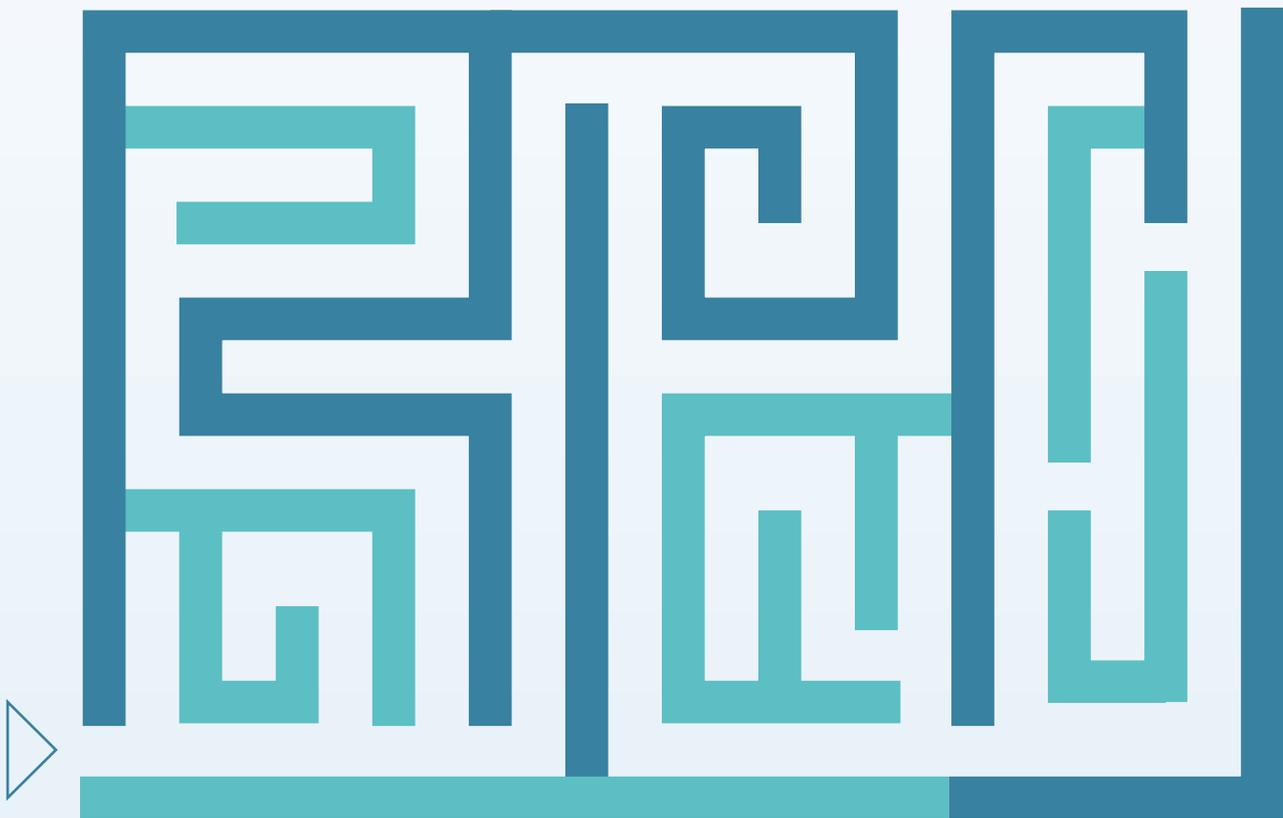


A Comprehensive Review of State RPO Framework and Regulations

Learnings for effective implementation



43.33%



A comprehensive review of State RPO framework and regulations: *Learnings for effective implementation*

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May 2024

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Prayas (Initiatives in Health, Energy, Learning and Parenthood) is a non-Governmental, non-profit organization based in Pune, India. Members of Prayas are professionals working to protect and promote public interest in general, and interests of the disadvantaged sections of the society, in particular. Prayas (Energy Group) works on theoretical, conceptual, regulatory and policy issues in the energy and electricity sectors. Our activities cover research and engagement in policy and regulatory matters, as well as training, awareness, and support to civil society groups. Prayas (Energy Group) has contributed to policy development in the energy sector as part of several official committees constituted by Ministries, Regulatory Commissions and the Planning Commission / NITI Aayog. Prayas is registered as SIRO (Scientific and Industrial Research Organization) with Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India.

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Background

India has set itself an ambitious target to reduce the emissions intensity of its GDP by 45 percent by 2030, from 2005 level and to achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030¹. Renewable energy (RE) is central to these goals including India's commitment to becoming net zero by 2070. RE (including large hydro) has an installed capacity of 190 GW as of March, 2024². In FY 23-24, the RE generation (excl. hydro) was 226 BU (13%), while non-fossil generation (incl. nuclear and large hydro) was 408 BU (24%)³.

To boost the RE generation & consumption in the country, section 86(1)(e) of Electricity Act, 2003 mandates State Electricity Regulatory Commissions (SERCs) to specify a minimum share of total consumption from renewable sources of energy for their state. This target or Renewable Purchase Obligation (RPO) is applicable on various obligated entities like DISCOMs and Open Access/Captive consumers. Over time, while states came up with their RPO regulations that set minimum RPOs for obligated entities, the Government of India also prescribed a common national RPO trajectory for states.

Till 2020, RPOs were specified in two categories, namely solar and non-solar. Meanwhile, in 2019, a specific hydro power obligation (HPO) was conceptualized⁴ by MoP but the category targets were introduced only in Jan 2021⁵. In 2022, this categorization was further revised to Wind, HPO and Other RPO (with total RPO target for FY 2029-30 being 43.33%), along with a new energy storage category⁶. However, as per the latest Ministry of Power (MoP) Notification [S.O.4617(E)] dated 20th Oct, 2023⁷ (referred to as 'MoP Oct 2023 Notification') issued under the Energy Conservation Amendment Act of 2022⁸, as shown in the table below, the categories have been further changed to Wind, Hydro, Distributed RE and Other RE^a. Despite different targets under each category, the total RPO target for each year remains the same as specified in MoP's July 2022 notification. The relevant excerpt from this notification is noted below.

"In exercise of the powers conferred by clauses (n) and (x) of section 14 of the Energy Conservation Act, 2001 (52 of 2001), the Central Government in consultation with the Bureau of Energy Efficiency, hereby specifies the minimum share of consumption of non-fossil sources (renewable energy) by designated consumers as energy or feedstock and different share of consumption for different types of non-fossil sources for different designated consumers in

1. As per updated NDC for India; <https://unfccc.int/sites/default/files/NDC/2022-08/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>.
2. https://cea.nic.in/wp-content/uploads/installed/2024/03/IC_Mar_2024_allocation_wise.pdf.
3. https://cea.nic.in/wp-content/uploads/resd/2024/04/Broad_Overview_of_RE_Generation_March_2024.pdf.
4. https://powermin.gov.in/sites/default/files/Measures_to_Promote_Hydro_Power_Sector.pdf.
5. https://www.recregistryindia.nic.in/pdf/REC_Regulation/MoP_RPO_Order_29012021_F.pdf.
6. https://powermin.gov.in/sites/default/files/Renewable_Purchase_Obligation_and_Energy_Storage_Obligation_Trajectory_till_2029_30.pdf.
7. https://powermin.gov.in/sites/default/files/webform/notices/Notification_Regarding_Renewable_Purchase_Obligation_RPO.pdf.
8. <https://powermin.gov.in/en/content/energy-conservation-amendment-act-2022>.

respect of electricity distribution licensee and other designated consumers who are open access consumers or captive users to the extent of consumption of electricity from sources other than distribution licensee as a percentage of their total share of energy consumption indicated in the Table below.”

Sl. No.	Year	Wind renewable energy	Hydro renewable energy	Distributed renewable energy	Other renewable energy	Total renewable energy
1	2024-25	0.67%	0.38%	1.50%	27.35%	29.91%
2	2025-26	1.45%	1.22%	2.10%	28.24%	33.01%
3	2026-27	1.97%	1.34%	2.70%	29.94%	35.95%
4	2027-28	2.45%	1.42%	3.30%	31.64%	38.81%
5	2028-29	2.95%	1.42%	3.90%	33.10%	41.36%
6	2029-30	3.48%	1.33%	4.50%	34.02%	43.33%

While the RPO framework has been one of the most important drivers for RE deployment in the country and led to impressive achievements in increasing RE capacity, the compliance and monitoring of RPO at the state level remains weak and needs further improvement. In spite of state RPO regulations and central guidelines, the monitoring and reporting of RPO compliance has been irregular, leading to a backlog of shortfall in meeting targets in most states. Historically MNRE has been tracking RPO compliance in the country and will continue to do so. Recently, there has been a renewed thrust on RPO compliance monitoring from the GoI, wherein, the Forum of Regulators (FoR) has been tasked with annually monitoring RPO compliance by obligated entities under the Forum of Regulators (Amendment) Rules, 2022⁹. Further, the BEE has also been mandated to maintain data related to compliance of renewable energy utilisation by the designated consumer(s) and submit report to the Central Government¹⁰. In addition to DISCOMs, RPO targets apply to Open Access and Captive consumers as well, however tracking RPO compliance for these obligated entities has been even harder than that for DISCOMs. The Green Open Access Rules which have lowered the Open Access threshold to 100 kW from 1 MW and paved the way for timely and easy procedures with a centralised application portal are likely to increase RE based OA and CPP consumption in the coming years. Improving transparency and accountability of obligated entities esp. regarding compliance will be crucial for the broader success of RPO.

9. (c) Monitoring of renewable purchase compliance- (i) The compliance of targets, by each of the distribution licensees, captive consumption and consumers procuring power through open access, for purchase of electricity from renewable sources as determined by the Central Government or by State Commission, whichever is higher, in accordance with the provisions of the Act and rules, regulations, guidelines made thereunder. (ii) An annual report comprising data and analysis thereof for compliance of the targets for purchase from renewables shall be submitted to the Central Government by 31st May of next financial year. [https://forumofregulators.gov.in/data/rules/FOR\(Amendment\)Rules2022.pdf](https://forumofregulators.gov.in/data/rules/FOR(Amendment)Rules2022.pdf).

10. https://powermin.gov.in/sites/default/files/webform/notices/Notification_Regarding_Renewable_Purchase_Obligation_RPO.pdf.

Motivation and Objective

While RPO targets continue to vary across states, few states are now aligning their targets with those mandated by Gol as part of the EC Act amendment. Apart from these targets themselves, the broader RPO framework, incl. its applicability, compliance, data reporting, incentives and penal structures also vary a lot across states.

Sharing of regulatory practices across states can promote cross-learning and wider adoption of good practices. A basic minimum level of uniformity across states in the RPO framework (while maintaining the space for innovation and state context specific frameworks) would greatly help in comparability of various parameters across states. A critical and comprehensive review of the state RPO regulations and their compliance proceedings has been done as part of this exercise and some of the important learnings from this are noted below. These are listed as per the following topics.

1. Applicability of RPO
2. Targets
3. Fungibility across RPO sub-categories
4. Net consumption for RPO calculation
5. Sources to fulfil RPO targets
6. Data reporting
7. Compliance verification process
8. Default/non-compliance penalties
9. Carry forward of RPO compliance shortfall
10. Incentives for RPO over-compliance
11. Revision of RPO targets

Based on our analysis, we have highlighted some good practices and made few recommendations for further improving the effectiveness of the RPO framework in States. We welcome suggestions and comments on this analysis^b and our recommendations.

Data and Methodology: For this study, we compiled, critically analysed and summarised over 250 public documents across 36 states including RPO regulations, MoP guidelines etc. A more detailed comparison of these regulations and visualisations based on this study can be seen at **Prayas' India RE Portal (<https://indiaredata.org/>)**.

Review of RPO Framework

1. Applicability of RPO

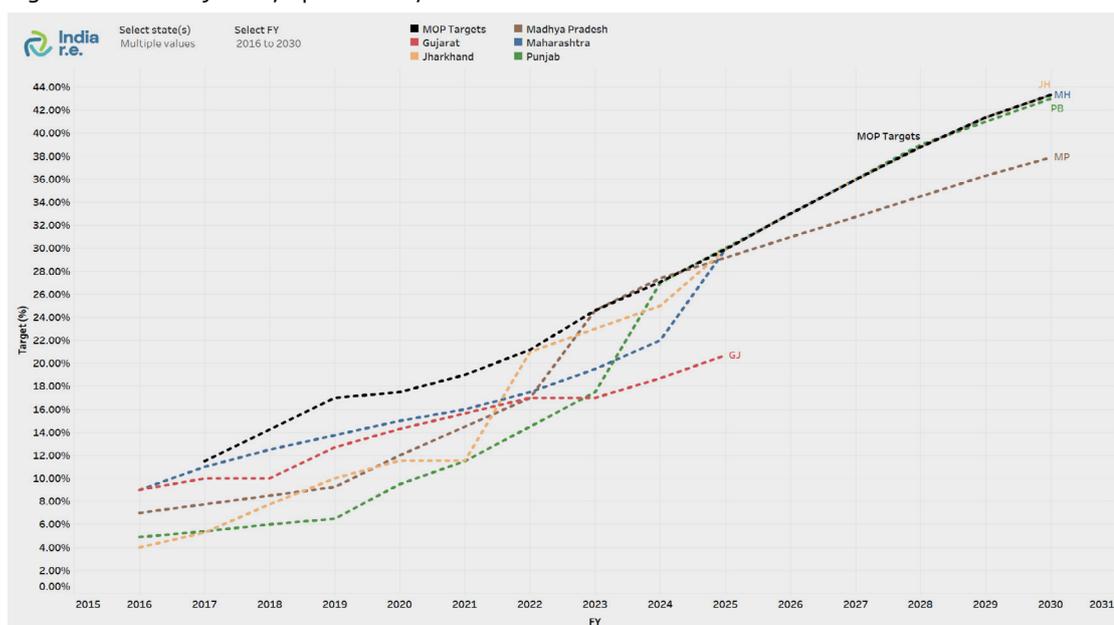
In many states like Chhattisgarh, Maharashtra, Telangana, the RPO regulations and its compliance is mandatory for all DISCOMs, captive consumers (with installed capacity of 1 MW and above) and open access consumers (1 MW and above) referred as Obligated Entities. However, few states like Haryana and Jharkhand consider captive consumers having capacity 5 MW and above as obligated entities. The MoP Oct 2023 Notification has specified RPO targets for designated consumers which include DISCOMs and other designated consumers who are open access consumers and captive users. Further, the Green Open Access Rules have lowered the threshold of availing Open Access to 100 kW and have placed no load limit for captive transactions.

Hence, there is a need of having a common benchmark in terms of applicability of RPO targets on open access & captive consumers. In this regard, MNRE and FoR can build consensus among states on what the benchmark should be and the same could be followed by all states. Given the weak RPO compliance monitoring in many states and time needed to implement the Green OA Rules, it might be preferable to initially have the benchmark at 1 MW, which can be further reduced to 100 kW in a 2-3 year timeline.

2. Targets and target categories

SERCs specify RPO targets for obligated entities in their states. These targets vary across states and few states have targets which vary from that specified by MoP under various notifications. Variations are seen for both, the level of the target as well as the time period for which targets are specified. These can be seen in the Figure 1 below.¹¹ While all states specify targets in their regulations, some have specified targets for further years in separate orders.

Figure 1: RPO trajectory specified by some states



Source: IndiaREData.org¹²

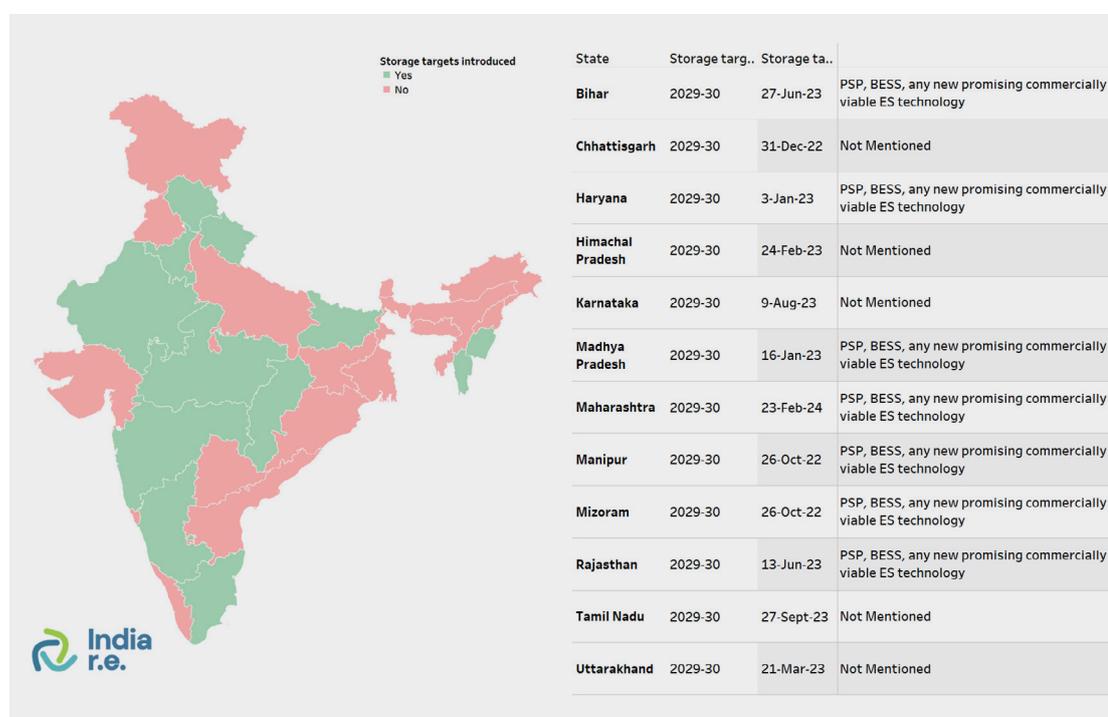
11. Targets for other states can be viewed on <https://indiaredata.org/rpo/compliance-visualisation/rpo-trajectory>.

12. <https://indiaredata.org/rpo/compliance-visualisation/rpo-trajectory>.

In addition to this, the RPO categories also vary across states. MoP introduced HPO, Wind RPO, Distributed RE and Energy Storage categories recently. Interestingly, the definition of Wind and HPO categories have been changed by MoP from their July 2022 to Oct 2023 notification^c. As a result of this, comparing compliance for Wind or HPO for two states can be misleading. For e.g., Maharashtra and Tamil Nadu both have Wind RPO, but for Maharashtra (as per MERC's RPO Regulation 1st Amendment 2024 dated 23rd Feb 2024), the wind renewable energy component shall be met by energy produced from Wind Power Projects (WPPs) commissioned after the 31st March, 2024 as per the MoP's Oct 2023 Notification. In case of Tamil Nadu (as per TNERC's RPO Regulation 2023 dated 27th Sep 2023), Wind RPO shall be met only by energy produced from Wind Power Projects (WPPs), commissioned after 31st March 2022 as per the MoP's July 2022 notification. Such differences in definitions of the same RPO category is prevalent in many other states as well.

Moreover, some states continue to retain solar and non-solar targets. Similarly, few states have added energy storage category, which can be seen in the Figure 2 below.

Figure 2 : Energy Storage



Source: IndiaREData.org¹³

Thus, states would have to align their RPO targets with the RPO trajectory mentioned in the MoP Oct 2023 Notification (as part of the EC Amendment Act, 2022). This has been done by states like Maharashtra and Jharkhand^d. States would also have to integrate energy storage targets in their RPO regulations in line with the MoP notification/guidelines. It is recommended that there should not be frequent changes in notified targets, categories and their definitions. Ideally, they should not change within the control period of RPO regulations, typically 5 years.

13. <https://indiaredata.org/rpo/regulation-visualisation/energy-storage>.

As a proactive initiative, Gol could also give some guidance on long-term RPO trajectories (up to FY 2033–34) which could be then adopted by States. This is important since Resource Adequacy modelling studies (in line with IEGC, CEA RA guidelines and SERC RA regulations) will have to be done for a ten-year period by CEA and all DISCOMs starting from FY 24–25. This will help obligated entities plan long term power procurement more effectively.

3. Fungibility across RPO sub-categories

"Fungibility" essentially means allowing the use of excess power procured under one category of RPO to another category, in case there is a deficit of RE power procurement under later category.

From the analysis of RPO regulations of various states over the years, it is observed that 30 states and UTs are allowing fungibility between the specified RPO sub-categories. These include e.g.; Gujarat, Bihar, details of which can be seen here.¹⁴ In addition, few states (like Karnataka, Andhra Pradesh, Punjab) have come out with composite RPO targets recently, thereby leaving it to the obligated entities to plan power procurement in holistic manner. Further, as per the MoP Oct 2023 Notification (clause 2, 3 and 4), any excess energy in a particular RPO sub-category, except for distributed RE can be utilized to meet the shortfall in some other categories (e.g., Maharashtra, Jharkhand).

Considering this, SERCs should include provisions related to fungibility across RPO sub-categories in their RPO regulations or effectively set a composite RPO target in their RPO regulations.

4. Net consumption for RPO calculation

"Net consumption" essentially means the annual electricity/ energy consumption by an obligated entity on basis of which the RPO targets and compliance will be calculated for that entity for that financial year.

Presently, the definition of net consumption varies across states. Most states (e.g., UP, Karnataka, etc.) use either net consumption (defined as total energy consumption – hydro consumption) to calculate RPO^e or total consumption from all sources. With the inclusion of large hydro as renewable (as per MoP Office Memorandum F.No. 15/2/2016–H–U (Pt.) dated 8th March, 2019¹⁵) and newer RPO sub-categories, it is the total consumption by an obligated entity that shall be considered as the basis for calculating RPO compliance, as mentioned in MoP Oct 2023 Notification.

"In exercise of the powers conferred by clauses (n) and (x) of section 14 of the Energy Conservation Act, 2001 (52 of 2001), the Central Government in consultation with the Bureau of Energy Efficiency, hereby specifies the minimum share of consumption of non-fossil sources (renewable energy) by designated consumers as energy or feedstock and different share of consumption for different types of non-fossil sources for different designated consumers in respect of electricity distribution licensee and other designated consumers who are open access consumers or captive users to the extent of consumption

14. Fungibility variation across states as specified in state regulation can be viewed on <https://indiaredata.org/rpo/regulation-visualisation/fungibility>.

15. https://powermin.gov.in/sites/default/files/Measures_to_Promote_Hydro_Power_Sector.pdf.

*of electricity from sources other than distribution licensee as a percentage of their **total share of energy consumption** indicated in the Table below.” (emphasis added)*

The variation of the definition of net consumption across various states can be viewed in detail here¹⁶.

Therefore, SERCs will have to reconsider their definition of net energy consumption for RPO compliance calculations in line with the MoP notification.

5. RE Sources to fulfil RPO targets

Various RE sources through which RPO targets can be complied with should be clearly mentioned in the state RPO regulations. Some states mention that RPO can be fulfilled from power procurement from RE projects, and include net-metering and gross metering based rooftop projects under certain circumstances. States like Maharashtra also allow power generation / consumption from off-grid projects for consideration in RPO compliance. Similarly, MoP's Oct 2023 notification specifies Distributed RE category, which shall be met only from the energy generated from renewable energy projects that are less than 10 MW in size and shall include solar installations under all configurations (net metering, gross metering, virtual net metering, group net metering, behind the meter installations and any other configuration) notified by the Central Government.

Recently, few SERCs have adopted Green OA Rules in the form of an amendment of existing OA / RPO regulations or finalized new Green OA regulations, which provide list of methods which can be considered for achieving RPO compliance. These include aspects of power markets (GTAM/ GDAM), green tariffs, green hydrogen & ammonia etc.

SERCs may have to reconcile their RPO regulations with these recent developments for bringing in greater clarity.

6. Data reporting formats, timelines and public availability of the data

Data reporting is one of the important and starting points for effectively monitoring RPO compliance by obligated entities in a state. Very few states like Bihar^f, Jammu and Kashmir^g, Jharkhand, etc. provide clear data reporting formats in their regulations. Some states like Maharashtra, AP, UK¹⁷, Punjab¹⁸ etc. have created a mechanism for data reporting by obligated entities to state nodal agency in timely manner. In Karnataka, KPTCL^h publishes quarterly data of RPO Compliance for five DISCOMs. However, public accessibility of such data is not easy for all states.

Few states do state specific timelines for data reporting from Obligated Entities to the SNA and from SNA to the SERC. Some examples of these data reporting timelines are noted in the table below.

16. Net consumption definition across states can be viewed on <https://indiaredata.org/rpo/regulation-visualisation/net-consumption>.

17. <https://rpoureda.uk.gov.in/>.

18. <https://rpo.peda.gov.in/>.

Table 1: Data reporting timeline in few states' RPO regulations

State	Obligated entity	Data to SNA	SNA verification	SNA to SERC
Gujarat	Captive, OA	On & before 30 th April		
Karnataka	All			Not later than 31 st July
Maharashtra	All	Within 45 days from end of FY	Within 60 days from end of FY	
Rajasthan	All	By 31 st July of Assessment year	By 30 th Sep of assessment year	By 31 st Dec of assessment year
Tamil Nadu	All	By end of July of succeeding FY		

Source: Compilation from State RPO regulations

The GoI has been emphasizing timely and transparent reporting of RPO compliance verification. In this direction, the MoP Oct 2023 Notification mentions that, "The Bureau shall maintain data related to compliance of renewable energy utilization by the designated consumer(s) and submit report to the Central Government."

Taking a cue from the MoP Notification under the EC Act, JSERC has specified in their latest RPO regulations amendment (dated 15th Mar 2024) that the Jharkhand Renewable Energy Development Agency shall maintain data related to compliance of renewable energy utilization by the designated consumer(s) and submit report to the Jharkhand State Electricity Regulatory Commission and Central Government.

In this regard, we suggest that the BEE and/or FoR should create a dedicated publicly accessible centralised portal¹⁹ for submission of data by obligated entities and state nodal agencies. Each obligated entity shall submit their details and data regarding RPO compliance to this centralised portal. State nodal agency, designated by the SERC under RPO regulations, shall use the data reported on this portal for validation and submit it to the Commission for RPO compliance proceedings. Post RPO compliance verification, the data shall be reported by the SNA to the portal within 30 days of completion of verification process. BEE shall subsequently submit the data both to MoP and MNRE within 30 days of data being uploaded on the website.

Furthermore, the obligated entities shall submit data related to RPO compliance for ensuing year to provide information on their plan to comply with RPO targets. Along with this, they should be asked to provide data on contracted capacity from RE sources, which would be needed as per the RA regulations in any case.

There shall be a standard data format in which the obligated entities shall report the compliance data. The sample data format is given in the Annexure-I. Obligated entities shall clearly mention the quantum of power carried forward from previous year, if any, and the number of RECs procured to fulfil the RPO targets while reporting the data.

19. This could be like PFC's Performance of State Power Utilities - <https://www.pfcapps.com/AIRSD/Login.aspx>.

7. Compliance verification process including stricter timelines

States have varied practices in RPO compliance calculation, monitoring, verification and reporting in line with their regulations, some aspects of which are elaborated below. This makes comparison of final compliance across obligated entities quite challenging.

- States like Bihar and Karnataka report RPO compliance data in true-up orders for each DISCOM separately whereas, Uttar Pradesh and Madhya Pradesh issue suo-motu orders to report RPO compliance. On other hand, Maharashtra used to have separate RPO proceedings in past, but the last proceeding was done during mid-term review exercise (for tariff order of 2020-25).
- UP, Gujarat and MP provide consolidated data by holding company (UPPCL, GUVNL and MPPMCL respectively) in their state.
- Few states do not publicly report RPO compliance at all.

As part of the IndiaREData portal, we have compiled information on RPO compliance data for DISCOMs which can be seen in **Annexure-II**. This shows that there is no compliance data available for some years for several states but further many states have a long delay in finalizing and publishing the final compliance orders.

Considering this, there is a need to follow a common and standardised process for RPO compliance monitoring and verification across states. Compliance verification should ideally be a public proceeding and should be independent from true-up or tariff determination processes. SERCs should incorporate clear and strict timelines of verification of RPO compliance on annual basis. Indicative timeline for such process is suggested below. In this way, the verification process can be completed within 180 days.

Table 2: Indicative timeline for RPO compliance verification process

Process step	Timeline
Data submission by Obligated Entity to state nodal agency (SNA)	Within 45 days of end of financial year
Data submission by SNA to Commission	Within 30 days of data received by SNA
Public notice by Commission for inviting comments on verification process	Within 30 days of data received by commission from SNA
Finalization of verification process	Within 75 days of issuing public notice to initiate public proceeding

Further, a review of RPO compliance orders (for FY 22) issued by some states show that the process timelines vary across states and time taken for issuance of final compliance order by SERCs starting from the end of a financial year for which that compliance proceeding is happening ranges from 280 to 400 days. The table below gives example of few states in terms of issuance of RPO compliance orders.

Table 3: Review of time taken for RPO Compliance proceedings

State	DISCOM	FY	RPO Compliance Order Date	Proceeding
Maharashtra	MSEDCL	2020-22	31-Mar-23	True-up
Bihar	NBPDCL, SBPDCL	2021-22	23-Mar-23	Tariff order
Uttar Pradesh	UPPCL	2020-22	24-May-23	True-up
Karnataka	BESCOM	2021-22	12-May-23	True-up
Punjab	PSPCL	2021-22	06-Jan-23	Petition

Source: Compilation from State RPO Compliance Orders

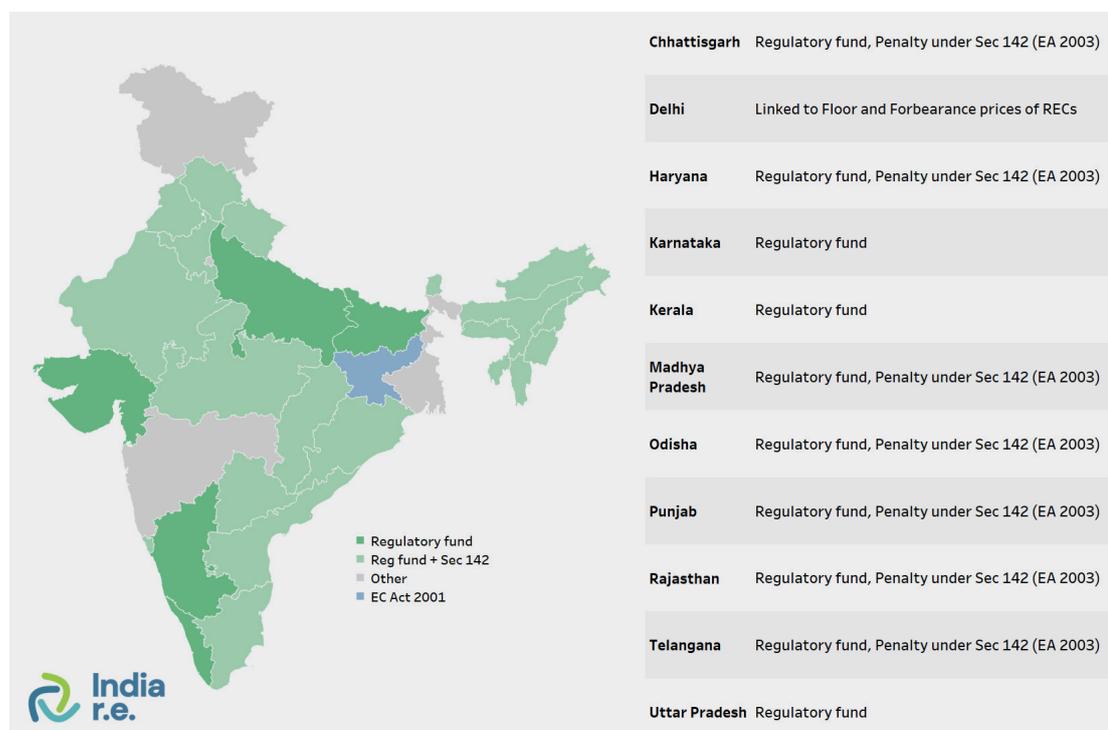
Ideally, SERCs should publish verified RPO compliance data for each obligated entity in public domain within 15 days of completion of verification process. The data reporting by the commission on RPO compliance proceeding should also be standardized, for which a sample is given in Annexure-IIIⁱ.

SERCs of states like Maharashtra^k, Karnataka^l, Goa and UTs^m, Biharⁿ and Himachal Pradesh^o provide good granular data in their RPO compliance orders in different aspects, an aspect which can be adopted by other states.

8. RPO non-compliance penalties

It is observed that most states, in spite of having shortfall in RPO compliance do not impose any penalty on Obligated Entities whereas, states like Delhi (on annual basis) and Uttar Pradesh and Madhya Pradesh have imposed some penalties on the DISCOMs for non-compliance of RPO. The variation of penalty provisions included in regulations across states can be seen in Figure 3.

Figure 3: Penalty provisions for non-compliance across states



Source: IndiaREData.org²⁰

20. <https://indiaredata.org/rpo/regulation-visualisation/penalty>

The variation is stark in some sense, as states like Uttar Pradesh, Gujarat, Karnataka can impose penalty as regulatory fund, while states like Rajasthan, Andhra Pradesh, Tamil Nadu can impose penalty as regulatory fund as well as under section 142 of Electricity Act, 2003. On the flip side, the states of Delhi and Maharashtra have penalty provisions linked to either REC prices or some fixed quantum (Rs/kWh). Maharashtra has provisioned a penalty of Rs. 0.10 per unit for cumulative shortfall in total RE procurement for all obligated entities (for DISCOMs, it will be reduced from ARR). However, there seems to be no public reporting of the actual penalty imposition and collection by states till date, despite Delhi, Bihar, Telangana, Madhya Pradesh and Uttar Pradesh imposing penalty on DISCOMs in some instances.

Since 2020, at least 4 states have imposed penalties on DISCOMs, details of which is tabled below:

Table 4: Penalties imposed on DISCOMs since 2020

State	DISCOM	Year	Petition No	Total Penalty Amount	Shortfall (MUs)	Penalty details
UP	UPPCL	2021	1565 of 2020	Rs. 1459.34 Cr	14,593	Till FY21 penalty Rs. 1/unit
Delhi	TPPDL	2020	03/2021	Rs. 2.75 Cr	274	Rs. 1/unit
Delhi	BSES-R	2020	01/2021	Rs. 14.62 Cr	1,462	Rs. 1/unit
Delhi	BSES-Y	2020	02/2021	Rs. 8.97 Cr	897	Rs. 1/unit
Delhi	NDMC	2020	07/2021	Rs. 0.63 Cr	63	Rs. 1/unit
MP	MPPMCL	2021			2,373	Amount equivalent to the deficit in fulfilment of RPO targets at the last available forbearance price for the REC certificates, be deposited in a separate fund
Telangana	TSNPDCL	2022	O.P.No.22 of 2023 (Suo-Motu)		8.446	10% of forbearance price (Rs.1000/- per MWh) decided by CERC for the relevant year or Rs. 1,00,000/- whichever is lower

Source: Compilation from State RPO Compliance Orders

The MoP Oct 2023 Notification states that,

*"The specified renewable energy consumption targets shall be met either directly or through Certificate in accordance with the Central Electricity Regulatory Commission (Terms and Conditions for Renewable Energy Certificates for Renewable Energy Generation) Regulations, 2022, published in the Gazette of India, Extraordinary, Part III, Section 4, dated the 24th May, 2022: Provided that **any shortfall in specified renewable energy consumption targets shall be treated as non-compliance and penalty shall be imposed as such rate specified under sub-section (3) of section 26 of the said Act.**" (emphasis added)*

In this regard, the section 26(3) of Energy Conservation Act, 2001 ("EC Act, 2001"), as amended on 19th December 2022, states that

*"(3) If any person fails to comply with the directions issued under clauses (n) and (x) of section 14, he shall be liable to a penalty which shall not exceed ten lakh rupees for each such failure: Provided that he shall also be liable to an additional penalty which **shall not exceed twice the price of every metric ton of oil equivalent prescribed under this Act, which is in excess of the prescribed norms.**" (emphasis added)*

The recent Jharkhand regulation specifies imposition of penalty under Section 26(3) of Energy Conservation Act, 2001²¹, thus becoming first state to adopt penalties specified under EC Act 2001. Other states may follow Jharkhand in this regard.

Any shortfall in fulfilling the RPO targets should be treated as non-compliance and shall be penalized. Only in rare and un-avoidable circumstances, should the shortfall be carry forwarded to next year. Given the specific penalty for RPO non-compliance mentioned under Section 26(3) of EC Act, 2001, it is expected that this specific penalty would be imposed rather than the one specified under Section 142 of Electricity Act, 2003²².

Penalty imposed on obligated entities should be deposited in a separate regulatory fund. This fund should be maintained on a regular basis and there should be transparency about the penalty collection process. The SERCs should mention the proposed timelines for payment of penalty while imposing any penalty on obligated entity. Also, SNA/ BEE should monitor whether the proposed timelines are adhered to by the entity. In case of any delay, public proceeding should take place and additional penalty can be imposed for not adhering to the directions issued by SERC in this regard.

Furthermore, the amount so collected should be used for either better integration of RE to the grid or promotion of RE in the state.

9. Carry forward of RPO compliance shortfall

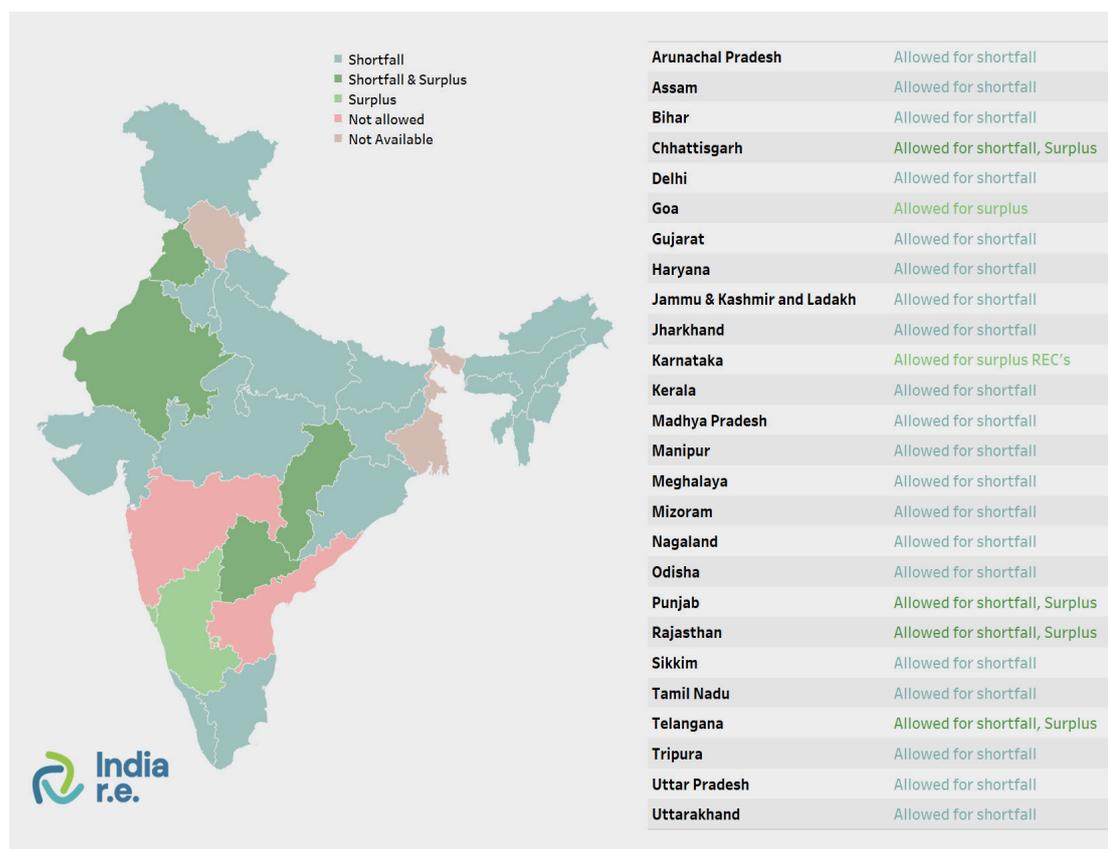
"Carry forward" essentially means the power procured from RE sources more than or lower than that required to meet the target specified (after allowing any fungibility) which can be adjusted to following year for fulfilment of RPO compliance. In case of shortfall being carried forward, excess power has to be procured by the obligated entity.

21. https://jserc.org/pdf/regulations/158_2_2024.pdf

22. The adjudicatory bodies under both the Acts are the same. Both Acts largely have the same provisions when it comes to penalties for RPO and adjudication proceedings. Thus, the power to adjudicate and levy penalties under both Acts is with the State Commissions and the APTEL. The hierarchy of appeals would be as shown below: Adjudicating Officer for inquiry (member of State Commission) → State Commission hearing → APTEL → Supreme Court. As a result, when it comes to imposition of penalties, whether section 142 of the E Act will be relied on by the State Commission or whether section 26(3) of the EC Act will apply is unclear. As per the legal principle of double jeopardy, no person can be punished twice for the same act. Thus, imposition of penalty has to be done only under one of the two sections, otherwise it will count as a double penalty. Perhaps the rule of general law versus specific law in the interpretation of statutes might prove helpful in this regard. This rule is based on the legal maxim "generalia specialibus non derogant" which basically means that when there is conflict between a general provision (in this case section 142 of the E Act) and a specific provision (here, section 26(3) of the EC Act), the specific provision shall prevail. Since the former does not specify a penalty specifically for RPO non-compliance while the latter does exactly that, it is the latter provision that should apply when it comes to imposition of penalty for RPO non-compliance. However, it is also up to adjudicatory forums to harmoniously construe both provisions so as to give effect to both provisions but this would be entirely discretionary and subject to legal dispute.

As expected, carry forward provisions vary across states. States like Goa and UTs allow only shortfall to be carried forward. States like Maharashtra (in its 2019 RPO Regulation dated 27th Dec 2019), Uttar Pradesh, Punjab and Bihar allow shortfall and surplus to be carried forward and few states like Gujarat, Karnataka do not allow carry forward. Details of such variation across states can be seen below. In the recent amendment to its RPO regulations dated 23rd Feb 2024, MERC has decided to not allow any carry forward of RPO shortfall to next years post FY23-24.

Figure 4: Carry forward provisions across states



Source: IndiaREData.org²³

The provisions regarding carry forward need to be more stringent. The carry forward should not be allowed as a routine measure as has been the practice in many states. The amount of shortfall allowed to carry forward should be mentioned in compliance proceeding clearly and it should be forwarded only to the next consecutive year and not further. This is particularly important as several shortfalls in past were allowed to be carried forward till date (like in case of MSEDCL in Maharashtra) and no penalty was imposed by the Commission on any DISCOM for non-compliance. In case any carry forward is to be allowed for unforeseen circumstances, the same should be capped (up to 10% of total RPO targets for that year), which should further reduce gradually.

23. <https://indiaredata.org/rpo/regulation-visualisation/carry-forward>

10. Incentives for RPO over-compliance

While most states have penalties for RPO non-compliance, no state except Maharashtra provide incentives to obligated entities in case of over-compliance.

MERC in its 2019 RPO regulations²⁴ had instituted an innovative incentive mechanism for over compliance of RPO. It offered a Rs 0.25/kWh incentive for DISCOMs who over-complied their state targets (only up to the national target), provided they had no backlog of under compliance from earlier years. However, this amount has been reduced to Rs. 0.10 per unit for future years under amendment to RPO regulations in 2024²⁵. The latest 2024 RPO amendment regulation in Maharashtra also states that the other obligated entities (captive and OA consumers) also shall get incentive of Rs 0.10 per kWh for RE procured above the minimum percentage specified for FY 24-30. An interesting aspect of this incentive for non-DISCOM obligated entities is the source of incentive payment. MERC regulations note that,

"7.5(C) Obligated Entities other than Distribution Licensee shall get incentive of Rs 0.10 per kWh for RE procured above the minimum percentage specified in Regulation 7.5 (A), which shall be paid by the Distribution Licensee supplying electricity to such consumer and recovered from the Aggregate Revenue Requirement of the Supply Business of that Distribution Licensee."

It is unclear why the regulated consumers of the DISCOM should be asked to pay an incentive for RPO achievement of non-DISCOM obligated entities (OA & CPP).

Ideally, only DISCOMs (e.g; Karnataka ESCOMs in the past) who are over achieving the RPO target should qualify for some level of incentives. The incentive amount should be decided by the SERCs and can be linked to the quantum of over-achievement of targets. However, the incentive can be capped at 125-150% of the target. This incentive calculation and data used in the same should be made publicly available by the SERC.

11. Revision of RPO targets

Obligated entities may fail to comply with the RPO targets in some circumstances due to reasons which are beyond their control. In such exceptional cases, some relaxation in form of revision of targets could be considered, though ideally allowing carry forward of non-compliance/cumulative compliance would be a better practice.

SERCs, under their power to remove difficulties or other relevant provisions of RPO regulations, can revise the targets for obligated entities, however the target revision for a year should not be less than the targets specified by the commission for the previous year. Also, the reason for such revision should be clearly mentioned in the order passed by the commission during the process of target revision. Furthermore, the relaxation should be given only in exceptional cases, instead of making it a routine exercise.

24. <https://merc.gov.in/wp-content/uploads/2022/07/Gazatte-Notification-RPO-REC-Regulation-2019.pdf>

25. <https://merc.gov.in/wp-content/uploads/2024/02/MERC-RPO-REC-First-Amendment-Regulation-2024.pdf>

In case of need of revision of targets, the obligated entity shall file a petition in this regard before the end of that financial year, and shall provide proper reasons for asking for such a revision. This is important as the obligated entity will be informed well in advance about the difficulties in compliance and hence, they should convey the same to the Commission and state nodal agency well within time.

Also, SERC should not revise any RPO targets for an obligated entity for a financial year after completion of one year after the end of that particular financial year. For example, Gujarat has revised Solar and Other RPO targets for DISCOMs for FY2018-19 in order (Petition No. 1808 of 2019) dated 21/04/2022. These targets have been revised based on weighted average of RE procurement by DISCOMs.

Conclusion

Renewable Energy (RE) is central to India's near term supply targets for 2030 as well as its commitment to becoming net zero by 2070. Despite our impressive achievements in increasing renewable energy capacity (56 GW over the last four years (2020-2024), or 14 GW/year), driven mainly by the Renewable Purchase Obligation (RPO) mandate, the task ahead is even more daunting. We need to triple our pace of RE addition in the next six years to 43 GW/year to reach the targets noted in the CEA's Optimal Mix report for 2030.

It is in this context, that the compliance and monitoring of RPO at the state level is an aspect which needs urgent improvement. In spite of state RPO regulations and central guidelines, the monitoring and reporting of RPO compliance has been irregular, leading to a backlog of shortfall in meeting targets in most states. This calls for improving transparency and accountability of obligated entities (incl. OA and CPP) esp. regarding compliance, which will be crucial for the success of RPO. As mandated under EC Act 2003, BEE can take the lead in coming up with a national framework for data reporting in consultation with FoR which can provide valuable insights for effective implementation in States. A basic minimum level of uniformity across states in the RPO framework (while maintaining the space for innovation and state context specific frameworks) would greatly help in comparability of various parameters across states.

This gains importance as RPO framework varies across states and few states are now aligning their framework with that specified by MoP in its recent notifications. Apart from targets, the broader RPO framework, incl. its applicability, compliance, categories and their definitions, data reporting, incentives and penal structures vary a lot across states, which has been described above.

A critical review of the state RPO regulations and their compliance proceedings has been done in this exercise and some of the important learnings from this are detailed in the sections above. It gives an idea about different approaches followed by various SERCs in setting the RPO framework and implementing it. Based on these learnings, a set of good practices / guidelines and reporting data formats have been prepared for the consideration of SERCs.

End Notes

- a. This notification does not make any changes in the earlier energy storage targets as specified by MoP.
- b. Please write to energy@prayaspune.org with your suggestions and observations.
- c. RPO categories were changed from Wind, HPO and Others to Wind, HPO, Distributed RE and Others. Apart from this, definition of Wind and HPO RPO targets were changed in terms of commissioning date of projects.
- d. However, Jharkhand has not adopted storage targets specified in the July 2022 notification by MoP.
- e. This is in line with the provisions (Clause No. 6.4 (1) (i)) given in Tariff Policy of 2016.
- f. Data format as per BEREC order can be seen here: <https://berc.co.in/orders/other-orders/2670-suo-motu-proceeding-for-4th-amendment-of-berc-renewable-purchase-organisation-its-compliance-and-rec-framework-implementation-regulations-2010-regulations-2010-4> (refer pg. 51-52 for data format).
- g. JERC for J&K and Ladakh provides data format for data reporting by state agency to Commission in its latest regulation of 2024, which can be accessed here: [https://jercjkl.nic.in/pdf/Joint%20Electricity%20Regulatory%20Commission%20for%20the%20UT%20of%20Jammu%20&%20Kashmirand%20the%20UT%20of%20Ladakh%20\(Renewable%20Purchase%20Obligation&its%20Compliance\)%20Regulations,%202024.pdf](https://jercjkl.nic.in/pdf/Joint%20Electricity%20Regulatory%20Commission%20for%20the%20UT%20of%20Jammu%20&%20Kashmirand%20the%20UT%20of%20Ladakh%20(Renewable%20Purchase%20Obligation&its%20Compliance)%20Regulations,%202024.pdf) (refer pg. 18-19).
- h. Data reporting for Karnataka DISCOMs can be seen here: <https://kptclsldc.in/RPO%20ESCOMs%202022-23.pdf>.
- i. Different data formats for RPO compliance data reporting by DISCOMs, Captive consumers and OA consumers can be found in attached excel file.
- j. The data format can be found in attached excel file.
- k. For MSEDCL, the data reported during compliance order for FY 2018-19 and FY 2019-20 can be found here: https://merc.gov.in/wp-content/uploads/orders_data/2021/Order%201631010923583.pdf.
- l. For DISCOMs, RPO compliance data for FY 22-23 can be found here: https://kerc.karnataka.gov.in/uploads/media_to_upload1713254243.pdf (refer pg. 62-64, Tables 4.18, 4.19, 4.20).
- m. For Goa, RPO compliance data for FY 2021-22 can be found here: https://jercuts.gov.in/writereaddata/UploadFile/102%20upload_1645.pdf (Refer pg. 75, Table 57).
- n. For Bihar DISCOMs, RPO compliance data for FY 2022-23 can be found here: <https://berc.co.in/orders/tariff/distribution/sbpdc/2761-tariff-order-of-discoms-nbpdc-sbpdc-for-fy-2024-25> (refer pg. 114, Table 4-35).
- o. For HP DISCOM, RPO compliance data for FY 2022-23 can be found here: <https://hperc.org/new1/File/38-23.pdf>.

Annexure I(a): Data reporting format for DISCOM

No entries needed

Name of Obligated entity	
Category of Obligated entity	
Location - State	
State Category	
FY Year	
Date of reporting	

S. No.	Particular	Formula	Unit	Values					
1	Total Energy Consumption		MU						
2	Total RPO target		%						
3	Total RPO target	(1)*(2)	MU						
	RPO type			Wind	Hydro	Other RE	Sub-total	Distributed RE	
4	Target		%						
5	Target	(4)*(1)	MU						
	Source of RE procurement								
6	RE power (thru PPA)	Wind	MU						
7		Solar	MU						
8		Biomass	MU						
9		Hydro	MU						
10		Small hydro	MU						
11		Others	MU						
12	REC		MU						
13	Green Market procurement (GTAM, GDAM)		MU						

Notes

RPO targets are different for different state category

The total consumption should be the net of total power procurement and power sale to entities other than its consumer at T<=>D periphery.

The entries made under this head should be net of total procurement and total sales through the identified method of procurement.

Enter the quantum of energy procured from Wind Power Projects (WPPs) commissioned after the 31st March, 2024 under "Wind" category
Rest of the wind procurement should be entered under "Other RE" category.

Enter the quantum of energy procured from Hydro (incl. PSP) and Small hydro Power Projects commissioned after the 31st March, 2024 under "Hydro" category
Rest of the hydro/ small hydro procurement should be entered under "Other RE" category.

Provide the net quantum of REC procured (after excluding any REC quantum sold through various means).

14	Distributed generation/ rooftop/ off-grid	Distributed generation	MU	[REDACTED]			
		Capacity for which no metering data mentioned	MW				
15		Determined generation from capacity with no metered data	MU				
16	Other sources		MU				
17	Total procurement	(6+7+8+9+10+11+12+13+14+15+16)	MU				
18	Target achieved	(17)/(3)	%				
19	Shortfall/ surplus	(17)-(9)	MU				
20	Shortfall/ surplus	(19)/(3)	%				
21	Status of RPO compliance						

The distributed renewable energy component shall be met only from the energy generated from renewable energy projects that are less than 10 MW in size and shall include solar installations under all configurations (net metering, gross metering, virtual net metering, group net metering, behind the meter installations and any other configuration) notified by the Central Government:
 Provided further that in case the designated consumer is unable to provide generation data against distributed renewable energy installations, the reported capacity shall be transformed into distributed renewable energy generation in terms of energy by a multiplier of 3.5 units per kilowatt per day (kWh/kW/day).

Banking or procurement of any other source of renewable can be included here.

(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance

(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance

Annexure I(b): Data reporting format for Captive consumer

Name of Obligated entity	
Category of Obligated entity	
Location - State	
State Category	
FY Year	
Date of reporting	

RPO compliance for Captive consumption

S. No.	Name of Plant (with location-state)	Generator Capacity (MW)	Source (Coal, Solar, Wind, etc.)	Date of commissioning	Total generation by captive plant (MU)	Share of Generation for the consumer (MU)	Power sold to DISCOM or in PX (within the share of consumer) (MU)	Net Consumption from the generator (MU)	Net Consumption from renewable source (MU)	Applicable RPO target (%)	Applicable RPO Target (MU)
1											
2											
3											
4											
5											
6											
7											
8											
Total											

Net consumption from captive plants	MU	
Applicable RPO target	MU	
Effective RPO target for the entity	%	
Total consumption from RE based captive source	MU	
Total consumption from RE based captive source	%	
REC bought from PX for RPO compliance	MU	

Notes

Please enter consumer ID as well. It should be noted that separate form is to be filled for each captive consumer, irrespective of ownership.

Any augmentation of capacity should be entered separately. The MoP issued a clarification dated 1st Oct, 2019 the RPO for captive power plants based on their date of commissioning, which is reproduced below:

" i) For CPPs commissioned before 1.04.2016, RPO should be at the level as mandated by the appropriate Commission for the year 2015-16. For CPPs commissioned from 1.04.2016 onwards, the RPO level as mandated by the appropriate Commission or Ministry of Power, whichever is higher, for the year of commissioning of the CPP shall be applicable.

ii) In case of any augmentation in the capacity, the RPO for augmented capacity shall be the RPO applicable for the year in which the CPP has been augmented.

iii) In case, for meeting the RPO obligation, CPP has surplus power than its consumption requirements, such a CPP may sell its surplus power to the DISCOMs under the prevailing arrangements or in the power exchange."

Exclude any REC sold through various means

REC retained and redeemed for RPO compliance	MU	
Total RPO compliance	MU	
Shortfall/ surplus	MU	
Shortfall/ surplus	%	
Status of RPO compliance		

RPO compliance for OA consumption

Power consumption from all OA sources	MU	
Power consumption from OA sources (renewable)	MU	
REC bought from PX for RPO compliance	MU	
REC retained for RPO compliance	MU	
Total RPO compliance	MU	
RPO targets	%	
RPO targets	MU	
Shortfall/ surplus	MU	
Shortfall/ surplus	%	
Status of RPO compliance		
Power Procurement from DISCOM	MU	

(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance
(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance
The number here represent the net of total power bought from all OA sources and sale through various means.
Exclude any REC sold through various means
(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance
(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance
Considering the DISCOM is complying with its RPO targets, the consumer is not responsible to meet RPO compliance for this consumption.

RPO Compliance status of consumer

Total consumption	Captive consumption	MU
	OA consumption	MU
	Total	MU
RPO targets	Captive consumption	MU
	OA consumption	MU
	Total	MU
RPO compliance	Captive consumption	MU
	OA consumption	MU
	Total	MU
Shortfall/ surplus		MU
Shortfall/ surplus		%
Status of RPO compliance		

(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance

(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance

Annexure I(c): Data reporting format for OA consumer

Name of Obligated entity	
Category of Obligated entity	
Location - State	
FY Year	
Date of reporting	

S. No.	Particular	Formula	Unit	Values
1	Total Energy Consumption		MU	
2	Total RPO target		%	
3	Total RPO target	(1)*(2)	MU	
	RPO type			Total
4	Target		%	
5	Target	(4)*(1)	MU	
	Source of RE procurement			
6	RE power (thru PPA)	Wind	MU	
7		Solar	MU	
8		Biomass	MU	
9		Hydro	MU	
10		Small hydro	MU	
11		Others	MU	
12	REC		MU	
13	Market procurement		MU	
14	Distributed generation/ rooftop/ off-grid		MU	
15	Other sources		MU	
16	Total procurement	(11+12+13+14+15+16+17+18+19+20)	MU	
17	Target achieved	(17)/(3)	%	
18	Shortfall/ surplus	(17)-(9)	MU	
19	Shortfall/ surplus	(18)/(3)	%	
20	Status of RPO compliance			

Notes

The total consumption should be the net of total power procurement (excl. DISCOMs) and power sale to other entities.

Provide the net quantum of REC procured (after excluding any REC quantum sold through various means).

(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance

(-ve) sign indicate shortfall; (+ve) sign indicate surplus in RPO compliance

Annexure II: DISCOM wise RPO Compliance data availability

		2011 15	2012 16	2013 21	2014 27	2015 32	2016 32	2017 34	2018 35	2019 39	2020 41	2021 29	2022 26	2023 8
	DISCOMs													
AN	ED A&N								✓	✓	✓	✓		
AP	APEPDCL			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	APSPDCL			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
AR	APDP			✓	✓	✓	✓	✓	✓					
AS	APDCL						✓	✓						
BR	NBPDCL & SBPDCL	✓	✓	✓										
	NBPDCL				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SBPDCL				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CG	CED	✓	✓	✓	✓	✓	✓	✓						
	EWEDC								✓	✓	✓	✓		
CH	BSP TEED	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CSPDCL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	JSPL-D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DNHDD	DNH & DD PCL											✓	✓	
DL	BSES-R			✓	✓	✓	✓	✓	✓	✓	✓	✓		
	BSES-Y							✓	✓	✓	✓	✓		
	NDMC								✓	✓	✓	✓		
	TPDDL			✓	✓	✓	✓	✓	✓	✓	✓	✓		
GA	EDG	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
GJ	GIFT PCL										✓	✓		
	GUVNL				✓	✓	✓	✓	✓	✓	✓	✓		
	MPSEZ				✓	✓	✓	✓	✓	✓	✓	✓		
	TPL Dahej				✓	✓	✓	✓	✓	✓	✓	✓		
	TPL-A,S				✓	✓	✓	✓	✓	✓	✓	✓		
HR	HVPNL									✓	✓	✓		
HP	HPSEBL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
JK	JPDCL & KPDCL										✓			
	LPDD											✓		
JH	TSL									✓	✓			
KA	BESCOM					✓	✓	✓	✓	✓	✓	✓	✓	✓
	CESC					✓	✓	✓	✓	✓	✓	✓	✓	✓
	GESCOM					✓	✓	✓	✓	✓	✓	✓	✓	✓
	HESCOM					✓	✓	✓	✓	✓	✓	✓	✓	✓
	MESCOM					✓	✓	✓	✓	✓	✓	✓	✓	✓
LK	LED									✓	✓	✓	✓	✓
MP	MPPCL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MH	BEST	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	MSEDCL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Rinfra/Adani	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TPCL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MG	MePDCL							✓	✓	✓	✓	✓	✓	✓
PY	PED	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PB	PSPCL		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RJ	RUVNL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SK	SEPD				✓	✓								
TS	TSNPDCL									✓	✓	✓	✓	✓
	TSSPDCL									✓	✓	✓	✓	✓
UP	UPPCL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK	UPCL												✓	

Annexure III: Data reporting format for Commission

Name of Obligated entity	
Type of Obligated entity	
Year	
Date of reporting (by obligated entity to SNA)	
Date of reporting (by SNA to commission)	
Date of verification (by commission)	

S. No.	Particular	Formula	Unit	Values			
1	Total sale		MU				
2	Excluded consumption (Hydro, etc.)		MU				
3	Net consumption	(1)-(2)	MU				
4	Total RPO target		%				
5	Total RPO target	(3)*(4)	MU				
	RPO type			Wind	HPO	Other RPO	Storage
6	Target		%				
7	Target	(3)*(6)	MU				
8	Shortfall/ surplus from previous year		MU				
9	Actual RPO target (incl. previous year shortfall/ surplus)	(7)+(8)	MU				
10	Procurement		MU				
11	Target achieved	(10)/(3)	%				
12	Shortfall/ surplus	(10)-(9)	MU				
13	Shortfall/ surplus	(12)/(3)	%				
14	Power available for Fungibility (-)		MU				
15	Power received under Fungibility (+)		MU				
16	Target achieved after considering fungibility	(10)+(14)+(15)	MU				
17	Target achieved after considering fungibility	(16)/(3)	%				
18	Shortfall/ surplus after considering fungibility	(16)-(9)	MU				
19	Shortfall/ surplus after considering fungibility	(18)/(3)	%				
20	Carry forward (future)		MU				
21	Carry forward (future)		Year				
22	Total RE Procurement		MU				
23	Total RE Procurement		%				
				Source of procurement			
24	RE power (thru PPA)		MU				
25	REC		MU				
26	Market procurement		MU				
27	Self-generation		MU				
28	Distributed generation/ rooftop/ off-grid		MU				
29	Other sources		MU				
30	Total procurement	(24+25+26+27+28+29)	MU				

India has set itself an ambitious target to achieve 50% electricity generation capacity from non-fossil fuel-based energy resources by 2030 and to become a net zero economy by 2070. Renewable energy is central to these goals. To boost RE generation & consumption in the country, section 86(1)(e) of Electricity Act, 2003 mandates State Electricity Regulatory Commissions to specify a minimum share of total consumption from renewable sources of energy for their state. While this Renewable Purchase Obligation (RPO) framework has been one of the most important drivers for RE deployment in the country and led to impressive achievements in increasing RE capacity, the compliance and monitoring of RPO at the state level remains weak and needs further improvement. In spite of state RPO regulations and central guidelines, the monitoring and reporting of RPO compliance has been irregular, leading to a backlog of shortfall in meeting targets in most states. Improving transparency and accountability of obligated entities esp. regarding compliance will be crucial for the broader success of RPO.

Apart from these targets themselves, the broader RPO framework, incl. its applicability, compliance, data reporting, incentives and penal structures also vary a lot across states. Sharing of regulatory practices across states can promote cross-learning and wider adoption of good practices. This discussion paper has done a critical and comprehensive review of the state RPO regulations and their compliance proceedings and makes some recommendations towards further improving the effectiveness of the RPO framework in States.