

## Regulatory and Policy Initiatives for Solar Renewable Purchase Obligation (RPO) and Renewable Energy Certificate (REC) Mechanism

### Background

India has undertaken a major initiative to scale-up grid-connected solar power to 100 GW by 2022. The enhanced deployment of solar power is a major motivator for energy security and reduction in dependence on conventional sources. It would also contribute in strengthening India's position to fulfil Nationally Determined Contributions (NDCs) by increasing share of non-fossil fuels-based electricity to 40% by the year 2030. As per the Section 86(e) of Electricity Act 2003 and amendment to the National Tariff Policy, the State Electricity Regulatory Commissions (SERCs) were mandated to determine a percentage of the power which has to be procured from renewable sources, termed as Renewable Purchase Obligation (RPO).

A study was undertaken to analyze the solar market and to identify gaps and challenges in terms of regulatory, policy and technical aspects to expedite solar capacity addition. During the study, extensive secondary research was conducted to understand status-quo of existing policies and regulations and primary research through region-wise stakeholder consultations and interactions with SERCs, DISCOMs (Distribution Companies/utilities) and State Nodal Agencies (SNAs). It was identified that RPOs and Renewable Energy Certificate Schemes (RECs) are two major drivers to promote solar.

In line with the Government of India's ambitious target of 100 GW of solar power in 2022, various SERCs have defined the trajectory for increasing the share of solar energy in the state's total demand. The SERCs have prescribed renewable purchase obligation for the obligated entities in the state through regulation for Renewable Purchase Obligation, its Compliance and Implementation.

### Issues and Challenges in the present system

In India, the RPO mechanism was introduced in 2010 and accordingly the RECs were conceptualized in order to comply with the RPO. Of the 29 states, 28 have their RPO targets in place, but compliance has been an issue. Monitoring the RPO compliance by the Obligated Entity (OE) has always been a challenge. Since most of the SERCs have mandated their State Nodal Agencies (SNAs) to publish the status of RPO compliance as per the format issued by the SERCs, there is also an issue on transparency of details and the number of the OEs of a particular state. A major issue that can be seen in the existing system is the identification of OEs and their listing. The list produced by the SNAs is often incomplete and not exhaustive. Further, there is no streamlined process for identification and registration of such OEs.

Verification of the energy-generated data submitted by the captive consumers is self-certified and may not be authentic for the purpose of RPO compliance. Barring few states (Gujarat, Maharashtra, and Chhattisgarh), no SNA has published their quarterly RPO compliance status report. The quarterly reports published on the SNAs' websites have limited information, which hampers monitoring as well as implementation process.

Definition of obligated entity as defined by various SERCs are described in the table below:

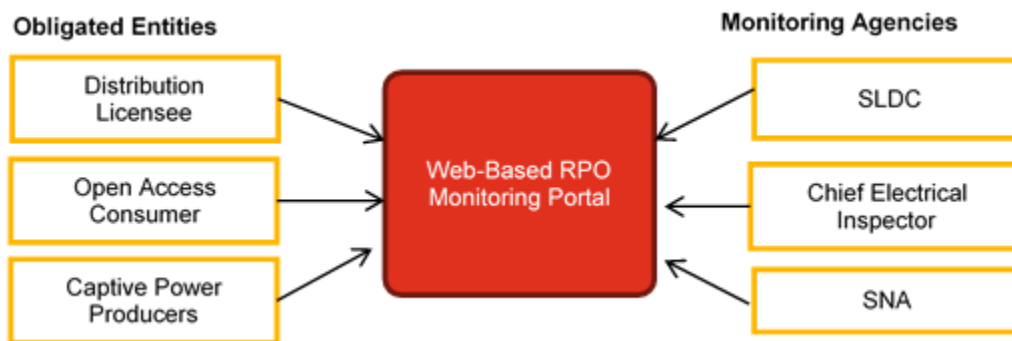
State	Regulation	Definition of Obligated Entity		
Andhra Pradesh	Renewable Power Purchase Obligation Compliance by Purchase of Renewable Energy / Renewable Energy Certificates Regulations, 2012	Every distribution licensee in the state of Andhra Pradesh	Every open access consumer in the state of Andhra Pradesh	Every consumer owning a captive generating plant of installed capacity of 1 MW
Delhi	Renewable Purchase Obligation and Renewable Energy Certificate Framework Implementation Regulations, 2012	Distribution licensee	Open access consumers	Consumer owning the captive power plants

State	Regulation	Definition of Obligated Entity		
Gujarat	Procurement of Energy from Renewable Sources Regulations, 2010	Distribution licensee	Person consuming electricity procured from conventional generation through open access and third party sale	Person consuming electricity generated from conventional captive generating plant having capacity of 5 MW and above for his own use
Haryana	Terms and conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate, 2010	Distribution licensee	Long-term open access consumers	Consumers owning captive power plant
Tamil Nadu	Renewable Energy Purchase Obligation Regulations, 2010	The entity mandated under clause (e) of sub-section (1) of Section 86 of the Act		
Orissa	Renewable and Co-generation Purchase Obligation and its Compliance Regulations, 2010	Distribution licensee (or any entity procuring power on their behalf)	Person consuming electricity procured from conventional generation through open access and third party sale	Person consuming electricity generated from conventional captive generating plant having capacity of 5 MW and above for his own use
Rajasthan	Renewable Energy Certificate and Renewable Purchase Obligations Compliance Framework (First Amendment), 2016	Distribution licensees	Open access consumers. For Open access consumers, total electricity procured other than from distribution licensee is through open access contracts	Consumers owning captive power plant
Karnataka	Power Procurement from Renewable Sources by Distribution Licensee and Renewable Energy Certificate Framework Regulations, 2011	Distribution licensees operating in the State of Karnataka	Any person consuming electricity with a contract demand exceeding 5 MW procured by open access from sources other than renewable sources of energy	Any other person consuming electricity generated from captive generating plant or plants, using other than renewable sources and having a total capacity exceeding 5 MW
Tripura	Regulation of Procurement of Energy From Renewable Sources Regulations, 2010	Distribution licensee (or any entity procuring power on their behalf)	Person consuming electricity procured from conventional generation through open access and third party sale	Person consuming electricity generated from conventional captive generating plant having capacity of 5 MW and above for his own use
Uttar Pradesh	Promotion of Green Energy through Renewable Purchase	Distribution license	Who consumes electricity procured from conventional	Who consumes electricity generated from its grid-connected

State	Regulation	Definition of Obligated Entity		
	Obligation Regulations, 2010		fossil fuel-based generation through open access subjected to RPO to the extent of his consumption met through such source	captive generating plant having installed capacity of 1 MW and above (or such other capacity as may be stipulated by the Commission from time to time by an order
Chhattisgarh	Renewable Purchase Obligation and REC Framework Implementation Regulations, 2011	Distribution licensees	Any person having a contract of not less than 1 MW and who consumes electricity procured from other than renewable energy source based power generation through open access as per Section 42(2) of the Act or co-located. Any open access consumer who also avails part of its power requirement from distribution licensee shall also be subjected to minimum percentage of RPO to the extent of his consumption met through such open access source	Any person who is a captive user (from other than renewable energy based power generating plant) with connected load of 1 MW and above

It can be seen from the above table, that there is ambiguity in the definition of an obligated entity across the states. There has to be a standardized definition throughout the country for defining obligated entities which would then be a necessary driver for promotion of the RPO and ensuring its compliance subsequently.

Another major hindrance has been the unavailability of data relevant for RPO compliance such as PPA-related information, open access deemed generation, captive RE generation, etc. This information has to be readily available on the public forum for effective monitoring of RPO compliance and other aspects. The figure below depicts various obligated entities and their respective monitoring agency/agencies who track the energy consumption of the obligated entities. A mechanism is critically required in order to address the challenges of monitoring and implementation.



## Impact of IT enabled mechanism on REC Market

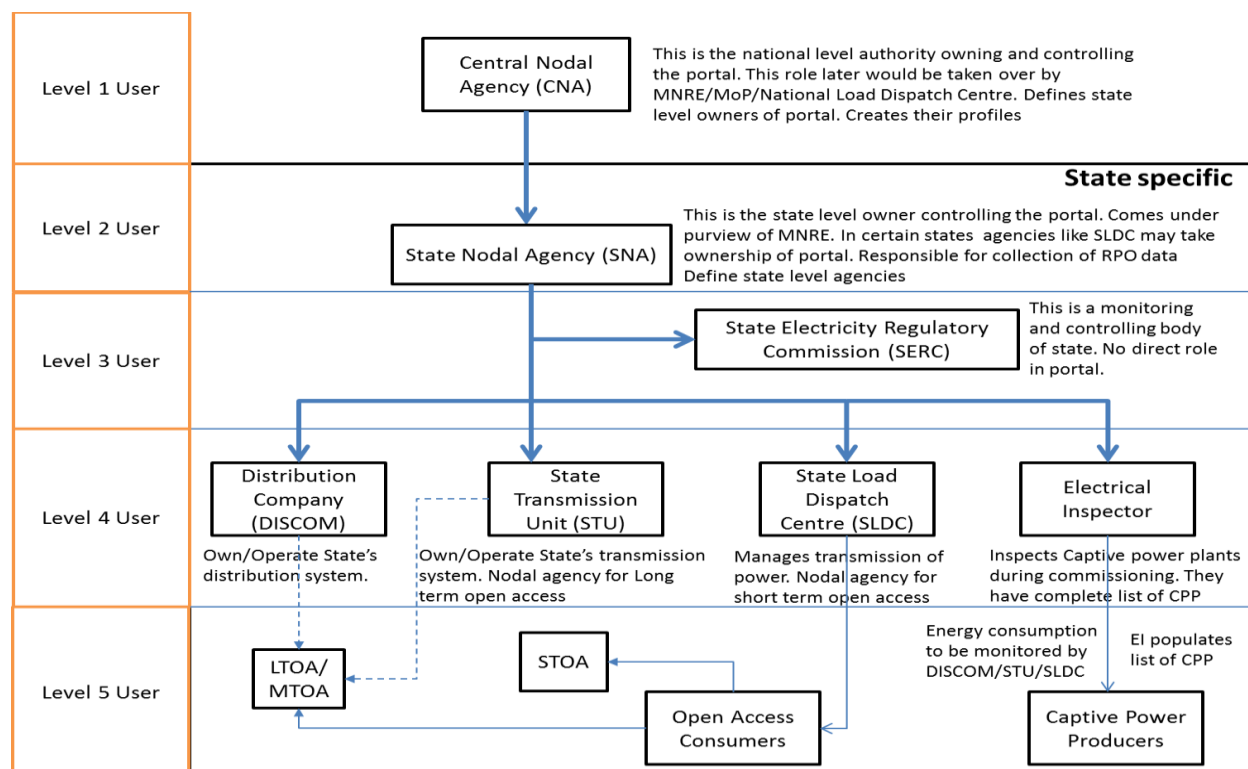
Today information technology is the backbone of any network and assists decision makers with full visibility and control over the information. With the proposed portal in place, SNAs, SERCs and Discoms will have the following advantages:

1. Full visibility over compliance status  
With all the information on compliance or its lack thereof the different stakeholders can effectively ensure compliance of RPO which would eventually lead to an increase in the volumes under the REC market in the short term and setting up of additional renewable/ solar capacity in the long term
2. Increased performance  
With the information at hand, the obligated entities can better plan compliance over the course of a financial year, SNAs can ensure timely compliance so that targets do not slip up which has been the case so far across states in India.
3. Informed decision making  
This information would help all stakeholders especially obligated entities to plan their compliance in such a manner that it is least cost to them and in line with their business model.

In the absence of such an infrastructure today it entails a lot of manual labor for different stakeholders and especially for SNAs ensuring compliance is like shooting in the dark. With the power of information, it is expected that the compliance levels would increase manifold. Therefore, it'd have an increasingly positive impact on the overall REC/RPO market as more and more states and OEs join this information network which would eventually ensure achievement of the 100 GW target.

## Overview of Proposed RPO-REC Compliance and Monitoring Mechanism

RPO-REC Registry is basically a repository that would have all relevant information of the states that have set their RPO targets for the purpose of monitoring and hence would help in effective achievement and monitoring of the RPO targets. The proposed RPO monitoring mechanism would consist of a multi-level hierarchical system with a national level agency at the center and nodal agencies in various states as shown in the figure below:



The operational framework as depicted above clearly defines the flow of information towards REC–RPO Registry. The State Load Dispatch Centres (SLDCs) and SNAs would play a pivotal role in monitoring and day-to-day activities of the REC–RPO Registry Mechanism. There are three steps that have to be followed for implementation of the proposed mechanism. Firstly, information asked in form (Annexure-I) should be duly filled in by all the OEs of the state. The filled in sheets have to be sent to the SNAs on a monthly basis. The monthly reports to be published on the SNAs website.

To implement the proposed REC mechanism at the national level, the aforementioned operating framework has to be put in place in various states. The success of the proposed mechanism will depend on adoption of precise definition of the roles and responsibilities of the institutions, adoption of the appropriate governance structures, and capacity building to undertake defined roles and responsibilities.

### Mechanism of Operation

The flow of information in the RPO portal is depicted in the figure below. The RPO monitoring portal is operated by a nodal agency in each state, which could either SNA or SLDC or any other agency as designated by SERC. The entire process could be divided into three phases.

#### Phase 1: Identification of obligated entities in the state.

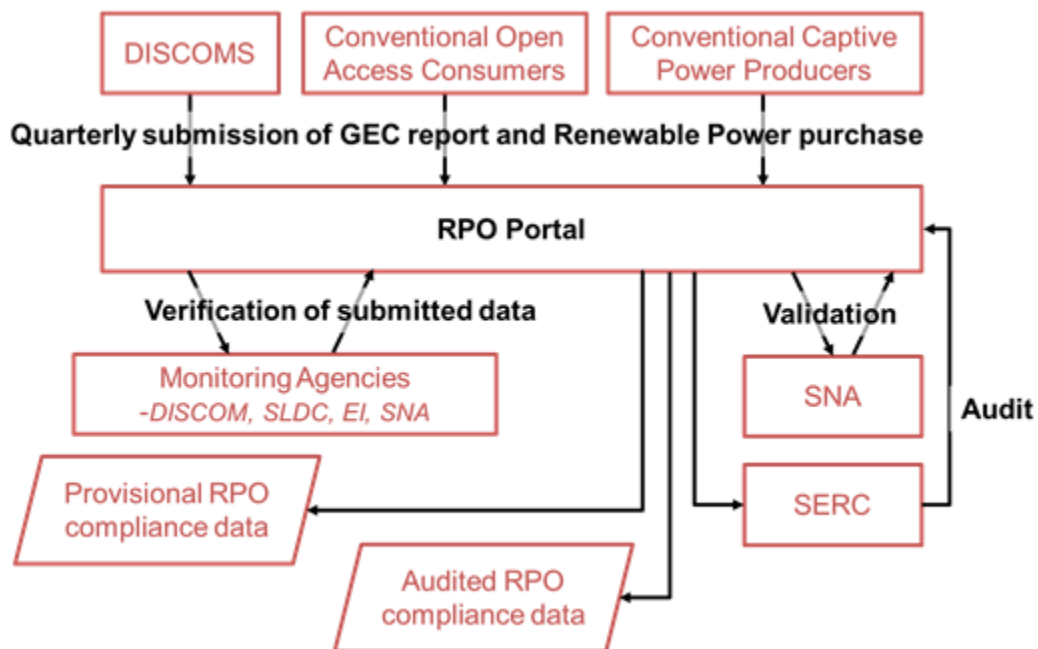
Apart from the state DISCOMs', the list of open access consumers and captive power producers are populated from the database of SLDC and Office of Chief Electrical Inspector respectively. The list is then updated and verified every quarter by the nodal agency. Subsequently, the obligated entities are communicated about their RE obligation

#### Phase 2: Collection of Electricity consumption data and RPO compliance data

The obligated entities will have to submit their gross electricity consumption data through the portal from which their RPO requirement would be calculated on the basis of the SERC defined RPO trajectory for the state. Apart from this, the customer will also have to submit the solar and non-solar compliance data along with supporting documents.

#### Phase 3: Verification of the data submitted by the obligated entities.

Once the aforementioned data is furnished by the obligated entities in the portal, the nodal agency then verifies the data for which it seeks help from agencies like SLDC and DISCOM. Once the data has been verified, it is then published on the public portal as unaudited data. Subsequently, the nodal agency submits the RPO compliance data to SERC, which performs its statutory duty and audits the data, which is then published on a public portal.



## **Conclusion**

The repository will serve as a major step towards achieving the RPO targets set by the Government; which in turn would be a critical step towards fulfilment of the bigger goal of achieving the 100 GW target. This mechanism would also bolster the compliance rate of the states. The IT enabled service would also serve as a driving force for the currently dead REC market.

However, for effective implementation it is critical that capacity building and training programs should to be conducted at the state level particularly for the SNA employees to be well versed with the technicalities of the system. Awareness campaigns should also be conducted for the promotion of this mechanism. Different stakeholders including the SERCs should perform their duties under the statute, SNAs should undertake rigorous follow-ups with OEs to ensure compliance as well address their issues so as that the system is in line with their expectations.

The Government should take up this initiative under mission mode and promote the mechanism which would eventually be the single most important cog in the wheel of the Government's ambitious target of achieving 100 GW by 2022.