

ENABLING RENEWABLE ENERGY GROWTH IN JHARKHAND

Focus on Policies
and Institutions



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List of Abbreviations

BESS	Battery Energy Storage Systems
CEA	Central Electricity Authority
CMPDI	Central Mine Planning & Design Institute
DISCOM	Distribution Company
DRE	Distributed Renewable Energy
DVC	Damodar Valley Corporation
ESO	Energy Storage Obligation
GSDP	Gross State Domestic Product
IPP	Independent Power Producer
ISTS	Inter State Transmission System
JBVNL	Jharkhand Bijli Vitran Nigam Limited
JREDA	Jharkhand Renewable Energy Development Agency
LCOE	Levelised Cost of Electricity
LGBR	Load Generation Balance Report
MNRE	Ministry of New & Renewable Energy
PM-KUSUM	Pradhan Mantri - Kisan Urja Suraksha evam Utthaan Mahabhiyan
PSU	Public Sector Units
R&D	Research and Development
RE	Renewable Energy
REDA	Renewable Energy Development Agency
RPO	Renewable Purchase Obligation
SECI	Solar Energy Corporation of India
SGST	State Goods and Services Tax
SLDC	State Load Dispatch Centre
TPP	Thermal Power Plant
TRANSCO	Transmission Company

Executive summary

Jharkhand is rich in natural resources, accounting for 26% of the country's iron ore and 27% of its coal reserves, respectively. These resources have supported the growth of a substantial industrial base, primarily in steel and cement production, while positioning the state as a hub for thermal power generation. As a result, Jharkhand's industrial expansion has closely aligned with India's broader industrial trajectory.

However, this trajectory may shift in the future. As part of its global climate commitments, India is actively working to identify and implement low carbon pathways for its industrial and energy sectors. Since 2012, the country has added over 100 GW of renewable energy (RE) capacity, with green industries thriving in the southern and western states. If Jharkhand does not adapt, its role in India's energy and industrial future could diminish.

To sustain and accelerate economic growth, Jharkhand must embrace sustainable development pathways. Encouragingly, the state is well positioned to do so. It holds critical minerals—such as lithium, silicon, and graphite—that are essential to green industries and local RE development. Furthermore, Jharkhand has significant RE potential, estimated at 77.5 GW by iFOREST's latest assessment and 18.4 GW by the Ministry of New and Renewable Energy earlier. Yet, the state's current RE capacity remains low, standing at only 409 MW, which is a mere 0.25% of India's total RE capacity.

In response, Jharkhand has rolled out key policies to boost RE development, such as the "State Solar Policy 2022," which aims for 4,000 MW of solar capacity by 2027. This policy targets growth in utility-scale solar, rooftop solar, and distributed renewable energy (DRE), with a focus on attracting private investment and improving energy access. However, the state lagged in implementation as it had missed its 2023–24 target of 443 MW by a wide margin.

Several factors contribute to Jharkhand's slow progress in the RE sector. One of the major challenge that has contributed to the slow progress is the state's underdeveloped institutional capacity. The Jharkhand Renewable Energy Development Agency (JREDA), responsible for RE development, currently operates with limited technical staff and lacks decentralized offices, hindering its reach and effectiveness. Moreover, JREDA's financial model relies heavily on delayed government grants, impairing timely project execution.

Policy enforcement is another concern. Jharkhand has struggled to meet its Renewable Purchase Obligation (RPO) targets, which mandate a specific share of electricity from renewable sources. In FY 2024-25, the JBVNL procured 11.33% of its power from RE which is well below the mandated 25%.

Nonetheless, the report identifies several opportunities to accelerate Jharkhand's energy transition. The state's rapid growth in electricity demand—driven by industrial expansion and population growth—presents an opportunity for RE integration. Between FY 2015-16 and FY 2024-25, electricity demand in Jharkhand rose by 90% with a shortfall of 0.5% in FY 2024-25 (one of the highest in India). Bridging this gap through RE can reduce deficits and ensure supply security.

This report also explores the potential to decarbonize Jharkhand's industrial sector. As a major industrial hub, the state has the opportunity to adopt green technologies such as carbon capture, utilization, and storage (CCUS) and green

hydrogen to reduce emissions from heavy industries. Furthermore, establishing local manufacturing capabilities for RE equipment—such as solar panels and storage systems—would also stimulate job creation and stimulate economic growth.

To realize these opportunities, the report recommends strengthening the policy framework and institutional capacity. Expansion of JREDA's technical workforce, decentralizing operations, and improving coordination with other government agencies to streamline project approvals and land acquisition. Additionally, introducing stronger financial incentives for RE investments, including subsidies, tax exemptions, and reduced transmission charges for developers can be explored by the state. These measures would help the state offset their higher levelized cost of energy (LCOE) for RE projects in Jharkhand, compared to that in states like Rajasthan and Karnataka.

The report also emphasizes the need for a robust RE ecosystem in Jharkhand, which could be fostered through demand aggregation models that allow small and medium-sized industries to pool their energy needs, facilitating larger and more viable projects. Stronger partnerships between industries and RE developers, can help accelerate the adoption of clean energy in its industrial sector and reducing coal dependence.

Jharkhand currently faces multiple challenges in enabling RE growth, it also holds clear and actionable pathways to overcome them. By strengthening its policies, building institutional capacity, and attracting more investment, the state can unlock its RE potential and contribute to India's broader clean energy goals. A successful energy transition would not only reduce Jharkhand's dependence on coal but also position it as a leader in green industrial development, driving sustainable economic growth and generate employment.

CHAPTER 1

Introduction



Jharkhand is one of India's major mining and industrial hubs and a vital part of the country's energy landscape, holding almost 40% of India's mineral resources¹ and 29% of all coal reserves². Jharkhand's Gross State Domestic Product (GSDP) is projected to reach a value of ₹5,06,356 crore marking, a growth of 7.5% over FY 2025-26³. A substantial share of the GSDP is constituted by primary sectors. The state is currently the largest producer of iron ore, uranium, mica, and coal in the country⁴.

Coal remains a key component of the state's economic output. For the year 2025-26, the state produced 191.158 million tonnes of coal, which constituted 19% of the national coal production⁵. Beyond its economic role, coal is also central to Jharkhand's energy profile. More than 85% of the state's utility capacity and 99% of captive power generation relies on fossil fuels, primarily coal.

Despite several attempts to promote renewable energy (RE) uptake in the state⁶, it has struggled to make a meaningful progress. As per MNRE's recent data, the state has a total installed RE capacity of 199 MW, which constitutes less than 1% of India's total RE capacity. RE procurement in the state has also underperformed⁷. In addition to the low installed capacity, the state's distribution company (DISCOM) has only procured 11.33% against the RPO mandate of 25% by JESRC.⁸

While Jharkhand underperforms in the installed RE capacity and RE procurement, the state does have a significant RE potential. The RE potential is assessed to be around 18.56 GW by the Ministry of New and Renewable Energy (MNRE), Government of India across solar, wind (at 150m agl), small hydro, and biomass sources. Independent studies suggest even higher potential. Harnessing this potential will require a comprehensive policy push⁹.

Jharkhand currently has one primary policy in place, the Jharkhand State Solar Policy, 2022, which sets a target of 4000 MW for solar power generation across utility, distributed renewable energy (DRE), and rooftop segments. Despite its moderate goal, the policy has been unsuccessful in spurring significant capacity development¹⁰. Moreover, the state's RE potential extends beyond solar, with significant opportunities in wind, hydro, and biomass energy. However, in the absence of a dedicated policy framework to harness these non-solar RE resources, the state risks falling short of its broader clean energy potential.

Given the growing importance of clean energy gains at both the national and state levels—driven by regulatory mandates and increasing market demand—it is essential to undertake a comprehensive review of existing policies. Such a review would not only assess the effectiveness of current frameworks in meeting their stated objectives but also help identify targeted policy and regulatory strategies to accelerate renewable energy development across all segments.

CHAPTER 2

State of the RE sector in Jharkhand



Jharkhand's renewable energy (RE) sector remains significantly underdeveloped—even when compared to neighbouring eastern states. Following a series of unsuccessful efforts, including policies (Jharkhand state solar policy 2015 and Jharkhand State Solar Rooftop Policy 2018), the state launched a fresh initiative through the Jharkhand State Solar Policy, 2022, to attract new developments in the sector. The 2022 policy places emphasis on expanding solar-based RE segments such as ground-mounted solar parks, rooftop solar systems, and distributed renewable energy (DRE), aiming to attract investment and scale adoption across these targeted domains.

Table 2.1: Installed utility and captive power capacity in Jharkhand

Energy source	Utility (MW)	Captive (MW)
Coal	2607.31	1524
Diesel	0	138.47
Gas	0	40
Hydro	191	0
RE	199.02	9.96
Total	2997.33	1712.43

Source: CEA, (As of 31/05/2025).

2.1 Installed capacity

Jharkhand has an installed capacity of 2,997 MW in the utility segment and 1,712 MW in the captive segment. The state's energy profile remains dominated by thermal power plants (TPPs). More than 85% (2,607 MW) of it's utility segment comes from coal based TPPs. As one of India's largest coal-producing state, the energy dynamics of the state also reflect the dominance of coal as the most tapped resource. By contrast, large hydro and RE sources represent only about 6–7% of the total utility capacity. In the captive segment, 99.5% (1,702 MW) of installed capacity is fossil fuel-based—including coal, diesel, and gas—while captive solar comprises less than 10 MW.¹¹

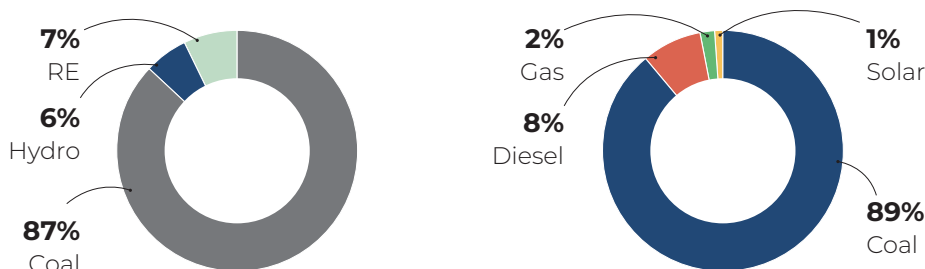
Figure 2.1: Installed capacity growth in Jharkhand



Source: CEA

A review of the year-on-year installed capacity growth in the state suggests that older coal-based TPPs were replaced by newer units in 2024. While the share of RE in the state's energy mix has gradually increased over time, the overall performance of the RE segment remains underwhelming.

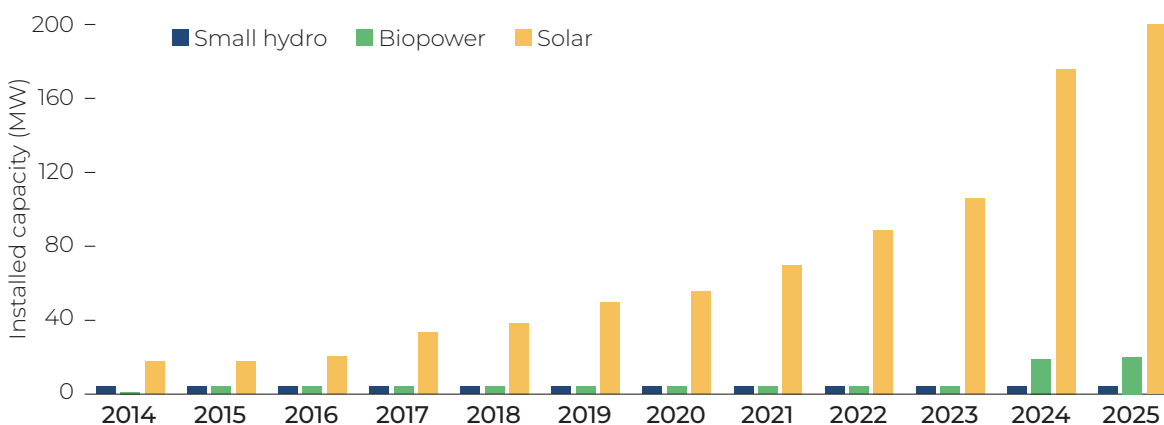
Figure 2.2 Installed captive and utility capacity in Jharkhand



Source: CEA

RE capacity growth in Jharkhand has been uneven across segments. Biopower and small hydro have remained largely stagnant, with biopower experiencing only brief increases in capacity during 2014–15 and 2023–24, and little movement in the intervening years. The only segment showing a consistent upward trend is solar energy, which aligns closely with the focus areas of the Jharkhand State Solar Policy, 2022. Between 2014 and 2024, the state's installed solar capacity expanded nearly tenfold. In terms of DRE, Jharkhand accounts for approximately 10% of all solar lanterns and 8% of total DRE installations in India. This reflects the aggressive stance of the past and present energy access related central and state schemes, as well as private sector deployments (under philanthropic funds and CSR support).¹²

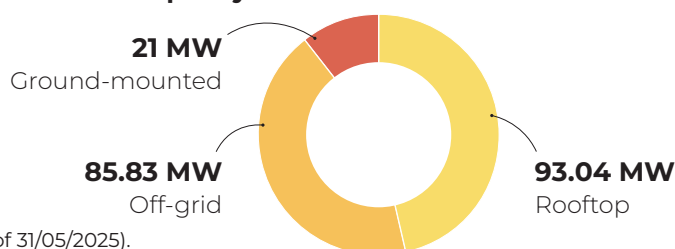
Figure 2.3: RE capacity growth in Jharkhand



Source: MNRE, (as of 31/05/2025).

Delving deeper into the installed solar capacity data, which has been rising steadily since 2014, the largest contribution comes solar in the state which constitutes 57 per cent of all solar capacity in the state. This is followed by off-grid solar/solar systems, including those deployed under the PM KUSUM scheme, representing 30 per cent of the total. Ground-mounted solar installations make up the remaining 13%.

Figure 2.4: Installed solar capacity in Jharkhand



Source: MNRE¹³, (as of 31/05/2025).

2.2 Policy landscape

Jharkhand has undertaken a series of policy measures to promote RE adoption since 2015. The currently active policy in the state, the Jharkhand State Solar Policy, 2022, is outlined below:

Table 2.2: Jharkhand State Solar Policy 2022

Policy Vision	This policy aims to facilitate energy transition for communities, businesses, and industries, fostering an environment conducive to business operations, promoting efficient technologies, and building necessary infrastructure. The policy emphasizes innovation and locally relevant business models, while also enhancing the capacity of implementing agencies and technical institutions. The objectives include empowering rural populations, ensuring access to clean and affordable energy, fostering sustainable urban and rural development, and promoting inclusive economic growth with full and productive employment opportunities.	
Objective & target	• Increase solar electricity share in DISCOM's energy purchase to 12.5 per cent by 2023-24, aligned with the State Commission's RPO trajectory. • Achieve 4,000 MW cumulative capacity by 2027 with diverse projects across scales, locations, and applications. • Develop a deployment roadmap covering utility-scale solar, distributed grid-connected, rooftop, and off-grid systems, fostering private investment. • Establish solar villages, cities, or districts through community projects, and promote energy storage integration. • Support domestic solar PV manufacturing, incentivize new deployment mechanisms, and encourage innovative non-electricity solar applications to boost employment and entrepreneurship. • Offer skill development training for employment generation, ensure last-mile connectivity for rural off-grid consumers, and promote gender inclusiveness in skilling and livelihood promotion. • Stimulate investment and job opportunities for overall state development.	
Technology specific targets	The policy has defined technology-specific measures and technology-specific targets. • Utility scale solar: 3,000 MW • Distributed solar: 720 MW • Off-grid solar: 280 MW	
Incentive and support	Stamp duty	100 per cent exemption of stamp duty on lease deed of land or purchase of land and any further sub-lease(s) for solar projects.
	Transmission and Wheeling Charges	100 per cent exemption for a period of 10 years on transmission and wheeling charges for grid-connected solar projects with storage selling power within the state. The transmission and distribution losses however are fully applicable for both third parties as well as captive solar within the state.
	Electricity duty	The electricity duty shall be exempted/reimbursed for 5 years from the commercial operation date for rooftop solar plants under net metering, captive solar projects, solar pumps, and EV charging stations set within the state in line with the Jharkhand Industrial and Investment Promotion Policy 2021

Table 2.2 continued

Jharkhand State Solar Policy, 2022		
	State Goods and Service Tax (SGST)	100 per cent exemption from the payment of SGST for all the inputs required for rooftop solar plants under net metering, captive solar projects, solar pumps, off-grid solar projects, or EV charging stations via the Commercial Tax department for a period of 5 years. (This exemption is subject to approval/recommendation from the GST council)
	Cross-subsidy and additional charge	The cross-subsidy surcharge and additional surcharge shall be exempted for the solar power projects set up for third-party sale within the state (less than 25 MW) and captive solar projects through open access.
	Banking Charges	- Banking charges shall be exempted for grid-connected rooftop solar projects and shall be adjusted in kind at 5 per cent of the energy delivered at the point of drawl. The banking year shall be from April to March. 100 per cent of energy shall be permitted during all 12 months of the year, based on the feasibility and prior approval of Jharkhand Transco/DISCOMs.
	Grid Connectivity and Evacuation	For solar projects based on government lands, the state transmission/ distribution utilities shall construct/augment the necessary grid infrastructure for connectivity and evacuation of solar power from the generating point through the nearest substations.
Nodal Agency and Responsibilities	Nodal agency: Jharkhand Renewable Energy Development Agency (JREDA) Responsibilities: - Facilitate the provision of evacuation Infrastructure for solar project development on government lands. - Setting up single-window facilities in coordination with other government departments. - Demand aggregation of power from government departments - Aggregating land parcel data from all concerned departments and inviting private lands through EOIs, followed by the development of a land bank and hosting it on its website - Oversee the implementation of the flagship 'Solar Village Program, where the main activities of JREDA include: - Identify and priority villages under the program - Develop and implement appropriate implementing models for each village - Oversee the procurement for solar projects to meet targets mentioned in this policy. - Identification of solar projects along with site(s) identification, potential assessment, and facilitating PPP arrangements. - Developing and maintaining rooftop solar data bank; building details and rooftop solar for commercial as well as industrial consumers. - Supporting the budgeting and financing of solar projects via supporting the state government and state-allocated funds for investment in solar projects. - Identifying and implementing skilling opportunities related to solar power development. - Facilitating and initiating R&D activities in regard to potential assessments, new technology identifications, storage, and green hydrogen among many others.	

Source: JREDA

The state solar policy has set categorical targets across all solar segments. During the policy period, it aims to support the implementation of 4,000 MW of installed solar capacity in the state across utility-scale (3,000 MW), off-grid (280 MW) and DRE (720 MW). The policy also provides detailed year-wise and category-wise installed capacity targets.

Table 2.3: Year-wise, category-wise solar capacity targets in Jharkhand

Project categories	Target (MW)	FY 23	FY 24	FY 25	FY 26	FY 27
1. Utility-scale	3,000	330	530	870	750	520
1.1. Solar parks	700	80	100	220	200	100
1.2. Non-park solar	1,000	100	150	300	250	200
1.3. Floating solar	900	100	200	250	200	150
1.4. Canal top solar	400	50	80	100	100	70
2. Distributed solar	720	80	120	175	175	170
2.1 Rooftop solar	250	30	50	60	60	50
2.2 Captive solar	220	30	40	50	50	50
2.3 Solar agriculture	250	20	30	65	65	70
3. Off-grid solar	280	33	47	60	65	75
3.1 Mini and microgrids (solar villages)	110	10	20	25	25	30
3.2. Solar for livelihood (solar for non-electric applications)	50	3	7	10	15	15
3.3 Solar pumps	120	20	20	25	25	30
Cumulative target	4,000	443	697	1,105	990	765

Source: JREDA

2.3 Recent developments

Despite the presence of a new policy, the Jharkhand has not seen significant on-ground progress in RE development. As per CEA's data, the state has only 3 projects in the pipeline comprising 1,089 MW. Of this, 989 MW is being implemented by the Damodar Valley Corporation (DVC) across Jharkhand and West Bengal. However, DVC is a central government utility and falls outside the purview of the Jharkhand State Solar Policy, 2022. Separately, the Solar Energy Corporation of India (SECI) is overseeing the development of a 100 MW floating solar project on the Getalsud Dam.¹⁴

The solar policy targeted an installation of 443 MW for the year 2023-24, and 697 MW in 2024-25. However, the state fell short of meeting its target for 2023-24. In addition to CEA's report on under-construction RE projects, media reports suggest additional solar projects in the pipeline worth 105.75 MW, of which most projects are captive solar projects undertaken by Coal India Limited.¹⁵

Table 2.4: Key solar projects in Jharkhand

Project name	Capacity	Implementing agency	Type of project	Project status
Central coal fields, Ranchi, NK Chatra	13 MW	Enerture Technologies	Ground mounted solar	Bids invited in March 2024
Palmu and East Singbhum	14 MW	JREDA	Ground mounted solar	Bids invited in March 2024
NTPC – North Karanpura	56 MW	NTPC	Floating solar	Bids invited in October 2023
Central coal fields - Ranchi	8 MW	CMPDI (a subsidiary of Coal India)	Ground mounted solar	Bids invited in October 2023
Central Coal Fields - Bokaro	6.25 MW	CMPDI (subsidiary of Coal India)	Ground mounted solar	Bids invited in August 2023
Central Coal Fields - Bokaro	8.5 MW	APM Projects	Ground mounted solar	Bids invited in August 2023

Source: Compiled from media sources

2.4 Institutional landscape

The Jharkhand Renewable Energy Development Agency (JREDA) was established in 2001 under the Department of Energy, Government of Jharkhand, with a mission to promote RE and improve energy efficiency across the state. As the designated nodal agency for state solar policy, JREDA is responsible for driving the adoption of clean energy technologies, while also acting as the designated agency for energy efficiency initiatives in Jharkhand.¹⁶

JREDA's primary areas of focus include large-scale solar energy projects, such as utility-scale solar plants and floating solar installations, as well as the deployment of solar water pumps. A significant project that underscores its efforts is the Giridih Solar City initiative, where JREDA is facilitating the development of 18 MW of ground-mounted solar systems and 22 MW of rooftop solar systems for commercial, institutional, and residential users.¹⁷ Notably, the responsibility for rooftop solar systems in the residential sector has been transferred to distribution company DISCOM. Additionally, JREDA has made considerable progress under the PM-KUSUM scheme, installing around 19,000 solar water pumps under its Component B.¹⁸

Despite various initiatives, JREDA's organizational structure remains highly centralized and lacks specialized divisions or district level offices. The agency functions with a lean team of 40 technical personnel and 10 support staff—significantly smaller than many of its higher-performing counterparts among renewable energy development agencies (REDAs) across the country. This centralisation presents distinct operational challenges. The absence of dedicated divisions for key functions restricts JREDA's flexibility and limits its technical depth, thereby hampering its ability to effectively oversee diverse and region-specific renewable energy programmes.

JREDA's financial model relies heavily¹⁹ on grants from both the state and central governments, with the state providing the majority of the funding. In 2023-24, the agency received an annual grant of ₹2.5 billion to finance its projects and operations. However, this funding model presents limitations, particularly as JREDA lacks a systematic mechanism²⁰ for ensuring the continuous flow of resources. Although the governing body is mandated to conduct quarterly reviews of the agency's financials, these reviews are frequently delayed by up to three months, which affects the agency's ability to stay on track with its financial oversight.

Furthermore, JREDA continues to face critical challenges²¹ in capacity building and monitoring. While technical officers are occasionally sent for training, the agency lacks a systematic framework for regular staff development and structured knowledge enhancement. This absence of a structured training program could affect the long-term effectiveness of JREDA's technical workforce. On the monitoring front, JREDA has engaged external organizations intermittently to carry out impact evaluations, but there are no continuous mechanisms for tracking the progress of projects in real-time.²²

JREDA is positioned to play a critical role in Jharkhand's renewable energy and energy efficiency landscape, its centralized structure, funding challenges, and lack of continuous monitoring and staff development mechanisms have hampered its operational efficiency. The agency's efforts, particularly in utility scale and DRE projects are important steps toward the state's energy transition. JREDA's institutional setup could benefit from stronger governance practices, regular training for technical staff, and the establishment of continuous monitoring systems to ensure that its projects are implemented efficiently and have a lasting impact.

2.5 Regulatory landscape

The regulatory landscape for RE procurements is guided by Jharkhand State Electricity Regulatory Commission (Renewable Energy Purchase Obligation and its compliance) (First Amendment) Regulations, 2021, wherein JSERC has set the RPO targets for various entities in the state, including DISCOM. However, the state regulation remains outdated, as it is not aligned with the latest national-level RPO and REC trajectory, and no draft update has yet been notified. Further, the state has not been able to comply with the prescribed RPO targets — in 2024-25 the actual achievement stood at only 5.83% for solar, 5.49% for non-solar, and 11.33% in total

Table 2.5: RPO targets defined by JSERC

	Solar	Non-solar	Total
2021-22	10.50%	10.50%	21.00%
2022-23	11.50%	11.50%	23.00%
2023-24	12.50%	12.50%	25.00%
2024-25	12.50%	12.50%	25.00%

Source: JSERC²³

The Renewable Purchase Obligation (RPO) applies to all distribution licensees, open-access consumers, and captive users within the state, under the following conditions:

1. **Captive Generating Plants:** Any individual or entity owning a captive generating²⁴ plant with an installed capacity of 5 MW or more (or as otherwise revised) and using the electricity generated for self-consumption is required to meet a minimum percentage of RPO based on the consumption from the captive source. This excludes captive consumers sourcing power from renewable energy-based plants. The capacity threshold may be revised periodically by the Commission through official orders.
2. **Open Access Consumers:** Any person with a contract demand of 1 MVA or more, consuming electricity generated from conventional fossil fuel-based sources through open access (as outlined in Section 42(2) of the Electricity Act), is also subject to a minimum RPO percentage. This obligation applies to the extent of their consumption through such open access sources. The Commission holds the authority to revise the applicable capacity thresholds as necessary through subsequent orders.

Under the defined criteria, the regulatory body has identified 20 entities responsible for complying with RPO targets.

Table 2.6: Entities responsible for RPO compliance

Category	Entity
Distribution Licensee	Jharkhand Bijli Vitran Nigam Ltd (JBVNL) – State DISCOM
	Tata Steel Ltd – Distribution License, Jamshedpur
	Tata Steel Utilities and Infrastructure Services Ltd, Saraikela
	Damodar Valley Corporation Ltd
	SAIL Bokaro – Distribution Licensee, Bokaro
Open Access	South Eastern Railways (Indian Railways)
Captive Power Plants	Tata Steel Ltd, Jamshedpur
	Usha Martin Ltd, Tatisilwai
	Tata Steel Long Products Ltd, Jamshedpur
	Hindalco Ltd, Muri
	ACC Cement Works, Chaibasa
	Grasim Ltd, Palamu
	Electrosteel Ltd, Bokaro
	SAIL Bokaro – Steel Plant
	Rungta Mines Ltd, Chaliyama Steel Plant
	Amalgam Steel and Power Ltd, Kandra
	Bihar Foundry & Casting Ltd, Hazaribagh
	Brahmaputra Metalliks Limited, Ramgarh
	Divine Vidyut Ltd, Palgam
	Kohinoor Steel Pvt Ltd, Adityapur

Source: JSERC

2.6 Key growth concerns

While the review of state policies suggest that Jharkhand has attempted a series of efforts to kickstart the promotion of RE in the state, the state has been unable to make any considerable progress towards developing RE capacity. The state faces a series of hindrances and challenges which have limited the growth of the RE sector, including underdeveloped institutional capabilities, local energy economics, policy & regulatory factors, and suitable waste land availability among many others.

One of the main concerns that has limited Jharkhand's growth is perceived low RE potential. MNRE's potential assessment numbers for solar, wind, and small hydro bio power act as the direction for state's policy makers and RE investors. However, MNRE's estimations are based on simplistic assumptions and grossly underestimate RE potential, especially for eastern states. In the case of Jharkhand, MNRE's estimation suggests only 18,567 MW of RE potential in the state while several independent assessments have estimated a potential higher than that from MNRE.

Further the demand for RE has also been curtailed in the state. Despite Jharkhand being one of the major power hubs for India, the state has been consistently facing shortages in energy supply and peak demand-supply. For the year 2023-24, the state had a requirement of 13,530 MU, while the Jharkhand Bijli Vitran Nigam Limited (JBVNL) supplied 9,665 MU and there was a shortage of 3,864 MU (28.6%). The deficit for the peak was 1150 MU (48%).

In addition to the energy shortages, the tariff orders also suggest that JBVNL is far from complying with RPO targets. For the year 2024-25, the DISCOM had a RPO target of 1766.93 MU from solar and 1766.93 MU from non-solar sources of which it was able to meet only 825.29 MU of solar RPO and 777 MU of non-solar RPO, falling short of 1602.29 MU.

The state DISCOM is not actively seeking to enter new PPAs, especially from RE producers, which will not only help meet energy demand but also comply with RPO targets. The lack of proactive approach in this regard has hindered the growth of the RE sector Jharkhand. Further, the RPO mandate in the state remains outdated and is yet to be aligned with the national mandate.

On the policy front, the state has not been successful in implementing the RE policies. Prior to the State Solar Policy 2022, the state had a series of RE policies with exclusive focus on utility-scale solar, DRE, and rooftop solar installations; Jharkhand State Solar Power Policy 2015 and the Jharkhand State Solar Rooftop Policy 2018.

The Jharkhand State Solar Policy 2015 had set a target of 2,650 MW to be installed by 2020 across three solar segments - Solar power plants, rooftop solar and thermal solar plants of target capacity of 2,100 MW, 500 MW and 50 MW respectively. However, the policy was not successful in meeting its mentioned targets.

Similarly, the Jharkhand solar rooftop policy 2018²⁵ was rolled out with the aim of scaling rooftop and small ground-mounted projects. The policy had set a target of 500 MW solar installations but was not successful in meeting the said targets.²⁶

Jharkhand currently has one active RE policy with a focus on solar. However, the non-solar segments; wind, hydro, biopower, and others have not been looked at.

RE segments such as large-scale ground mounted solar power plants are land intensive and require large wasteland parcels whereas wasteland in Jharkhand is limited. As per iFOREST's recent assessment, the state has wasteland of 10,698 sq km, and over 30% of the state is enveloped in forests too. Jharkhand has 14.76% of overall landmass designated as wasteland(s), of which several categories are not feasible for solar/RE development. The limited wasteland availability coupled with local land laws such as the Santhal Parganas Tenancy Act limits the use of agricultural land/pooling of land resources for RE project development.

Additionally, the cheaper coal-based energy for the very long term has also hindered the development of intra-state RE capacity. Jharkhand has some of the largest coal deposits in India and a high share of energy production capacity dependent on coal, which has consistently maintained coal prices and energy procurement costs amongst the cheapest in the country as well. Competitive energy prices have acted as a disabler for alternative energy resource development in the state. While western and southern states in India, which had to import coal from eastern states had higher costs for electricity produced from coal and were incentivised to develop alternative resource electricity.

2.7 Conclusion

RE comprises a marginal share of Jharkhand's energy mix. The state ranks among the states with the lowest share of RE capacity, even within the eastern region of India. Despite successive solar policies—including in 2015, 2018 and 2022—the state has consistently failed to meet its policy objectives and installation targets. More importantly, these policies have been unable to generate meaningful momentum within Jharkhand's RE sector, reflecting deeper structural, institutional, and implementation challenges.

An assessment of the Jharkhand State Solar Policy, 2022, and the efforts undertaken since its introduction, indicates that implementation during 2022–2024 has fallen short of the policy's stated targets. The policy had outlined a cumulative installation goal of 1,140 MW—comprising 443 MW in 2023 and 697 MW in 2024. However, the state has been unable to meet these benchmarks, highlighting persistent gaps in planning, execution, and investment mobilisation.

CHAPTER 3

New imperatives



Given the current low baseline of renewable energy (RE) development in Jharkhand, the state's RE resources remain significantly underutilized. To address this gap, the RE policy must prioritise generating initial momentum for project deployment, creating the institutional and market conditions necessary to catalyze investment, accelerate adoption, and demonstrate proof of concept across key RE segments.

In the effort to scale up RE development in a state like Jharkhand, it is essential to situate the state's progress within the broader trajectory of national RE growth over the past decade. National capacity addition has been disproportionately concentrated in western and southern states, which possess abundant natural resources, robust institutional ecosystems, and proven RE markets. In contrast, eastern states like Jharkhand—where RE sectors remain underdeveloped—face considerable challenges in attracting private investment and competing with more mature RE-rich regions. To address this asymmetry, Jharkhand requires enhanced government support to generate early momentum. This may include preferential policy instruments, risk mitigation frameworks, infrastructure readiness, and targeted funding mechanisms to unlock its untapped RE potential.

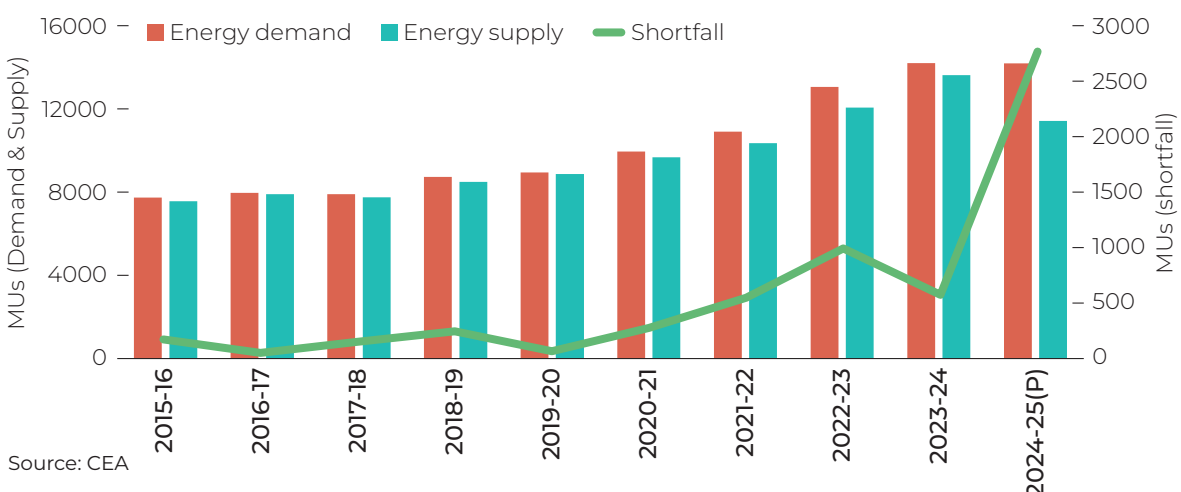
In addition to catalysing the initial momentum for RE development, Jharkhand's RE policy must also reflect the state's position as an industrial hub. To this end, the state should actively promote green technologies and low-carbon solutions such as industrial decarbonization, carbon capture and storage (CCS), green hydrogen deployment, and energy-efficient process innovations.

Moreover, building local RE capacity could rejuvenate Jharkhand's industrial sector. However, if the state lags in RE development, it risks missing out on opportunities that other states are already capitalising on. This section of the report identifies emerging imperatives and untapped opportunities for accelerating RE development in Jharkhand. Drawing from recent policy evaluations and sectoral trends, it presents a case for targeted interventions that can unlock the state's latent RE potential and establish a foundation for sustainable energy transition.

3.1 Expanding electricity demand

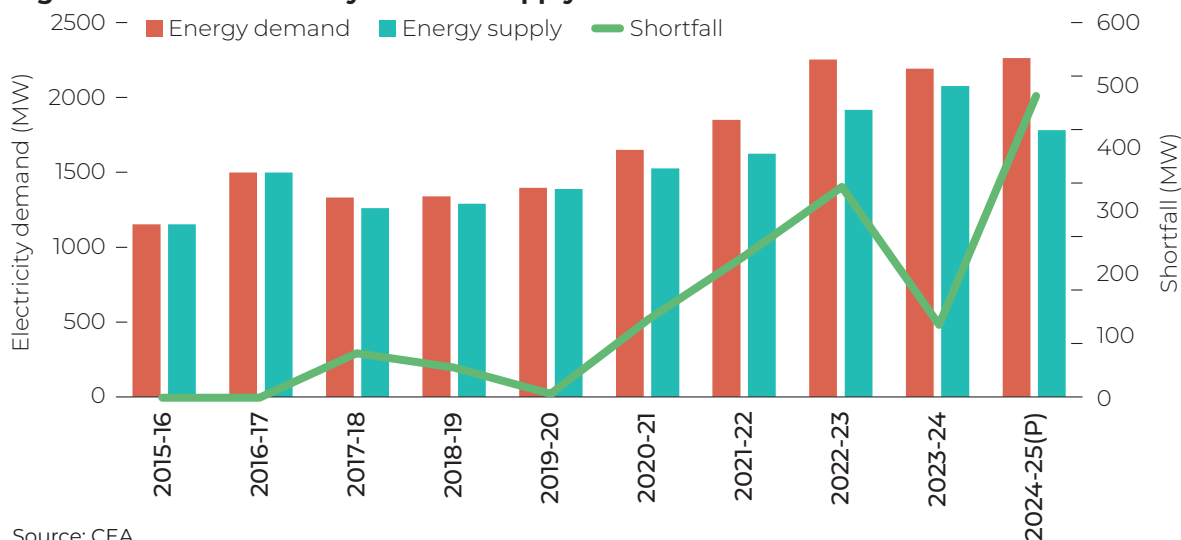
The electricity demand in Jharkhand has been steadily increasing. The electricity requirement has increased from 7,735 MUs in 2015-16 to 14,187 MUs in 2024-25, which is more than 83% increase within a decade. With the rapid growth, the state has been unable to keep up with the demand, leading to increased deficits year-on-year. The deficits in energy supply, until 2020 ranged between 2 to 3%. However, there is drastic rise in energy deficits in the recent years and the trend is expected to further increase sharply. For the year 2024-25, LBGR report anticipates the electricity deficit to be 2,764 MUs, which is 20% of the state's energy requirement.²⁷ However, as per CEA, the actual deficit is only 0.5% for FY 2024-25 (77 MUs).

Figure 3.1: Electricity demand and supply situation



Similarly, the state has been facing increasing deficits in meeting the peak demands. The state's peak demand has almost doubled from 1,153 MW in 2015-16 to 2,263 MW in 2024-25. The state's peak hour deficits have sharply increased. The LGBR 2024-25 anticipates the peak deficit to be 481 MW, which is more than 20% of the peak supply available.²⁸

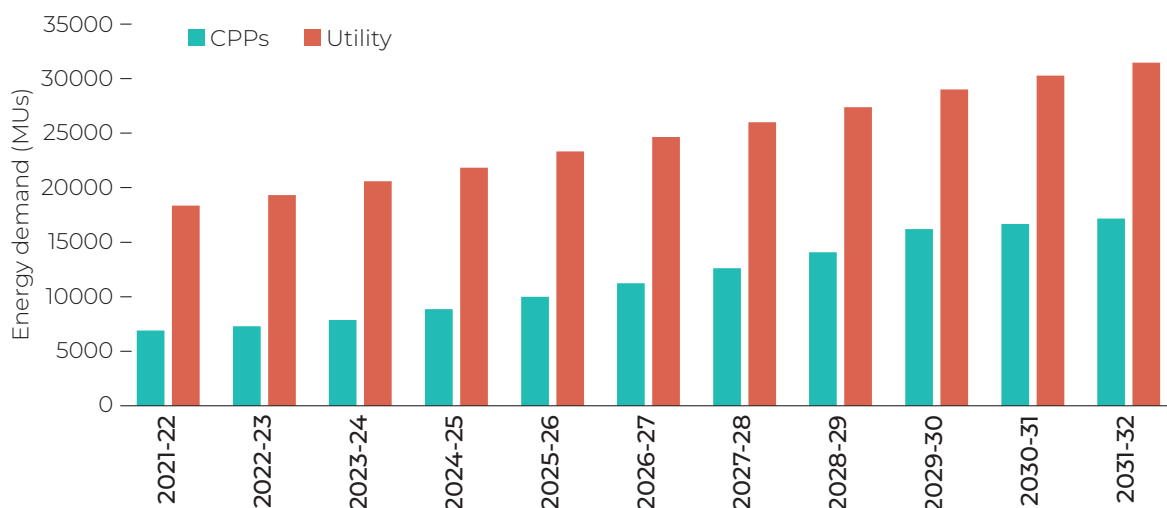
Figure 3.2: Peak electricity demand-supply scenario



Source: CEA

The growth in electricity demand is only projected to strengthen in the coming years. Jharkhand is comparatively underdeveloped and the state achieved 100% electrification only in 2019. There are significant growth and consumption levels to catch up to in the coming decade. According to CEA's 20th Electricity Power Survey of India, the utility electricity demand is projected to grow at a CAGR of 5.01% between 2021-22 to 2031-32 under a moderate scenario, while the captive demand is projected to grow by 8.63% during the same period. By 2031-32, the cumulative electricity demand in Jharkhand across the two segments is projected to increase to over 48,631 MUs. Amid this growing demand, RE will need to play an important role, especially when the state DISCOM²⁹ has been facing high energy deficit and RPO shortfalls as well.

Figure 3.3: Projected growth in utility and captive power requirement



Source: CEA

3.2 New RPO trajectory

Enhanced regulatory mandates for RE procurement provide a clear imperative for RE expansion. The RPOs established by the Ministry of Power emphasise the need to meet growing energy demands using RE sources. The latest RPO trajectory, issued in October 2023, requires obligated entities—such as distribution companies (DISCOM), captive power consumers, and OA users—to increase their electricity procurement from 29.9% in 2024-25 to 43.3% by 2029-30.³⁰ This trajectory also broadens the scope of eligible sources to include distributed renewable energy.³⁰

Table 3.1: Source-wise RPO targets under national mandate

Year	WPO	HPO	DRE	Other sources	Total
2024-25	0.67%	0.38%	1.50%	27.35%	29.91%
2025-26	1.45%	1.22%	2.10%	28.24%	33.01%
2026-27	1.97%	1.34%	2.70%	29.94%	35.95%
2027-28	2.45%	1.42%	3.30%	31.64%	38.81%
2028-29	2.95%	1.42%	3.90%	33.10%	41.36%
2029-30	3.48%	1.33%	4.50%	34.02%	43.33%

Note: WPO = Wind purchase obligation; HPO = Hydro purchase obligation; DRE = Distributed renewable energy
Source: Ministry of Power

Table 3.2: RE capacity requirement corresponding to new RPO trajectory for Jharkhand (MW)

Year	Segment	Wind	Hydro	DRE	Other	Total
2026-27	Utility	190.88	64.92	538.16	4,351.38	5,145
	Captive	93.67	31.86	264.09	2,135.35	2,525
2031-32	Utility	447.57	85.53	1,190.57	6,563.03	8,287
	Captive	237.23	45.33	631.04	3,478.63	4,392

Note: RPO for 2031-32 is assumed to be equal to 2029-30.
Source: iFOREST Assessment

The new RPO trajectory is yet to notified in Jharkhand, while the state discom has been consistently lagging behind in meeting even the lower RPO targets. For the year 2021-22, JESRC had mandated the DISCOM to source 21% (2,635.66 MU) electricity from renewable energy, 10.5% (1,317.83 MU) from solar and non-solar sources each.³¹ However, against the mandated RPO targets, the discom has met only 0.93% (128.9) MU from solar sources and 5.94% (816.89) MU from non-solar sources.³²

Table 3.3: RE procurements of JBVNL 2021-22

RE source	Generating station	Total units purchased (MU)	Total cost of purchase (₹ crores)	Cost of unit (₹/Kwh)
SOLAR	SECI (Tranche-I)	96.04	24.33	2.53
	SECI (MNRE-II)	14.72	9.09	6.18
	State IPPs	18.24	32.74	17.95
	Total	129	66.16	5.13
Wind	PTC	520.3	183.66	3.53
	SECI	296.62	80.69	2.72
	Total	816.92	264.36	3.24

Source: JSERC

It is also important to note, majority of the RE for RPO was inter-state and from central RE plants, and very minimal was procured from intra-state Independent Power Producers (IPPs). Solar RE procurement of 128.9 MU consisted of 100.76 MU from SECI and mere 18.24 MU from state IPPs. Similarly, the non-solar procurement consisted on 816.89 MU of wind from PTC and SECI. The overall intra-state RE procurement has been abysmally low.

Table 3.4: Estimated power purchase quantum for 2023-24

RE source	Generating station	Total units purchased (MU)	Total cost of purchase (₹ crores)	Cost of unit (₹/Kwh)
Solar	SECI (Tranche-I)	977.32	249.36	2.55
	SECI (MNRE-II)	15.03	3.92	2.61
	State IPPs	18.46	33.15	17.96
	Total	1010.81	286.43	2.83
Wind	PTC	467.53	165.04	3.53
	SECI	291.67	79.33	2.72
	Total	759.2	244.37	3.22

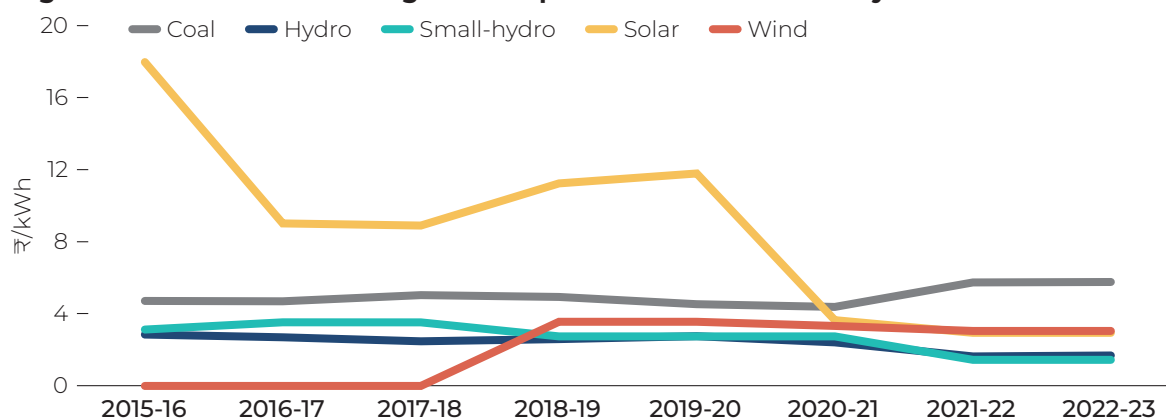
Source: JSERC

In addition to the RPO obligations, the central government's RPO notification also introduces Energy storage obligation (ESO) which increases from 1% during 2023-24 to 4% by 2029-30, to be met through solar and wind power projects with energy storage. This will be calculated in energy terms as a proportion of total electricity consumption and will be regarded as satisfied only when at least 85% of the total energy stored in the energy storage system is obtained from RE sources each year.³³

3.3 Economics of procurement

RE sources are increasingly becoming economically viable thanks to several converging factors. In case of Jharkhand, RE procurement costs have significantly reduced in the past few years owing to scaling of RE capacity in India and the RE procurement costs for DISCOM are significantly lower than coal-based electricity. The costs for solar procurement has drastically reduced from ₹18/kWh in 2015-16 to less than ₹3/kWh by 2022-23. Similarly, the costs for other RE procurement have also rationalised to prices below coal-based electricity prices. It is also important to note that the costs of coal-based electricity have increased by 20% during the same period.

Figure 3.4: Source-wise average cost of procurement of electricity



Source: Niti Aayog, India Climate and Energy Dashboard

Meanwhile, there is a strong argument for setting up new RE capacities within the state to meet the emerging RPO requirement, as the ISTS charges and losses waiver is set to be phased out. So far, Jharkhand has significant dependence on RE imports to meet the RPO requirement.

Though Jharkhand is often considered as a coal rich state, the state also faces periodical energy and peak shortages. The economics of the state also suggest that the state, despite housing large industries, has low levels of energy consumption and the state is in early stages of growth. The state is placed 27th among 33 Indian states in terms of GDP/capita, while the state has achieved 100% electrification only in the year 2019³⁴.

Jharkhand, as a comparatively underdeveloped state, is poised for substantial economic and infrastructural growth in the coming years. This upward trajectory implies that energy demand across sectors to increase at an accelerated pace. To meet these projected needs, the state must significantly expand its installed energy capacity, with RE playing a central role in ensuring sustainable, resilient, and inclusive growth.

3.4 Demand aggregation

A holistic state RE policy should prioritise the establishment of round-the-clock (RTC) plants through advanced tendering/procurement mechanisms. Jharkhand's energy requirements landscape is well suited to aggregate industrial demand and invite tenders for RTC RE plants, this approach will not only drive industrial decarbonisation objectives for heavy industries but also reduce the overall energy storage costs for RTC facilities significantly.

3.5 Building local manufacturing

Government of India is aiming to ramp up renewable equipment manufacturing in India, targeting both, domestic manufacturers and global manufacturers to set up RE equipment manufacturing in India. MNRE has initiated action towards setting up new hubs for manufacturing RE equipment in India to meet both domestic and global demand, aiming to manufacture silicon ingots and wafers, solar cells and modules, wind equipment and ancillary items like steel frames, inverters, batteries etc. Eastern states like Odisha have also shown keen interest in setting up renewable manufacturing parks.

In the current phase of green growth, job creation is expected to extend beyond energy into other sectors. A joint study by Sattva and the Skill Council for Green Jobs predicts that India could create up to 35 million green jobs by 2047, spanning not only energy but also waste management, electric vehicles, sustainable textiles, and green construction.

Jharkhand, already a power surplus state and a hub for heavy industries³⁵, provides a favourable environment for manufacturing. The state's industrial profile is skewed towards primary manufacturing (which includes ancillary products for renewable equipment manufacturing), including aluminum and steel products.

Being an industrialised hub, Jharkhand is well-positioned to expand its industrial profile to include secondary manufacturing. The state's industrial policy has already promoted renewable equipment manufacturing as one of priority industries, the state has attracted some solar equipment manufacturing capacity³⁶.

Establishing solar manufacturing capacity in Jharkhand presents a practical and high-impact opportunity, particularly in light of the state's rising demand from commercial and industrial (C&I) consumers and its favourable solar potential. Given these enabling conditions, solar manufacturing could become one of the most readily achievable interventions—offering dual benefits of supporting

domestic value chains and reducing dependence on imported components. By localizing module and component production, Jharkhand can create skilled jobs, attract climate-tech investments, and position itself as a regional hub for clean energy manufacturing aligned with national “Make in India” priorities. While non-solar renewable manufacturing such as wind are highly specialised industries and often require working with global companies for knowledge transfer and technical capabilities, the state can achieve the same through attracting foreign investments.

As part of regulatory support and implementation support, the new RE policy ensures that the obligated entities support the development of local resources through framework such as ‘Local Sources Requirement’ by procuring locally rather than importing from the inter-state RE market.

3.6 Conclusion

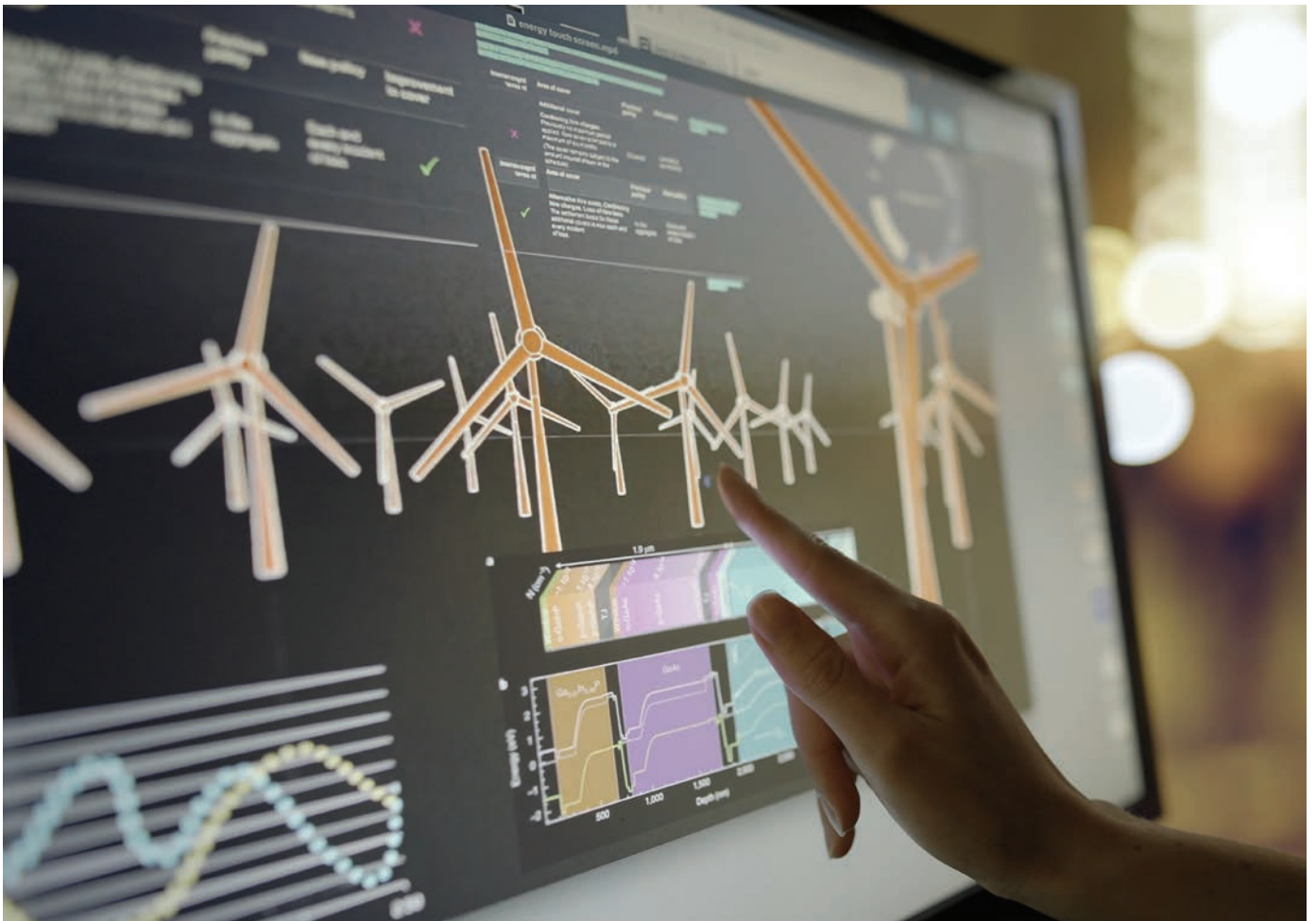
With electricity demand expected to rise sharply in the coming years, Jharkhand faces an upward sloping cost curve in energy procurement. The expenses could escalate sharply, especially as RE procurement—mandated by RPOs—will soon be undertaken without the benefit of ISTS charge waivers. This increase in electricity costs could further complicate efforts to green the state’s large- and small scale industries.

However, by transitioning to clean energy technologies for electricity generation, Jharkhand can not only meet the growing demand at a lower cost but also set the state on a path toward sustainable growth. Moving toward a greener industrial base would allow Jharkhand to tap into a significant share of the green jobs expected to be created in India over the next two decades, which is essential for ensuring a just transition for the state’s workforce.

To date, Jharkhand has remained largely peripheral to India’s renewable energy (RE) growth trajectory. However, with untapped RE potential and a robust industrial base, the state now stands at a pivotal juncture. By strategically aligning its energy ambitions with national and state targets, Jharkhand has a unique opportunity to become an active participant in the next phase of India’s clean energy expansion, contributing to both regional equity and national sustainability goals.

CHAPTER 4

Pathways to RE growth



Jharkhand is well-positioned to maintain its relevance in the energy sector while transitioning from conventional energy sources to renewable energy (RE) sources and partake in the next phase of RE growth. However, this transformational change will require cohesive and forward-looking and well-implemented policy and institutional strategies.

Despite having a series of dedicated RE policies, the state has consistently fallen short of achieving its targets owing to poor institutional capacity and inadequate direction to implementing institutions.

Given that Jharkhand has faced challenges in successfully implementing its solar energy policies, this is a crucial time to rethink the approach. The revised RE strategy should focus on enabling a supportive ecosystem—one that includes the right incentives, simplified regulatory processes, targeted infrastructure support, and dedicated efforts toward skill development and entrepreneurship.

Additionally, the Jharkhand Renewable Energy Development Agency (JREDA) must be strengthened to effectively facilitate investments, especially in the utility-scale RE sector. By addressing past shortcomings and aligning efforts with these objectives, Jharkhand can work toward revitalizing its RE landscape and driving sustainable growth in the state.

4.1 Policy strengthening

RE policies have been notified by nearly all states in India. These policies are aimed at supporting RE growth within the respective states, with defined implementation mechanisms and incentives for investors. A new and ambitious RE policy framework that targets comprehensive RE growth in Jharkhand must focus on the following parameters:

Develop a Comprehensive Policy Scope for Jharkhand: Jharkhand's potential in RE and decentralized renewable energy (DRE) technologies, have been underutilized by its policies. In contrast to other states, which have tailored their approaches based on local strengths—like Madhya Pradesh's focus on large-scale projects or Karnataka's inclusion of rooftop solar—Jharkhand's framework needs to be more expansive to include non-solar such as- wind, hydro, biomass, and energy storage, alongside utility-scale and DRE.

A renewed policy framework for Jharkhand must holistically address the full spectrum of RE technologies, encompassing both utility-scale and DRE solutions to provide a broad developmental framework and technology specific guidelines targeting high-potential areas that can drive growth.

Establish Technology-Specific Implementation Mechanisms: Jharkhand's RE policies must evolve to address its unique challenges and capitalize on its untapped potential, particularly in solar energy. The new policy framework should include facilitation mechanisms tailored to each RE technology:

For utility-scale solar projects, Jharkhand faces significant hurdles related to land identification and acquisition. To overcome these obstacles, the state nodal agency should establish a resource center dedicated to identifying viable solar projects, offer development options through public-sector units (PSUs) or private developers using competitive bidding processes. Innovative solutions, such as land lease agreements and virtual solar parks, should also be explored to manage fragmented land holdings effectively. Furthermore, targeted programs could be introduced to help meet Renewable Purchase Obligation (RPO) requirements through local solar initiatives, thus encouraging community engagement and investment.

For wind based projects, high-potential sites must be identified in collaboration with institutions like the National Institute of Wind Energy or through private resource assessments. A first-come, first-served approach for project development could help incentivize early developers, making it easier to tap into wind resources quickly.

For small hydro projects, waiving royalty requirements under the policy could further stimulate investment and promote sustainable energy generation. Additionally, prioritizing storage solutions, such as pumped hydro and battery energy storage systems (BESS), will be crucial to managing supply variability and enhancing grid stability. Jharkhand should also consider hybridizing thermal power plants with RE sources or bundling thermal and solar power projects to effectively meet the state's energy needs.

Incentivise utility and industrial RE procurement: To drive the development of RE in Jharkhand, the state must implement a robust incentive framework to encourage procurement of RE in both utility and industrial sectors. Jharkhand faces certain cost disadvantages in developing local RE projects compared to other states like Rajasthan and Karnataka. This is largely due to geographic and infrastructural factors, which result in higher costs. For example, estimates by iFOREST indicate that the levelized cost of energy (LCOE) for solar projects in Jharkhand could be approximately ₹0.21 per unit higher than similar projects in states with more favorable solar conditions, such as Rajasthan or Karnataka. Additionally, Jharkhand-based projects currently miss out on certain cost advantages, such as waived interstate transmission charges, which can add an extra ₹0.60 per unit for RE procured from outside the state.

To address this gap and promote investment in Jharkhand's local RE sector, the state government must design policies that offer competitive financial incentives. These could include tax breaks, subsidies, and rebates specifically aimed at offsetting the higher LCOE for developers who choose to invest in Jharkhand. Furthermore, the policy should strategically align these incentives with the planned phase-out of the Inter-State Transmission System (ISTS) charge waivers. As these waivers are gradually eliminated, the state should compensate developers by offering local incentives that make Jharkhand-based RE projects financially attractive.

Additionally, Jharkhand should focus on promoting demand aggregation models, which consolidate the energy demands of small to medium-sized industrial and commercial enterprises. By pooling demand, the state can facilitate larger and more economically viable RE projects through innovative tendering and procurement mechanisms. These models will allow smaller industries and businesses to access affordable RE through open-access mechanisms, thus stimulating RE adoption across the industrial sector. By doing so, Jharkhand can not only improve its RE capacity but also enhance the competitiveness of its industrial base, reduce energy procurement costs, and meet its Renewable Purchase Obligation (RPO) targets more efficiently.

Infrastructure support: In Jharkhand, two critical components that require attention are land acquisition and grid infrastructure development. While land acquisition is typically the responsibility of developers, the state can take steps to ease this process and encourage RE investments.

Jharkhand could follow the example set by states like Gujarat and Madhya Pradesh, which offer government wastelands or water bodies at concessional rates to developers who supply power to state utilities. This practice would reduce the financial burden on developers and helps in accelerating RE projects. Additionally, Jharkhand can adopt policies that enable deemed conversion of agricultural land for RE projects, which simplifies the land acquisition process and encourages investments in utility-scale and DRE projects.

To further support RE development, Jharkhand should establish dedicated units within its nodal agency, JAREDA. These units would focus on identifying suitable land and other resources for RE projects and work closely with developers to facilitate the overall project development process. Their responsibilities would include aggregating land parcels, assisting in project approvals, and ensuring the alignment of RE development with state energy goals.

In terms of grid infrastructure, the policy must prioritize the development of a robust RE evacuation system that can support the growing capacity of RE projects. This includes building new transmission lines, upgrading existing ones, and integrating advanced monitoring technologies to

maintain grid stability. Given the intermittent nature of renewable energy sources, it is also critical to implement technologies that ensure grid flexibility and reliability.

Create a Renewable Energy Ecosystem: The policy should incorporate measures to boost demand for renewable energy (RE) through initiatives such as green power tariffs for consumers aiming for 100% RE supply. Allowing the purchase of RE at pre-fixed, levelized tariffs for an initial capacity cap without competitive bidding can simplify the process. Furthermore, incentives should be established for the gradual development of green zones, cities, villages, and government buildings that utilize RE.

To cultivate a skilled workforce for the renewable energy sector, the policy should utilize existing skill development programs to train individuals in renewable energy technologies. This approach will address the increasing demand for skilled labor both within Jharkhand and beyond. Additionally, support for research and development (R&D) initiatives is crucial to foster innovation and sustain growth in Jharkhand's green economy.

Jharkhand's position as an industrial hub provides a favorable environment for establishing manufacturing within the RE sector. As an industrialized state, Jharkhand is well-equipped to broaden its industrial landscape to include RE manufacturing. The state's industrial policy has already recognized renewable equipment manufacturing as a priority sector, attracting initial investments in solar equipment manufacturing. By integrating renewable manufacturing into the state's RE policy and offering competitive incentives to investors, Jharkhand can tap into its underutilized solar manufacturing capacity and emerge as a leader in India's RE sector.

4.2 Institutional strengthening

One of the core factors determining Jharkhand's ability to enable energy transition is the capacity of its implementing agencies. JREDA must build its capacity as a facilitator and anchor the utility-scale RE segment (both for utility and captive capacities) and DRE implementation in the state. This would entail not only spearheading initiatives but also assessing opportunities, designing technology and policy solutions, engaging stakeholders, and fostering investments to ensure sustainable sectoral growth.

- **Identifying RE investment opportunities:** JREDA must establish capabilities to conduct thorough techno-economic assessments of the state's RE potential across different sources at utility and DRE scale. This is vital for shaping policy, designing tailored incentive packages, and creating a database of viable projects and development sites. Given the land constraints in Jharkhand, special emphasis should be placed on identifying parcels for solar installations, as well as alternatives like floating solar, canal-top solar, wind energy, small-hydro projects, agri-PV and pumped storage hydro.
- **Facilitate DRE deployments:** JREDA must also expand its capabilities to expand DRE deployments to oversee the designing, deploying, and managing DRE installations.
 - » Identify DRE opportunities in agriculture and non-agriculture areas, especially to enable energy accessibility in rural and remote areas in collaboration with state government and central government agencies through central schemes and secure additional funding through grants and low-cost loans.
 - » Drive demand creation through consumer awareness and engagement with DRE vendors to enable a robust vendor ecosystem, promoting local enterprise.
 - » Oversee the assessment management and after-sales services of DRE deployments, and periodic monitoring & evaluation of DRE deployments.

- » JREDA should also be directed to adopt a decentralized operational model to enable implementation support and after-sales services for distributed renewable energy (DRE) deployments at the district and regional levels. Establishing field offices across key geographies would strengthen last-mile service delivery, enhance technical troubleshooting, and improve uptake among end-users, particularly in rural and peri-urban areas.
- **Building a compelling investment case:** JREDA should lead efforts to attract RE investment by developing business models that match the state's techno-commercial landscape. This includes collaborating with state and central policymakers to establish favourable policies and incentives, as well as working with regulators to remove barriers to RE deployment. The agency could also pilot new technologies and business models to demonstrate their viability, and work closely with other stakeholders to aggregate demand and facilitate project development.
- **Enhancing ease of investment:** To create a more attractive environment for developers, JREDA must focus on streamlining the RE project development process. Key areas of support should include:
 - » Identifying and securing appropriate land, particularly given the challenges of land availability.
 - » Assisting developers with obtaining regulatory approvals from relevant authorities (e.g., discoms, transcos, SLDCs, electrical inspectors) quickly and efficiently, ideally through an online single-window clearance system to simplify the process.
 - » Ensuring the timely development of necessary infrastructure to support RE projects.
- **Cultivating a strong developer ecosystem:** The agency should actively engage with RE developers and DRE vendors by clearly communicating the state's investment opportunities. This can be achieved through a strategic communication plan that includes hosting investment summits and conducting targeted meetings with developers to foster partnerships and encourage project development.
- **Exploring new growth opportunities through collaborations:** JREDA must take a proactive approach to future RE growth, identifying emerging trends and opportunities beyond the current scope. Collaborations with academic institutions, research organisations, and think tanks can help explore new avenues for innovation and growth in the state's RE sector.

CHAPTER 5

Conclusion



The renewable energy (RE) landscape in Jharkhand presents a mix of untapped potential, emerging opportunities, and persistent challenges. While the state's previous efforts have fallen short to meet any policy targets mainly due to implementation challenges including inadequate institutional capacity and direction, the state has adequate opportunities to kick start development in the RE segment. Jharkhand has made commendable progress in the distributed renewable energy (DRE) segment, particularly in rural areas, while the large-scale RE segment remains underdeveloped.

Jharkhand's current energy profile is heavily dominated by coal, with scarce progress in utility and captive RE projects. This reliance on traditional energy sources reflects both the state's rich coal deposits and a policy framework that has, so far, been unsuccessful in stimulating RE projects. For Jharkhand to kickstart development in the RE segment and realise its RE potential and implement its RE policies, a clearer policy framework and proactiveness and strong institutions are needed.

Though the state's current RE policies—Jharkhand State Solar Policy 2022 provides a moderately ambitious target and a positive direction for RE development, it is not sufficient to drive the transformational change required to harness its RE potential. The policy faces similar challenges faced by earlier policies, inadequate government-led direction, poor institutional mechanism and capacities, and incentives to attract investments.

The new RE policy framework should primarily focus on empowering state's implementing agencies, followed by solutions tailored to the state's unique conditions, aligning with national objectives and ambitious growth targets with an objective to signal its commitment to RE, thereby attracting investment and fostering local job creation. The policy should offer technology-specific solutions for solar, wind, biomass, and small-hydro, as well as innovative models such as floating solar, canal-top solar, and agri-PV. Additionally, it must provide a structured support system for developers and investors, simplifying processes for project approvals, land acquisition, and infrastructure development. A centralised, digitised single-window clearance system would be instrumental in reducing delays and improving the ease of doing business in the RE sector. Additionally, the state should enhance collaboration with national agencies, research institutions, and private sector stakeholders to identify new growth opportunities and leverage emerging technologies.

Despite the challenges, Jharkhand has strengths that it can leverage to kickstart its RE growth. Considering a very low base of RE development in the state, initially its focus should be on the low hanging opportunities which will instil momentum in the sector.

Moreover, the RPO regulations as per JSERC and Ministry of Power themselves provide adequate demand to kickstart much needed initial momentum in the RE segment. Initial focus on policy to meet RPO through instar-state RE procurement could alone lead to significant development in the state's RE sector.

Transitioning to a greener energy future presents a tremendous opportunity for Jharkhand to diversify its economy and reduce its dependence on coal. The development of RE infrastructure can stimulate local industries, create green jobs, and position the state as a key player in India's clean energy transition. The scaling up of non-fossil fuel-based energy, from the current 13% to 44% of total capacity within the next six years, is a daunting but achievable task with the right policy and institutional support.

Jharkhand stands at a pivotal moment in its energy transition. With a rapidly growing economy and increasing electricity demand, the state must embrace RE as a core component of its future energy mix. The path forward requires bold policy decisions, strategic investments, and institutional reforms to unlock the full potential of renewable energy. By developing a comprehensive and ambitious RE policy framework, the state can overcome current challenges, attract significant investments, and partake proactively in India's green energy future. In doing so, Jharkhand will not only contribute to the country's climate change mitigation efforts but also secure long-term economic growth and job creation in the burgeoning green economy. The time for action is now, and with the right support, Jharkhand can rise to meet the challenge, setting a new standard for sustainable development in India.

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Notes

Handwriting practice lines consisting of 20 horizontal dotted lines.



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