocate the largest shares of their budgets to energy. Among the smaller states (Manipur, Arunachal Pradesh, Nagaland, Meghalaya, Tripura, Goa, Mizoram, and Sikkim), Goa has the highest energy budget, and also leads with 16 per cent of its total state budget allocated to energy. Arunachal Pradesh and Mizoram follow by dedicating 7 per cent of their total state budgets to energy (Figure 2).

### 3.2. Snapshot of public finance strategies to support REN sector development in 2022-23: Comparison across states

Renewable energy budgets remain limited in many states as only a few states demonstrate a strong commitment to sustainable energy transitions. States such as Chhattisgarh (Rs. 680 crore; 0.63% of the total budget), Jharkhand (Rs. 291 crore; 0.38%), and Gujarat (Rs. 627 crore; 0.26%) have emerged as leaders in REN prioritisation in their state budgets (Figure 3a). These allocations indicate a strategic shift toward green energy transitions, despite differing economic capacities. Haryana, Maharashtra, and Uttar Pradesh also show moderate allocations to REN, balancing between conventional energy needs and clean energy initiatives. But the share of REN in the state budget is less than 0.04 per cent for other major states: Tamil Nadu, Andhra Pradesh, and Jammu & Kashmir have no identifiable budgeted spending for REN through public finance mechanisms; and Himachal Pradesh, Madhya Pradesh, Karnataka, Assam, and Telangana spend a miniscule amount from their budgets (less than 0.01%) on REN, highlighting a gap in their clean energy investment frameworks.

**Figure 3: State-level expenditure on REN and share of REN in state budgets (2022-23 A)**

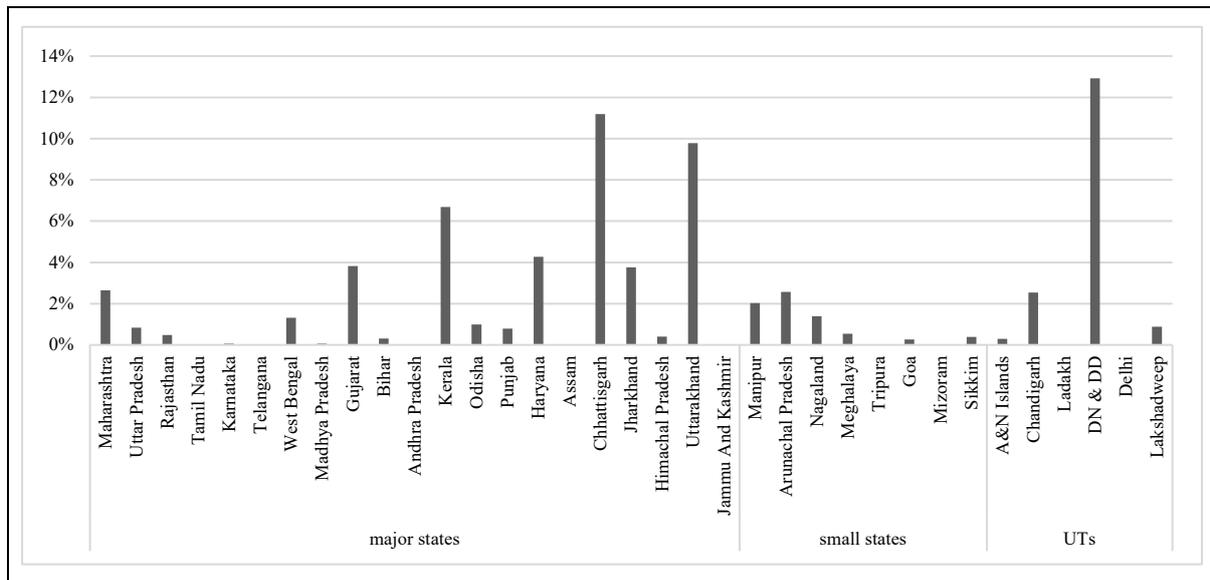


**Source:** Various finance accounts documents for states.

Renewable energy allocations remain marginal across most UTs, both in absolute and percentage terms. Among the UTs, Chandigarh leads in its REN budget share (0.50%) (Figure 3b), reflecting its consistent urban sustainability efforts. Dadra & Nagar Haveli follows with 0.41 per cent of its budget and Lakshadweep with 0.16 per cent, likely reflecting decentralised REN needs. In the small states, too, the share of renewables in state budgets is very low. These trends suggest that while some states are beginning to prioritise clean energy, REN remains a marginal component of public expenditure in most. Enhancing institutional capacity, aligning with national targets, and leveraging external support could help bridge this gap and accelerate a just energy transition in these regions.

It is evident that the share of REN in state budgets is very low in all the states. While states like Madhya Pradesh spend 10.83 per cent of their budget on energy, only 0.006 per cent of the state budget goes toward REN. This is reflected in the small share of REN in energy budgets (Figure 4), despite significant spending on energy. For states which spends more than 5 per cent of their budget on energy (11 of the major states), REN receives limited attention except in Chhattisgarh (11%) and Jharkhand (4%). This stands in contrast to industrialised states like Tamil Nadu and Telangana, which despite high energy demand, report negligible REN spending from their state budgets, pointing to a reliance on private investments or central schemes. Uttarakhand and Kerala show a comparatively high share of REN in their energy budgets, but that is largely the outcome of overall low spending in the energy sector in those states.

**Figure 4: State-wise share of REN in the energy budget (2022-23 A)**

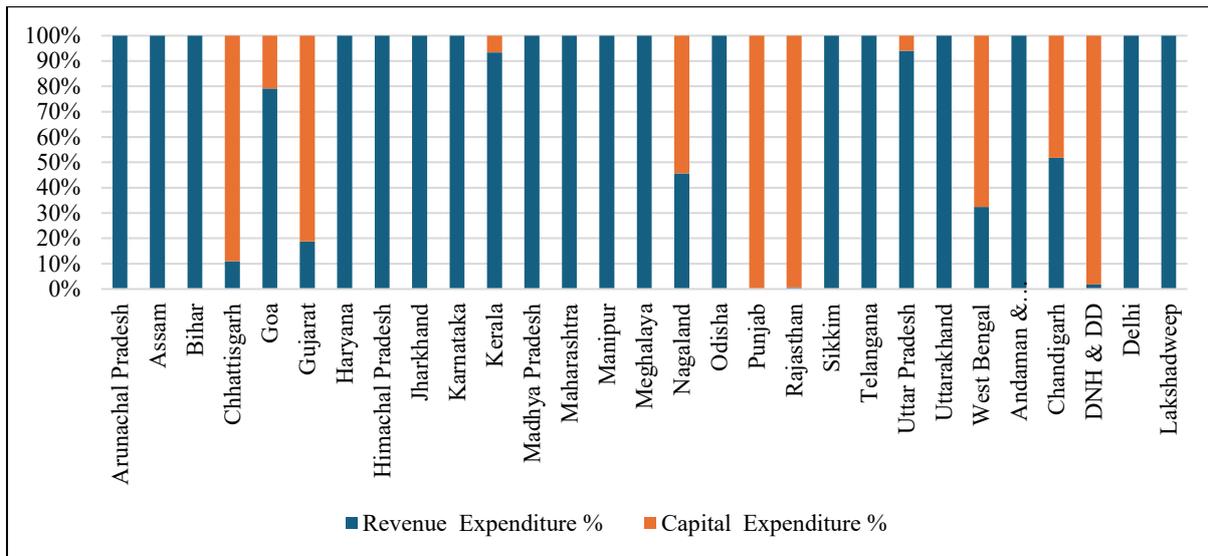


**Source:** Various finance accounts documents for states.

Expenditure levels in the north-eastern states remain modest compared to their potential REN sources. For example, Arunachal’s annual REN expenditure is often below Rs 50 crore despite its abundant small-hydro potential. Some states, like Mizoram and Nagaland, have periods of no expenditure, indicating implementation bottlenecks rather than lack of allocations. Difficult terrain, scattered settlements, and the lack of a skilled local workforce hamper large grid-connected projects. Dependency on diesel and unreliable grids persists in the remote areas. Further, we see that the majority of states spend on revenue, and capital expenditure is often neglected leading to the lack of infrastructural development (Figure 5).



**Figure 5: Revenue vs capital components of state expenditure on REN (2022-23 A)**



*Source:* Various finance accounts documents for states.

### 3.3. Potential and progress in REN capacity addition across states

India has seen a huge rise in power demand in the 21st century. Electricity consumption in the country has increased from 90,245 GWh in 1981-82 to 13,16,765 GWh in 2021-22, almost 14 times in the last 40 years. Over the past decade, India's power generation landscape has undergone a significant transformation, marked by a clear shift toward cleaner energy sources. Between 2013–14 and 2023–24, the country's total installed power generation capacity expanded at an average annual rate of 6 per cent; the REN sector notably outpaced this growth, recording a robust annual increase of 10 per cent. This was more than double the growth rate of thermal power at 4.3 per cent, and substantially higher than that of nuclear power at 5.9 per cent.

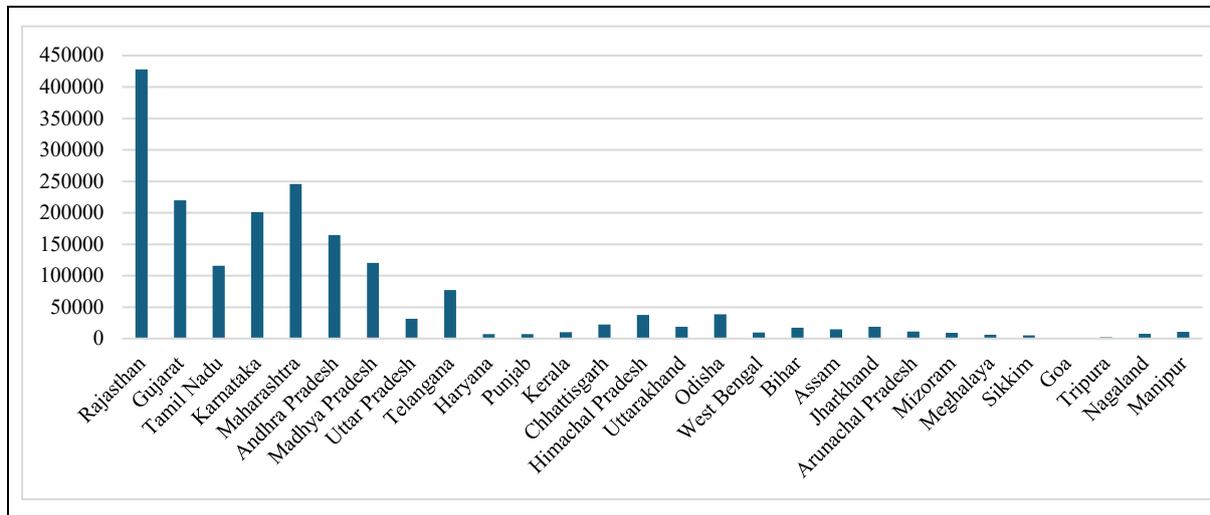
As a result, the share of thermal power in the overall energy mix declined from 72 per cent in March 2014 to 60 per cent in March 2024, while the contribution of REN rose significantly from 26 per cent to 38 per cent in this period. This shift underscores the growing importance of sustainable energy in India's development trajectory and sets the context for examining the policies, financial mechanisms, and institutional support driving this transition.

The role of Indian states in electricity generation and the promotion of REN has become increasingly prominent in recent years, reflecting a broader trend of decentralisation in energy governance. Electricity, being a concurrent subject under the Indian Constitution, allows both central and state governments to legislate and regulate in the sector. As a result, states have assumed a critical role in shaping the trajectory of power generation, particularly in REN development. A comparative analysis of installed capacity between 2015–16 and projected figures for 2024–25 reveals significant capacity expansion in states such as Rajasthan, Gujarat, Tamil Nadu, and Karnataka. These states have not only increased their generation capacities but have also become frontrunners in REN deployment. Rajasthan, for instance, has capitalised on its high solar irradiation and available land to emerge as a leader in solar energy, while Tamil Nadu has long been a pioneer in wind energy due to favourable coastal wind patterns and early policy initiatives.

In addition to realised capacity, the distribution of total REN potential across states illustrates considerable geographic concentration. States like Rajasthan, Maharashtra, Gujarat, and Madhya Pradesh exhibit substantial untapped potential, particularly in solar and wind

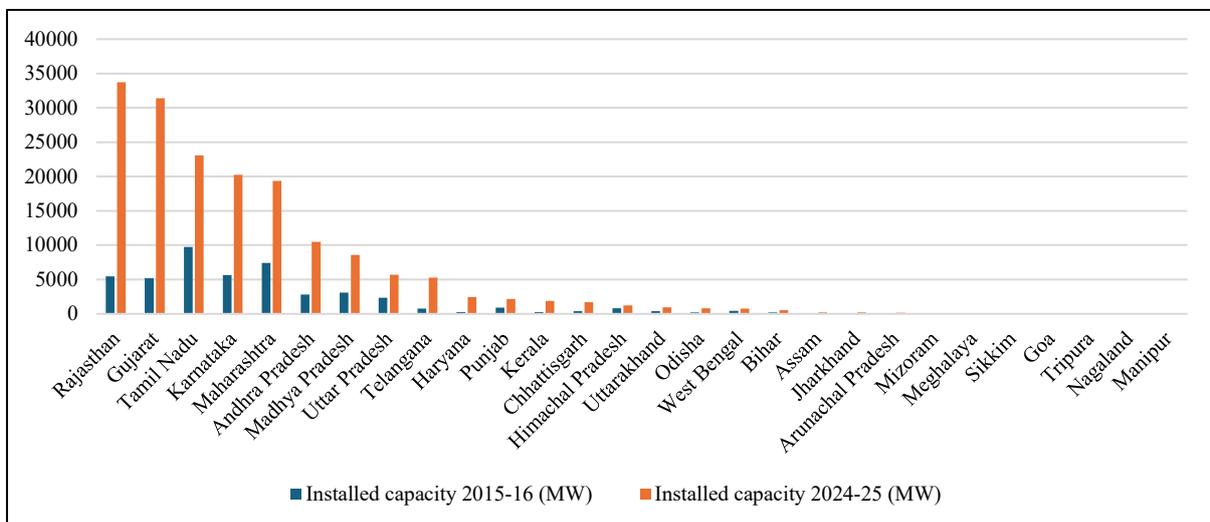
energy. Recognising this, many states have introduced dedicated REN policies, established energy development agencies and implemented mechanisms such as feed-in tariffs and renewable purchase obligations (RPOs) to incentivise investment. Furthermore, state-level initiatives often align with central schemes, such as the National Solar Mission, the Green Energy Corridor project, and the PM-KUSUM scheme which supports decentralised solar generation for agriculture.

**Figure 6: Total REN potential across states (MW)**



Source: <https://iced.niti.gov.in> accessed on 21 April, 2025.

**Figure 7: Installed capacity for renewable power generation across states (MW)**



Source: <https://iced.niti.gov.in> accessed on 21 April, 2025

India’s REN expansion is characterised by significant variation across states, reflecting differences in natural resource endowment, policy support, and infrastructure. States like Rajasthan, Gujarat, Tamil Nadu, Karnataka, and Maharashtra (Figures 6 and 7) illustrate the opportunities and challenges in realising India’s ambitious clean energy goals.

### 3.4. State-level in-depth analysis of REN sector financing in selected states: Magnitude, composition and utilisation

As a federal parliamentary democracy, India is subdivided into 29 states and 7 UTs. Energy policy in India is a shared responsibility between the central government and individual states, each with its own power sector institutions, electricity pricing structures, and subsidy regimes (Dubash and Ranjan, 2001). As discussed in the last section, potential and installed capacities vary widely across states, so do public expenditures on REN. This section has an in-depth analysis of six major states (Chhattisgarh, Jharkhand, Gujarat, Haryana, Maharashtra, and Uttar Pradesh) which spend the highest proportion of their budgets on REN, focussing on their priority areas and policies. The socio-economic characteristics of these states are presented in Table 1.

**Table 1: Socio-economic profile of six selected states**

Indicator	Gujarat	Chhattisgarh	Uttar Pradesh	Maharashtra	Haryana	Jharkhand	India (Avg.)
<b>Population (2022–23)</b>	71.5 M (5.2%)	30.2 M (2.2%)	235.7 M (16.5%)	126.4 M (9.1%)	30.2 M (2.2%)	40.2 M (2.8%)	~1,429 M (100%)
<b>Real GDP Growth (2012–13 to 2021–22)</b>	8.50%	5.50%	5.30%	4.80%	6.80%	6.20%	<b>5.60%</b>
<b>Employment: Agriculture, Forestry &amp; Fishing</b>	41.80%	62.60%	54.30%	45.80%	29.80%	55.90%	<b>45.80%</b>
<b>Employment: Services</b>	26.40%	18.80%	23.00%	34.20%	40.40%	24.10%	<b>27.60%</b>
<b>Employment: Manufacturing</b>	23.80%	7.60%	9.20%	12.40%	16.10%	8.50%	<b>12.10%</b>
<b>Employment: Construction</b>	7.10%	9.70%	13.10%	6.40%	12.80%	11.20%	<b>12.20%</b>
<b>Unemployment Rate (2022–23)</b>	1.70%	2.40%	2.40%	3.10%	6.10%	3.00%	<b>3.20%</b>
<b>Female Labour Force Participation Rate (FLFPR) (15 years and above)</b>	42.30%	59.80%	31.20%	40.70%	20.70%	50.10%	<b>37.00%</b>
<b>Literacy Rate (2011)</b>	78.00%	70.30%	67.70%	82.30%	75.60%	66.40%	<b>73.00%</b>

*Source:* Various Government data sources published by MoSPI.

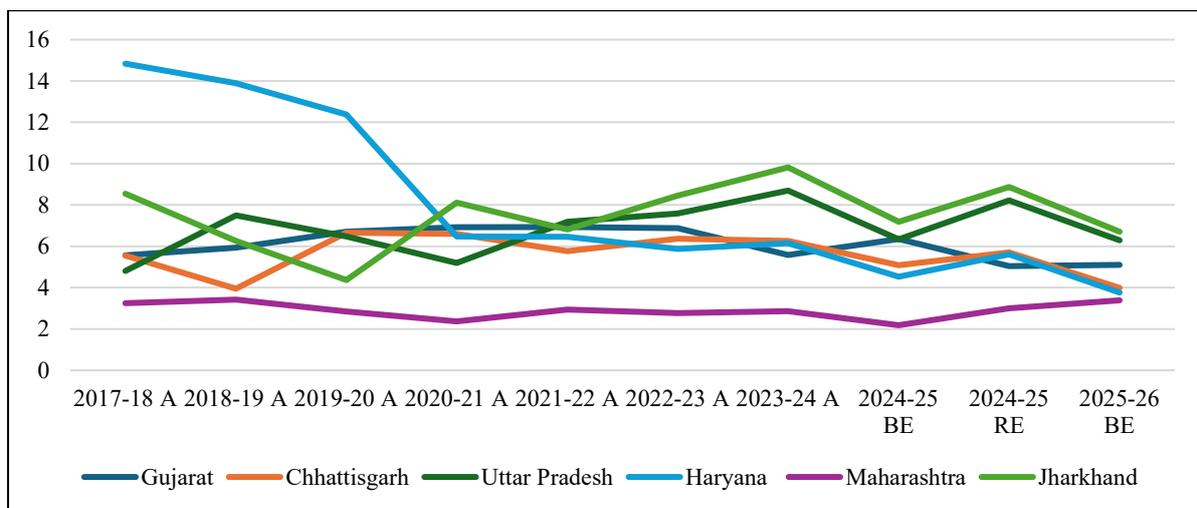
#### 3.4.1 Trends in public spending on REN

Decentralisation is the main institutional arrangement to demonstrate the fiscal expenditure relationship between central and local governments. The theory of fiscal decentralisation

explains the importance of local governments. Central governments need to give local governments authority over fiscal expenditures in order to allocate resources more efficiently [Yusuf, S. (Ed.),1999]. In this context, we discuss the level of expenditure on REN at the state level and the priority areas in this sector.

We begin with an analysis of the overall energy sector, both renewable and non-renewable. The evolution of the importance of this sector in state budgets can be seen in Figure 8. Among the selected states, Haryana shows a significant shift in expenditure away from energy; Maharashtra shows a consistent but low share of state expenditure on energy over the years; Jharkhand and Uttar Pradesh reveal an upward trend despite a few variations, reaching a peak of 9-10 per cent in 2023-24 (A); and spending in Gujarat, Chhattisgarh and Haryana consistently hovers around 6 per cent of state expenditure on energy.

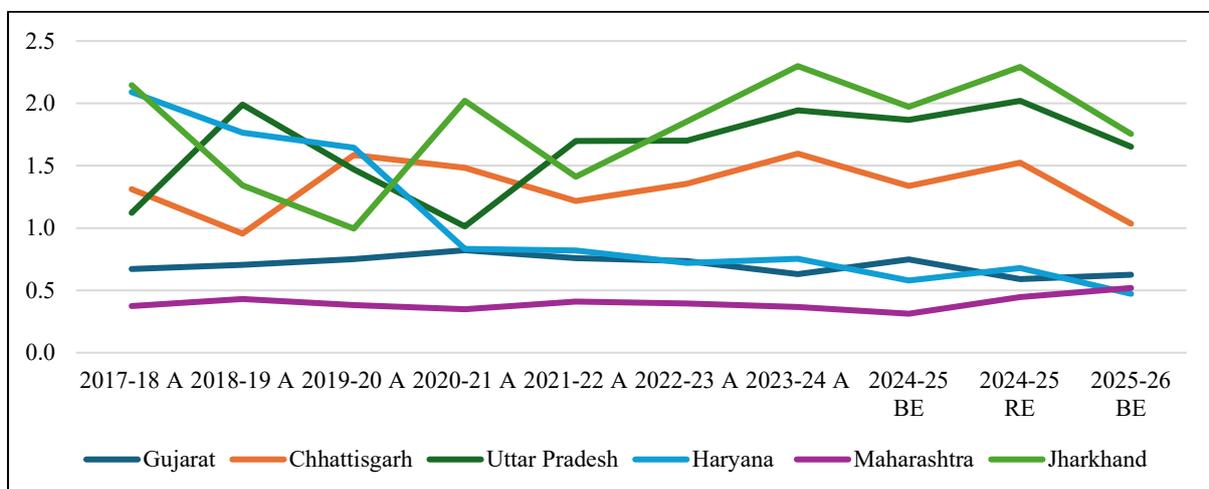
**Figure 8: Total expenditure on energy as % of state budgets**



*Source:* Detailed demand for grants documents for various states and years.

Total expenditure on energy as a percentage of gross state domestic product (GSDP) has remained around 0.3-2.3 per cent for all the states under study, from 2017-18 to 2025-26. Jharkhand, Uttar Pradesh, and Chhattisgarh exhibit higher expenditure on energy as a per cent of GSDP, compared to the other three states. Haryana experienced a significant fall in its share over the years.

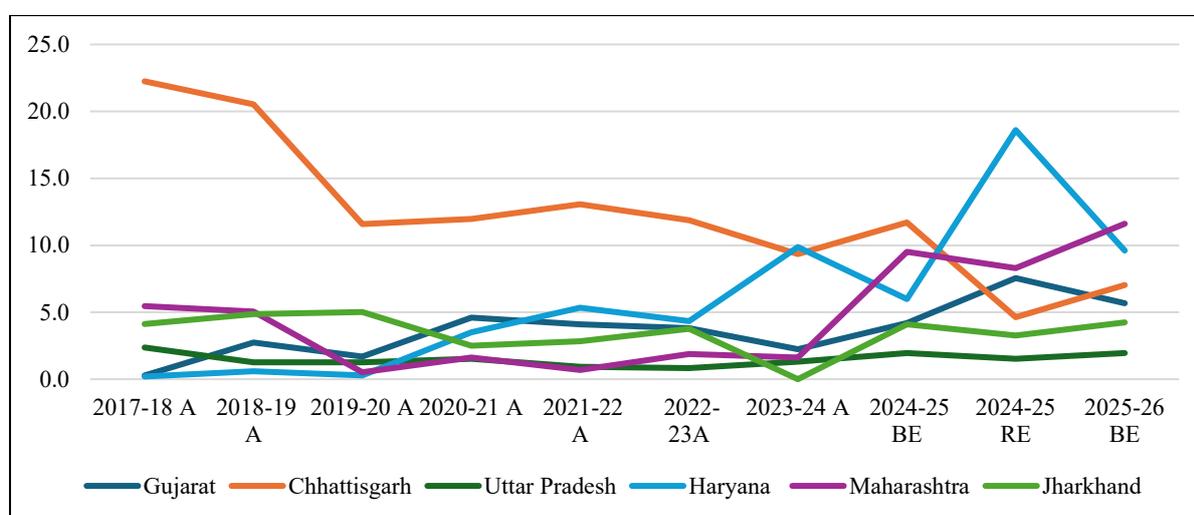
**Figure 9: Total expenditure on energy as % of GSDP**



**Source:** Detailed demand for grants documents for various states and years.

Comparing the share of renewables in the energy sector (Figure 10), Chhattisgarh shows a sharp decline (from 25% to 5%) over the years, while Haryana displays a significant rise in 2022-23 A, compared to the previous years, which continues in the revised and budget estimates in subsequent years. Till 2022-23 A, the remaining four states indicate a stable share of spending of less than 5 per cent, but Maharashtra and Gujarat show an inclination towards REN by allocating greater a share in the revised and budget estimates in subsequent years. Uttar Pradesh, meanwhile, has a consistently low share, mostly between 1 and 2 per cent implying minimal prioritisation of the renewable segment within its energy sector budget. Thus, it is found that though states are spending significantly on energy, REN has a miniscule share in their actual budgets, except for Chhattisgarh and Haryana in actual expenditures in recent years.

**Figure 10: Share of REN in the energy sector of selected states (%)**

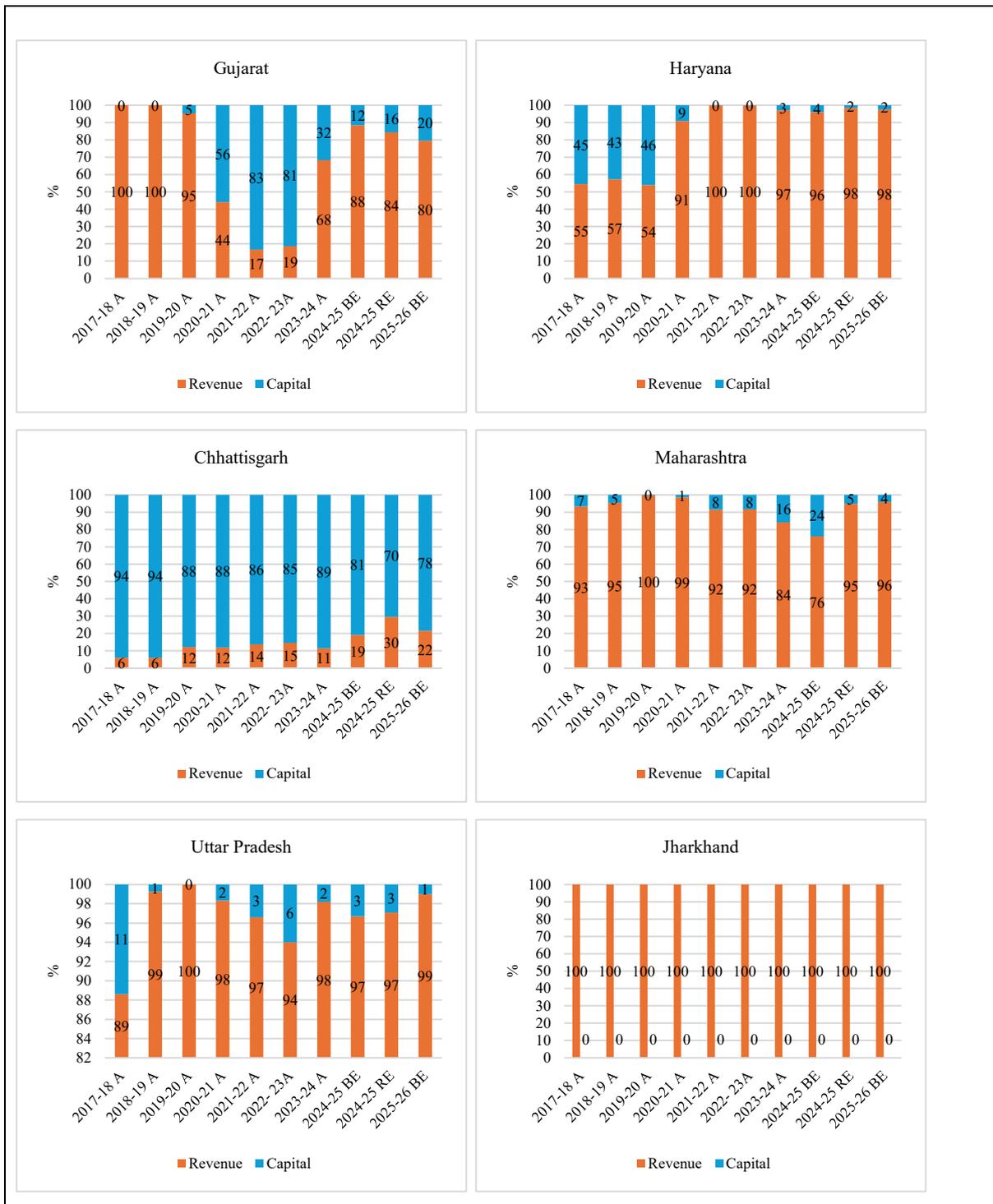


**Source:** Detailed demand for grants documents for various states and years.

### 3.4.2. Revenue vs. capital expenditure

The shares of revenue and capital expenditure in REN across states reveal divergent fiscal approaches: Haryana, Maharashtra, Uttar Pradesh, and Jharkhand exhibit a strong preference towards revenue expenditure, indicating an emphasis on operational costs and programme delivery rather than infrastructure expansion (Figure 11). Chhattisgarh had a strong preference for capital expenditure, revealing a focus on asset-creation over recurring expenses. While Gujarat has shown a policy shift toward capital investment, Haryana has gone the opposite way.

**Figure 11: Shares of revenue and capital component in REN sector expenditure (%)**



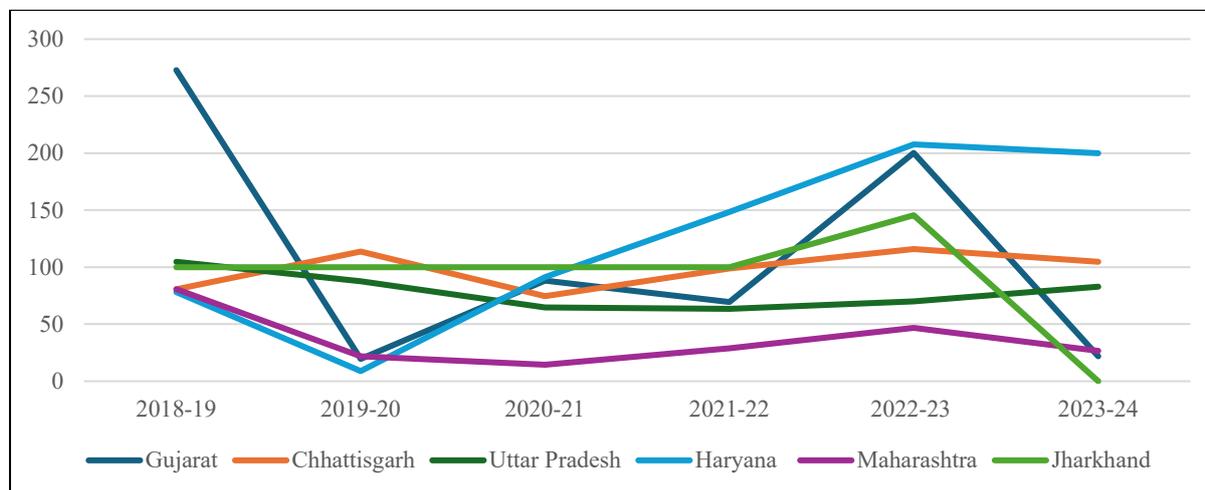
**Source:** Detailed demand for grants documents for various states and years.

### 3.4.3. Utilisation rates

The utilisation rate of REN reflects the efficiency and timeliness of fund absorption (Figure 12). Fund utilisation is defined as actual expenditure over the estimated budgetary expenditure (BE). The greater the deviation from the 100 per cent yardstick, the more evident is the lack of feasible planning. It is often perceived that a state accounting more than 100 per cent budget utilisation, reflects that actual expenditure in that year was higher than the budgeted

expenditure. For most such cases, this indicates that in the consecutive year, expenditure was less than 100 per cent, reflecting recoveries. This type of fluctuation is particularly seen in Gujarat. Haryana has made significant improvements in its fund utilisation rate over the years, but its share has exceeded 100 per cent in later years, again indicating poor budget planning, but in the opposite direction. Chhattisgarh shows good planning with an around 100 per cent utilisation rate. Uttar Pradesh and Maharashtra depict underutilisation of expenditure on REN.

**Figure 12: Fund utilisation rate of renewable energy (%)**



*Source:* Detailed demand for grants documents for various states and years.

A detailed analysis at the minor-heads level shows that in Gujarat (Appendix Table 2-7), the most consistently utilised component under revenue expenditure has been ‘Renewable Energy’ and under revenue expenditure ‘Rural Application’. In Chhattisgarh, all the minor heads show 80-120 per cent utilisation rates, denoting good planning. In Uttar Pradesh, only the ‘Special Component Plan for the Scheduled Castes’ shows an around 100 per cent utilisation rate. Maharashtra, Jharkhand, and Haryana exhibit poor planning under almost all the minor heads, which mostly show underutilisation.

### 3.4.4. Priorities of the components of REN across states (minor-head-wise distribution)

Between 2018-19 and 2020-21, most of the funds allocated to Gujarat under the ‘Renewable Energy and Rural Application’ is for connection of the solar microgrid to agricultural pump sets. In subsequent years, with a similar objective, these funds have been reallocated to the PM-Kusum Scheme, under the minor head ‘Assistance to Public Sector and other undertakings’. In Chhattisgarh, from 2018-19, there have been two major components in the allocation: ‘New and Renewable Energy Program and Applications’ (around 55%) and ‘Investments in State Electricity Boards’ (around 34%), both components of capital expenditure. In Uttar Pradesh, from 2017–18 to 2022–23, a dominant share, from 77 per cent to 94 per cent, was consistently directed toward ‘Research, Design, and Development in REN’, indicating a strong focus on research. From the 2023-24 actuals, and the subsequent revised and budget estimates, funds have been reallocated to ‘Other Expenditure’, suggesting increased spending on operational or miscellaneous components. From 2024-25 BE on, ‘Storage Charges’ has emerged as a new category, accounting for 8–9 per cent.

Maharashtra’s electricity sector expenditure has undergone a notable transformation between 2017–18 and 2023–24. In 2017–18, the majority of the funds (80%) were directed

towards the Supporting Programme, indicating a strong focus on broad-based subsidies and foundational energy interventions. However, this allocation has declined sharply over the years and was phased out completely by 2021–22, suggesting a strategic shift in spending priorities. In contrast, the Photovoltaic Programme for Solar Agricultural Pumps emerged as a key focus area, highlighting a growing emphasis on clean energy adoption in agriculture. Simultaneously, ‘Other Expenditure,’ ‘the Special Component Plan for Scheduled Castes’, and the ‘Tribal Area Sub-Plan’ have maintained a steady share of around 18-30 per cent each in recent years. Haryana’s expenditure pattern in REN between 2018–19 and 2023–24 reveals a consistently dominant focus on ‘Grid Interactive and Distributed Renewable Power’ (almost over 80%), suggesting a strong emphasis on centralised and grid-based renewable infrastructure in all the years except 2022-23A. Between 2017–18 and 2022–23, Jharkhand’s REN spending exhibited a consistent and socially inclusive pattern, with allocations spread primarily across three categories: ‘Grid Interactive and Distributed Renewable Power’ (30–45 per cent), the ‘Special Component Plan for Scheduled Castes’ (25–27 per cent), and the ‘Tribal Sub-Plan’ (36–45 per cent). This reflects a deliberate focus on ensuring energy access for marginalised communities, particularly the SC and ST populations. A detailed trend analysis is shown in Appendix Figure 1.

**Figure 13: Key components in budget allocation for REN (minor head in budget)**



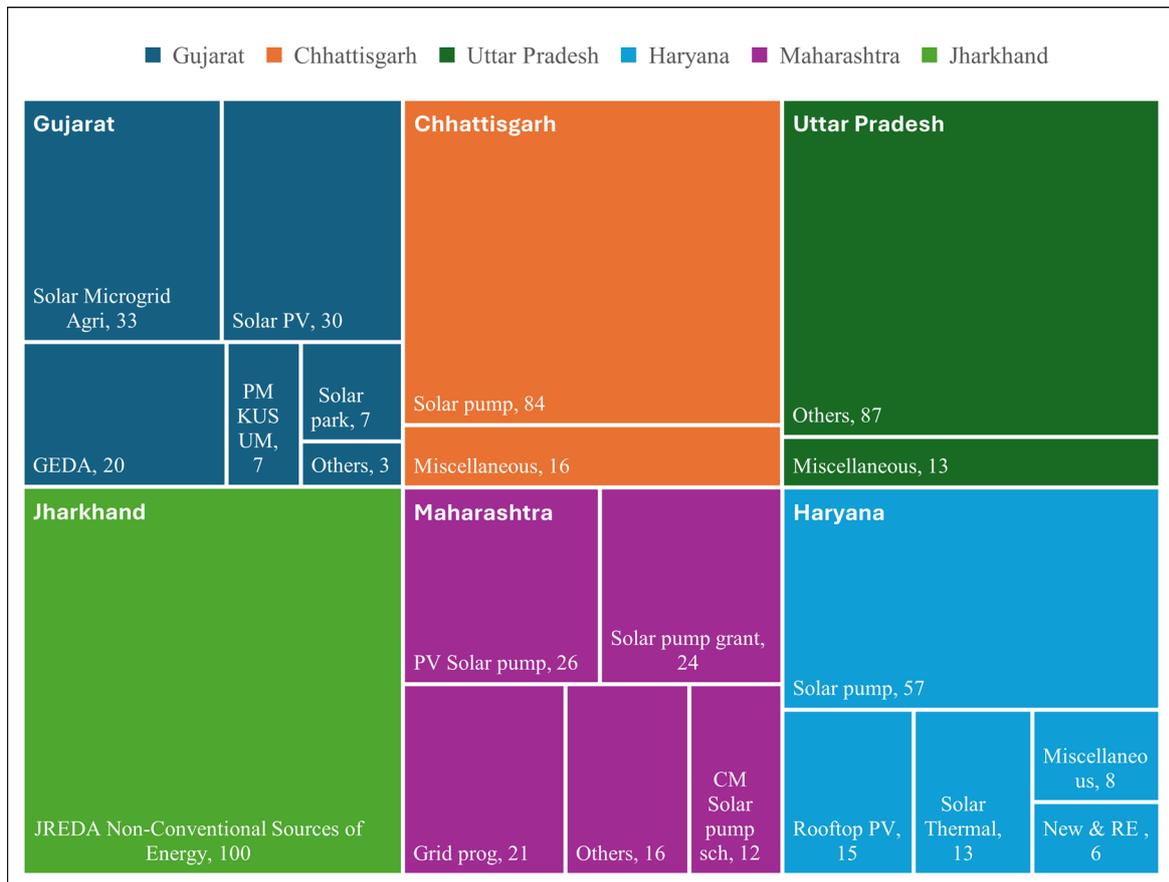
*Source:* Compiled from Detailed Demand for Grants of various states.

### 3.4.5. Scheme-wise allocation

Gujarat's REN expenditure was initially dominated by grants to GEDA (96 per cent in 2017 A), but over time its share declined significantly as the state diversified its portfolio. The focus shifted largely to grid-connected solar PV projects near GETCO substations, and newer schemes such as PM-KUSUM, solar parks, and CAPEX solar projects on government buildings began gaining ground. Interestingly, Gujarat also introduced allocations for EV

charging infrastructure, energy storage technologies, and PM Surya Ghar: Muft Bijli Yojana, signalling a broader transition beyond traditional solar to include mobility and storage in its green strategy. Chhattisgarh’s REN strategy had been consistently driven by a single major scheme: grants for the creation of solar pumps. However, in 2025–26 BE, this was completely dropped, indicating a major shift. Initially, nearly all the REN expenditure in Uttar Pradesh was lumped under ‘Others’, but from 2022–23 A on, the state adopted a more programmatic approach with the ‘Implementation through Non-Conventional Energy Development Agency’, ‘Rooftop Solar’, and PM-KUSUM schemes. Maharashtra’s REN budget is dominated by schemes supporting solar pumps for agriculture, including the Chief Minister’s Solar Agricultural Pump Scheme; state share grants together account for the majority of expenditure. Haryana’s REN budget is highly concentrated in just two schemes: Installation of Solar Water Pumping Systems and Grid-connected Rooftop Solar. The major schemes in terms of average expenditure from 2017-18 A to 2023-24 A are shown in Figure 14. A detailed description of schemes and their importance is state budget REN expenditure for different states is shown in Appendix Table 8-13.

**Figure 14: Average share of major schemes in REN sector budgets (2017-18 to 2023-24) (%)**



**Source:** Compiled from detailed demand for grants documents for various states and years.

Overall, the PM-KUSUM scheme has emerged as a common focus, especially in Uttar Pradesh, Gujarat, and Chhattisgarh, highlighting a nationwide push for solar-powered agriculture. States like Chhattisgarh, Maharashtra, and Haryana allocate a significant share of their REN budgets to solar pump schemes, reflecting a continued emphasis on rural electrification and irrigation. Gujarat and Uttar Pradesh, however, showcase a broader strategy

by diversifying into rooftop solar, battery storage, and EV infrastructure, indicating a forward-looking clean energy agenda. In contrast, Maharashtra and Haryana continue to have a narrow focus, concentrating REN investments largely in agriculture-linked solar applications. Despite some movement, most states are yet to meaningfully invest in emerging technologies like energy storage and conservation, with Gujarat standing out as a frontrunner experimenting with such innovations. Jharkhand has only one scheme under the JREDA Non-Conventional Sources of Energy that has 100 per cent allocation over the years.

### 3.4.6. Subsidies

Subsidies have played a pivotal role in shaping India’s ongoing transition from a fossil-fuel-dominated energy system to one that increasingly embraces renewable and cleaner energy sources. For an emerging economy, where affordability, energy access, and rapid scaling are central to energy policy, subsidies function as a critical policy tool to steer investments, correct market failures, and ensure social inclusion. For instance, the PM-KUSUM scheme offers up to 60 per cent subsidy for solar irrigation pumps, supporting over 65,000 installations by 2023 (MNRE, 2023). Rooftop solar initiatives have similarly offered capital subsidies for residential users. States vary in their approaches towards subsidies (Table 2). Haryana provided a significant amount as subsidies in 2023-24 (and in previous years too), and while Chhattisgarh and Jharkhand provide subsidies on other components of the energy sector, they do not give subsidies to REN. Maharashtra and Haryana adopted a strategy of subsidies to REN later than Gujarat and Uttar Pradesh.

**Table 2: State-wise analysis of subsidies for the REN sector (Rs. crore)**

State	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Gujarat	0	264	176	249	57	84	204
Maharashtra	11	113	9	125	102	153	203
Haryana	0	63	33	218	376	301	802
Uttar Pradesh	211	248	206	222	211	232	239

**Source:** Compiled from Finance Accounts of various states and years.

### 3.5. *Financial, operational, institutional and social hindrances to the growth of the REN sector*

Each state government has a policy landscape to foster clean energy by investing in the sector and devising policy frameworks. However, we still see a huge gap in financing requirements, and operational, institutional and social challenges in the sector.

#### 3.5.1. Financial challenges faced by the REN sector

##### *Financing gap*

Renewable energy technologies, particularly solar photovoltaic (PV), wind, and battery storage systems, are highly capital-intensive with substantial upfront costs. Unlike fossil-fuel-based power plants, where operating costs dominate, the economics of REN projects hinge on initial capital expenditure and the cost of finance. There is huge financial gap between the required and actual investment for REN capacity addition (*The Indian Parliamentary Standing Committee on Energy Report*). According to a study by the IEEFA, the investment required in

the REN sector need to be more than doubled (to USD 30–40 bn) against the current investment of USD14 bn in FY 2022 (Garg, 2022).

State-specific energy development agencies support central government's endeavours in providing technical and financial assistance to REN projects in the state. As discussed earlier, state expenditure on REN technologies as a share of total energy sector investment remains nascent, ranging from below 1 per cent to 10 per cent for 2023.

### ***Stressed assets***

The central government has played a key role in mobilising funds for the development of the REN sector through the government-owned agency, Indian Renewable Energy Development Agency (IREDA). At present, both government entities and other financial lenders faces challenges of stressed assets and NPAs. The gross NPAs of IREDA were Rs 1,513 crore and Rs 1,401 crore in FY 2023 and FY 2024, respectively (IREDA, 2024). Delays in payments from DISCOMS and subsequent tariff-related issues are cited as primary reasons behind these NPAs. Similarly, the Power Finance Corporation (PFC), which extends 84 per cent of their loans to government projects, reported 9.39 per cent gross NPAs in FY 2019 and 8.08 per cent in FY 2020. The amount of NPAs against loans disbursed has, however, subsequently fallen to 4.21 per cent in FY 2023, the lowest in the last six years (Power Finance Corporation, 2022).

Though the NPAs of government agencies (such as IREDA, PFC, and REC) have significantly come down over the last few years, the share of gross NPAs in their total loan exposure has remained higher than in other nonbanking financial companies (CareEdge Research, 2023).

### ***Inadequate access to long-term finance***

Both the initial cost of investment and the tenure of financing for an REN project are high in India. The REN sector's initial growth has seen low participation from banks, which were averse to lending for projects with tenors exceeding 5-7 years, given the short-term maturity of their deposits (Nelson et al., 2012). Insurance and pension funds have also played a minimal role in financing this sector (Sarangi, 2018). Given that banks have typically dealt with the loan portfolios of non-conventional energies, they found it difficult to shift their investment portfolios to an evolving sector with uncertain returns. Therefore, loans to the REN sector by public banks remained on a small scale, largely based on existing relationships with REN project promoters (Umamaheswaran et al., 2024). The central government and the Reserve Bank of India (RBI) have classified REN lending as Priority Sector Lending (PSL). Notably, the REN-Invest Expo held in Gujarat in 2024 facilitated significant pledges from both public and private financial institutions, amounting to commitments of USD 295.25 bn by 2030.

### ***Struggling health of DISCOMS***

The financial health of DISCOMS remains a structural vulnerability in India's electricity sector. Between FY 2014–15 and FY 2019–20, DISCOMS' annual gross losses rose from Rs. 59,000 crore to Rs. 75,000 crore (Power Finance Corporation, 2021; Raizada, 2024). The National Institute of Public Finance and Policy (NIPFP) estimates that cumulative losses reached Rs. 6.77 lakh crore in FY 2022–23. States like Tamil Nadu, Uttar Pradesh, and Rajasthan account for a disproportionately high share of these losses (Josey et al., 2024). The poor financial health of DISCOMS implies delayed payments to REN generators and an inability to honour power

purchase agreements (PPAs), thereby undermining investment in grid modernisation and new capacity additions.

### ***No green priority specification in the financial framework of India***

In India, all energy projects, REN and conventional energy alike, are treated on par (Government of India, 2022). This means that the indirect advantages to the environment and society at large resulting from REN are often not taken into accounts while determining returns to this sector (Brito Cedeno & Wei, 2024). Due to its seasonal nature, revenue generation is not uniform across the year in REN. In this context, if a project does not yield a return, it is treated as an NPA as per the RBI's notification and asset categorisation, which further impacts the flow of finance to the sector.

### **3.5.2. Operational and institutional challenges in REN**

Apart from the financial barriers highlighted above, the REN sector being at the nascent stage of development also faces substantial operational and institutional challenges, some of which are highlighted in the sections below.

#### ***Land acquisition***

Renewable energy infrastructure demands a significantly larger land footprint compared to fossil-fuel-based technologies. Estimates suggest that REN requires ten times more land per unit of energy generated (Eshbach et al., 2021). Fragmented land ownership, inflated prices, and weak land records in India complicate land acquisition. Moreover, regulatory hurdles such as the need for consent from a majority of landowners, environmental impact assessments (EIAs), and social impact assessments (SIAs) delay project execution (Anand, 2024).

#### ***Challenges with residential rooftop solar schemes***

Residential rooftop solar (RTS) adoption faces both technical and regulatory barriers. Many residential structures are not engineered to handle the additional weight of panels or lack optimal orientation, and older buildings often require expensive electrical upgrades. In addition, multiple permits and approvals cause procedural delays that discourage potential adopters (Gulia et al., 2022).

#### ***Infrastructural needs***

Transmission infrastructure must keep pace with decentralised REN generation, often located at a distance from consumption centres. Solar and wind projects typically require 6–12 months for commissioning, while evacuation infrastructure can take 3–5 years to develop, depending on land and right-of-way (RoW) issues (Kumar et al., 2020). As of 2024, India had approximately 4,91,504 circuit km (cKm) of transmission lines, with substantial additions by central, state, and private entities (ICED-NITI Aayog, 2024).

#### ***Institutional challenges***

India's REN sector lacks a unified regulatory framework. Decision-making is split between central and state governments, creating policy misalignment and investor uncertainty. Although the Ministry of New and Renewable Energy (MNRE) released guidelines in 2017 to standardise REN projects, these remain rudimentary compared to global best practices (Kumar & Majid, 2020; Seetharaman et al., 2019). State-specific Renewable Purchase Obligations (RPOs) are unevenly enforced, and the absence of penalties allows DISCOMs to circumvent compliance.

### **3.5.3. Social challenges**

The 'Not in My Backyard' (NIMBY) sentiment also impedes REN development. Local resistance—particularly in wind energy—stems from concerns over noise, aesthetics, and land use (Mussal & Kuik, 2011).

Additionally, India's coal-dependent eastern states, including Jharkhand and Chhattisgarh, are likely to experience adverse employment impacts as REN transitions are concentrated in solar-rich western states like Rajasthan and Gujarat (Ordonez et al., 2023). Western states have vast solar and wind potential but face challenges like transmission bottlenecks and land-use conflicts in rural and tribal areas. While there is substantial industrial energy demand, providing opportunities for captive REN projects, grid integration and storage infrastructure need to keep pace.

## ***3.6. Strategies to enhance the performance of states in achieving green transition targets***

### **3.6.1. Financial incentives**

#### ***Short-term recommendations***

- Ensure continued waiver of ISTS charges for solar and wind power commissioned before June 2025 to reduce upfront costs;
- Promote rooftop solar through targeted subsidies for households and performance-linked incentives to DISCOMs;
- Maintain fiscal incentives like accelerated depreciation, concessional customs duties, and lower GST for REN equipment;
- Enforce the use of Letters of Credit (LCs) by DISCOMs to improve payment security for REN producers; and
- Facilitate 100 per cent FDI through the automatic route to enhance private capital inflows.

#### ***Long-term recommendations***

- Develop blended finance models combining climate finance, viability gap funding (VGF), and credit-enhancement instruments;
- Expand capital market involvement by mobilising institutional investors;
- Support the issuance of sovereign and corporate green bonds;
- Facilitate access to international climate finance mechanisms; and
- Expand capital market participation in the REN sector to reduce dependence on public funding.

### **3.6.2. Infrastructural support**

#### ***Short-term recommendations***

- Accelerate implementation of solar parks and wind zones, or hybrid renewable parks to provide plug-and-play project readiness;
- Expand deployment under central public sector undertakings (CPSUs) and PM-KUSUM schemes for government and agricultural solar capacity;
- Strengthen intra-state REN transmission networks under the Green Energy Corridor; and
- Promote waste-to-energy projects in urban and industrial areas.

#### ***Long-term recommendations***

- Implement the National Green Hydrogen Mission to establish India as a global leader in hydrogen production;
- Scale up high-efficiency solar PV module manufacturing through production-linked incentive (PLI) schemes; and
- Invest in energy storage technologies and large-scale grid modernisation for better REN integration.

### **3.6.3. Regulatory support**

#### ***Short-term recommendations***

- Ensure cost-reflective, predictable, and transparent tariff mechanisms to boost investor confidence;
- Streamline net metering and interconnection regulations to support rooftop and decentralised solar;
- Operationalise Dispute Resolution Committees to address unforeseen conflicts in REN contracts;
- Continue declaration and enforcement of Renewable Purchase Obligation (RPO) trajectories; and
- Maintain ‘must run’ status for REN plants to avoid curtailment.

#### ***Long-term recommendations***

- Establish a Renewable Energy Industry Promotion & Facilitation Board to coordinate sector-wide reforms;
- Create ultra-mega renewable energy parks with ready access to land and transmission;
- Mandate REN capacity additions alongside new thermal power projects; and
- Invest in long-term skill development programmes through ITIs, polytechnics, and rural training centres.

### **3.6.4. Public expenditure approaches**

#### ***Short-term recommendations***

- Along with solar energy, which gets highest priority in state budget allocations among the schemes and components, increase in investment is needed in sectors like wind, waste-to-energy etc;
- Stabilise annual state-level REN budgets through multi-year investment planning;
- Support REN sector expansion by increasing capital expenditure;
- Improve planning of public expenditure: monitoring of utilisation rates is important in this context, as well as planning, monitoring, and improving governance capacity in state nodal agencies;
- Though subsidies have proved successful in the expansion of REN, some states do not provide a subsidy to the sector. States need to learn from best practices and update their strategy;
- Prioritise rooftop solar, solar irrigation, and mini-grids in agriculture-based and remote regions;
- Consolidate fragmented REN projects into integrated clusters (e.g., biomass hubs, agro-solar parks);
- Encourage private participation through simplified regulatory procedures and timely payments;
- Link REN with rural livelihood schemes (e.g., solar pumps for fisheries, solar-powered cold chains); expand benefit-sharing models for local communities in areas hosting large REN parks to ensure social acceptance; and
- Launch targeted green job training programmes in fossil-fuel-intensive regions.

#### ***Long-term recommendations***

- Increase the share of REN in state energy budgets, especially in high-potential states;
- Invest in modern transmission and battery storage infrastructure to reduce REN curtailment; invest in grid modernisation and storage pilots in high-demand areas;
- Diversify the REN portfolio with offshore wind, tidal, and floating solar projects in coastal regions;
- Promote decentralised, community-owned energy models in off-grid and tribal areas;
- Facilitate industrial REN uptake through captive generation models in manufacturing hubs;
- Leverage small hydro, biomass, and waste-to-energy potential in hilly and urbanising states;
- Develop financing instruments like state-level green bonds and climate finance taxonomy to attract private investment in clean energy.

- To balance intermittent solar and wind power, renewable energy integration or balancing is needed to ensure grid stability, reliability, and cost-effectiveness. This can be achieved through financing towards geographical diversification, energy storage technologies, use of flexible power generation sources and smart grids.

#### 4. Recommendations to the 16<sup>th</sup> Finance Commission

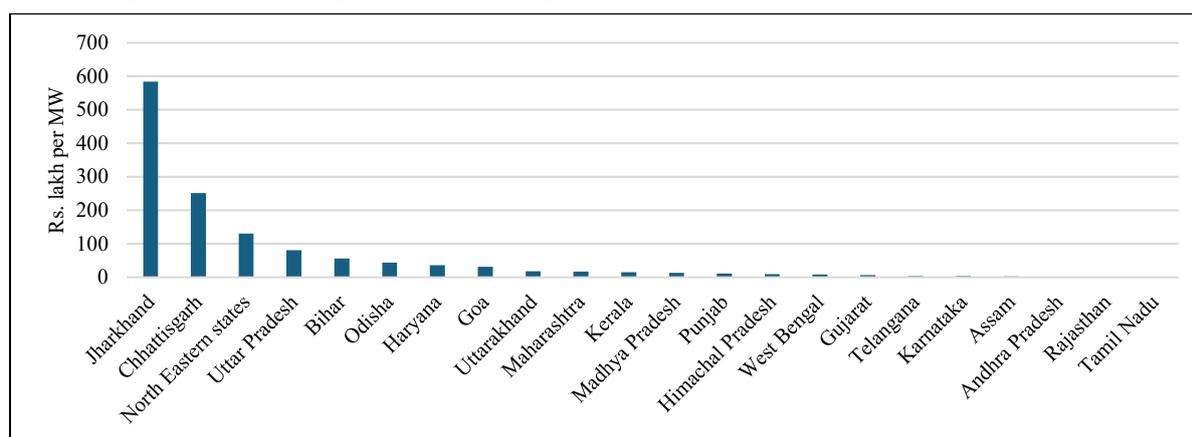
Public expenditure on renewable energy (REN) in India has steadily increased over the past decade, reflecting the country's commitment to energy transition and climate goals. The state governments have allocated growing budgetary resources to support the expansion of solar, wind, small hydro, biomass, etc. These expenditures are critical not only for direct project financing but also for enabling infrastructure, research and development (R&D), subsidies, and capacity building.

On the expenditure side, states allocate their budgets to REN sources mainly through the Department of Energy and Petrochemicals. For example, Gujarat allocated funds to REN through the Energy and Petro Chemical Department (95%), Climate Change Department (5%), and Tribal Development Department (1%) under revenue expenditure in the budget estimates for 2025-26.

However, new and renewable energy (major heads: 2810, 4810, 6810) has a very small share in state budgets. As per state budget 2022-23 (A), the majority of states spend less than 0.05 per cent of their state budgets on REN. The states with the highest share of expenditure on REN in their state budgets are: Chhattisgarh (0.63%), Jharkhand (0.32%), Gujarat (0.26%), and Haryana (0.18%). But the physical share of renewable energy in power generation in 2024-25 in these states is: Chhattisgarh (2%), Jharkhand (0.1%), Gujarat (28%), and Haryana (6%). So, there is a long way to go.

To estimate the grant volume, several factors need to be considered. Given the varied present installed capacity and the potential in REN (Table 3) (as obtained from the India Climate and Energy Dashboard published by Niti Aayog and Vasudha Foundation), the national target is distributed across states; and the gaps between the state targets and present installed capacities are estimated for states. Public sector resource support to finance the gap is estimated using the average efficiency of government expenditure. This efficiency is estimated using the total increase in the REN budget (revenue and capital) with a lag of two years, considering the gestation lag of projects, and increase in installed capacity of REN over the last 10 years. This average efficiency of government expenditure varies widely across states. States like Tamil Nadu, Rajasthan, Andhra Pradesh, Assam, Karnataka, Telangana, Gujarat, West Bengal, and Himachal Pradesh show high efficiency in government spending on increasing installed capacity (less than Rs 10 lakh per MW increase in installed capacity). In contrast, the average spending is very high in Jharkhand (Rs. 584.1 lakh per MW), followed by Chhattisgarh (Rs. 251.7 lakh per MW), and the north-eastern states (Rs. 130.6 lakh per MW) (Figure 1).

**Figure 15: Average efficiency of government expenditure in the REN sector**



**Source:** Author's estimation based on data from India Climate Energy Dashboard. (<https://iced.niti.gov.in/>) by Niti Aayog and Vasudha Foundation and Budget data on revenue and capital expenditure on renewable energy (major head 2810, 4810, 6810 from Finance Accounts of various states).

Considering the potential, installed capacity, and the present trend in spending on new energy and the REN sector, it is estimated that the average yearly grant requirement for all the states would be around Rs. 17,095 crore over the next five years, to reach the target. A 20 per cent increase in expenditure efficiency in states, with an average lower than the median value, leads to a yearly grant requirement of Rs. 14,064 crore. The detailed allocation of the grant across states is presented in Table 3.

**Table 3: State-wise allocation of installed capacity & potential of REN, 2024-25 and recommendation for average yearly green energy grant (Rs. crore)**

	Installed capacity 2024-25 (MW)	Total potential (MW)	Estimated state-wise target to meet 500GW capacity (MW)	Suggested average yearly green energy grant (Rs. crore)
Andhra Pradesh	10,504	164,464	44,004	165
Arunachal Pradesh	155	10,979	2,938	569
Assam	233	14,743	3,945	23
Bihar	539	17,061	4,565	349
Chhattisgarh	1,708	22,471	6,012	15,88
Goa	58	932	249	6
Gujarat	31,403	219,955	58,851	217
Haryana	2,450	6,975	1,866	0
Himachal Pradesh	1,215	37,609	10,063	177
Jharkhand	224	18,570	4,969	4,288
Karnataka	20,228	201,233	53,842	380
Kerala	1,889	10,156	2,717	32
Madhya Pradesh	8,593	120,419	32,219	688
Maharashtra	19,354	245,521	65,692	1,711
Manipur	19	10,792	2,887	595
Meghalaya	73	6,214	1,663	338
Mizoram	76	9,262	2,478	518
Nagaland	36	7,526	2,014	391

	Installed capacity 2024-25 (MW)	Total potential (MW)	Estimated state-wise target to meet 500GW capacity (MW)	Suggested average yearly green energy grant (Rs. crore)
Odisha	804	38,494	10,299	642
Punjab	2,174	7,252	1,940	0
Rajasthan	33,725	427,912	114,492	97
Sikkim	63	5,212	1,394	288
Tamil Nadu	23,063	115,580	30,925	29
Telangana	5,283	77,024	20,609	128
Tripura	37	2,161	578	119
Uttar Pradesh	5,722	31,527	8,435	569
Uttarakhand	975	18,821	5,036	140
West Bengal	771	9,675	2,589	21
Total	171,378	1858,543	497,270	14,064

**Source:** Author's estimations based on data from the India Climate Energy Dashboard. (<https://iced.niti.gov.in/>) by Niti Aayog and the Vasudha Foundation; budget data on revenue and capital expenditure on renewable energy (major heads 2810, 4810, 6810 from the Finance Accounts of various states.

**Note:** The REN refers to solar, wind, bio-energy and small-hydro. The REN installed capacity of the UTs is 1 per cent of the present installed capacity of the country, and is assumed to have the same share in the future. The estimates are based on state government expenditure only. The analysis assumes a status quo in private investment.

In conclusion, to achieve sustainable development and net-zero emissions, increased government support is essential. To meet the government target of installed capacity in REN of 500GW by 2030, the Finance Commission needs to provide a green energy grant to states. Improving financial efficiency and designing balanced policies can help to reduce costs. REN projects often face higher investment risks due to high capital costs, emerging technologies, and long payback periods, apart from being hampered by the poor financial health of DISCOMs and payment delays. Regulatory barriers, land acquisition challenges, and weak grid infrastructure further hinder progress. Given the high risk and low returns, public investment must lead the way. Incentive-based policies can motivate states to improve. Further study is required to assess state-level demand projections and fund requirements given the macro-economic structure of the state economies.

## 5. Conclusion

The REN sector in India is at a pivotal stage. Structural barriers such as the negative externalities of fossil fuels, the public goods nature of clean energy, high upfront costs, and information asymmetries have limited private investment and slowed REN deployment. In this context, public finance plays a foundational role in correcting price signals, reducing risk, and supporting equitable access to clean energy—thereby catalysing the transition toward a low-carbon economy.

State-level public expenditure trends reveal considerable variation in how resources are deployed. While Chhattisgarh prioritises subsidies for solar pumps, Gujarat demonstrates a more diversified approach, investing in large-scale solar-wind hybrid parks, microgrids, and decentralised systems. In contrast, Rajasthan, despite its high renewable potential, spends a very small share of its budget on REN. Tamil Nadu, Andhra Pradesh, and Jammu & Kashmir have no identifiable budgeted spending for REN through public finance mechanisms, while

Himachal Pradesh, Madhya Pradesh, Karnataka, Assam, and Telangana spend a miniscule amount from their budget on REN (less than 0.01% of the state budget). These differences underscore the need for strategic and well-targeted financing that aligns state actions with their technical and economic potential.

The role of the Finance Commission becomes particularly critical in this context. As a constitutional body responsible for recommending the distribution of financial resources between the centre and the states, the Finance Commission can drive REN development through suggesting green grants linked to climate goals. It can incentivise states to invest in clean energy by recommending performance-based grants for REN expansion, energy access improvements, and reductions in fossil fuel dependency.

The north-eastern states continue to face significant challenges due to poor grid infrastructure, limited financial capacity, and weaker institutions. Central financial support, guided in part by Finance Commission recommendations, can address these disparities by providing earmarked grants, technical assistance, and capacity-building funds. Encouraging states with significant REN potential to invest on the sector is crucial to ensuring a just and inclusive energy transition, and to attracting private sector participation as well. Beyond grants and subsidies, public finance must also focus on structural interventions—such as transmission infrastructure upgrades, support for storage technologies, and grid integration measures. It must also promote decentralised REN systems in rural and underserved areas, which offer co-benefits for livelihoods, education, and health services.

In conclusion, public finance, including the strategic role of the Finance Commission, has the potential to shape India's REN trajectory. A transparent, diversified, and performance-linked public financing approach, aligned with climate, social equity, and development goals, is essential to unlock the full potential of renewables. By enabling coordinated action across central and state levels, fostering financial innovation, and supporting local institutions, India can accelerate its energy transition while safeguarding inclusive and sustainable growth.

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## Appendix

**Appendix Table 1: Key Public Finance Schemes Supporting Clean Energy**

Scheme	Launch Year	Key Objective	Target/Progress
PM-KUSUM (Kisan Urja Suraksha Evam Utthaan Mahabhayan)	2019	Aimed at ensuring energy security for farmers in India, along with honouring India's commitment to increase the share of installed capacity of electric power from non-fossil-fuel sources to 40% by 2030 as part of Intended Nationally Determined Contributions (INDCs).	30 GW solar capacity by 2026 (Phase III underway)
PM Surya Ghar: Muft Bijli Yojana	2024	Investment of over Rs. 75,000 crore, with the aim to light up 1 crore households by providing up to 300 units of free electricity every month.	Target is 25 lakh Rooftop Solar (RTS) Systems; 10,44,035 total installations and 13,32,400 households completed so far. Gujarat has the highest with 4,76,355 households covered.
Rooftop Solar Phase II	2022	To promote grid-connected SPV rooftop and small SPV power generating plants among residential, community, institutional, industrial, and commercial establishments.	4GW installed (of the 40GW target)
National Wind-Solar Hybrid Policy	2018	Main objective is to provide a framework for the promotion of large grid-connected wind-solar PV hybrid systems for optimal and efficient utilisation of wind and solar resources, transmission infrastructure and land. Also aims to encourage new technologies, methods and way-outs, involving combined operation of wind and solar PV plants.	5GW tendered (e.g., SECI's 1.2GW in Gujarat)
National Green Hydrogen Mission	2023	Demand creation: Making Indian-produced green hydrogen competitive for domestic and export markets. Supply-side interventions: Incentive frameworks to address constraints in production and distribution. Building an enabling ecosystem by supporting scaling and development through infrastructure and technological advancements.	The target is to achieve 5 MMTPA of green hydrogen production capacity with associated RE capacity of about 125 GW. These targets are projected for FY 2029–30, with no intermediate milestones. Rs.19,744 crore allocated for R&D and pilot projects
SATAT (Sustainable Alternative Towards Affordable Transportation)	2018	A government initiative to promote the production and utilisation of compressed bio-gas (CBG) as an alternative to traditional fossil fuels. Launched in 2018, it aims to reduce dependency on imported oil, tackle pollution, and create economic opportunities.	5,000 CBG plants planned (900+ approved) and a total financial outlay of Rs. 564.75 crore for FY 2023-24 to FY 2026-27.
FAME-II (Faster Adoption and	2019	Main objective is to encourage faster adoption of electric and hybrid vehicles by offering incentives on the purchase of electric vehicles and by establishing the necessary charging infrastructure for EVs.	10 lakh e-2W, 5 lakh e-3W, 55,000 4Ws, 7,000 e-buses, 7,000 charging stations sanctioned with an outlay of Rs. 10,000 crore

<b>Scheme</b>	<b>Launch Year</b>	<b>Key Objective</b>	<b>Target/Progress</b>
Manufacturing of EVs)			
Green Energy Corridors	2015	The Intra-State Transmission System (InSTS) GEC-I scheme is being implemented by eight renewable-rich states, namely Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Tamil Nadu. The scheme is implemented by the respective State Transmission Utilities (STUs).	By completing over 10,000 km of transmission lines under Phase I, the Green Energy Corridors scheme has significantly enhanced the grid's ability to absorb intermittent renewable power, with 40% of the funding coming from the MNRE and EUR500 million from KfW.
PLI Scheme for Solar Modules	2021	India's solar manufacturing push aims to boost high-efficiency PV module production through technology-neutral incentives, prioritising better-performing technologies. The scheme promotes integrated plants for quality and competitiveness while building local supply chains. This supports job creation and reduces import dependence, fostering a self-sufficient solar industry.	48GW manufacturing capacity allocated to firms like Reliance and Adani.

**Source:** Compiled from various Government scheme documents.

**Appendix Table 2: Minor-Head-Wise Fund Utilisation in RE Sector in Gujarat (%)**

Major Head	Minor Head	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
2810- New and Renewable Energy	102 Renewable Energy and Rural Application	350	32	250	56	136	151
	103 Renewable Energy for Urban Industrial	-	-	0	0	0	-
	104 Research, Design & Development in Renewable Energy	-	-	-	-	-	-
	105 Supporting Programmes	-	0	0	0	23	29
	188 Assistance to Autonomous Bodies	-	-	-	-	-	-
	190 Assistance to Public Sector and other Undertakings	-	-	8	25	124	94
	796 Tribal Area Sub-Plan	24	93	42	45	61	72
	800 Other Expenditure	88	96	83	73	89	74
4810- Capital Outlay to Renewable Energy	101 New and Renewable Energy Programmes & Applications	-	0	-	-	-	-
	190 Investments in Public Sector and other Undertakings	-	-	78	78	253	8
	796 Tribal Area Sub-Plan	-	-	-	-	-	-

*Source:* Compiled from the Detailed Demand for Grants Gujarat, various years.

**Appendix Table 3: Minor-Head-Wise Fund Utilisation in RE Sector in Chhattisgarh (%)**

Major Head	Minor Head	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
2810- New and Renewable Energy	101- Grid Interactive and Distributed Renewable Energy	50	98	75	100	104	75
	104- Research Design and Development in Renewable Energy	45	172	83	70	88	93
	800- Other Expenditure	35	3	0	-	-	-
4810- Capital Outlay on non-conventional sources of energy	101- Investments in State Electricity Boards	-	-	-	105	120	110
	101- New and Renewable Energy Programme and Applications	109	116	74	98	119	108
	102- Solar	0	-	-	-	-	-

*Source:* Compiled from the Detailed Demand for Grants Chhattisgarh, various years.

**Appendix Table 4: Minor-Head-Wise Fund Utilisation in RE in Uttar Pradesh (%)**

Major Head	Minor Head	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
2810- New and Renewable Energy	101- Grid Interactive and Distributed Renewable Energy	114	96	80	82	85	70
	102- Renewable Energy for Rural Applications	-	-	-	-	-	-
	103- Storage Charges - Electricity Duty	-	-	-	-	-	-
	104- Research, Design and Development in Renewable Energy	-	-	-	-	-	-
	789- Special Component Plan for Scheduled Castes	100	100	0	100	100	100
	800- Other Expenditure	76	51	14	4	13	67
4810- Capital Outlay on New and Renewable Energy	101- Grid Interactive and Distributed Renewable Energy	-	-	-	-	-	-
	102- Renewable Energy for Rural Applications	27	0	100	100	191	39

**Source:** Compiled from Detailed Demand for Grants, Uttar Pradesh.

**Appendix Table 5: Minor-Head-Wise Fund Utilisation in RE in Maharashtra (%)**

Major Head	Minor Head	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
2810- New and Renewable Energy	102 Photovoltaic (01) Programme for Installation of Solar Power Agricultural Pumps	100	3	25	20	70	30
	105 Supporting Programme	80	0	-	-	-	-
	789 Special Component Plan for Scheduled Castes	-	0	0	0	100	70
	800 Other Expenditure	58	17	4	60	23	19
	796 Tribal Area Sub-Plan	-	-	100	75	100	0

**Source:** Compiled from Detailed Demand for Grants, Maharashtra.

**Appendix Table 6: Minor-Head-Wise Fund Utilisation in RE in Haryana (%)**

Major Head	Minor Head	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
2810- New and Renewable Energy	001-Direction and Administration	87	85	82	90	83	75
	101- Grid Interactive and Distributed Renewable Power	66	6	97	179	74	157
	102- Renewable Energy for Rural Applications	-	1512	54	1	19	14
	103- Renewable Energy for Urban Industrial & Commercial Applications	-	30	-	-	-	-
	104- Research Design & Development in Renewable Energy	-	41	25	39	0	-
	105- Supporting Programme	-	-	-	0	-	-
	190- Assistance to Public Sector and other Undertakings	85	41	34	170	93	91
	789- Special Component Plan for Scheduled Castes	-	3555	20	3	0	0
	792- Irrecoverable Loans Written Off	-	-	-	-	-	-
4810- Capital Outlay on New and Renewable energy	101-New and Renewable Energy Programmes & Applications	-	50	100	139	-	-

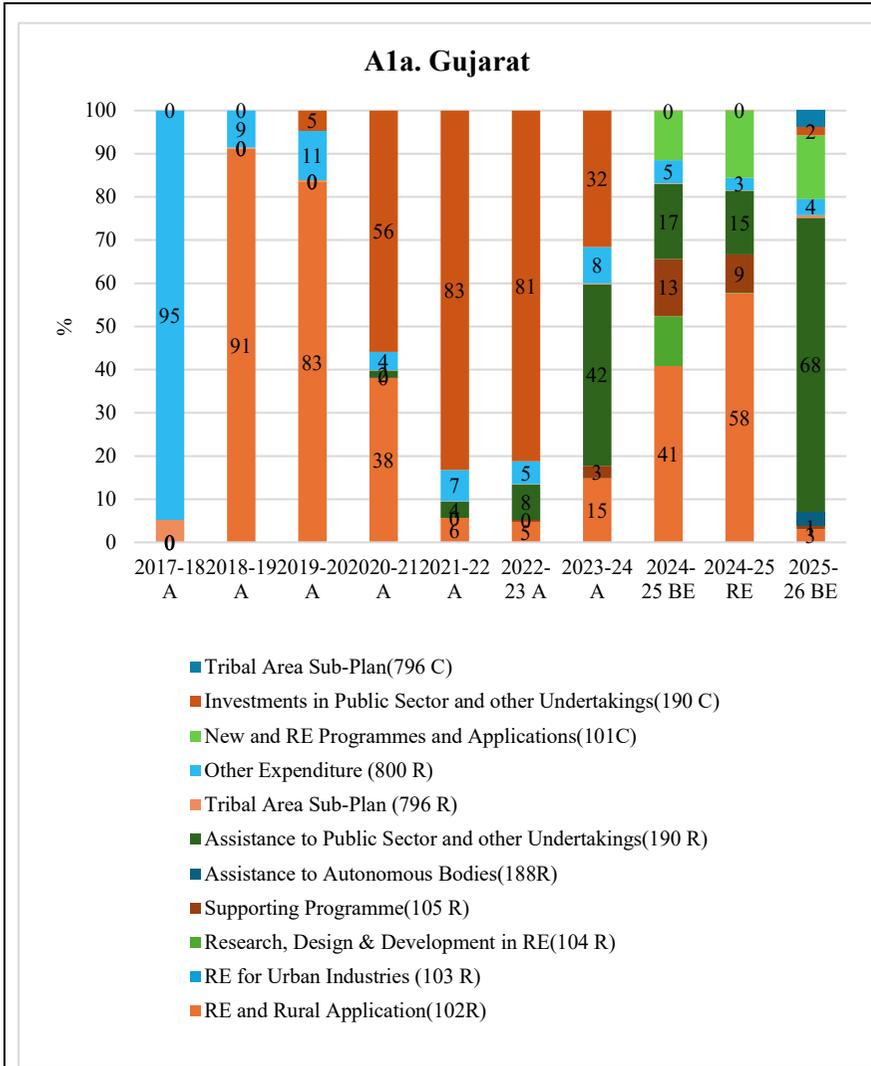
*Source:* Compiled from Detailed Demand for Grants, Haryana.

**Appendix Table 7: Minor-Head-Wise Fund Utilisation in RE in Jharkhand (%)**

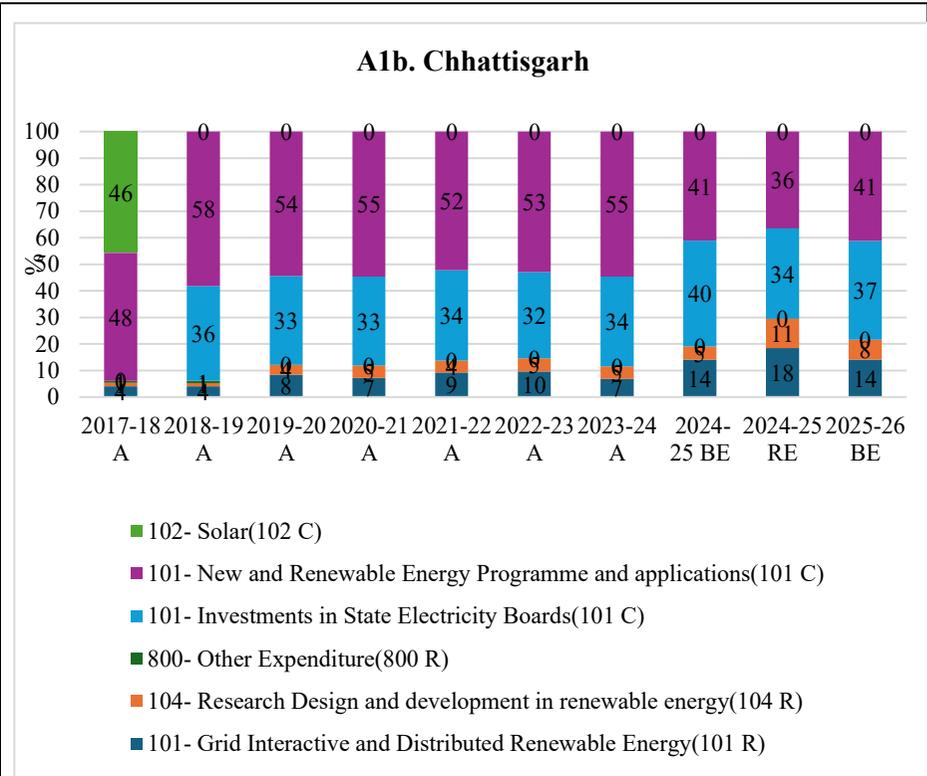
Major Head	Minor Head	2018-19	2019-20	2020-21	2021-22	2022-23
2810	101- Grid interactive and Distributed Renewable Power	100	100	100	100	146
	789- Special Component Plan for Scheduled Castes	100	100	100	100	146
	796- Tribal Area Sub-Plan	100	100	100	100	146

*Source:* Compiled from Detailed Demand for Grants, Jharkhand.

**Appendix Figure 1: Minor-Head-Wise Share in Renewable Energy in Selected States (%)**

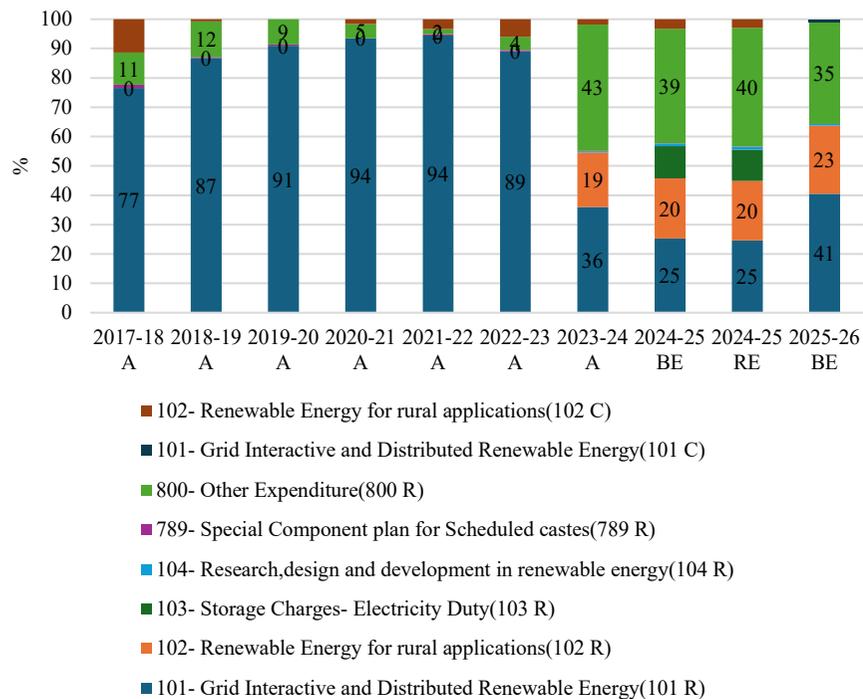


**Source:** Compiled from the Detailed Demand for Grants Gujarat, various years.



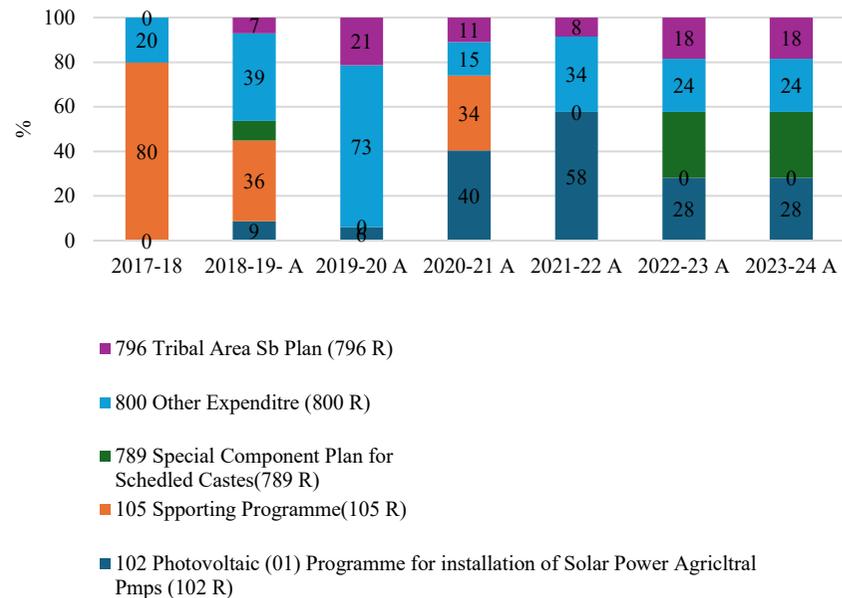
**Source:** Compiled from the Detailed Demand for Grants Chhattisgarh, various years.

### A1c. Uttar Pradesh



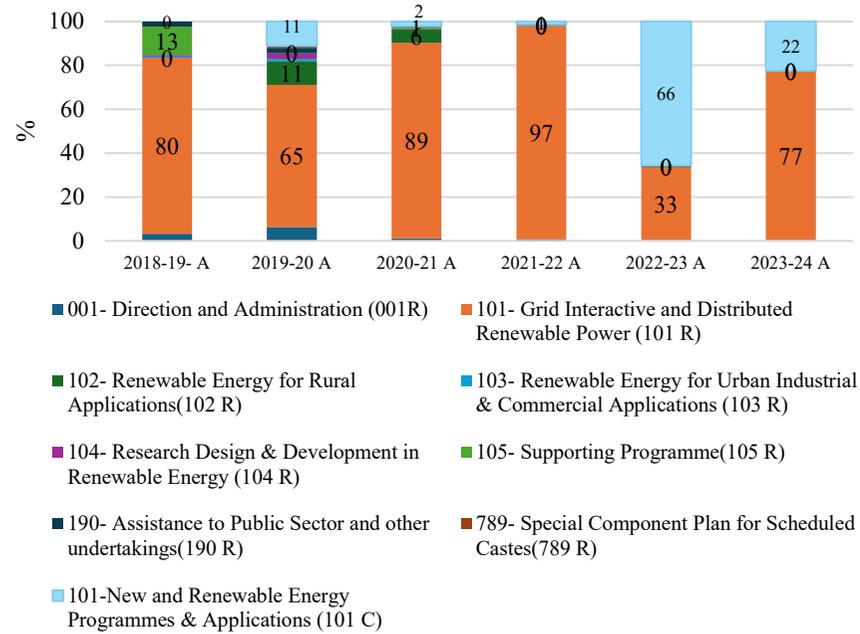
**Source:** Compiled from the Detailed Demand for Grants Uttar Pradesh, various years.

### A1d. Maharashtra



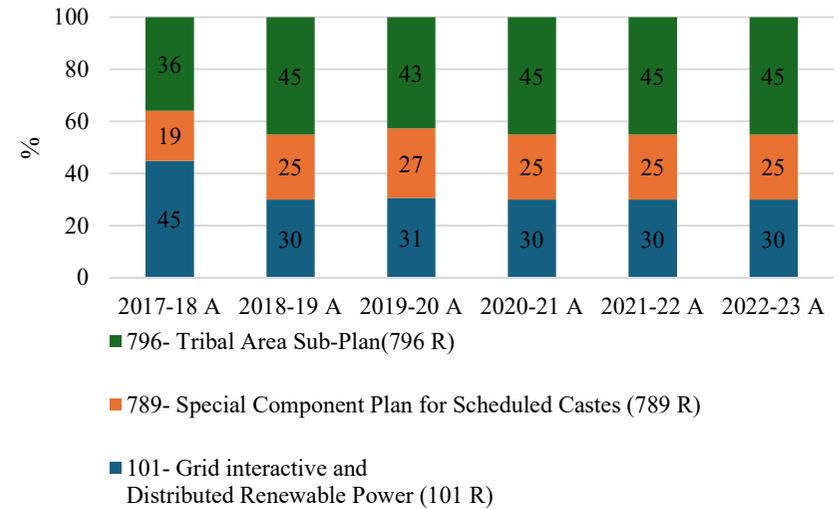
**Source:** Compiled from the Detailed Demand for Grants Maharashtra, various years.

### A1e. Haryana



**Source:** Compiled from the Detailed Demand for Grants Haryana, various years.

### A1f. Jharkhand



**Source:** Compiled from the Detailed Demand for Grants Jharkhand, various years.

**Appendix Table 8: Share of Schemes in RE Expenditure in Gujarat (%)**

Scheme	2017-18	2018-19	2019-20	2020-21	2021-22	2022-	2023-24	2024-25	2024-25	2025-26
	A	A	A	A	A	23 A	A	BE	RE	BE
Setting up Grid Connected Solar PV Power Project on Govt. Waste land near GETCOs Sub Stations	0	0	5	56	75	73	0	37	55	33
Development of Electric Vehicle Charging Infrastructure in the State.	0	0	0	0	0	0	0	0	0	5
Assistance to promote adoption of electric vehicle	0	0	0	0	0	0	0	1	0	0
Solar Rooftop on Govt Buildings	0	0	0	0	0	0	0	0	0	4
Solar Park in the State	0	0	0	0	8	8	32	0	0	2
Bio-Fuel Policy Implementation	0	0	0	0	0	0	0	0	0	0
Assistance for Energy Conservation	0	0	0	0	0	0	0	11	8	9
PM KUSUM Scheme (Component-B) of Solar Agriculture Pump Sets	0	0	0	0	1	8	42	17	15	10
Solarization of Grid Connected AG Pumps under Component-C of PM KUSUM Scheme	0	0	0	1	3	0	0	0	0	0
Development of New/ Green Technology in Renewable Energy Sector.	0	0	0	0	0	0	1	1	0	1
Grid Connected Solar Microgrid for Agriculture pump sets	0	91	83	32	5	4	15	4	3	3
Assistance for various Storage Technologies like Pump Hydro storage, Battery Energy Storage System (BESS)	0	0	0	0	0	0	0	7	0	0
Assistance to GEDA for Renewable Energy	96	9	11	4	7	5	8	5	3	4
Solar projects under CAPEX model on government and semi-government offices and government residential buildings	0	0	0	0	0	0	0	11	16	15
PM Surya Ghar: Mufta Bijli Yojana	0	0	0	0	0	0	0	0	0	9
Others*	4	1	1	6	1	0	2	5	0	6
Total	100	100	100	100	100	100	100	100	100	100

**Source:** Compiled from the Detailed Demand for Grants Gujarat, various years.

**Appendix Table 9: Share of Schemes in the RE Expenditure in Chhattisgarh (%)**

Scheme	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2024-25	2025-26
	A	A	A	A	A	A	A	BE	RE	BE
3188- Grant- in- Aid to Energy Development Agency	1	1	3	4	3	4	4	4	9	5
5415- Subsidy for Rural Energy	0	0	0	0	0	0	0	0	1	1
5695- Chhattisgarh Bio-fuel Development Authority	0	0	0	0	0	0	0	0	1	1
6375- Solar powered tricycled scheme for handicapped persons	0	0	0	0	1	0	0	0	0	0
6785- Expenditure from Energy Conservation Fund	0	0	0	0	0	0	0	0	0	0
7110- Grid Connected Solar Roof Top Connected Programme	0	0	0	0	0	0	0	6	0	0
7694- Subsidy for solar energy-based schemes	3	1	3	2	3	3	2	2	5	5
7695- Capacity Upgradation and maintenance of existing plants	1	3	4	5	5	6	4	5	11	5
7696- Grants for promotion of non- conventional sources of energy other than solar energy	0	0	0	0	0	0	0	0	0	0
7697- Bio energy-based programmes	0	0	0	0	1	0	0	0	0	0
7698- Energy Education Grant	0	0	1	1	2	1	1	1	2	3
6415- PM Kusum Yojana	0	0	0	0	0	0	0	0	0	69
6416- Schemes for filling ponds with water from river/anicuts through solar pump	0	0	0	0	3	1	0	0	0	0
6483- Bioethanol Demonstration Plant	0	0	0	0	0	0	0	0	0	0
6634- Indira Gao Ganga Yojana	0	0	0	0	0	1	2	1	2	0
7061- Solar Community Irrigation Scheme	0	0	0	0	0	0	0	3	7	1
7203- Chhattisgarh Gao Ganga Yojana	0	0	0	0	0	0	0	0	0	1
7209- PM Surya Ghar Mufta Bijli Yojana	0	0	0	0	0	0	0	0	0	7
7652- Deendayal Upadhyay Gramjyoti Yojana	2	0	6	0	0	0	0	0	0	0
7693- Grants for creation of solar pump	88	90	75	88	77	83	86	76	60	0
7897- Prime Minister Sahaj Electricity to each household (Saubhagya Yojana)	3	4	6	0	6	0	0	0	0	0
8965- Chief Minister Majra Tola Electrification	2	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100

*Source:* Compiled from the Detailed Demand for Grants Chhattisgarh, various years.

**Appendix Table 10: Share of Schemes in the RE Expenditure in Uttar Pradesh (%)**

Scheme	2017-18 A	2018-19 A	2019-20 A	2020-21 A	2021-22 A	2022-23 A	2023-24 A	2024-25 BE	2024-25 RE	2025-26 BE
PM-KUSUM	0	0	0	0	0	0	8	16	16	19
Solar City	0	0	0	0	0	0	11	6	6	8
Solar/ Bio Energy Policy, 2022	0	0	0	0	0	0	3	8	8	7
Electrification of villages through solar energy under Decentralised Distributed Generation(DDG) program	0	0	0	0	0	2	6	3	3	3
Grid Connected Biomass Solar Hybrid Power plant	10	0	0	0	0	0	0	0	0	0
Modernisation/Renovation of New and Renewable Energy Training Centres	1	0	0	0	0	0	0	0	0	0
Implementation of additional energy source programs through Non-Conventional Energy Development Agency(District Plan)	1	0	0	0	0	0	35	27	29	27
Pt. Deendayal Upadhyay Solar Street lights Scheme	0	0	0	0	0	0	4	1	2	2
Babuji Kalyan Singh, installation of solar street lights under Gram Unnati Yojana	0	0	0	0	0	0	6	2	3	2
Rooftop solar power plants	0	0	0	0	0	0	18	16	16	30
Subsidy for Utility Scale Battery Storage -Solar Power Projects	0	0	0	0	0	0	0	11	11	0
Others*	88	99	99	100	99	97	9	8	7	1
Total	100	100	100	100	100	100	100	100	100	100

*Source:* Compiled from Detailed Demand for Grants, Uttar Pradesh.

**Appendix Table 11: Share of Schemes in RE Expenditure in Maharashtra (%)**

<b>Scheme</b>	<b>2017-18- A</b>	<b>2018-19- A</b>	<b>2019-20 A</b>	<b>2020-21 A</b>	<b>2021-22 A</b>	<b>2022-23 A</b>	<b>2023-24 A</b>	<b>2024-25 BE</b>	<b>2024-25 RE</b>	<b>2025-26 BE</b>
Chief Minister Solar Agriculture Pump Scheme	0	10	0	0	0	0	6	10	26	20
Capital investment in Solar Project.	0	0	0	0	0	0	0	0	0	0
Grant to Maharashtra State Electricity Distribution Company.	3	0	0	0	4	18	23	6	6	7
Photovoltaic (01) Programme for installation of Solar Power Agricultural Pumps.	0	7	95	31	51	0	0	0	0	0
Maharashtra Energy Development Fund scheme	18	36	0	0	10	0	0	0	0	0
To Install Energy Grid Programme under Renewable Energy (CSS)	79	37	0	31	0	0	0	0	0	0
Grant for installation of Solar Power Agricultural Pumps (State Share 5%)	0	10	5	38	31	40	46	63	28	39
Chief Minister Solar Agricultural Pump Scheme	0	0	0	0	4	42	25	21	40	34
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Source:** Compiled from Detailed Demand for Grants, Maharashtra.

**Appendix Table 12: Share of Schemes in RE Expenditure in Haryana (%)**

<b>Scheme</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>	<b>2024-25</b>	<b>2024-251</b>	<b>2025-26</b>
	<b>A</b>	<b>BE</b>	<b>RE</b>	<b>BE</b>						
Administrative Setup of New and Renewable Energy	4	7	7	1	1	1	0	0	0	0
Grid Connected Rooftop SPV Power Plant Programme	78	41	9	0	0	1	0	1	0	0
Installation of Solar Water Pumping System in the State	0	23	28	95	98	97	77	58	92	80
Promotion of New and Renewable Energy Sources	0	11	35	0	1	0	0	0	0	0
Promotion of New & Renewable Energy for Urban Industrial & Commercial Applications	1	1	0	0	0	0	0	0	0	0
Solar Thermal Energy Programme	0	0	0	0	0	0	0	0	0	0
Research Design & Development in Renewable Energy	1	3	1	0	0	0	0	0	0	0
Kalpana Chawla Haryana Solar Award	15	0	4	0	0	0	0	0	0	0
Energy Efficient Building Programme	0	1	2	0	0	0	0	0	0	0
Supporting Programme for promotion of New & Renewable Energy Source and Energy Conservation	2	2	0	1	1	1	0	0	0	0
Shikshadeep Scheme on LED Based Solar Lanterns for Scheduled Castes Students	0	1	1	0	0	0	0	0	0	0
New and Renewable Energy Programmes & Applications	0	12	13	2	0	0	22	40	8	20
<b>Total</b>	<b>100</b>	<b>100</b>								

**Source:** Compiled from Detailed Demand for Grants, Haryana.

**Appendix Table 13: Share of JREDA Non-Conventional Sources of Energy Scheme in the Renewable Energy Expenditure in Jharkhand (%)**

<b>Year</b>	<b>Share</b>
2017-18 A	100
2018-19 A	100
2019-20 A	100
2020-21 A	100
2021-22 A	100
2022-23 A	100
2023-24 BE	100
2023-24 RE	100
2024-25 BE	100

**Source:** Compiled from Detailed Demand for Grants, Jharkhand. No further classification is available in state budget document.



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