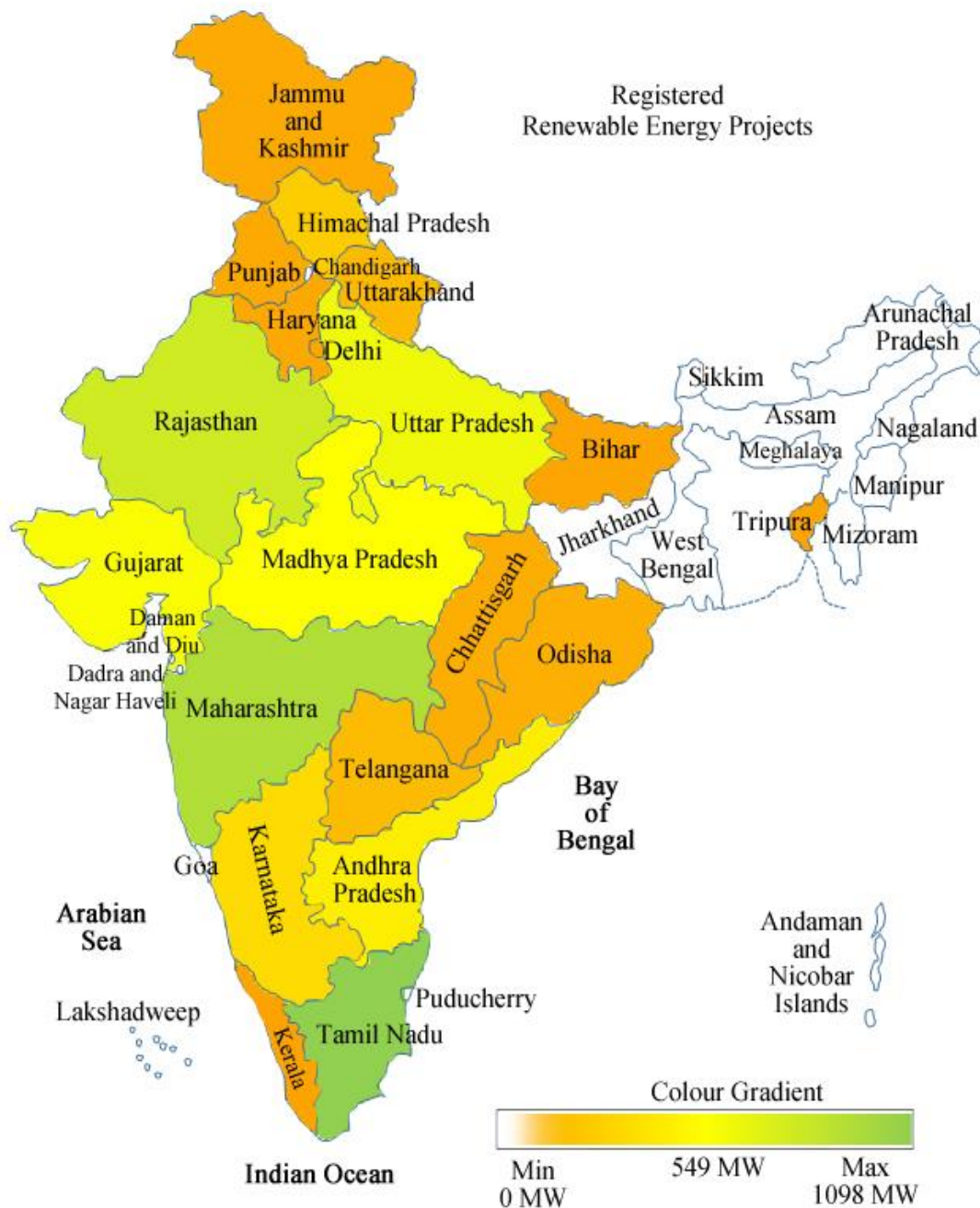




Renewable Energy Certificate Mechanism in India

Key learnings, Data analysis and Way forward



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MESSAGE

CERC in 2010 notified the regulations on Renewable Energy Certificate (REC) mechanism. REC, a green tradable certificate, was conceptualized in a way to develop the pan-India market for renewable energy in the country. The REC mechanism has created a robust and transparent ecosystem for tradable green energy certificates in the country.

REC mechanism has facilitated the obligated entities to meet their Renewable Purchase Obligation (RPO) in those States that are deprived of RE sources. REC has served as a viable instrument for RPO compliance, especially for smaller entities like open access consumers and captive plants. The distribution companies are also participating in a big way in this market segment. It is heartening to note that, POSOCO has put lots of efforts into the smooth implementation of REC mechanism in the country. I am happy that POSOCO has analyzed the seven-year time-series data which has provided a deep insight into the pattern of Accreditation, Registration, RECs issued, prices discovered at power exchanges, RECs purchased, and their redemption etc.

Analysis presented in this report is extremely useful not only for the policy makers and Regulators but also for the academia and industry with regard to working of the green energy certificates as a market instrument in the country.

The report by Central Agency presents a holistic picture of development of REC Mechanism as well as implementation of mechanism by the Stakeholders. This report will facilitate stakeholders to appreciate and gain from the experience of implementation of the REC mechanism.


(P.K. Pujari)

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July 31, 2018



MESSAGE

Renewable energy sector is witnessing exponential growth due to focus of Government of India to increase the renewable energy penetration in the country. In this regard, it is the opportune time for new ideas, research, and learning from the past, to map out the trajectory for future growth in the renewable energy sector.

In line with the focus of Government of India, Renewable Energy Certificate (REC) Mechanism was launched in 2010. REC, as a pan-India market instrument has facilitated obligated entities to meet their Renewable Purchase Obligation (RPO) which in turn developed the market for green certificates in the country. In addition to purchase of more than 3.7 crore RECs by more than 3,000 obligated entities, about 30,000 RECs have been purchased by the voluntary buyers that shows the concerns of the stakeholders towards promotion of green energy in the country.

I am happy to note that REC, as a market instrument, which promote actions that address climate concerns, has also been included in the India's Intended Nationally Determined Contribution (INDC) under the United Nations Framework Convention on Climate Change (UNFCCC).

This report by POSOCO, presents an interesting analysis of the Indian experience of implementation of the REC mechanism. The report inter-alia includes the broader aspects of legal, policy and regulatory framework which led to the market development for RECs in the country.

I hope that this comprehensive report would be able to meet the expectations of the general public including those of experts, policymakers and regulators in providing way forward based on the experience shared in this report.


(A.K. Bhalla)



Acknowledgement



Ministry of Power (MoP) and the Ministry of New and Renewable Energy (MNRE), Government of India have provided various policy level directions for promoting renewable energy and its large-scale grid integration. The Central Electricity Regulatory Commission (CERC) has provided the Regulatory Framework through the CERC REC Regulations. The enabling policy and regulatory framework have facilitated the implementation of the REC Mechanism in the country.

POSOCO is grateful to CERC for recognizing and placing the trust on NLDC to perform the roles and responsibilities of the Central Agency of the REC mechanism. The support received from CERC on matters of regulations, various orders, approval of procedures for implementing the pan-India REC mechanism successfully, is duly acknowledged. At the same time, without the acknowledgement of the support extended by the concerned SERCs, State Agencies, SLDCs and Power Exchanges, the REC mechanism would not have achieved the success gained over the years.

POSOCO is also grateful to Forum of Regulators (FOR) for initiating the study for feasibility of REC mechanism and approval of the model REC regulations for streamlining the Accreditation process across various States.

I take immense delight in extending my acknowledgement to M/s CRISIL Risk and Infrastructure Solutions Limited for technical support with regard to development, maintenance, modifications in the software as per CERC Regulations, subsequent amendments and orders in the REC web application.

The detailed analysis of the information available with the Central Agency has been carried out and the same has been shared in the report. I hope that this report would be able to meet the expectation of the readers including subject experts and to provide them useful insights about the working of the REC mechanism in India.

We would like to thank Dr. S. K. Chatterjee, Joint Chief, CERC, a distinguished expert on REC mechanism, for providing invaluable insights, advice and inputs with respect to REC mechanism.

The contribution of the Shri S. K. Soonee in making the journey of REC mechanism, its smooth administration and providing inspirational mentorship to POSOCO officials needs special mention.

Further, contribution of Shri P. K. Agrawal, Ms. Minaxi Garg, Shri S. R. Narasimhan, Shri S. S. Barpanda, Shri S. C. Saxena, Shri Shailendra Verma, Shri K. C. Saini and Shri S. Sadhukhan in preparation of this report is gratefully acknowledged.

A handwritten signature in blue ink, appearing to read 'K.V. S. Baba'.

K.V. S. Baba
CMD, POSOCO

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Abbreviations

Act	Electricity Act, 2003
AEGCL	Assam Electricity Grid Corporation Limited
AERC	Assam Electricity Regulatory Commission
ANERT	Agency for Non-conventional Energy and Rural Technology, Kerala
APDCL	Assam Power Distribution Company Limited
APERC	Andhra Pradesh Electricity Regulatory Commission
APPC	Average Power Purchase Cost
APSLDC	Andhra Pradesh State Load Despatch Centre
APTEL	Appellate Tribunal for Electricity
BERC	Bihar Electricity Regulatory Commission
BSEB	Bihar State Electricity Board
CBIP	Central Board of Irrigation and Power
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CGP	Captive Generating Plant
CIGRE	International Council on Large Electric Systems
CPP	Captive Power Producer
CSERC	Chhattisgarh Electricity Regulatory Commission
CSPTCL	Chhattisgarh State Power Transmission Limited
CSR	Corporate Social Responsibility
CUF	Capacity Utilisation Factor
DISCOM	Distribution Company
DOE	Directorate of Energy
DPE	Department of Public Enterprises
DSM	Deviation Settlement Mechanism

ESCerts	Energy Saving Certificates
EIR	Energy Injection Report
FOR	Forum of Regulators
HAREDA	Haryana Renewable Energy Development Agency
HERC	Haryana Electricity Regulatory Commission
HPERC	Himachal Pradesh Electricity Regulatory Commission
HPSEB	Himachal Pradesh State Electricity Board Limited
HVPNL	Haryana Vidyut Prasaran Nigam Limited
IEX	Indian Energy Exchange
IMPS	Immediate Payment Service
INDC	Intended Nationally Determined Contribution
IWEA	Indian Wind Energy Association
IWPA	Indian Wind Power Association
IWTMA	Indian Wind Turbine Manufacturers Association
JERC	Joint Electricity Regulatory Commission
JKSERC	Jammu & Kashmir State Electricity Regulatory Commission
JSEB	Jharkhand State Electricity Board
JSERC	Jharkhand State Electricity Regulatory Commission
KPTCL	Karnataka Power Transmission Corporation Limited
KSERC	Kerala State Electricity Regulatory Commission
MCP	Market Clearing Price
MCV	Market Clearing Volume
MEDA	Maharashtra Energy Development Agency
MERC	Maharashtra Electricity Regulatory Commission
MNRE	Ministry of New and Renewable Energy
MNREDA	Meghalaya Non-Conventional and Rural Energy Development Agency

MOP	Ministry of Power
MPERC	Madhya Pradesh Electricity Regulatory Commission
MPPTCL	Madhya Pradesh Power Transmission Company Limited
MSEDCL	Maharashtra State Electricity Distribution Company Limited
NAPCC	National Action Plan on Climate Change
NBPDCL	North Bihar Power Distribution Company Limited
NEFT	National Electronic Funds Transfer
NERC	Nagaland Electricity Regulatory Commission
NLDC	National Load Despatch Centre
OA	Open Access
OERC	Odisha Electricity Regulatory Commission
OPTCL	Odisha Power Transmission Corporation Limited
PAT	Perform Achieve and Trade
POSOCO	Power System Operation Corporation Limited
PPA	Power Purchase Agreement
PSTCL	Punjab State Transmission Corporation Limited
PXIL	Power Exchange India Limited
PXs	Power Exchanges
REAP	Renewable Energy Agency Pondicherry
RE	Renewable Energy
REC	Renewable Energy Certificate
RERC	Rajasthan Electricity Regulatory Commission
RLDC	Regional Load Despatch Centre
RPO	Renewable Purchase Obligation
RTGS	Real Time Gross Settlement
SBPDCL	South Bihar Power Distribution Company Limited

SERC	State Electricity Regulatory Commission
SHP	Small Hydro Plants
SLDC	State Load Despatch Centre
TANTRANSCO	Tamil Nadu Transmission Corporation Limited
TSERC	Telangana State Electricity Regulatory Commission
TSSLDC	Telangana State Load Despatch Center
TSTRANSCO	Transmission Corporation of Telangana Limited
UERC	Uttarakhand Electricity Regulatory Commission
UPCL	Uttarakhand Power Corporation Limited
UPNEDA	Uttar Pradesh New & Renewable Energy Development Agency
UREDA	Uttarakhand Renewable Energy Development Agency
WBERC	West Bengal Electricity Regulatory Commission
WRLDC	Western Regional Load Dispatch Centre
ZEDA	Zoram Energy Development Agency, Mizoram

Executive Summary

“Let us sacrifice our today so that our children can have a better tomorrow.” ~ A. P. J. Abdul Kalam

The National Action Plan for Climate Change (NAPCC) announced in June, 2008, provided the policy mandate for undertaking various measures for promoting renewables. It identified increasing the share of renewable energy in total electricity consumption in the country as one of the important measures to combat climate change. The NAPCC envisaged Dynamic Minimum Renewable Purchase Standard of 5% during FY 2009-10 which was to increase by 1% per annum over the next 10 years. One such policy instrument to achieve desired level of penetration of renewable energy is Renewable Energy Certificate (REC) Mechanism, which was implemented based on the motivation provided in NAPCC. It was envisaged that REC would enable more states and consumers to meet their renewable purchase obligations in a cost-effective manner.

Hon'ble Central Electricity Regulatory Commission (CERC) introduced the modalities of Renewable Energy Certificates in the Indian Electricity Sector by notifying the 'Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation' Regulations, 2010 in January 2010, also termed as REC Regulations, 2010. The regulations provided the enabling regulatory provisions for development and implementation of REC mechanism for trading of RECs at the CERC approved Power Exchange(s) platform.

Subsequently, CERC in conjunction with the Central Agency also formulated procedures for accreditation, registration, issuance and redemption of RECs. Further, it approved rules/bye laws and mechanism for REC market through the power exchanges. In addition to the initiative taken by the CERC, the Forum of Regulators (FOR) has approved the Model Regulations on Renewable Purchase Obligation, its compliance and Implementation of REC Framework for the State Electricity Regulatory Commission.

Renewable Energy Certificate (REC) mechanism essentially seeks to address the mismatch between availability of RE sources and the requirement of the Obligated Entities to meet their renewable purchase obligation across States.

Chronology of the implementation of the REC mechanism, concept of REC, fees and charges paid by generators, legal and policy framework for promotion of renewable energy including development of market for RECs are detailed in the report.

In order to facilitate implementation of REC mechanism, an on-line web portal has been developed. The Renewable Energy (RE) generator applies for Accreditation to State Agency through online web portal; thereafter, the Central Agency i.e. NLDC, POSOCO registers the project under REC mechanism. Subsequently, REC is issued to RE generator as per Energy Injection Report (EIR) certified by the concerned State Load Despatch Centre (SLDC). After issuance of REC(s), RE generator may sell RECs at CERC approved Power Exchanges. Subsequent to transaction of RECs at Power Exchange(s), Central Agency redeems the RECs of the sellers, and maintain the records of the sellers and buyers in the Registry. Further, the

entity-wise details are also made available to CERC, SERCs and State Agencies through REC web application. It is pertinent to mention that few State Agencies/ SLDCs including Telangana, Maharashtra and Gujarat have developed online web application to facilitate the Accreditation and issuance of energy injection reports to the concerned RE generators.

REC, being a pan-India market instrument, the role of all stakeholders viz. FOR, CERC, SERC, SLDCs, State Agencies, RE generators, Power Exchanges along with the role of Central Agency in the scheme of implementation of the REC mechanism, is very important. Many stakeholders are involved in the implementation of the REC mechanism; therefore, the integrity and transparency of whole process is pre-requisite to gain the confidence of the stakeholders in the mechanism. To maintain the integrity and probity of the whole process, CERC has appointed compliance auditors to check the compliance of the REC Regulations by the concerned entities. This report discusses the relevant provisions of the CERC REC Regulations for compliance audit, audit criteria, observations of the auditors and action taken by the Central Agency.

As on March 31, 2018, about 905 renewable energy generators having capacity 3,948 MW, are registered, and in 83 trading sessions, transactions of more than Rs. 6,000 crore have been carried through Power Exchanges. In the process of implementation of the REC mechanism, huge data has been generated and the same has been analyzed to derive the wisdom from the data and key learnings. The analysis of projects Accredited by concerned State Agencies, projects registered by the Central Agency, issued RECs, buyers of RECs, analysis of the technology-wise projects, state-wise analysis, capacity utilization factor (CUF) of the plants etc. have been detailed in the report.

Further, the report also mentions the legal issues handled by the Central Agency, and important points of the judgments of the Hon'ble Supreme Court and Hon'ble APTEL regarding RPO compliance by the obligated entities.

The cost incurred in the management of Registry is approx. Rs. 14 crore in last 7 years, which is about 0.25% of the total value of transactions of RECs, till March'18. The experience of implementation of REC mechanism including the features of the REC website has also been brought out in the report.

The impact of REC mechanism pertaining to facilitation of investment, inter-state transactions of RE, RPO compliance, development of market for voluntary buyers, creation of ESCerts Registry etc. has also been detailed in the report. There have been many challenges in the implementation of REC mechanism in the country. The report discusses the challenges as well as the way forward with respect to REC mechanism. Important highlights pertaining to the registration, issuance, trading of RECs, advantages of RECs over RE for RPO compliances is given below:

1. Registration from 20 States

- 413 nos. of Wind power projects with capacity of 2,167 MW from 7 States
- 360 nos. of Solar power projects with capacity 736 MW from 13 States

- 41 nos. of Biomass projects with capacity of 401 MW from 12 States
- 30 nos. of Small Hydro power projects with capacity of 212 MW from 8 States

The typical size of the registered RE plants is given below:

S. No.	RE Source	Maximum Capacity (MW)	Minimum Capacity (MW)	Average Capacity (MW)
1	Bio-fuel cogeneration	25.26	0.95	7.07
2	Biomass	31.5	0.74	9.79
3	Small Hydro	24.00	1.00	7.08
4	Solar PV	19.00	0.10	2.04
5	Wind	50.40	0.23	5.25

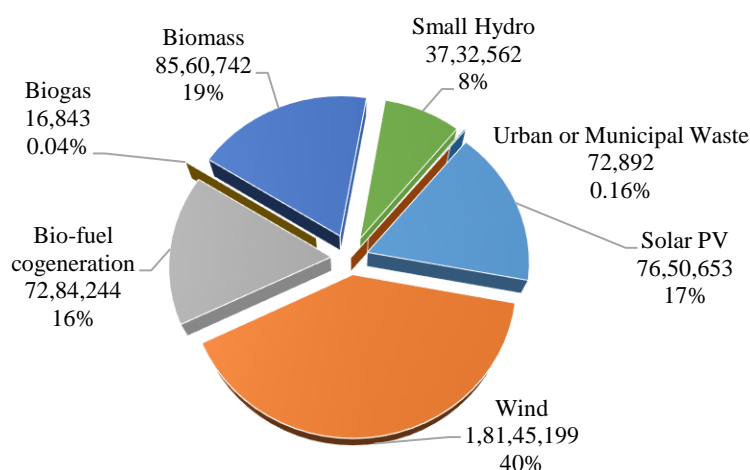
Out of 1,307 registered projects, the information about off-take routes of electricity of 1,248 projects have been collected from RE generators/State agencies, and details of the remaining 59 projects have been sought from the concerned State agencies. The offtake routes and RECs issued against the projects are given below:

S. No.	Route off-take	Total Registered till 31.03.2018		Registration Revoked/ Expired		Registered as on 31.03.2018		No. of RECs Issued
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	
1	OA	368	1,112	72	279	296	833	8,068,723
2	APPC	425	2,055	121	396	304	1,659	16,359,559
3	CGP	355	2,137	161	1,156	194	981	16,602,593
4	APPC/OA	4	57	1	24	3	33	444,418
5	CGP/OA	96	428	1	2	95	427	3,824,715

2. Issuance of RECs

- 4.61 crore RECs (0.77 crore Solar RECs & 3.84 crore Non-solar RECs) have been issued to RE Generators/DISCOMs. Technology-wise breakup of the REC issuance is given below:

Technology-wise breakup of RECs issuance



3. Trading/Redemption of RECs

- 3.70 crore RECs amounting to more than Rs. 6,000 crore traded at Power Exchanges
- 52 Lakh RECs amounting to Rs. 782 crore were traded in the month of December 2017, which was the highest traded volume in a single trading session
- 15.6 Lakh RECs self-retained by the RE generators
- Approx. 30,000 RECs bought by voluntary buyers
- 61 % of total traded RECs purchased by DISCOMs
- 39 % of total traded RECs purchased by CPPs/OA consumers.
- More than 3,000 buyers purchased RECs through Power Exchanges
- More than 1,000 sellers sold the RECs through Power Exchanges
- REC mechanism facilitates the compliance of RPO of small entities like OA consumers, CPPs as well as large entities like DISCOMs. The financial year-wise breakup of RECs purchased by the obligated entities are given below:

Type of Buyer	2011-12*	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	769,986	2,037,013	2,075,604	2,396,711	2,051,278	3,412,651	9,756,733	22,499,976	60.7
OA/CPP	245,698	532,151	671,346	663,232	2,901,010	3,073,112	6,426,872	14,513,421	39.2
Voluntary	14	20,650	1,744	1,979	2,865	1,976	546	29,774	0.1
Total	1,015,698	2,589,814	2,748,694	3,061,922	4,955,153	6,487,739	16,184,151	37,043,171	100

* Include 424 RECs Purchased by OA consumer / CPP and Voluntary in March 2011

4. REC Market Analysis

REC mechanism has played an important role in the development of the market for renewables in the country. Large number of buyers, sellers, DISCOMs, OA consumers and CPPs participated in the REC trading process. Power Exchange-wise yearly summary of buyers and sellers is given below:

Financial Year	Number of buyers of RECs		Number of sellers of RECs		Transacted RECs		Total Transected RECs
	PXIL	IEX	PXIL	IEX	PXIL	IEX	
2010-11	1	2	1	1	274	150	424
2011-12	38	359	39	158	64,266	951,008	1,015,274
2012-13	158	644	279	404	598,825	1,990,989	2,589,814
2013-14	179	904	447	597	1,424,371	1,324,323	2,748,694
2014-15	158	663	628	750	1,514,298	1,547,624	3,061,922
2015-16	240	1,092	679	833	1,816,263	3,138,890	4,955,153
2016-17	378	1,382	699	889	1,869,120	4,618,619	6,487,739
2017-18	234	938	685	915	6,854,898	9,329,253	16,184,151
Total Number of RECs transacted through PXs					14,142,315	22,900,856	37,043,171

Small-obligated entities (OA/CPP) as well as **large obligated entities** (DISCOMs) have participated in the REC trading process. The year-wise break-up of no. of entities participated in the trading process is given below:

Buyer Type FY ↓	No. of DISCOMs participated in trading			No. of OA/CPP participated in trading			No. of Voluntary Buyer participated in the trading		
	PXIL	IEX	Total	PXIL	IEX	Total	PXIL	IEX	Total
2010-11	0	1	1	1	0	1	0	1	1
2011-12	5	8	9	32	348	351	1	3	3
2012-13	8	13	14	148	622	714	2	9	11
2013-14	11	13	16	166	889	958	2	1	3
2014-15	14	15	20	143	646	727	1	2	2
2015-16	12	14	16	227	1,074	1,180	1	4	4
2016-17	14	19	22	360	1,355	1,581	4	8	8
2017-18	16	15	22	216	920	1,045	2	2	4

5. Purchase of RECs vis-a-vis RE for RPO compliance

It has been observed that REC as a market instrument has some advantages over direct purchase of Renewable Energy (RE) for RPO compliance by the obligated entities. Advantages of RECs over RE for RPO compliance are given below:

S. No.	Particular	Compliance of RPO by Purchase of	
		Renewable Energy	REC(s)
1.	Technology Agnostic	Specific RE Tech.	Yes
2.	Competition among different RE technologies	Not Possible	Possible
3.	Transaction Costs	High	Low
4.	Flexibility in procurement in terms of timing	Yes	No
5.	Location Dependent	Yes	No
6.	Exit Load, Barrier for Utility/Beneficiary/Developer/generator	Significant barrier/ only option to terminate the existing PPA	Freedom and flexibility to purchase in terms of quantum/timing

6. Capacity building or knowledge / information

Central Agency has conducted about 27 workshops, and more than 1,500 officials from State Agencies, SLDCs, RLDCs and NLDC participated in the capacity building workshops. Further, relevant MIS reports are available in public domain on <https://www.recregistryindia.nic.in>.

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1. Introduction

“The only way forward, if we are going to improve the quality of the environment, is to get everybody involved.” ~ Richard Rogers

The Renewable Energy Certificate (REC) mechanism was launched in November 2010. The mechanism is based on the REC Regulations notified by the Central Electricity Regulatory Commission (CERC) on January 14, 2010. Through the REC mechanism, a pan-India market has been created for trading of RECs through the power exchanges. REC, as a pan-India market instrument has been designed in a way to facilitate renewable purchase obligation (RPO) by the obligated entities, which, in turn, will promote renewable energy in the country.

As Renewable Energy (RE) sources are not uniformly located in India, and all states are not evenly endowed with RE resources, the REC mechanism was launched to enable obligated entities of less resourceful states to meet their RPO by purchasing RECs instead of directly procuring RE all the way from projects located in different states.

The energy generated by RE generators may be considered as having two components- electricity component (brown component) and the environmental attribute (green component). The total cost of electricity generation from RE sources is classified as the cost of electricity generation equivalent to conventional energy sources and the cost of environmental attributes. Environmental attributes can be exchanged in the form of RECs. The block diagram depicting the conceptual framework of CERC REC Regulations is shown in Figure 1.

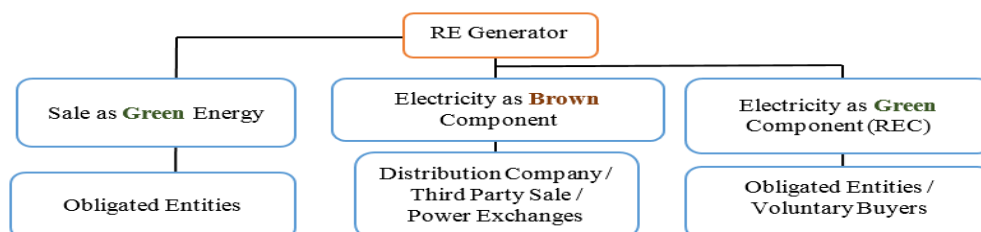


Figure 1: Conceptual framework for REC mechanism as per CERC Regulations

REC mechanism has provided an extra avenue for sale of renewable energy to buyers. The RE generator may exercise any of the two routes for sale of energy:

- Sale of green energy to the obligated entities (Captive Power Plants/Open Access consumers, DISCOMs) wherein a buyer uses the purchased energy for compliance of RPO. In such cases, RE generator(s) are not eligible for registration and issuance of RECs.
- The second option with the RE generator is to register RE project under REC mechanism. In this, RE generator(s) sell the generated electricity to the local DISCOM at Average Power Purchase Cost (APPC) or to Open Access consumer at mutually agreed rates or through Power Exchange(s). In such cases, the buyer of such a quantum of electricity is not **allowed** to use the purchased quantum for compliance of RPO. Only in, such cases, energy sold to the purchaser is eligible for issuance of RECs.

CERC, vide order dated January 29, 2010, designated National Load Despatch Centre (NLDC),

POSOCO, as the Central Agency for the implementation of REC mechanism. Subsequently, centralized integrated web-based software application has been put in place for all stakeholders through the website <https://recregistryindia.nic.in>. The website is used by the RE Generators, DISCOMs, State Agencies, SLDCs, Central Agency, Power Exchanges, SERCs and CERC for all activities related with the REC mechanism.

The REC mechanism has provided an avenue for small as well as large RE generators to take the benefit of REC mechanism without worrying about the power purchase agreement for sale of renewable power. Moreover, the REC mechanism has provided a hassle-free market instrument for obligated entities to meet the RPO by purchase of RECs through Power Exchanges.

Table 1: Chronological development of the REC mechanism

Jun'08	Forum of Regulators (FOR) initiated study for increasing RE Share and feasibility of REC https://www.recregistryindia.nic.in/pdf/ROR/1_FOR_Report_on_Policies_on_Renewables-08.04_2009_.pdf
Jun'08	Hon'ble Prime Minister announced NAPCC recognizing implementation of REC mechanism as a tool to promote RE http://www.moef.nic.in/downloads/home/Pg01-52.pdf
Jun'09	Report on development of conceptual framework for REC mechanism for India https://mnre.gov.in/file-manager/UserFiles/MNRE_REC_Report.pdf
Oct' 09	FOR approved Model REC Regulations http://www.forumofregulators.gov.in/Data/Reports/Final-Model-regulations-for-SERCs-for-REC-implementation.pdf
Jan'10	CERC notified REC Regulations https://www.recregistryindia.nic.in/pdf/REC_Regulation/2(a)CERC_Regulation_on_Renewable_Energy_Certificates_REC.pdf
Jun'10	CERC issued order on Floor and Forbearance Price https://www.recregistryindia.nic.in/pdf/REC_Regulation/Final_Order_on_Forbearance_and_Floor_Price_for_REC.pdf
Jun'10	CERC approved REC detailed procedures submitted by NLDC https://recregistryindia.nic.in/pdf/Procedure_REC/REC_Procedures.pdf
Sep'10	CERC Issued Order on REC fee and charges https://www.recregistryindia.nic.in/pdf/REC_Regulation/fees_and_charges_of_REC.pdf
Sep'10	1 st Amendment to the CERC REC Regulations https://www.recregistryindia.nic.in/pdf/REC_Regulation/REC_Amendment_Regulation.pdf
Nov'10	REC mechanism launched http://pib.nic.in/newsite/PrintRelease.aspx?relid=67239
Mar'11	1 st REC trading https://www.recregistryindia.nic.in/index.php
Jul'13	2 nd Amendment to the REC regulations https://www.recregistryindia.nic.in/pdf/REC_Regulation/Second_Amendment_Notification.pdf
Dec'14	3 rd Amendment to the REC regulations https://www.recregistryindia.nic.in/pdf/REC_Regulation/REC_Regulations_3rd_Amendment.pdf
May'15	Hon'ble Supreme Court judgment regarding RPO compliance https://www.recregistryindia.nic.in/pdf/REC_Regulation/Supreme_Court_Judgement_regarding_RPO_Compliance.pdf
Mar'16	4 th Amendment to the REC regulations https://www.recregistryindia.nic.in/pdf/REC_Regulation/REC_Regulations_Fourth_Amendment_30.03.2016.pdf
Mar'17	CERC Order on floor and forbearance price https://www.recregistryindia.nic.in/pdf/REC_Regulation/CERC_order_30.03_2017_on_Floor_and_Forbearance_price_.pdf
Jul'18	87 th trading session of REC https://www.recregistryindia.nic.in/index.php

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2. Legal and Policy Framework

“Energy conservation is the foundation of energy independence.” ~ Thomas H. Allen

2.1 Electricity Act 2003

The Electricity Act 2003 provided an overall framework for promotion of Renewable Energy in the country. In this reference the Preamble to the Electricity Act 2003 is given as under:

*“An Act to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, **promotion of efficient and environmentally benign policies**, constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto.”*

Further, the Electricity Act 2003 has outlined the following enabling provisions for promotion of Renewable Energy.

Section 3(1): *The Central Government shall, from time to time, prepare the National Electricity Policy and tariff policy, in consultation with the State Governments and the Authority for development of the power systems based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy.*

Section 3(3): *The Central government may, from time to time in consultation with the State Governments, and the Authority review or revise, the National Electricity Policy and tariff policy referred to in section 3(1).*

Section 61(h): *The Appropriate Commission shall, subject to the provisions of the Act, specify the terms and conditions for the determination of tariff, and in doing so, shall be guided by the promotion of co-generation and generation of electricity from renewable sources of energy.*

Section 66: *The Appropriate Commission shall endeavor to promote the development of a market (including trading) in power in such manner as may be specified and shall be guided by the National Electricity Policy referred in Section 3 in this regard.*

Section 86(1)(b): *The SERCs shall discharge the function to regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State.*

Section 86(1)(i): *The State Commission shall ‘promote cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee.’*

Section 79(1) (k): *The CERC shall discharge the functions assigned under the Act.*

2.2 National Electricity Policy 2005

National Electricity Policy outlines several provisions for promoting and harnessing of RE sources. The important provisions of the National Electricity Policy are as follows:

Para- 5.12.1- *“Non-conventional sources of energy being the most environment friendly there is an urgent need to promote generation of electricity based on such sources of energy. For this purpose, efforts need to be made to reduce the capital cost of projects based on non-conventional and renewable sources of energy. Cost of energy can also be reduced by promoting competition within such projects. At the same time, adequate promotional measures would also have to be taken for development of technologies and a sustained growth of these sources.”*

Para- 5.12.2- *“The Electricity Act 2003 provides that co-generation and generation of electricity from non-conventional sources would be promoted by the SERCs by providing suitable measures for connectivity with grid and sale of electricity to any person and also by specifying, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee. Such percentage for purchase of power from non-conventional sources should be made applicable for the tariffs to be determined by the SERCs at the earliest. Progressively the share of electricity from non-conventional sources would need to be increased as prescribed by State Electricity Regulatory Commissions. Such purchase by distribution companies shall be through competitive bidding process. Considering the fact that it will take some time before non-conventional technologies compete, in terms of cost, with conventional sources, the Commission may determine an appropriate differential in prices to promote these technologies.”*

Para- 5.12.3 – *“Industries in which both process heat and electricity are needed are well suited for cogeneration of electricity. A significant potential for cogeneration exists in the country, particularly in the sugar industry. SERCs may promote arrangements between the co-generator and the concerned distribution licensee for purchase of surplus power from such plants. Cogeneration system also needs to be encouraged in the overall interest of energy efficiency and also grid stability.”*

2.3 National Action Plan on Climate Change (NAPCC) 2008

National Action Plan on Climate Change (NAPCC) was launched in 2008 to address the concerns of the climate change. NAPCC envisages several measures to address the problem of global warming. Further, NAPCC suggested that increasing the share of renewable energy in total electricity consumption in the country is one of the important measures for promotion of Renewable Energy. NAPCC had set a target of 5% renewable energy purchase for FY 2009-10, and envisaged that such target will increase by 1% for the next 10 years.

2.4 Tariff Policy 2016

The objective of the tariff policy inter-alia includes the promotion of generation of electricity from renewable sources. The policy is intended to promote REC mechanism for compliance of RPO. Further, the tariff policy stated that the long-term RPO trajectory will be indicated by the

Ministry of Power in consultation with the Ministry of New and Renewable Energy (MNRE).

The pan [India RPO trajectory notified by Ministry of Power](#) is given in Table 2.

Table 2: RPO trajectory notified by Ministry of Power

Long-term Trajectory	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Non-solar	8.75%	9.50%	10.25%	10.25 %	10.25 %	10.50 %
Solar	2.75%	4.75%	6.75%	7.25 %	8.75 %	10.50 %
Total	11.50%	14.25%	17.00%	17.50 %	19.00 %	21.00 %

As per the CEA report, total energy generated during FY 2016-17 was **1,160,141 MUs** and Renewable Energy (RE) generated was **81,869 MUs** i.e. the RE generated was **~7%** of total energy generated which is way behind the RPO target of 11.5% for FY 2016-17.

2.5 Target of 175 GW of Renewable Energy

The Government has up-scaled the target of renewable energy capacity to 175 GW by 2022 which includes 100 GW from solar, 60 GW from wind, 10 GW from bio- resources and 5 GW from small hydro-power. With this ambitious target, India will become one of the largest green energy producers in the world.

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3. Overview of Regulatory Framework

"I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait till oil and coal run out before we tackle that." ~ Thomas Edison

3.1 CERC Regulations and Amendments

CERC has notified the principle regulations in 2010. Subsequently, four amendments have been notified by the Hon'ble CERC. The consolidated regulations are available on REC's website and the same is also attached at **Annexure-I**.

The important points of the regulations and amendments are given below:

3.1.1 Salient features of CERC Regulations notified on January 14, 2010

- Regulations accorded requisite authority to Central Agency for implementation of the provisions of the REC regulations. The functions of the **Central Agency** inter-alia include: **(i)** registration of eligible entities, **(ii)** issuance of certificates, **(iii)** maintaining and settling accounts in respect of certificates, **(iv)** repository of transactions in certificates, and **(v)** such other functions incidental to the implementation of REC mechanism as may be assigned by the Commission from time to time and preparation of the detailed procedures for implementation of REC regulations.
- **Eligible RE sources and technologies:** Grid connected RE technologies approved by MNRE would be eligible under the REC mechanism.
- **Categories of certificates:** There are two categories of RECs, viz., solar RECs and non-solar RECs. Solar RECs are issued to eligible entities for generation of electricity based on solar energy and non-solar RECs are issued to eligible entities for generation of electricity based on other renewable energy sources.
- **Eligibility and Registration for Certificates:** RE generator shall be eligible to apply for registration for issuance of, and dealing in certificates, if it fulfils the following conditions:
 - It has obtained accreditation from the State Agency;
 - It does not have any power purchase agreement for the capacity related to such generation to sell electricity at a preferential tariff determined by the appropriate Commission;
 - It sells the electricity generated either (i) to the distribution licensee of the area in which the eligible entity is located, at a price not exceeding the pooled cost of power purchase of such distribution licensee, or (ii) to any other licensee or to an open access consumer at a mutually agreed price, or through power exchange at market determined price.
- **One REC is treated as equivalent to 1 MWh energy injected into the grid.**

- The eligible entities shall apply to the Central Agency for RECs within three months after corresponding generation.
- **Trading of RECs:** REC would be traded through CERC approved Power Exchanges within the floor price and forbearance price as determined by CERC from time to time on last Wednesday of the month. In the event of a bank holiday on the last Wednesday of any month, trading shall take place on the next bank working day. If there are other exigencies warranting change in the day for trading, the Central Agency can make such change as considered necessary under intimation to all concerned.
- **Validity of REC:** Initially RECs were valid up to 365 days from the date of issuance of RECs, subsequently, CERC extended the validity of REC from time to time.
- **Appointment** of compliance auditors by CERC to inquire into and report on the compliance of the REC regulations by the generators.

3.1.2 1st amendment to CERC REC Regulations w.e.f. September 29, 2010

CERC clarifies eligibility with regard to **termination of PPA** and **inclusion of CPP** for registration and issuance of RECs as follows:

- RE generator who has entered into a Power Purchase Agreement (PPA) for sale of electricity at a **preferential tariff** shall not be eligible in case of pre-mature termination of the PPA for participating in the REC scheme for a period of three years from the date of termination of such agreement or till the scheduled date of expiry of PPA whichever is earlier.
- **Captive Power Plant (CPP)**, based on renewable energy sources **shall be eligible** for the entire energy generated from such plant including self-consumption for participating in the REC scheme, subject to the condition that such CPP has not availed or does not propose to avail any benefit in the form of concessional/promotional transmission or wheeling charges, banking facility benefit and waiver of electricity duty.
- Each certificate issued shall represent **one megawatt hour** of electricity generated from renewable energy source and injected or deemed to be injected (in case of self-consumption by eligible CPP) into the grid.

3.1.3 2nd amendment to CERC REC Regulations 2013 w.e.f. July 11, 2013

CERC has amended various provisions pertaining to Captive Generation Plants (CGPs), waiver of electricity duty, competitive bidding, eligibility of DISCOMs for issuance of RECs, extension of validity of REC, self-retention of RECs etc.

- Amendments regarding registration eligibility are:
 - Renewable energy (RE) contracted via competitive bidding is not eligible for issuance of RECs.

- Co-generation plants (CGP) for their captive generation are eligible for registration under REC mechanism only up to the connected load capacity for issuance of RECs irrespective of the PPA.
- Captive Generating plants who are availing the **benefit of Electricity duty**, now eligible for registration and issuance of RECs.
- **RE generator selling** electricity to an obligated entity for compliance of its RPO is not eligible under REC mechanism.
- Amendments regarding issuance of RECs are:
 - The DISCOM that has purchased RE energy over and above its RPO is entitled to register and receive RECs. This amendment addresses the issue of RE-rich states, which are averse to purchasing RE above their RPO targets
 - Previously, the RE generator applied to the Central Agency for issuance of RECs within three months from the date of energy injection into the grid. As per the amendments, the time period for applying for issuance of RECs has been extended to six months
 - Application for issuance of RECs may be made **3 times** instead of 2 times in a month.
 - The RE generator will be **eligible for RECs** from the date of commercial operation **or** from the date of registration, whichever is **later**
 - To avoid expiry of RECs, the CERC has extended the validity of RECs from 365 days to 730 days
 - The provision for revocation of RECs and/or recovery of sale proceeds from those RE generators that have registered their projects on false information
- The amendment has introduced self-retention of RECs
 - A registered RE generator is permitted to retain RECs for offsetting its RPO

3.1.4 3rd amendment to CERC REC Regulations 2014 w.e.f. January 01, 2015

Amendment pertaining to extension of validity of REC and the concept of vintage multiplier factor have been made. The details are:

- Validity of RE certificate has been extended from 730 days to 1,095 days from the date of issuance of REC
- Vintage multiplier factor of 2.66 for solar generators that have registered their projects prior to January 1, 2015 and was valid up to March 31, 2017

3.1.5 4th amendment to CERC REC Regulations 2016 w.e.f. March 30, 2016

CERC, through 4th amendment in REC Regulations, reduced the supply side of RECs by introducing following provisions:

- Renewable Energy Generators which are opting for **self-consumption** are not Eligible for Registration / Issuance of RECs in following cases:

- If the plant is commissioned prior to September 29, 2010 or after March 31, 2016
- If the plant is commissioned between September 29, 2010 and March 31, 2016, and not registered before June 30, 2016
- If the plant is availing benefits in the form of concessional / promotional transmission or wheeling charges and /or banking facility
- RE generator who is selling power through **open access** and taking benefit in the form of concessional/ promotional transmission or wheeling charges and/or banking facility benefit are not eligible.

3.2 SERC Regulations

As per Section 86(1) (e) of the Electricity Act 2003, the SERCs are mandated to specify the percentage of electricity to be purchased by the obligated entities from the renewable sources of energy. Accordingly, SERCs have specified the Renewable Purchase Obligation (RPO) for area under their jurisdiction by notifying relevant RPO Regulations. SERCs have notified the RPO Regulations/orders inter-alia which included the RECs as an instrument for compliance of RPO Regulations. The list of SERC's Regulations, as available on respective website, is attached at **Annexure-II**.

3.3 CERC orders on fees and charges

To strengthen the institutional capacity of central and state agencies with regard to implementation of the REC mechanism, the CERC has determined fees and charges to be paid by the concerned entities for participation in the REC mechanism.

The details of the orders notified by the CERC are:

- CERC order on determination of fee and charges dated September 21, 2010
- CERC order on determination of fee and charges dated February 5, 2014
- CERC order on determination of fee and charges dated December 28, 2016

3.3.1 Fees and charges payable to State Agency

On the basis of the CERC orders, fees and charges paid by RE generator/DISCOM to the state agency are given in Table 3.

Table 3: Fees and charges payable by RE generator/DISCOM to State Agency

S. No.	Type	Fee in (Rs.)
1	Application Processing Fee	5,000
2	Accreditation Charges	30,000
3	Annual Charges	10,000
4	Revalidation Charge at the end of five (5) years	15,000

3.3.2 Fees and charges payable to Central Agency

The details of fee and charges towards Registration and issuance of RECs (Paid by RE generator/DISCOM to the Central Agency) are given in Table 4.

Table 4: Fees and charges payable by RE generator/DISCOM to the Central Agency

S. No.	Type	CERC order dated 21.9.2010 Fee in (Rs.)	CERC order dated 05.02.2014 Fee in (Rs.)	CERC order dated 28.12.2016 Fee in (Rs.)
1	Application Processing Fee	1,000	1,000	1,000
2	Registration Charges	5,000	5,000	5,000
3	Annual Charges	1,000	1,000	1,000
4	Revalidation Charge at the end of five (5) years	5,000	5,000	5,000
5	<u>REC Issuance Fee per Certificate</u>	<u>10</u>	<u>4</u>	<u>2</u>

Central Agency, on regular basis, share the information related with income accrued and expenditure incurred with the CERC. On the basis of the inputs given by the Central Agency, CERC reduced the issuance fee per certificate in the subsequent years.

Before implementation of the Goods & Services Tax (GST), service tax was collected on fees and charges paid by RE generators. Following the implementation of GST, w.e.f. July 1, 2017, tax is being collected on fees and charges paid by RE generators as per the GST rules. Further, in the case of the REC mechanism, a separate GST Identification Number has been taken and the relevant GST rules are being followed by the Central Agency.

3.4 CERC orders on floor and forbearance price

As per CERC REC Regulations, the transaction of REC(s) is to be carried out on CERC-approved power exchanges (PXs). Further, CERC notifies the forbearance and floor price from time-to-time. Accordingly, the sale and purchase of RECs are to be carried out between the 'floor price' and the 'forbearance price' specified for solar and non-solar RECs. Summary of the floor and forbearance price for Non-solar and solar REC are given in the Table 5 and 6 respectively.

Table 5: Summary of floor and forbearance Price of Non-solar REC

	01.06.2010 – 31.03.2012	01.04.2012 – 31.03.2017	w.e.f. 01.04.2017
Forbearance Price (Rs. / MWh)	3,900	3,300	3,000
Floor Price (Rs. / MWh)	1,500	1,500	1,000

Summary of the floor and forbearance price for Solar RECs are given in the Table 6.

Table 6: Summary of floor and forbearance Price of Solar REC

	01.06.2010 – 31.03.2012	01.04.2012 – 31.12.2014	01.01.2015 – 31.03.2017 #	w.e.f. 01.04.2017
Forbearance Price (Rs. / MWh)	17,000	13,400	5,800	2,400
Floor Price (Rs. / MWh)	12,000	9,300	3,500	1,000
# Vintage multiplier (2.66) introduced, and was valid up to March 31, 2017				

3.5 CERC approved REC procedures for implementation of the REC mechanism

As per CERC REC Regulations, the REC process comprises four stages- Accreditation, Registration, Issuance and Redemption.

Accreditation of the project is carried out by the state agency. Subsequently, the RE generator applies online for registration to the Central Agency via the REC web application. After registration of the project under the REC mechanism, the RE generator is eligible for issuance of RECs corresponding to the energy injected into the grid. Subsequent to issuance of RECs, the RE generator may trade the RECs through PXs. After trading of RECs, the Central Agency redeems the RECs from the respective account of the RE generators.

In line with the CERC REC Regulations, the detailed procedure for implementation of the REC mechanism has been prepared by the Central Agency, and the same has been approved by the CERC. Brief details of the procedure are:

- **Model Procedure for Accreditation of Renewable Energy Project** - In order to streamline the accreditation process across states, the Central Agency has formulated a model procedure for accreditation of a RE project for a state agency. The RE generator, through the REC web application, submits the application for accreditation of the project. Subsequently, the project is accredited by the concerned state agency. Post accreditation, the state agency recommends the registration of the project to the Central Agency
- **Procedure for Registration of Renewable Energy Generation Project**- Subsequent to accreditation, an application for registration is made by the RE generator to the Central Agency through the REC web application. The Central Agency, after verifying the application and other requisite documents, issues a 'Certificate for Registration' to the applicant. Post registration, the applicant is entitled to receive RECs from the date of registration or date of commercial operation, whichever is later
- **Procedure for Issuance of RECs**- As per the Energy Injection Report (EIR) certified by the concerned SLDC and application submitted by the RE generator, the Central Agency issues RECs to the RE generator

- **Procedure for Redemption of Renewable Energy Certificates-** Power Exchanges (PXs) intimate successful transactions to the Central Agency. Subsequently, the Central Agency redeems and extinguishes the traded RECs. Trading sessions are held monthly, on the last Wednesday of the month. The eligible entity (buyers/sellers) may place bids for dealing of RECs on the PXs.

RECs are currently traded on two PXs - Indian Energy Exchange (IEX) and Power Exchange of India (PXIL). The prices quoted for sale/purchase of RECs are between the 'floor price' and 'forbearance price' specified for the solar and non-solar RECs by the CERC.

3.6 Salient features of the REC mechanism, as on 31.03.2018

Participation	Voluntary
REC denomination	1 REC = 1MWh
RE technology	MNRE approved technologies are eligible for participation
Validity	1095 days after issuance of REC, increased from time to time
Categories	<ol style="list-style-type: none"> 1. Solar (unique certificate number) 2. Non-solar (unique certificate number)
Sellers	Eligible RE Generators / Distribution Licensees (DISCOM)
Buyers	<ol style="list-style-type: none"> 1. Obligated Entities (DISCOM/ CPP / OA Consumers) 2. Voluntary
Trading platform	CERC approved Power Exchanges
Trading periodicity	Last Wednesday of the month
Self-retention	Allowed for consumption units of the RE generators which may be used for RPO compliance
Banking / Borrowing	Not Allowed
Transfer type	Single transfer only, repeated trade of the same certificate is not allowed
Solar RECs	Floor price: Rs. 1000 / MWh Forbearance price: Rs. 2400 / MWh
Non-solar RECs	Floor price: Rs. 1000 / MWh Forbearance price: Rs. 3000 / MWh

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4. Management of REC Registry

“You can’t manage what you can’t measure” ~ Edwards Deming

The Central agency has setup an IT infrastructure for Registry function and allocated manpower as per CERC Regulations Orders and Procedures.

Details of the REC web application, features of the REC website, capacity building and legal cases handled are given below:

4.1 REC web application

To implement the pan India REC mechanism, the Forum of Regulators appointed M/s CRISIL Risk and Infrastructure Solutions Limited to develop the REC web application. Subsequent to development of the software, the REC mechanism was launched on November 8, 2010. The web application has been developed as per CERC Regulations and Procedures. Since inception, M/s CRISIL Risk and Infrastructure Solutions Limited has been the technology partner with POSOCO, and providing technical support for maintenance, development and facility management for the REC web application.

Various steps followed by RE generators for Accreditation, Registration, Issuance and Trading of RECs are show in Figure 2.

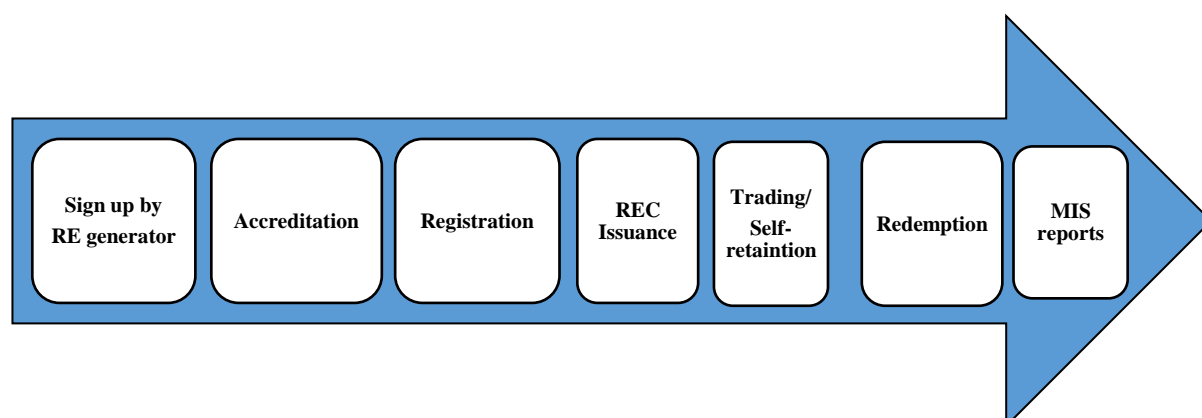


Figure 2: Steps for navigation in web application

The important features of the REC web application under the REC mechanism are:

- Sign-up by the prospective RE generator
- Accreditation of the RE generator by the state agency
- Registration of the RE generator by the Central Agency
- Issuance of RECs to the RE generator by the Central Agency
- Trading of RECs on the PXs/ self-retention
- Redemption of RECs by the Central Agency
- MIS report generation

The operational framework of REC web application is shown in Figure 3.

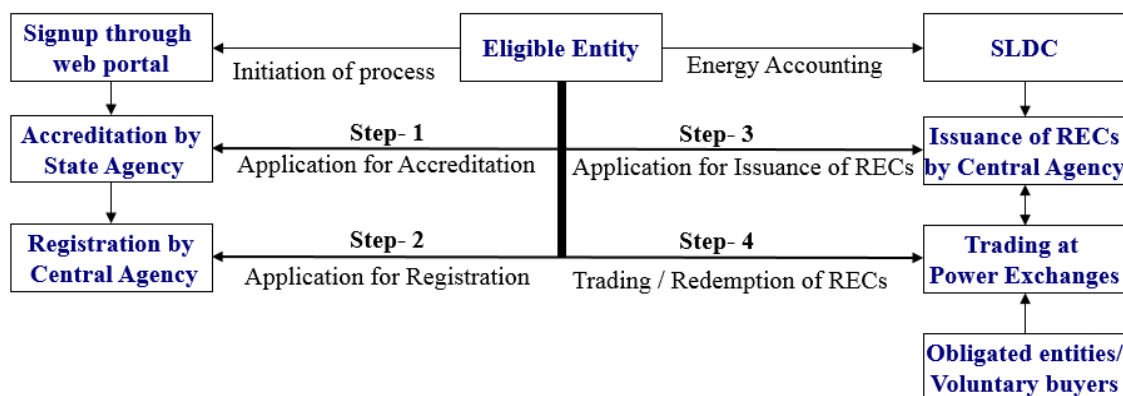


Figure 3: Operational framework of REC web application

The REC web application has helped all stakeholders in implementation of the REC mechanism. Users of the website have been provided dashboards with up-to-date information for relevant decision-making. This portal has also helped state agencies monitor RPO compliance with regard to purchase of RECs. In fact, the website has had approximately 70 lakh hits, which shows its popularity among stakeholders.

Table 7: User Classes & Characteristics of the REC website

Users of the website	Usage Frequency*	Features available to the users
RE Generator	Medium	Accreditation, Registration, Issuance of REC, Redemption of REC, MIS
State Agency Normal User	High	Accreditation, MIS
State Agency Advance User	Medium	Accreditation, MIS
State Electricity Regulatory Commission [SERC]	Low	MIS
Central Agency Normal User	High	Registration, Issuance of REC, Redemption of REC, MIS
Central Agency Advance User	High	Registration, Issuance of REC, Redemption of REC, MIS
Central Electricity Regulatory Commission [CERC]	Low	MIS
Super administrator	Low	Admin
* Usage Frequency Low - Once in a month, Medium - Once in a week, High - Once in a day, Very High - Continuous		

4.2 Schematic description of processes under the REC mechanism

4.2.1 Accreditation of RE project

- The RE generator applies on the REC web application for accreditation
- The state agency verifies the details submitted by the RE generator
- Post scrutiny of the details provided by the RE generator, the state agency either accredits or rejects the application

- Upon accreditation of the RE project, the state agency provides confirmation to the RE generator and also intimates the respective SLDC and the Central Agency
- After successful Accreditation of RE project, State Agency provide confirmation to RE generator and also intimate for same to respective SLDC and Central Agency

The schematic description of accreditation of RE project is shown in Figure 4.

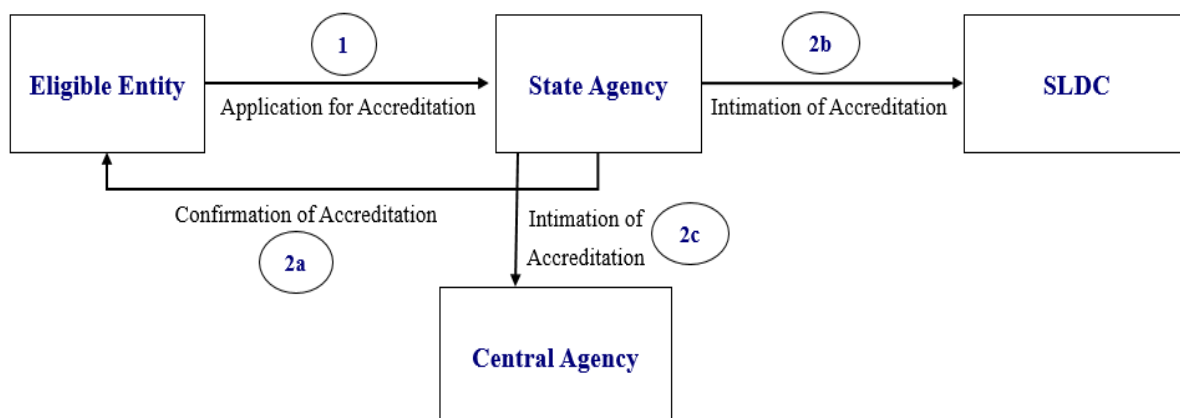


Figure 4: Schematic description of Accreditation of RE project

4.2.2 Registration of RE project

- Subsequent to accreditation of a RE project, the RE generator applies on the REC web application for registration and provides the relevant documents to the Central Agency with applicable fees and charges
- The Central Agency verifies the details submitted by the RE generator
- After verification of the details provided, the Central Agency either registers or rejects the application in case of a deficiency
- Upon registration of the RE project, the Central Agency provides confirmation to the RE generator and also intimates the respective state agency, SLDC and PXs

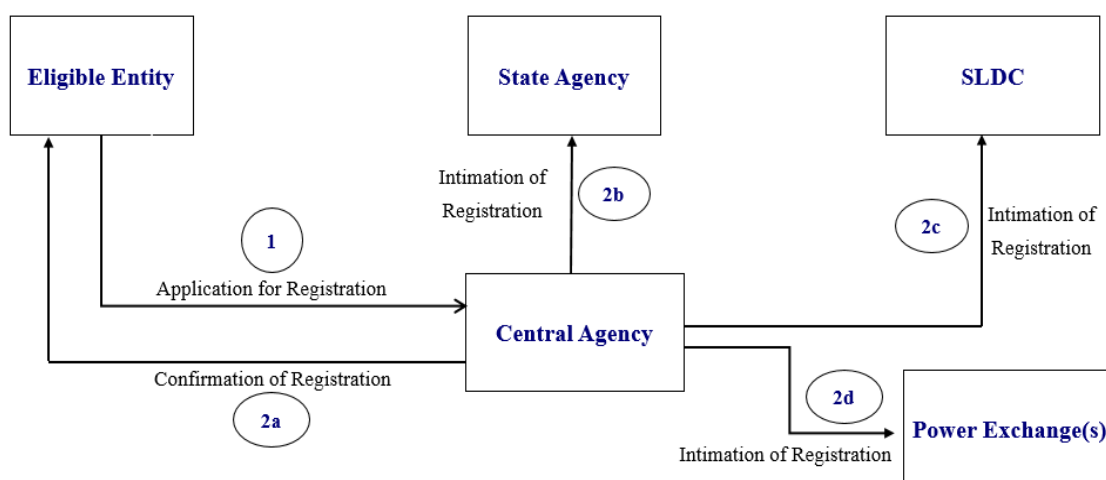


Figure 5: Schematic description of Registration of RE project

4.2.3 Issuance of RECs to eligible entities

- After registration of the RE project, the RE generator becomes an eligible entity under the REC mechanism
- The RE generator applies online for issuance of REC(s) and provides relevant documents to the Central Agency
- The Central Agency verifies the application as per the EIR provided by the concerned SLDC, and, thereafter, issues REC(s) to the RE generator

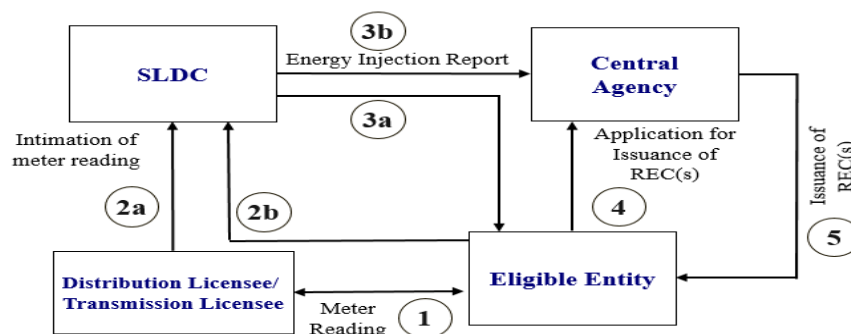


Figure 6: Schematic description of issuance of RECs

4.2.4 Redemption of RECs

PX(s) intimate the successful transactions to the Central Agency. Subsequently, the Central Agency redeems and extinguishes the traded RECs. The RECs are extinguished by the Central Agency on ‘first-in-first-out’ basis. The RECs may also be retained by RE generators to fulfill their RPOs.

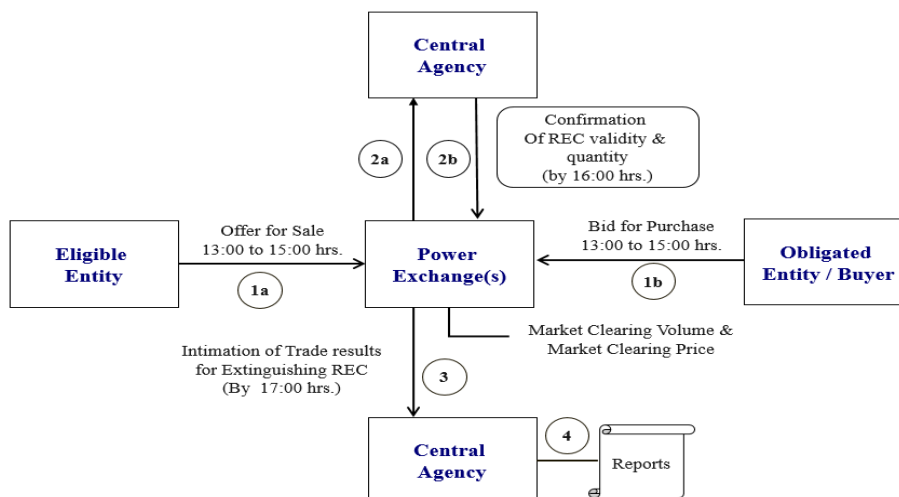


Figure 7: Schematic description of Redemption of RECs

4.2.5 Online Payment gateway

Initially, the fees and charges were paid by RE generators to the Central Agency for registration and issuance of RECs via electronic mode, i.e., RTGS, IMPS or NEFT. The offline payment mode has been discontinued due to challenges faced by RE generators as well as the Central Agency in case of refunds, party-wise reconciliation etc.

The Central Agency has integrated the online payment gateway with the REC web application w.e.f. August 2017. Subsequently, all payments are being made by RE generators via the payment gateway, after verification of the submitted application of the RE generator by the Central Agency. A user manual for the online payment gateway is available at: https://recregistryindia.nic.in/pdf/helpdocument/Help_Manual_paymentgateway.pdf

4.3 Features of the REC website

4.3.1 REC website

The REC website has been designed and developed in accordance with CERC Regulations and Procedures. The website has evolved over the time because of various amendments in the REC regulations, procedures and orders of the CERC.

Important features of the website are:

- User ID and password are generating through web application and intimation given to RE generators, CERC, SERCs and state agencies
- Stakeholders can access the relevant MIS reports
- Detailed help manual is available on the website for ready reference
- The website is provided with a dedicated section containing Frequently Asked Questions
- Audit trail logs of access to the website is maintained and monitored on a regular basis for cyber security reasons

4.3.2 A Virtual Tour of the REC website

A centralized integrated web-based software application has been put in place for all stakeholders through the website - www.recregistryindia.nic.in. It is used by RE generators, DISCOMs, state agencies, Central Agency, PXs, SERCs and CERC for all activities related with the REC mechanism. The homepage snapshot of website is shown in Figure 8.

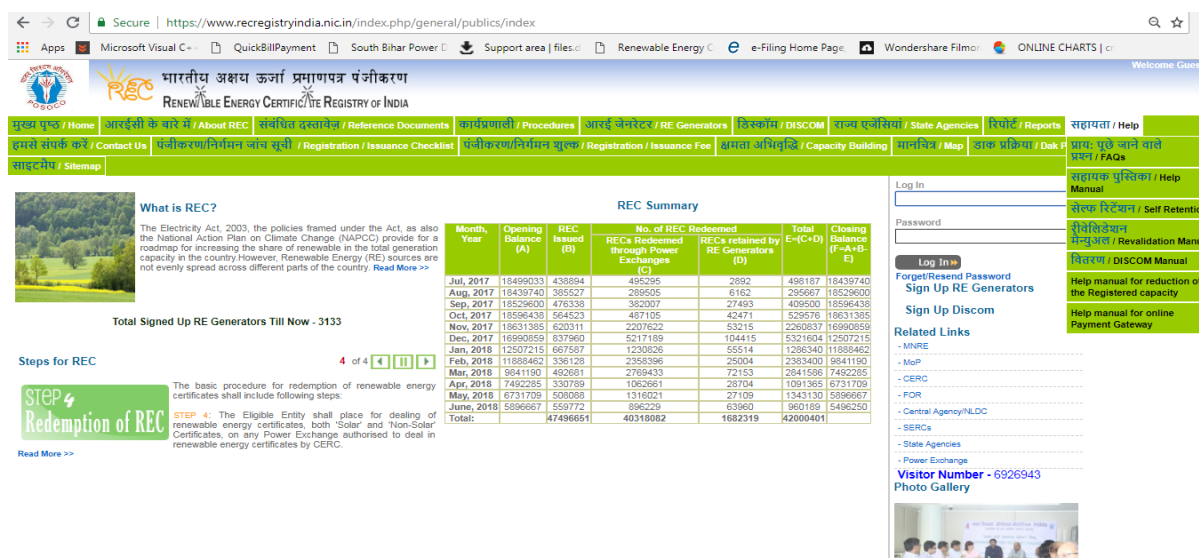


Figure 8: Snapshot of the REC website

4.3.3 Tailor-made reports e.g. REC inventory

- a) Detailed break-up of State and Source wise Accreditation/ Registration status (shown in Figure 9):

https://recregistryindia.nic.in/index.php/general/publics/State_Source_Wise_Accr_Status

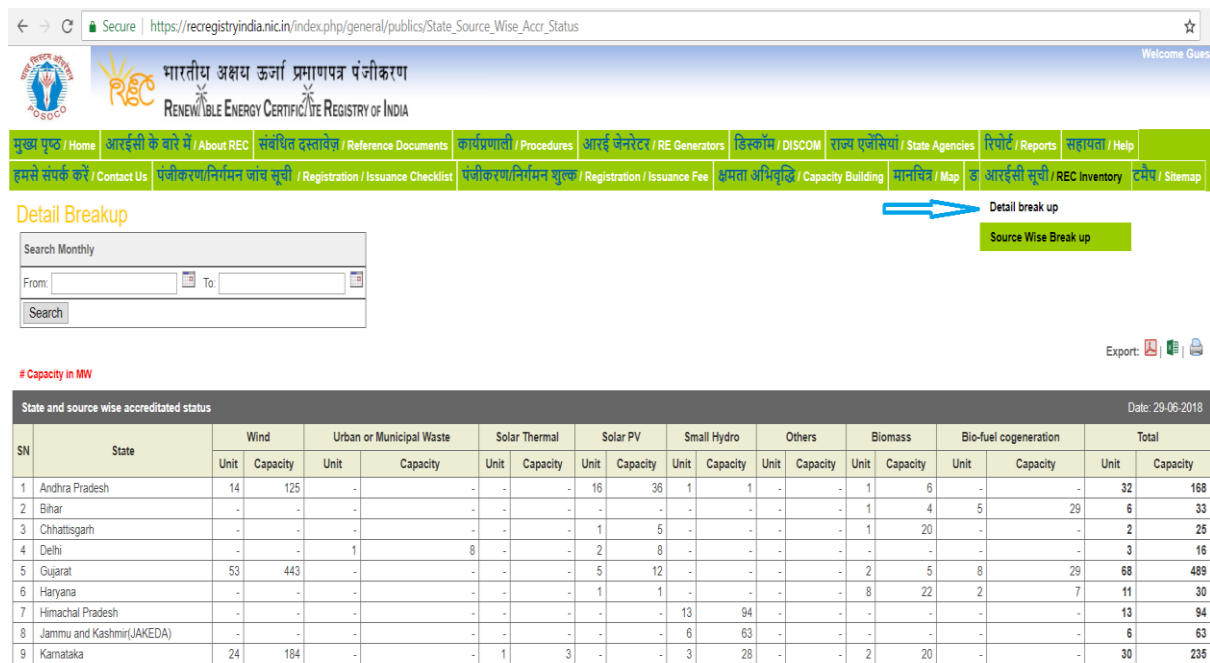


Figure 9: Snapshot of state wise report on REC website

- b) Detailed break-up of Registered Projects (shown in Figure 10):

https://recregistryindia.nic.in/index.php/general/publics/registered_regens

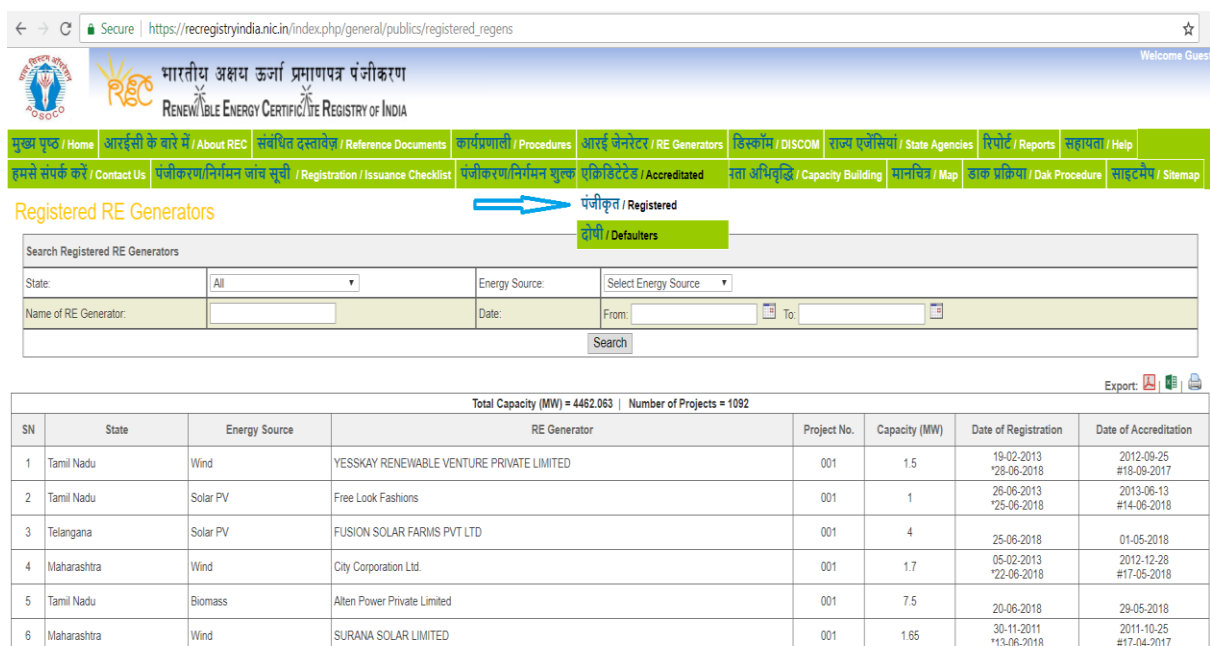
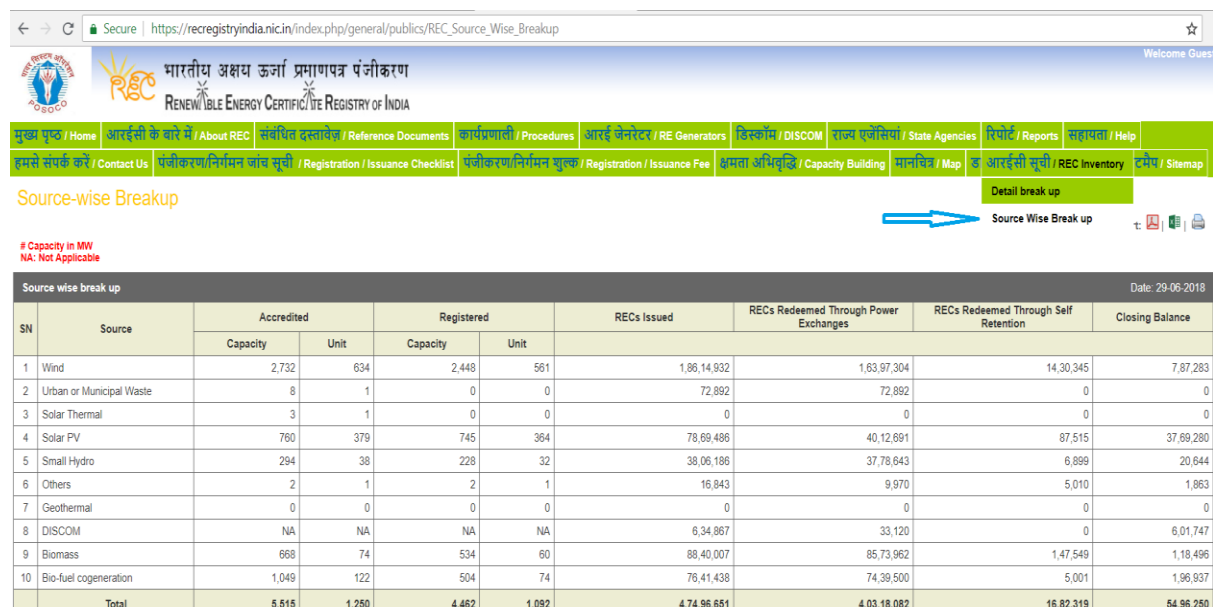


Figure 10: Snapshot of breakup of registered RE generators on REC website

c) Source wise break-up of REC Inventory (shown in Figure 11):

https://recregistryindia.nic.in/index.php/general/publics/REC_Source_Wise_Breakup



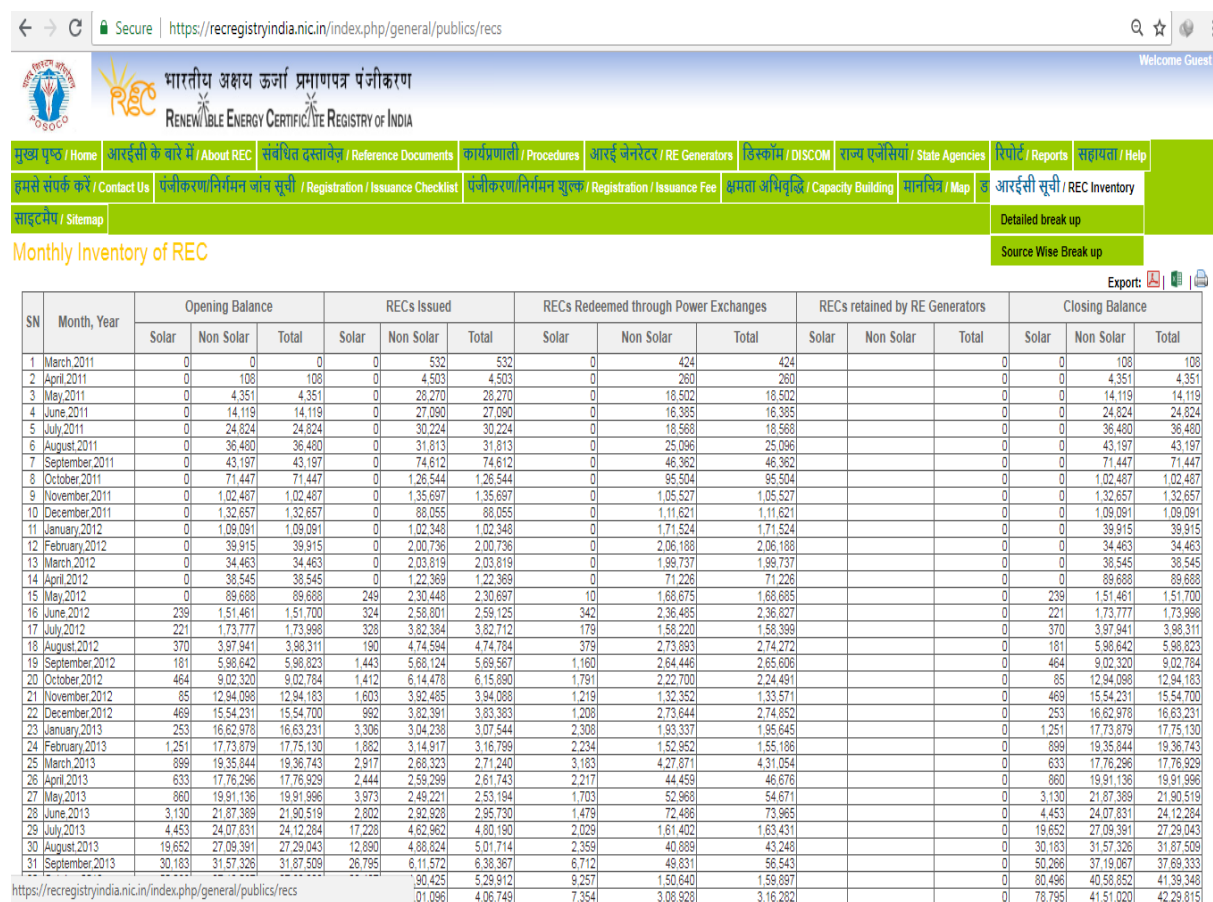
The screenshot shows the 'Source wise break up' page on the REC website. It features a navigation bar with links like 'Home', 'About REC', 'Reference Documents', 'Procedures', 'RE Generators', 'DISCOM', 'State Agencies', 'Reports', 'Help', 'Contact Us', 'Registration / Issuance Checklist', 'Registration / Issuance Fee', 'Capacity Building', 'Map', 'REC Inventory', and 'Sitemap'. A 'Detail break up' button is highlighted. Below the navigation bar, a table titled 'Source wise break up' displays data for various energy sources. The table has columns for SN, Source, Accredited Capacity and Unit, Registered Capacity and Unit, REC Issued, REC Redeemed Through Power Exchanges, REC Redeemed Through Self Retention, and Closing Balance. The data is as of 29-06-2018.

SN	Source	Accredited Capacity	Accredited Unit	Registered Capacity	Registered Unit	REC Issued	REC Redeemed Through Power Exchanges	REC Redeemed Through Self Retention	Closing Balance
1	Wind	2,732	634	2,448	561	1,86,14,932	1,63,97,304	14,30,345	7,87,283
2	Urban or Municipal Waste	8	1	0	0	72,892	72,892	0	0
3	Solar Thermal	3	1	0	0	0	0	0	0
4	Solar PV	760	379	745	364	78,69,486	40,12,691	87,515	37,69,280
5	Small Hydro	294	38	228	32	38,06,186	37,78,643	6,899	20,644
6	Others	2	1	2	1	16,843	9,970	5,010	1,863
7	Geothermal	0	0	0	0	0	0	0	0
8	DISCOM	NA	NA	NA	NA	6,34,867	33,120	0	6,01,747
9	Biomass	668	74	534	60	88,40,007	85,73,962	1,47,549	1,18,496
10	Bio-fuel cogeneration	1,049	122	504	74	76,41,438	74,39,500	5,001	1,96,937
	Total	5,515	1,250	4,462	1,092	4,74,96,651	4,03,18,082	16,82,319	64,96,260

Figure 11: Snapshot of source wise break-up on REC website

d) Monthly Inventory of REC (shown in Figure 12):

<https://recregistryindia.nic.in/index.php/general/publics/recs>



The screenshot shows the 'Monthly Inventory of REC' page on the REC website. It features a navigation bar similar to the previous page. Below the navigation bar, a table titled 'Monthly Inventory of REC' displays data for each month from March 2011 to September 2013. The table has columns for SN, Month, Year, Opening Balance (Solar, Non Solar, Total), REC Issued (Solar, Non Solar, Total), REC Redeemed through Power Exchanges (Solar, Non Solar, Total), REC retained by RE Generators (Solar, Non Solar, Total), and Closing Balance (Solar, Non Solar, Total). The data is as of 29-06-2018.

SN	Month, Year	Opening Balance Solar	Opening Balance Non Solar	Opening Balance Total	REC Issued Solar	REC Issued Non Solar	REC Issued Total	REC Redeemed through Power Exchanges Solar	REC Redeemed through Power Exchanges Non Solar	REC Redeemed through Power Exchanges Total	REC retained by RE Generators Solar	REC retained by RE Generators Non Solar	REC retained by RE Generators Total	Closing Balance Solar	Closing Balance Non Solar	Closing Balance Total
1	March 2011	0	0	0	0	532	532	0	424	424	0	0	0	0	108	108
2	April 2011	0	108	108	0	4,503	4,503	0	260	260	0	0	0	0	4,351	4,351
3	May 2011	0	4,351	4,351	0	28,270	28,270	0	18,502	18,502	0	0	0	0	14,119	14,119
4	June 2011	0	14,119	14,119	0	27,090	27,090	0	16,385	16,385	0	0	0	0	24,824	24,824
5	July 2011	0	24,824	24,824	0	30,224	30,224	0	18,568	18,568	0	0	0	0	36,460	36,460
6	August 2011	0	36,460	36,460	0	31,813	31,813	0	25,096	25,096	0	0	0	0	43,197	43,197
7	September 2011	0	43,197	43,197	0	74,612	74,612	0	46,362	46,362	0	0	0	0	71,447	71,447
8	October 2011	0	71,447	71,447	0	1,26,544	1,26,544	0	95,504	95,504	0	0	0	0	1,02,487	1,02,487
9	November 2011	0	1,02,487	1,02,487	0	1,35,697	1,35,697	0	1,05,527	1,05,527	0	0	0	0	1,32,657	1,32,657
10	December 2011	0	1,32,657	1,32,657	0	88,055	88,055	0	1,11,621	1,11,621	0	0	0	0	1,09,091	1,09,091
11	January 2012	0	1,09,091	1,09,091	0	1,02,348	1,02,348	0	1,71,524	1,71,524	0	0	0	0	39,915	39,915
12	February 2012	0	39,915	39,915	0	2,00,736	2,00,736	0	2,06,188	2,06,188	0	0	0	0	34,463	34,463
13	March 2012	0	34,463	34,463	0	2,03,819	2,03,819	0	1,99,737	1,99,737	0	0	0	0	38,545	38,545
14	April 2012	0	38,545	38,545	0	1,22,369	1,22,369	0	71,226	71,226	0	0	0	0	89,688	89,688
15	May 2012	0	89,688	89,688	249	2,30,448	2,30,697	10	1,68,675	1,68,685	0	239	1,51,461	1,51,700		
16	June 2012	239	1,51,461	1,51,700	324	2,58,801	2,59,125	342	2,36,485	2,36,827	0	221	1,73,777	1,73,998		
17	July 2012	221	1,73,777	1,73,998	328	3,82,384	3,82,712	179	1,58,220	1,58,399	0	370	3,97,941	3,98,311		
18	August 2012	370	3,97,941	3,98,311	190	4,74,594	4,74,784	379	2,73,893	2,74,272	0	181	5,98,642	5,98,823		
19	September 2012	181	5,98,642	5,98,823	1,443	5,68,124	5,69,567	1,160	2,64,446	2,65,606	0	464	9,02,320	9,02,784		
20	October 2012	464	9,02,320	9,02,784	1,412	6,14,478	6,15,890	1,791	2,22,700	2,24,491	0	85	12,94,088	12,94,183		
21	November 2012	85	12,94,088	12,94,183	1,603	3,92,485	3,94,088	1,219	1,32,352	1,33,571	0	469	15,54,231	15,54,700		
22	December 2012	469	15,54,231	15,54,700	992	3,82,391	3,83,383	1,208	2,73,644	2,74,852	0	253	16,62,978	16,63,231		
23	January 2013	253	16,62,978	16,63,231	3,306	3,04,238	3,07,544	2,308	1,93,337	1,95,645	0	1,251	17,73,879	17,75,130		
24	February 2013	1,251	17,73,879	17,75,130	1,882	3,14,917	3,16,799	2,234	1,52,952	1,55,186	0	899	19,35,844	19,36,743		
25	March 2013	899	19,35,844	19,36,743	2,917	2,68,323	2,71,240	3,183	4,27,871	4,31,054	0	633	17,76,296	17,76,929		
26	April 2013	633	17,76,296	17,76,929	2,444	2,59,299	2,61,743	2,217	44,459	46,676	0	860	19,91,136	19,91,996		
27	May 2013	860	19,91,136	19,91,996	3,973	2,49,221	2,53,194	1,703	52,968	54,671	0	3,130	21,87,389	21,90,519		
28	June 2013	3,130	21,87,389	21,90,519	2,802	2,92,928	2,95,730	1,478	72,496	73,965	0	4,453	24,07,631	24,12,084		
29	July 2013	4,453	24,07,631	24,12,084	17,228	4,62,962	4,80,190	2,029	1,61,402	1,63,431	0	19,652	27,09,391	27,29,043		
30	August 2013	19,652	27,09,391	27,29,043	12,890	4,88,824	5,01,714	2,359	40,889	43,248	0	30,183	31,57,326	31,87,509		
31	September 2013	30,183	31,57,326	31,87,509	26,795	6,11,572	6,38,367	6,712	49,831	56,543	0	50,286	37,19,067	37,69,333		
					90,425	5,29,912	5,39,337	9,257	1,50,640	1,59,897	0	80,496	40,58,852	41,39,348		
					01,096	4,06,749	4,07,845	7,354	3,08,928	3,16,282	0	76,795	41,51,020	42,29,815		

Figure 12: Snapshot of monthly REC inventory on REC website

4.3.4 Site map of the REC website

Home	RE Generators
<ol style="list-style-type: none"> Home About REC Reference Documents Procedures <ul style="list-style-type: none"> Approved REC Procedures RE Generators <ul style="list-style-type: none"> Accredited Registered Defaulters State Agencies Reports <ul style="list-style-type: none"> REC Inventory Detail break up Source Wise Break up Self-Retention Report Help <ul style="list-style-type: none"> FAQs Help Manual Self-Retention Contact Us <ul style="list-style-type: none"> Central Agency SERCs Technical Assistance Registration / Issuance Checklist Registration / Issuance Fee Capacity Building Highlights Map Dak Procedure Feedback 	<ol style="list-style-type: none"> Application for Accreditation <ul style="list-style-type: none"> Apply for Accreditation View Application of Accreditation Application for Registration <ul style="list-style-type: none"> Apply for Registration View Application of Registration Issuance of REC <ul style="list-style-type: none"> Apply for Issuance of RECs Search <ul style="list-style-type: none"> Search Energy Injection Reports Search RECs Reports <ul style="list-style-type: none"> Energy Injection List of RECs Update Contact Details Change Password
Central Agency	State Agency
<ol style="list-style-type: none"> In-Process Registrations Accredited RE Generators Registered RE Generators Rejected Registration-Applications Issuance of REC <ul style="list-style-type: none"> Approve/Reject Injection Report Trading Process <ul style="list-style-type: none"> Make Trade View All Trades Self-Retention Trading Report Self-Retention of RECs <ul style="list-style-type: none"> Pending Rejected Redeemed Sellers Buyers <ul style="list-style-type: none"> Buyers Registration Search Buyer 	<ol style="list-style-type: none"> In-Process Accreditations Accredited RE Generators Registered RE Generators Rejected Accreditation-Applications Search <ul style="list-style-type: none"> Search Injection Reports Search RECs Search RE Generators Reports <ul style="list-style-type: none"> Energy Injection Accredited RE Generators Registered RE Generators Entity-wise Inventory Report Entity-wise REC Status Entity-wise Energy Balance Pending Accreditation Application Rejected Accreditation-Applications <p style="text-align: right;">Continued...</p>

Central Agency	State Agency
10. Search <ul style="list-style-type: none"> ○ Search Energy Injection Reports ○ Search RECs ○ Search RE Generators 11. Reports <ul style="list-style-type: none"> ○ Energy Injection ○ Accredited RE Generator ○ Registered RE Generator ○ Entity Inventory Report ○ Entity REC Status ○ Entity Energy Balance ○ Pending Accreditation Application ○ Pending RE Generator Injection Report ○ Rejected Accreditation-Applications 12. Revocation of Registration <ul style="list-style-type: none"> ○ Revoke ○ Revoked Accreditation List 13. State Agencies User <ul style="list-style-type: none"> ○ Normal User ○ Advance User 14. Re-registration <ul style="list-style-type: none"> ○ Pending ○ Verified ○ Approved ○ Rejected ○ Re-registration Fees 15. Invoices List <ul style="list-style-type: none"> ○ Re-registration Invoices 16. Administration <ul style="list-style-type: none"> ○ Add/View/Update State Agencies ○ Add/View/Update SERCs ○ Add/View/Update CERC ○ Add/View/Update Power Exchanges ○ Update Profile ○ Change Login Password ○ System Audit 	7. Profile <ul style="list-style-type: none"> ○ Update Profile ○ Change Password
CERC	SERC
1. View Accredited RE Generators 2. View Registered RE Generators 3. Search <ul style="list-style-type: none"> ○ Search RECs ○ Search RE Generators 4. Reports <ul style="list-style-type: none"> ○ Accredited RE Generators ○ Registered RE Generators ○ Entity Inventory Report ○ Entity-wise REC Status 5. Profile <ul style="list-style-type: none"> ○ Update Profile ○ Change Password 	1. View Accredited RE Generators 2. View Registered RE Generators 3. Reports <ul style="list-style-type: none"> ○ Accredited RE Generators ○ Registered RE Generators ○ Entity Inventory Report ○ Entity-wise REC Status 4. Profile <ul style="list-style-type: none"> ○ Update Profile ○ Change Password

4.4 Expenditure incurred by the Central Agency for implementation of the REC mechanism

Besides infrastructure deployment of software/hardware and capacity building, NLDC has deployed the requisite manpower and the necessary tools to perform the functions of the Central Agency.

Table 8: FY-wise expenditure incurred for the management of registry

FY	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Rs. (in Crore)	0.47	1.26	1.53	1.59	1.74	2.53	2.20	2.04	~ 14 Cr.

4.5 Knowledge dissemination through publication of technical papers

Efforts have been made to disseminate the knowledge regarding features of REC mechanism through publication of technical papers in various conference. Details of paper published in various national and international conferences are given in Table 9.

Table 9: Paper published in national and international conferences

S. No.	Title of Paper	Authors	Name of the conference	Year
1.	Renewable Energy Certificate Mechanism in India	Shri S. K. Soonee, Ms. Minaxi Garg, Satya Prakash	16 th National Power Systems Conference 2010, College of Engineering, Osmania University, Hyderabad	2010
2.	Implementation of Renewable Energy Certificate (REC) mechanism in India	Shri S. K. Soonee, Ms. Minaxi Garg, Shri S. C. Saxena, Shri Satya Prakash	CIGRE Session-2012, Paris	2012
3.	Analysis of Indian Renewable Energy Certificate (REC) Market	Shri S. K. Soonee Shri V. K. Agrawal Shri A. Mani Ms. Minaxi Garg Shri Satya Prakash	17 th NPSC Indian Institute of Technology BHU	2012
4.	Experience of Solar Renewable Energy Certificate (REC) Market in India	Shri S.K. Soonee, Shri V. K. Agrawal, Ms. Minaxi Garg, Shri Shailendra Verma	Conference on Solar Power Development organized by CBIP- CIGRE India, New Delhi	2015
5.	Impact of Renewable Energy Certificate (REC) mechanism in India	Shri S. K. Soonee, Shri K. V. S Baba, Shri U. K. Verma, Ms. Minaxi Garg, Shri Shailendra Verma, Shri K. C. Saini	1 st International Conference on Large-Scale Grid Integration of Renewable Energy in India, September 2017, New Delhi	2017

4.6 Experience from capacity building workshops

Experts from the Central Agency have undertaken extensive capacity building exercises on the REC mechanism in Workshops/Conferences/Training Programs etc. organized by various stakeholders/ forums and have also carried out campaigns through exhibitions etc. to improve awareness about the REC mechanism. Moreover, the Central Agency has organized 27 workshops, wherein almost all states have participated; on an average 30 officials per workshop/capacity building program from SLDCs and SNAs have been trained.

The list of workshops organized by the Central Agency is attached in **Annexure- III**. The list of workshops organized by Central Agency is also available at: https://www.recregistryindia.nic.in/index.php/general/publics/workshop_event_details

Cross-fertilization of ideas through regular interactions between the Central Agency, state agencies, SLDCs and RE generators has improved the process of decision-making with regard to solving issues of the stakeholders.

4.7 Petitions filed in the Hon'ble Supreme Court/ High Courts/ APTEL/ CERC

More than 40 petitions have been filed in the Hon'ble Supreme Court/High Courts/APTEL/CERC by RE generators seeking relief on various kinds of generic/specific issues. Subsequently, on the basis of decisions, the Central Agency had modified the Registry software wherever required and implemented the orders. The generic set of issues and remarks on the orders with respect to petitions are given in Table 10.

Table 10: Salient points of petitions and remarks

S. No.	Details
1	<p>Delayed Registration of projects by the Central Agency, which lead to loss to the RE generator.</p> <p>The delayed registration was due to late submission of the requisite documents by the RE generators.</p> <p><u>In many cases, CERC has accepted the prayer(s) and allowed issuance of RECs.</u></p>
2	<p>Non-issuance of REC by the Central Agency due to delayed submission of REC issuance application.</p> <p>In many cases, SLDCs issued Energy Injection Report (EIR) at the fag end of the deadline for submission of the application or issued EIR on expiry of the deadline for submission of application. In other cases, application received by the Central Agency was beyond the prescribed timelines.</p> <p><u>In most of the cases, CERC allowed the issuance of RECs with a rider that such order should not be treated as a precedence in future.</u></p>
3	<p>Petitions regarding name change, ownership transfer of the projects registered under REC mechanism.</p> <p><u>In few cases, CERC allowed the petition of RE generators for issuance of RECs and directed Central Agency to modify the software and Procedure accordingly.</u></p>

S. No.	Details
4	<p>Regarding eligibility conditions for Captive Power Plants (CPP) that are taking the benefit of electricity duty in cases where the State Govt. has waived off/exempted the payment of duty to CPPs</p> <p><u>In such cases, CERC has allowed for issuance of RECs to RE generators on the basis of the State Govt. policies on waiver/exemption of electricity to RE generators. Further, vide 2nd Amendment in CERC REC Regulations, clause related with Electricity duty was deleted and all CPPs are now eligible irrespective of the RE generator is availing benefit of duty or not.</u></p>
5	<p>Issues regarding capacity to be registered for co-generation plants in cases where plant is registered under self-consumption.</p> <p><u>CERC in its Orders as well in the 2nd Amendment clarified that capacity to be registered is limited to connected load capacity as assessed or sanctioned by the concerned distribution licensee irrespective of the capacity tied under the power purchase agreement.</u></p>
6	<p>Petition regarding issuance of RECs from the date of commissioning of the plant while Regulations allowed issuance of RECs from the date of Registration of the project under REC mechanism.</p> <p><u>CERC rejected the petition, subsequently; APTEL allowed the issuance of RECs from the date of commissioning of the plants, later Hon'ble Supreme Court stayed the order of APTEL.</u></p> <p><u>CERC vide 2nd Amendment in REC Regulations clarified that RECs shall be issued from the date of Registration of the project or from the date of commercial operation whichever is later.</u></p>
7.	<p>The Petition in APTEL against CERC order regarding floor and forbearance price of RECs and subsequently petition before Hon'ble Supreme Court</p> <p><u>The Hon'ble Supreme Court has given the interim order for the stay of the trading, and subsequently, allowed the trading of RECs with some modification till the final order of the Hon'ble Court.</u></p>
8.	<p>Petitions in various High Courts regarding notification of the 4th amendment to CERC REC Regulations wherein amendment disallowed the registration of projects under self-consumption route.</p> <p><u>The matter is still pending in the Delhi High Court. Till the matter is kept pending, the court directed concerned SLDC to maintain records of energy injection from the plants of the petitioners.</u></p>

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5. Analysis of Accreditation, Registration and Issuance of RECs

“Most decisions are not binary, and there are usually better answers waiting to be found if you do the analysis and involve the right people.” ~ Jamie Dimon

5.1 Details of projects under REC mechanism

Accreditation certificate is valid for five years. Many generators whose accreditation is due to expire at the end of five years, approached the concerned State Agency for re-validation of the projects.

Further, due to change in the eligibility conditions as per amendments to the REC Regulations, many projects have undergone revocation/ de-accreditation from the REC mechanism.

Moreover, many RE generators due to various reasons, requested to revoke their Accreditation/Registration of their projects from the REC mechanism. Financial year-wise break-up of projects accredited is given in Table 11.

Table 11: Projects Accredited (since inception of the REC mechanism)

Year	Total Accredited till 31.03.2018		Re-validated (after end of Five years)		Accreditation Revoked/Expired		Accredited as on 31.03.2018	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
2010-11	54	259	0	0	0	0	20	104
2011-12	402	2,340	0	0	0	0	243	1,526
2012-13	307	1,352	0	0	7	38	142	716
2013-14	283	899	0	0	17	93	266	824
2014-15	130	516	0	0	17	163	115	413
2015-16	80	317	23	127	53	290	78	291
2016-17	101	648	176	934	148	729	98	621
2017-18	35	168	163	663	154	531	34	159
Total	1,392	6,499	362	1,723	396	1,845	996	4,654
DISCOMs								
2016-17	2	NA	0	NA	0	NA	2	NA

Similar to Accreditation, Registration certificate is also valid for five years. Therefore, many RE generators whose registration was due to expire at the end of five years, had approached the Central Agency for re-validation of their projects.

Further, due to change in the eligibility conditions, many projects were revoked from the REC mechanism. Moreover, RE generators had requested to revoke the registration of their projects due to various reasons. Year-wise details of registered, re-validated and revoked projects are

given in Table 12.

Table 12: Projects Registered (since inception of the REC mechanism)

Year	Total Registered till 31.03.2018		Re-Validated (after end of Five years)		Registration Revoked/Expired		Registered as on 31.03.2018	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
2010-11	18	166	0	0	0	0	10	70
2011-12	346	2,087	0	0	0	0	177	1,018
2012-13	330	1,271	0	0	10	97	158	711
2013-14	239	811	0	0	13	70	220	669
2014-15	163	642	0	0	3	27	136	486
2015-16	86	311	8	67	35	334	80	263
2016-17	87	555	98	671	199	1,103	86	553
2017-18	38	179	184	752	142	443	38	179
Total	1,307	6,022	290	1,490	402	2,073	905	3,948
DISCOMs								
2016-17	2	NA	0	NA	0	NA	2	NA

Post revocation, technology wise breakup of valid number of Accredited and Registered projects, under REC mechanism is given in Table 13.

Table 13: Technology wise breakup of projects

Sr. No.	Technology	Accredited as on 31.03.2018		Registered as on 31.03.2018		No. of RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Solar PV	376	754	360	736	7,650,653	1,653,478	82,539	5,914,636
2	Wind	433	2,231	413	2,167	18,145,199	16,090,035	1,324,427	730,737
3	Bio-fuel cogeneration	101	911	61	431	7,284,244	7,146,768	5,001	132,475
4	Biogas	1	2	0	0	16,843	9,970	5,010	1,863
5	Biomass	51	526	41	401	8,560,742	8,341,279	138,953	80,510
6	Small Hydro	34	230	30	212	3,732,562	3,718,347	6,616	7,599
7	Urban or Municipal Waste*	0	0	0	0	72,892	72,892	0	0
DISCOMs									
8	DISCOM	2	NA	2	NA	634,867	10,402	0	624,465
	Total	998	4,654	907	3,948	46,098,002	37,043,171	1,562,546	7,492,285

*Only one project has been registered, later, as per the request of the RE generator the project was de-registered from the REC Mechanism.

5.2 Details of Accredited Projects

Accreditation of projects started in December-2010. Since then, 1,392 projects have been accredited by various State Agencies. Due to amendments in the CERC REC Regulations, many RE generators had become ineligible under the REC mechanism. Therefore, 396 projects have been revoked or not renewed by RE generators after the expiry of their accreditation, after five years. Financial year-wise growth of accreditation of projects(including revoked/expired) is shown in Figure 13.

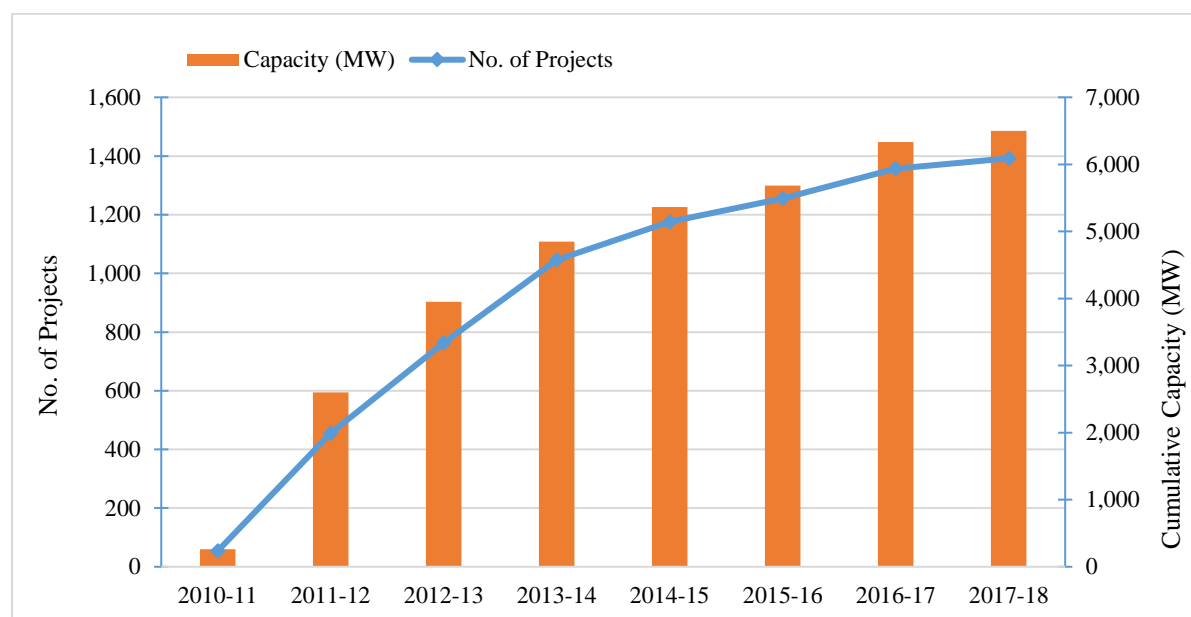


Figure 13: FY-wise Accreditation of projects up to March 31, 2018

The details of technology wise accredited projects are shown in Figure 14.

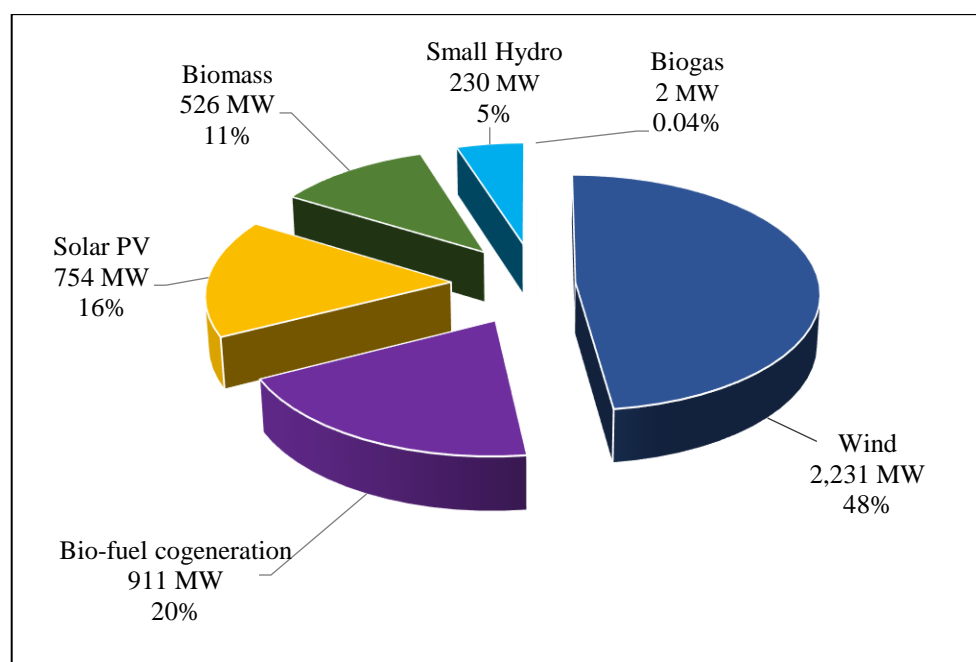


Figure 14: Source wise accredited capacity (MW)

The projects from 20 states/UTs have been accredited under the REC mechanism. More than 44% of the accredited capacity belongs to two states: Maharashtra and Tamil Nadu. Further, state-wise accreditation details are given in Table 14.

Table 14: RE projects accredited by respective State Agencies as on March 31, 2018

S. No.	State	No. of Projects	Capacity (MW)
1	Tamil Nadu	245	1,134
2	Maharashtra	296	932
3	Rajasthan	127	601
4	Madhya Pradesh	103	206
5	Uttar Pradesh	64	749
6	Gujarat	44	263
7	Andhra Pradesh	32	168
8	Karnataka	15	136
9	Himachal Pradesh	13	94
10	Telangana	12	56
11	Uttarakhand	10	86
12	Haryana	8	21
13	Punjab	8	63
14	Odisha	5	38
15	Jammu and Kashmir	5	53
16	Bihar	3	18
17	Delhi	2	8
18	Chhattisgarh	2	25
19	Kerala	1	1
20	Tripura	1	5
DISCOMs			
1	Maharashtra	1	NA
2	Himachal Pradesh	1	NA
	Total	998	4,654

5.3 Details of Registered projects

Registration of RE projects started in January-2011. Presently, more than 905 projects having capacity of 3,948 MW are registered under REC mechanism. List of RE generators registered under REC mechanism (as on March 31, 2018) is attached at **Annexure-IV**. The list of projects registered by Central Agency is available at:

https://recregistryindia.nic.in/index.php/general/publics/registered_regens

The technology-wise details of projects are given in Table 15.

Table 15: Technology wise breakup of registered projects as on March 31, 2018

S. No.	Technology	No. of Projects	Capacity (MW)
1	Wind	413	2,167
2	Small Hydro	30	212
3	Biomass	41	401
4	Bio-fuel cogeneration	61	431
5	Solar PV	360	736
DISCOMs			
6	DISCOM	2	NA
Total		907	3,948

It has been observed that initially a large number of projects were registered. However, due to grid parity, participation of RE generators in the competitive bidding process, etc. the registration of new projects under the REC mechanism reduced. The graph of financial year-wise cumulative growth of registration of projects (including revoked/expired) till March 2018 is shown Figure 15.

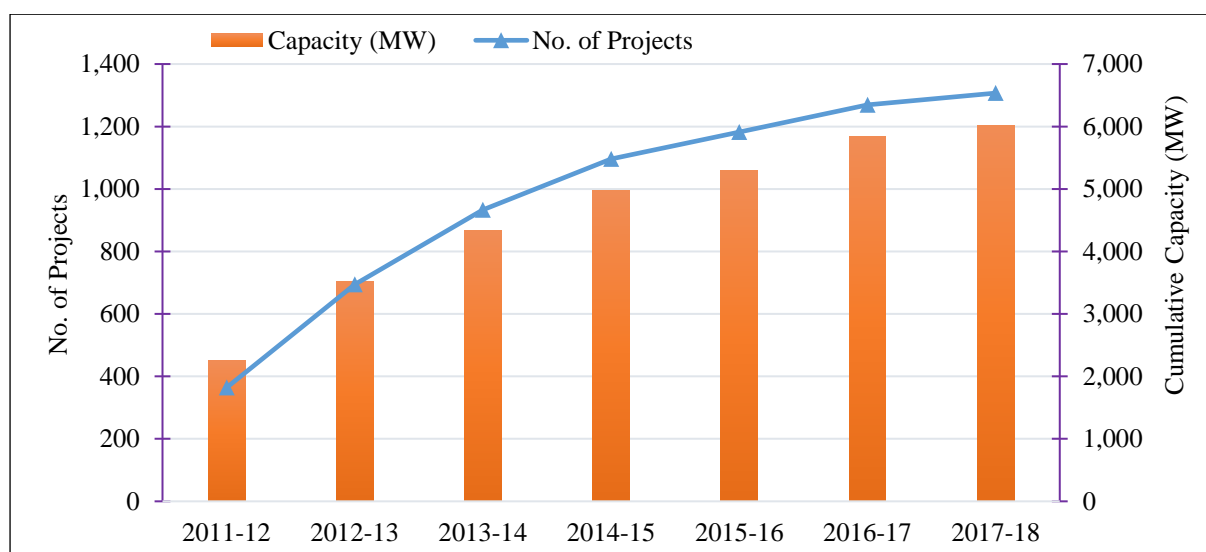


Figure 15: FY-wise Registration of projects up to March 31, 2018

As on date, projects from 20 states/UTs have been registered under the REC mechanism. More than 49% of the registered capacity belongs to two states: Maharashtra and Tamil Nadu. State-wise details of registered projects are given in Table 16.

Table 16: RE projects registered by the Central Agency as on March 31, 2018

S. No.	State	No. of Projects	Capacity (MW)
1	Tamil Nadu	239	1,098
2	Maharashtra	268	848
3	Rajasthan	126	600
4	Madhya Pradesh	102	206
5	Gujarat	42	254
6	Andhra Pradesh	32	168
7	Uttar Pradesh	31	327
8	Karnataka	14	126
9	Himachal Pradesh	13	94
10	Telangana	12	56
11	Haryana	6	14
12	Uttarakhand	6	52
13	Odisha	4	30
14	Punjab	2	15
15	Chhattisgarh	2	25
16	Delhi	2	8
17	Bihar	1	6
18	Kerala	1	1
19	Jammu and Kashmir	1	15
20	Tripura	1	5
DISCOMs			
1	Maharashtra	1	NA
2	Himachal Pradesh	1	NA
	Total	907	3,948

5.4 Analysis of RE projects registered under OA/APPC/CGP (self-consumption) route

Out of 1,307 registered projects, details of 1,248 projects are available for projects registered under different routes and RECs issued against them, the details of the same are given in Table 17.

Table 17: Registered projects -OA/APPC/CGP

S. No.	Off-take Route	Total Registered till 31.03.2018		Registration Revoked/ Expired		Registered as on 31.03.2018		No. of RECs Issued
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	
1	OA	368	1,112	72	279	296	833	8,068,723
2	APPC	425	2,055	121	396	304	1,659	16,359,559
3	CGP	355	2,137	161	1,156	194	981	16,602,593
4	APPC/OA	4	57	1	24	3	33	444,418
5	CGP/OA	96	428	1	2	95	427	3,824,715
Total		1,248	5,789	356	1,855	892	3,934	45,300,008

Table 18: RE projects registered under CGP route

Financial Year	Total Registered till 31.03.2018		Registration Revoked/ Expired		Registered as on 31.03.2018	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
2010-11	2	20	0	0	0	0
2011-12	93	935	0	0	28	239
2012-13	78	267	2	28	20	74
2013-14	50	248	2	20	39	138
2014-15	67	340	0	0	46	248
2015-16	28	119	4	54	24	75
2016-17	37	208	114	868	37	208
2017-18	0	0	39	185	0	0
Total	355	2137	161	1156	194	981

Table 19: RE projects registered under OA route

Financial Year	Total Registered till 31.03.2018		Registration Revoked/ Expired		Registered as on 31.03.2018	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
2010-11	10	76	0	0	9	68
2011-12	104	371	0	0	78	263
2012-13	70	187	0	0	33	69
2013-14	82	178	4	36	79	158
2014-15	37	101	2	19	34	80
2015-16	28	62	4	49	27	60
2016-17	23	60	26	104	22	58
2017-18	14	78	36	72	14	78
Total	368	1112	72	279	296	833

Table 20: RE projects registered under APPC route

Financial Year	Total Registered till 31.03.2018		Registration Revoked/ Expired		Registered as on 31.03.2018	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
2010-11	1	2	0	0	1	2
2011-12	124	633	0	0	64	443
2012-13	130	580	0	0	77	408
2013-14	73	296	4	10	68	284
2014-15	41	134	1	8	39	115
2015-16	11	33	18	156	10	31
2016-17	21	276	48	83	21	276
2017-18	24	101	50	138	24	101
Total	425	2055	121	396	304	1659

Table 21: RE projects registered under APPC/OA route

Financial Year	Total Registered till 31.03.2018		Registration Revoked/ Expired		Registered as on 31.03.2018	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
2010-11	0	0	0	0	0	0
2011-12	0	0	0	0	0	0
2012-13	1	25	0	0	1	25
2013-14	1	5	0	0	1	5
2014-15	2	27	0	0	1	3
2015-16	0	0	0	0	0	0
2016-17	0	0	1	24	0	0
2017-18	0	0	0	0	0	0
Total	4	57	1	24	3	33

Table 22: RE projects registered under CGP/OA route

Financial Year	Total Registered till 31.03.2018		Registration Revoked/ Expired		Registered as on 31.03.2018	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
2010-11	0	0	0	0	0	0
2011-12	8	75	0	0	7	74
2012-13	27	136	0	0	27	136
2013-14	20	70	0	0	20	70
2014-15	16	39	0	0	16	39
2015-16	19	97	0	0	19	97
2016-17	6	11	1	2	6	11
2017-18	0	0	0	0	0	0
Total	96	428	1	2	95	427

5.5 Analysis of issuance of RECs

Issuance of RECs started with a modest figure of 532 RECs in the month of March, 2011. Since then, more than 46.1 million RECs have been issued up to March 2018. As expected, the issuance of RECs increased year by year due to addition of capacity under the REC mechanism.

The graph depicting the technology-wise RECs issued is shown in Figure 16.

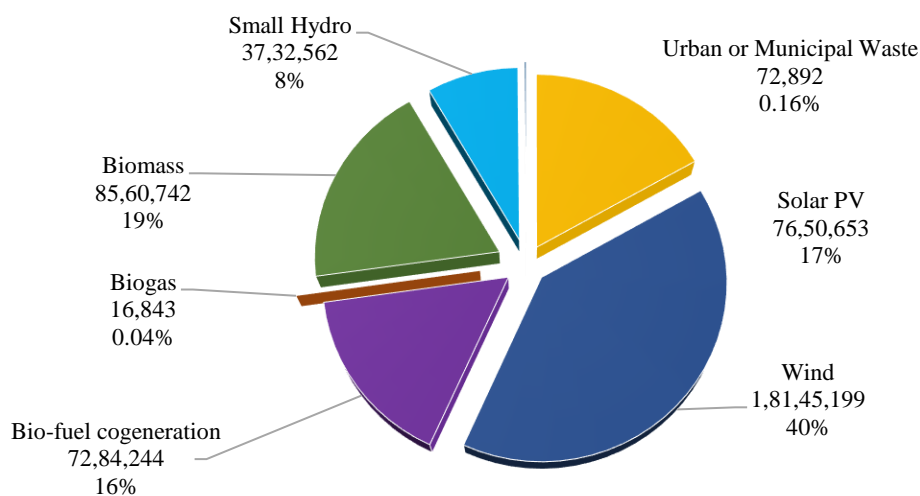


Figure 16: Technology wise RECs issued as on March 31, 2018

The details of **state-wise issuance** of RECs is given in Table 23.

Table 23: State-wise breakup of issuance of RECs to eligible RE generators

S. No.	State/UT	No. of RECs issued
1	Tamil Nadu	12,119,543
2	Uttar Pradesh	7,098,583
3	Maharashtra	6,240,463
4	Rajasthan	4,363,417
5	Gujarat	3,500,481
6	Madhya Pradesh	2,316,114
7	Himachal Pradesh	2,144,866
8	Chhattisgarh	1,829,519
9	Andhra Pradesh	1,310,977
10	Karnataka	1,035,865
11	Uttarakhand	871,381
12	Odisha	839,626
13	Punjab	832,342
14	Jammu and Kashmir	447,278
15	Nagaland	278,084
16	Telangana	214,470
17	Haryana	185,935
18	Bihar	185,835
19	Kerala	177,366
20	Delhi	92,492
21	Tripura	13,365
	TOTAL	46,098,002

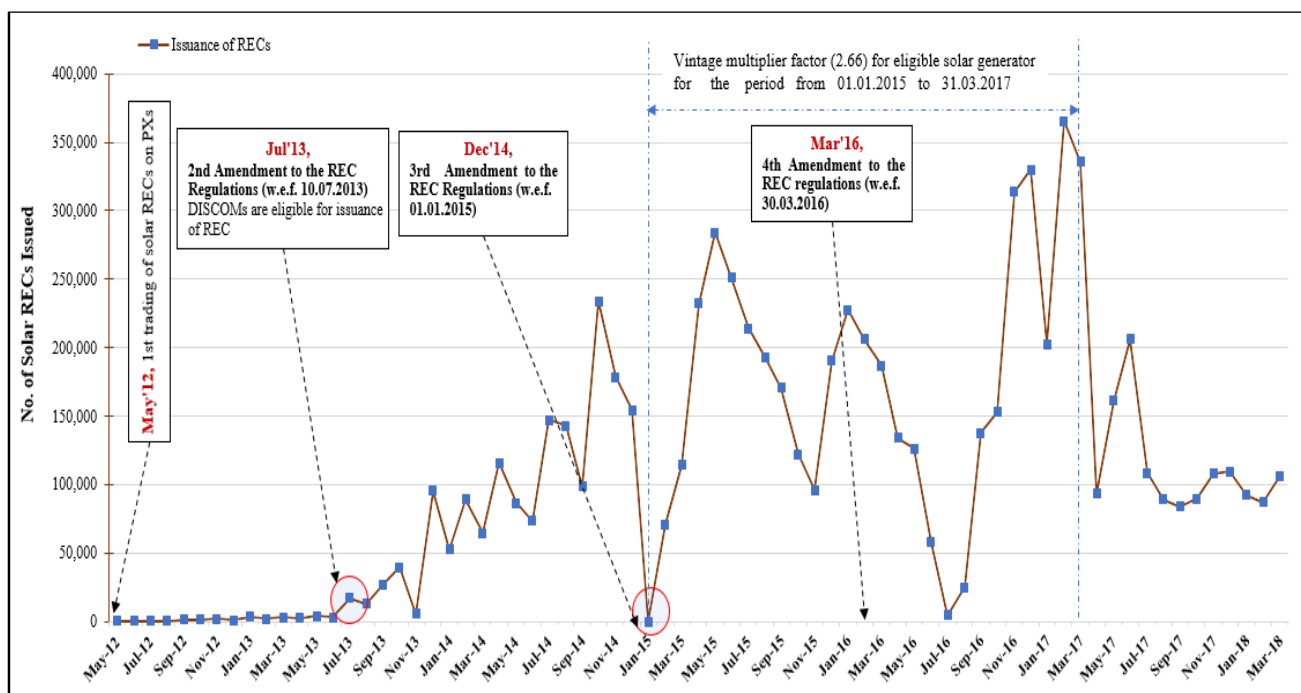


Figure 17: Month-wise issuance of solar RECs

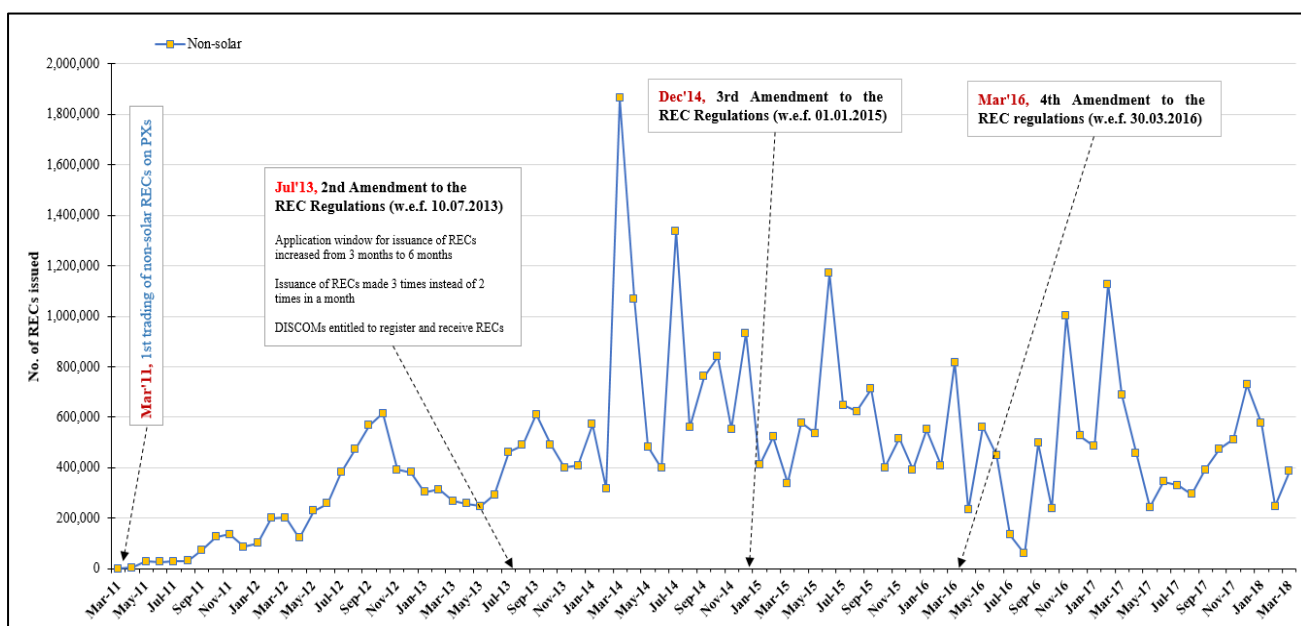


Figure 18: Month-wise issuance of non-solar RECs

5.6 RECs issued to DISCOMs

As per the 2nd amendment to the CERC REC Regulations, distribution licensees (DISCOMs) that had purchased renewable energy over and above their RPO are entitled to register and receive RECs. This amendment has addressed the problem of RE-rich states that are averse to purchase renewable energy over and above their RPO. The details of RECs issued, redeemed and closing balance with regard to DISCOMs are given in Table 24.

Table 24: Breakup of RECs issued to DISCOMs

S. No.	Name	State	Date of Registration	No. of RECs issued		No. of RECs Redeemed		Closing Balance	
				Non-solar	Solar	Non-solar	Solar	Non-solar	Solar
1	Reliance Infrastructure Limited	Maharashtra	16.06.2016	6,070	78,777	6,070	4,332	0	74,445
2	HPSEB Limited	Himachal Pradesh	11.07.2016	541,000	9,020	0	0	541,000	9,020
	Total			547,070	87,797	6,070	4,332		

5.7 RECs available for trade as on 31.03.2018

More than 7.4 million RECs were available for trade as on 31.03.2018. Due to suspension of trading of solar RECs by Hon'ble Supreme Court from May 2017 to March 2018, about 6 million solar RECs out of total 7.4 million RECs are available for trade at Power Exchanges. The technology wise breakup of RECs available for trade is shown in Figure 19.

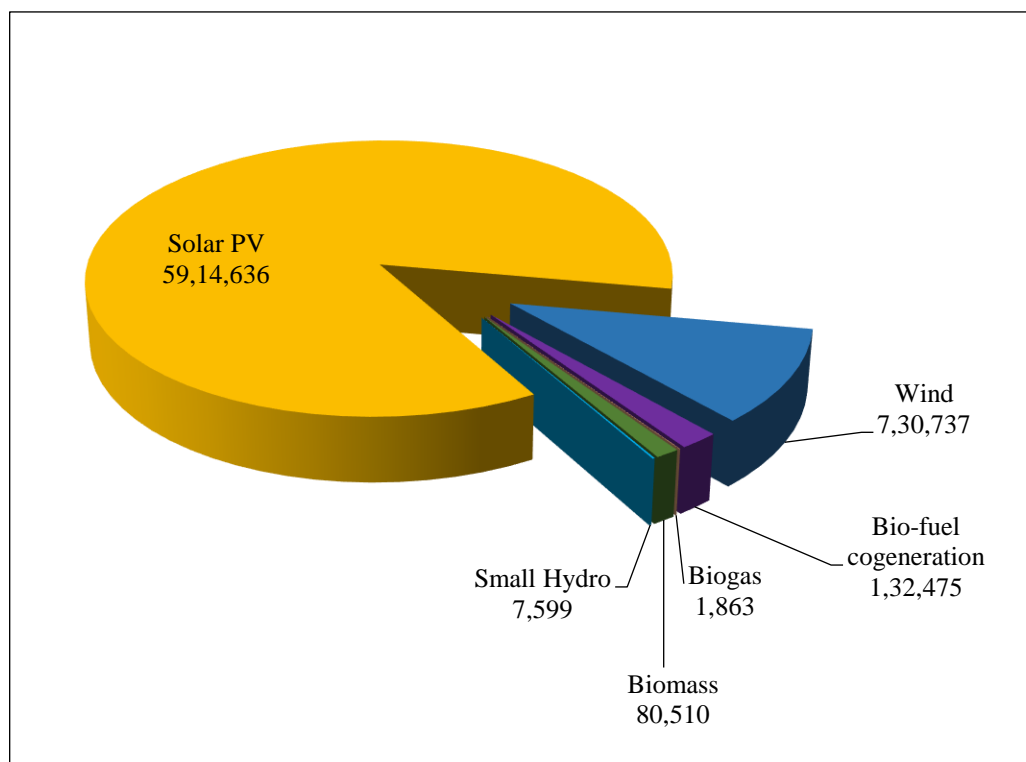


Figure 19: RECs available for trade as on 31.03.2018

X

The details of accredited, registered, revoked or expired (not renewed after the end of 5 years) projects and RECs issued, redeemed, and available for trade are given in Table 25.

Table 25: Details of Wind Projects

Accreditation						Registration						Breakup of RECs			
Total		Revoked/ Expired		Net		Total		Revoked/ Expired		Net		Issued	Redeemed through		Closing Balance
No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)		PXs	Self Retention	
699	2,934	266	703	433	2,231	664	2,781	251	614	413	2,167	18,145,199	16,090,035	1,324,427	730,737

Till March 31, 2018, total 664 projects with capacity of 2781 MW have been registered, subsequently, 251 projects with capacity of 614 MW projects have been revoked/expired. Thus, 413 projects from 7 states having capacity of 2167 MW are registered under REC mechanism as on March 31, 2018, the details of the same are given in Table 26.

Table 26: State-wise registered Wind Projects as on 31.03.2018

S. No.	State	No. of Projects	Capacity (MW)
1	Tamil Nadu	172	887
2	Maharashtra	161	454
3	Gujarat	32	227
4	Rajasthan	22	361
5	Andhra Pradesh	14	125
6	Karnataka	11	107
7	Madhya Pradesh	1	6
	Total	413	2,167

6.2 Monthly energy generation from wind projects

For monthly analysis of the wind generation, only projects that had continuously injected power in the grid have been considered. The details of the year-wise number of projects which have been considered for time-series analysis of the monthly generation from RE projects are given in Table 27.

Table 27: No. of Wind Projects selected for analysis of monthly wind generation

Year	Nos. of projects	Capacity (MW)
2012	127	719
2013	360	719
2014	258	1,529
2015	286	1,637
2016	270	1,584
2017	219	1,546

The time series decomposition plot for monthly generation is given at Figure 21. The figure comprises the plot based on the observed data set, plot based on the seasonality of the wind generation, trend of the generation data after removing the seasonality from the observed value, and plot of the remainder after removing the seasonality and trend signals from the original observed data.

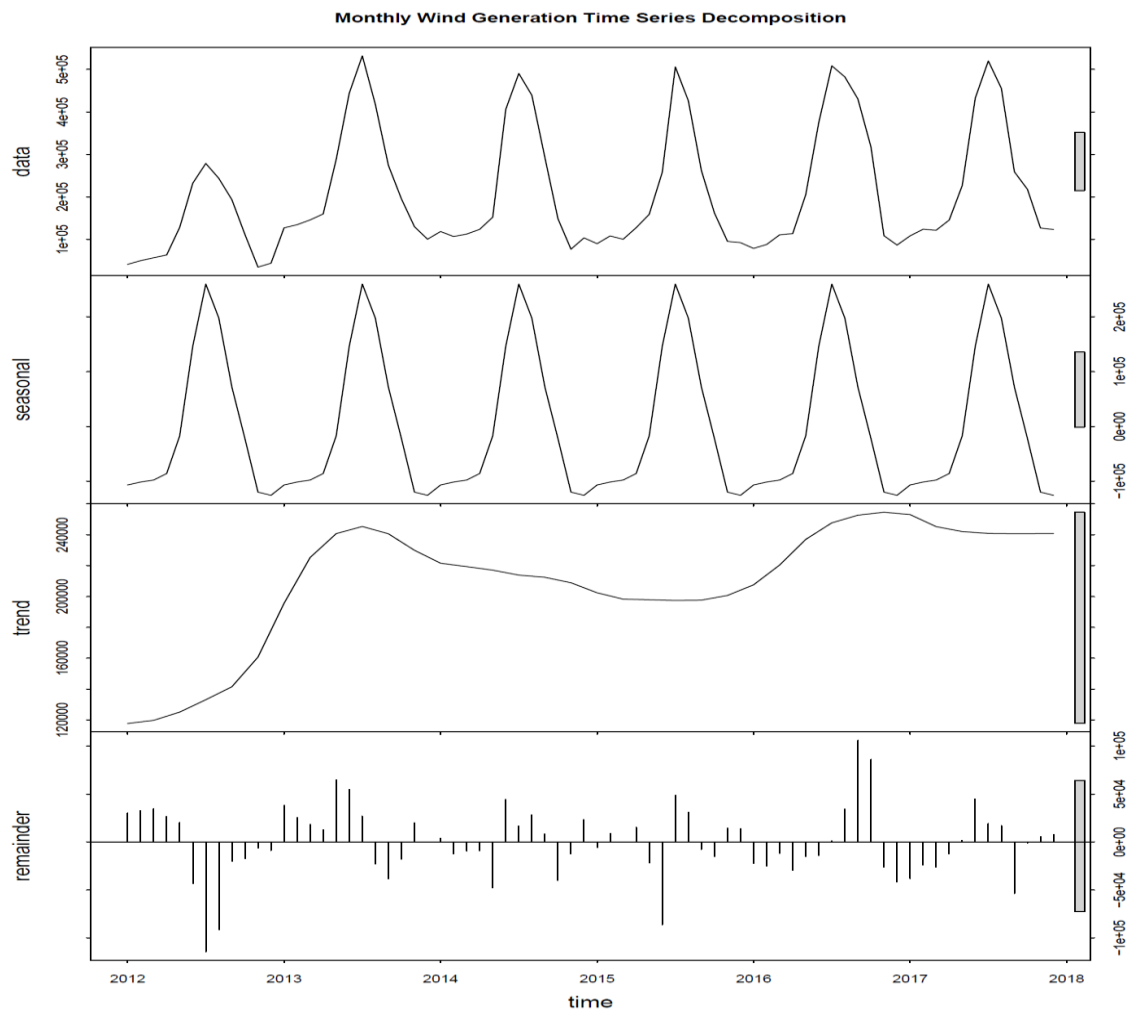


Figure 21: Monthly energy injected by registered wind projects

6.3 Capacity Utilisation Factor (CUF) of wind projects

The CUF of 219 wind projects having capacity of 1546 MW have been calculated and the same is given below in Figure 22.

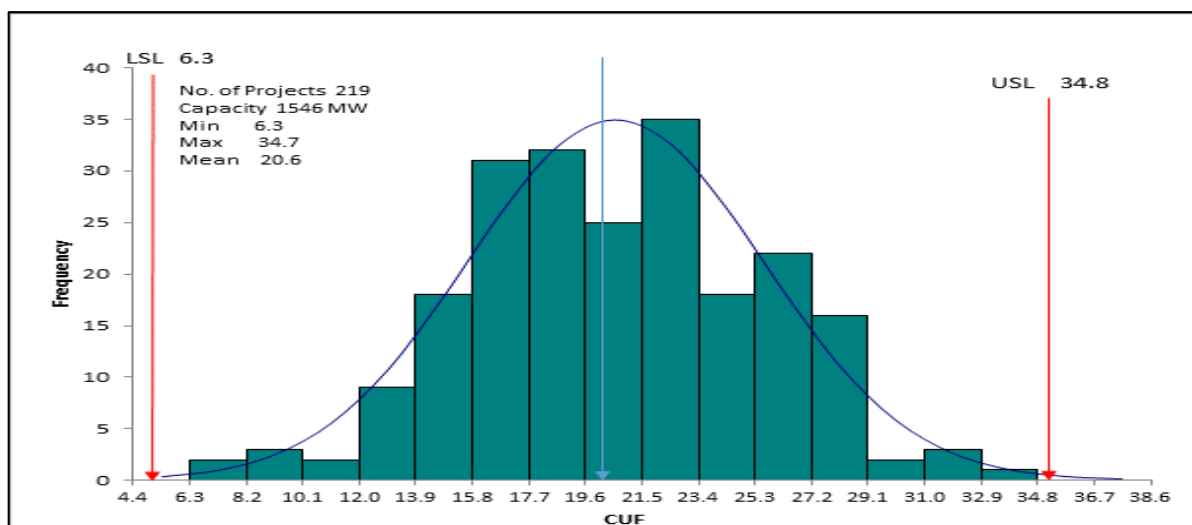


Figure 22: Histogram of CUF of wind projects for 2017

6.4 Analysis of Solar Photo Voltaic (PV) Projects

360 projects having total capacity 736 MW were registered from 13 states up to March 31, 2018. The projects having varying capacity from **0.1 MW** - **19 MW** have been registered under REC mechanism. Map of solar projects registered under the REC mechanism is shown in Figure 23.



Figure 23: Registered solar PV Projects on map of India

The details of the accredited, registered, revoked or expired (not renewed after the end of 5 years), number of RECs issued, redeemed and RECs available for trade on Power Exchanges

are given in Table 28.

Table 28: Details of solar PV projects

Accreditation						Registration						Breakup of RECs			
Total		Revoked/ Expired		Net		Total		Revoked/ Expired		Net		Issued	Redeemed through		Closing Balance
No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)		PXs	Self Retention	
394	792	18	38	376	754	373	756	13	20	360	736	7,650,653	1,653,478	82,539	5,914,636

Since launch of the mechanism, total 373 projects with capacity of 756 MW have been registered, subsequently, 13 projects with capacity of 20 MW had been revoked/expired. Thus, 360 projects from 13 States with capacity of 736 MW have been registered under REC mechanism **as on March 31, 2018**, the details of the same are given in Table 29.

Table 29: State-wise registered solar PV projects

S. No.	State	No. of Projects	Capacity (MW)
1	Rajasthan	104	239
2	Madhya Pradesh	99	182
3	Maharashtra	62	99
4	Tamil Nadu	56	121
5	Andhra Pradesh	16	36
6	Telangana	10	28
7	Gujarat	4	7
8	Odisha	3	5
9	Delhi	2	8
10	Haryana	1	1
11	Chhattisgarh	1	5
12	Kerala	1	1
13	Tripura	1	5
	Total	360	736

6.5 Capacity Utilisation Factor (CUF) of solar PV projects

The Capacity Utilisation Factor (CUF) of 239 solar projects with capacity of 505 MW have been calculated for 2017, and the histogram is shown in Figure 24.

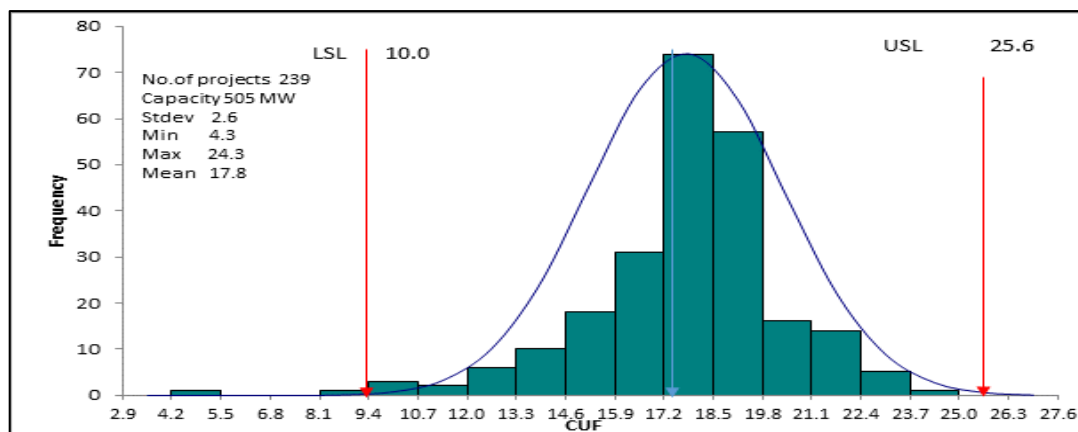


Figure 24: Histogram of CUF of solar PV projects for 2017

6.6 Analysis of Small Hydro Projects (SHP)

30 projects having total capacity 212 MW were registered from 8 states up to March 31, 2018. The individual project capacities ranged from 1 MW - 24 MW. State-wise registered projects under REC mechanism are shown on map at Figure 25.

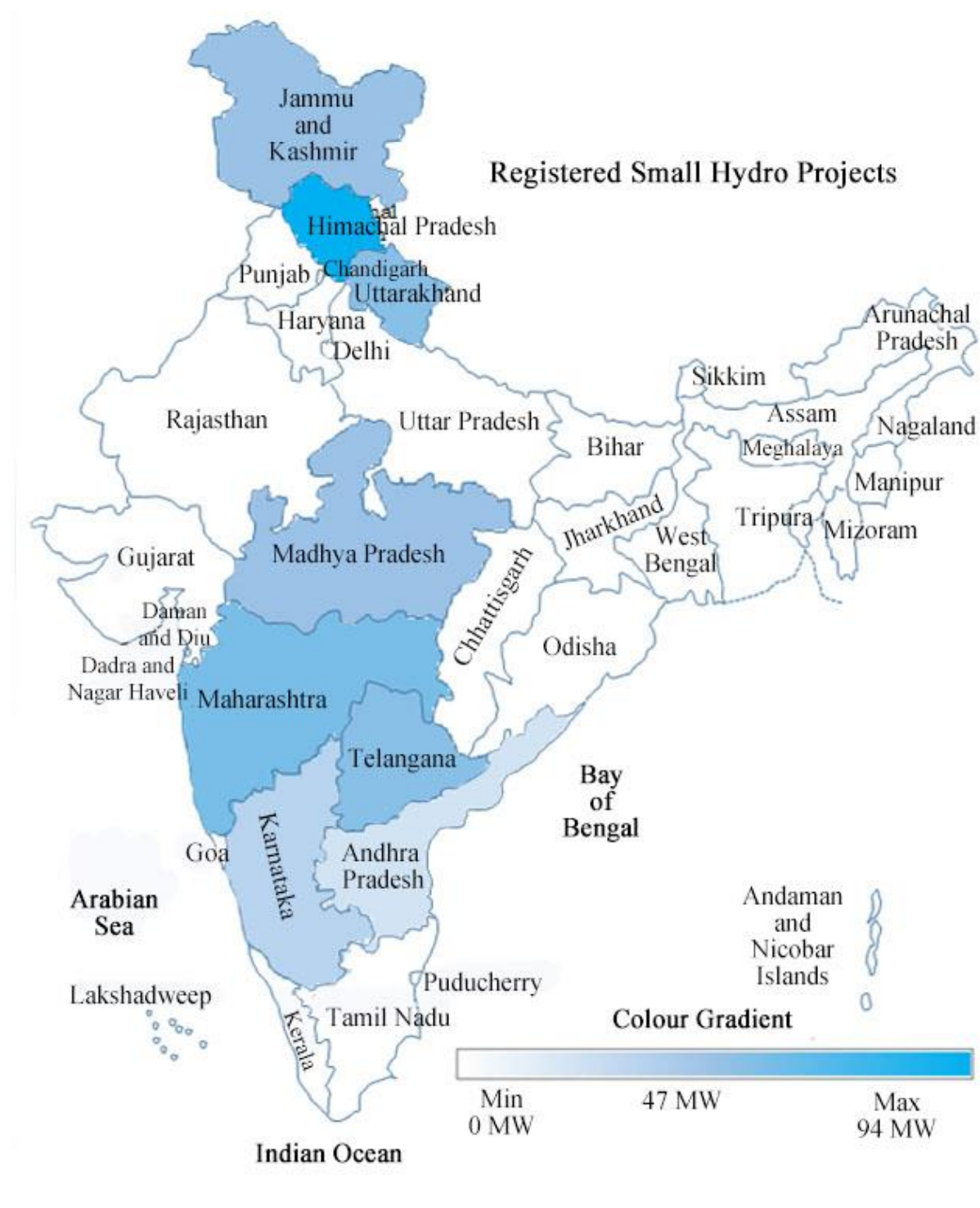


Figure 25: Registered small hydro projects on map of India

The details of the accredited, registered and revoked or expired (not renewed after the end of 5

years), RECs issued, redeemed and RECs available for trade are given in Table 30.

Table 30: Details of small hydro projects

Accreditation						Registration						Breakup of RECs			
Total		Revoked/ Expired		Net		Total		Revoked/ Expired		Net		Issued	Redeemed through		Closing Balance
No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)		PXs	Self Retention	
54	493	20	263	34	230	47	412	17	200	30	212	3,732,562	3,718,347	6,616	7,599

Since launch of the mechanism, total 47 projects with capacity of 412 MW have been registered, subsequently, 17 projects with capacity of 200 MW were revoked/expired. Thus, 30 projects from 8 states having capacity of 212 MW are registered under REC mechanism **as on March 31, 2018**, the details of the same are given at Table 31.

Table 31: State-wise registered small hydro projects

S. No.	State	No. of Projects	Capacity (MW)
1	Himachal Pradesh	13	94
2	Maharashtra	10	32
3	Karnataka	2	10
4	Madhya Pradesh	1	14
5	Andhra Pradesh	1	1
6	Telangana	1	24
7	Uttarakhand	1	24
8	Jammu and Kashmir	1	15
Total		30	212

6.7 Capacity Utilisation Factor (CUF) of SHP

The Capacity Utilization Factor (CUF) of 13 nos. of small hydro plants having capacity of 159 MW have been calculated for 2015 and the histogram is shown in Figure 26.

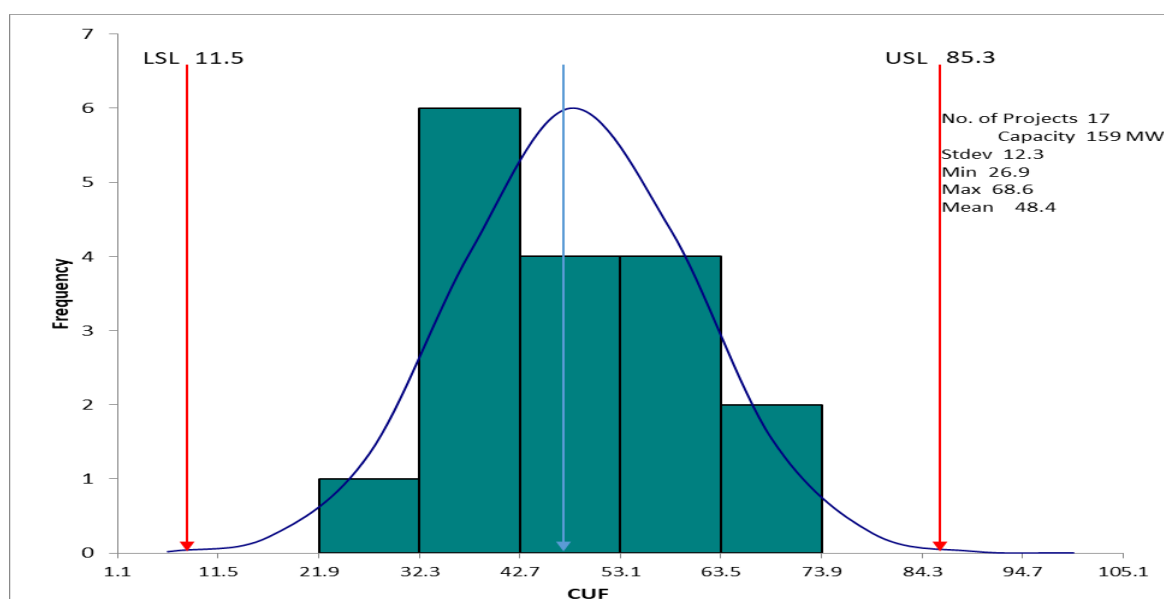


Figure 26: Histogram of CUF of small hydro projects for 2015

6.8 Monthly energy generation from SHP

Only those projects which continuously injected power in the grid were included for analysis. The year-wise details of the number of projects which have been considered for time-series analysis of monthly generation are given in Table 32.

Table 32: SHP projects selected for monthly analysis of generation

Year	Number of projects	Capacity (MW)
2012	8	92
2013	14	115
2014	14	150
2015	13	159
2016	12	106
2017	11	99

The time series decomposition plot for monthly generation is shown in Figure 27. The figure 27 comprises the plot based on the data set, plot based on the seasonality of the wind generation, trend of the generation data after removing the seasonality from the observed value, and plot of the remainder after removing the periodic and the trend signals from the original data.

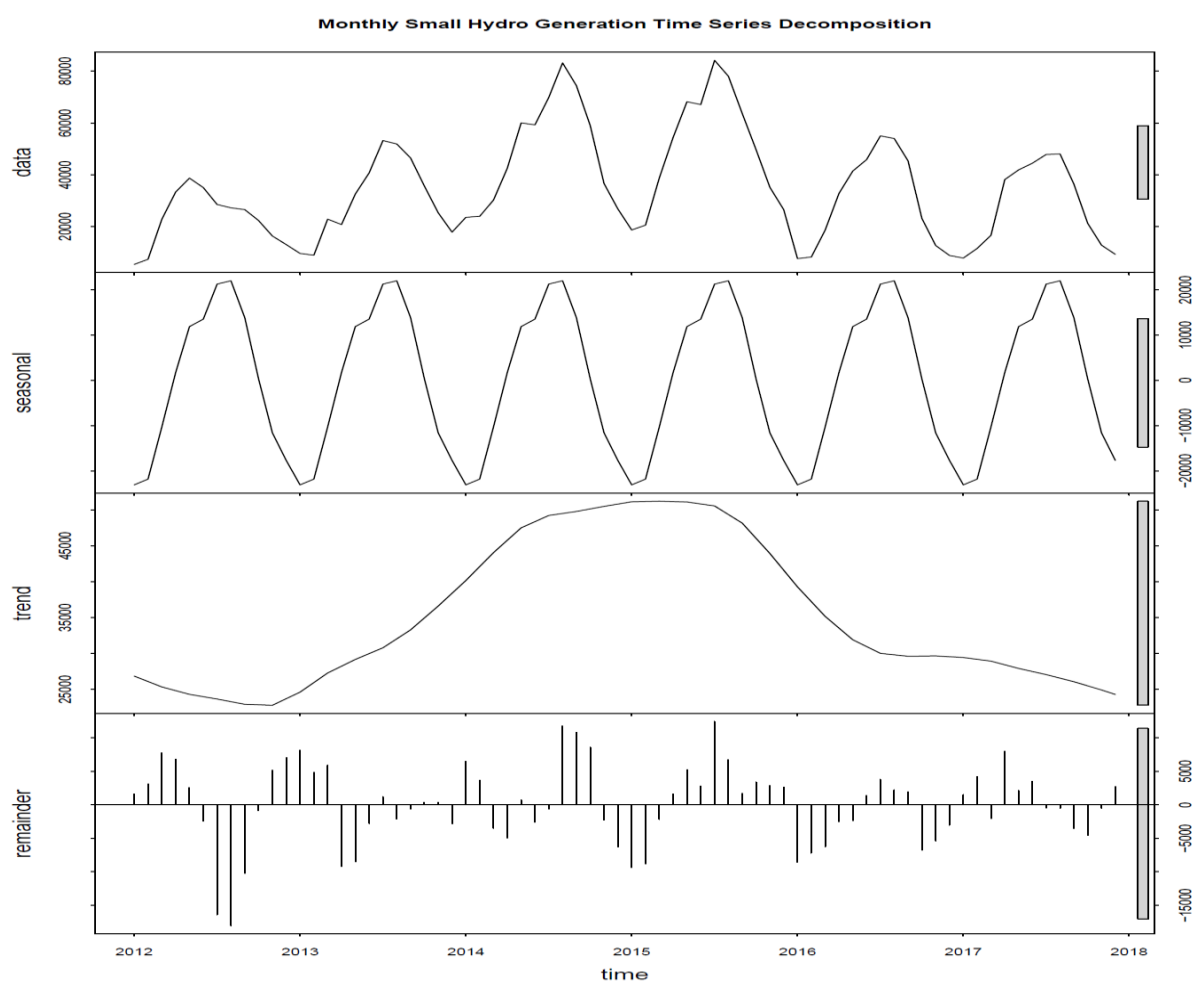


Figure 27: Monthly energy injected by SHP

6.9 Analysis of biomass projects

41 projects having total capacity of 401 MW were registered from 12 States up to March 31, 2018. The individual project capacities ranged from 0.7 MW - 34 MW. State-wise registered biomass projects under REC mechanism are shown below on map at Figure 28.

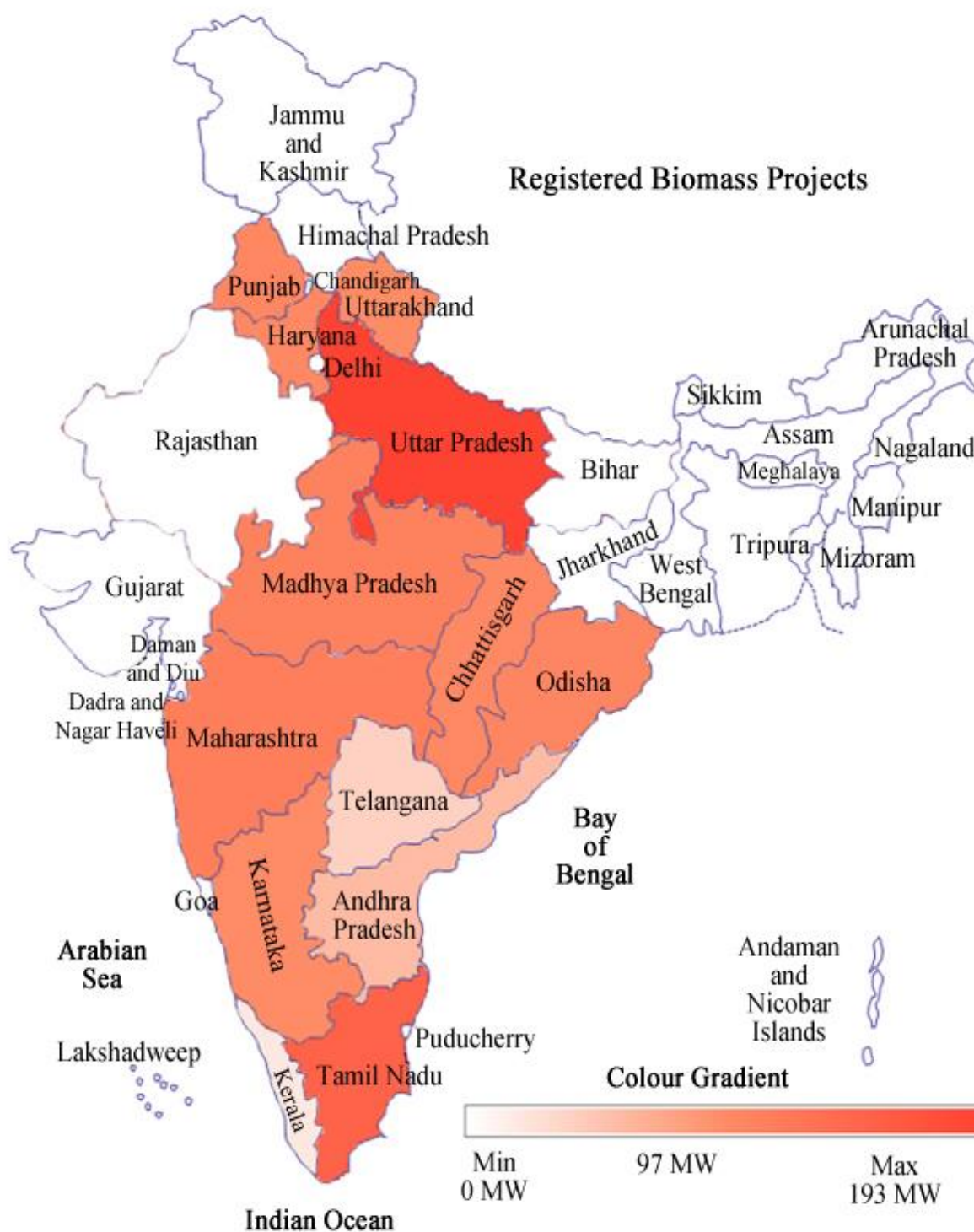


Figure 28: Registered biomass projects on map of India

Details of the accredited, registered and revoked/ expired (not renewed after the end of 5 years) biomass projects, RECs issued, redeemed and RECs available for trade are given in Table 33.

Table 33: Breakup of Biomass Projects with REC details

Accreditation						Registration						Breakup of RECs			
Total		Revoked/ Expired		Net		Total		Revoked/ Expired		Net		Issued	Redeemed through		Closing Balance
No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)		PXs	Self Retention	
104	1,044	53	518	51	526	93	925	52	524	41	401	8,560,742	8,341,279	138,953	80,510

Since launch of the mechanism, 93 projects with a total capacity of 925 MW have been registered. Subsequently, 52 projects with a capacity of 524 MW were revoked/expired. Thus, 41 projects from 12 states having capacity of 401 MW remained registered under the REC mechanism **as on March 31, 2018**, the details of the same are given in Table 34.

Table 34: State-wise registered biomass projects

S. No.	State	No. of Projects	Capacity (MW)
1	Uttar Pradesh	14	193
2	Tamil Nadu	10	81
3	Maharashtra	5	28
4	Haryana	4	11
5	Madhya Pradesh	1	4
6	Andhra Pradesh	1	6
7	Karnataka	1	10
8	Telangana	1	4
9	Uttarakhand	1	10
10	Odisha	1	25
11	Punjab	1	10
12	Chhattisgarh	1	20
Total		41	401

6.10 Analysis of bio-fuel cogeneration projects

61 projects having total capacity 431 MW were registered from 8 states up to March 31, 2018. The individual project capacities ranged from 0.9 MW - 34 MW. State-wise registered Bio-fuel cogeneration projects under REC mechanism are shown on map at Figure 29.



Figure 29: Registered bio-fuel Cogeneration Projects on map of India

Details of the accredited, registered, revoked or expired (not renewed after the end of 5 years) Bio-fuel Cogeneration Projects, and RECs issued, redeemed and RECs available for trade on

Power Exchanges are given in Table 35.

Table 35: Breakup of bio-fuel cogeneration Projects with REC details

Accreditation						Registration						Breakup of RECs			
Total		Revoked/ Expired		Net		Total		Revoked/ Expired		Net		Issued	Redeemed through		Closing Balance
No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)		PXs	Self Retention	
136	1,214	35	303	101	911	128	1,138	67	707	61	431	7,284,244	7,146,768	5,001	132,475

Since launch of the mechanism, 128 projects with a total capacity of 1138 MW were registered. Subsequently, 67 projects with capacity of 707 MW were revoked/expired. Thus 61 projects from 8 states having a total capacity of 431 MW remained registered under the REC mechanism as on March 31, 2018, the details of the same are given in Table 36.

Table 36: State-wise registered bio-fuel cogeneration Projects

S. No.	State	No. of Projects	Capacity (MW)
1	Maharashtra	30	236
2	Uttar Pradesh	17	134
3	Gujarat	6	21
4	Uttarakhand	4	18
5	Tamil Nadu	1	10
6	Haryana	1	3
7	Punjab	1	5
8	Bihar	1	6
Total		61	431

6.11 Analysis of urban or municipal waste projects

Only M/s Timarpur Okhla Waste Management Co. Pvt. Ltd., Delhi having capacity 8 MW have been registered and REC were issued to the projects. Later, as per request of the RE generator, the project was de-registered from REC mechanism. As on date, no project under Urban or municipal waste is registered. The details of the Accredited, Registered project are given in Table 37.

Table 37: Breakup of urban or municipal waste projects with details of RECs

Accreditation						Registration						Breakup of RECs			
Total		Revoked/ Expired		Net		Total		Revoked/ Expired		Net		Issued	Redeemed through		Closing Balance
No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)		PXs	Self Retention	
2	16	2	16	0	0	1	8	1	8	0	0	72,892	72,892	0	0

6.12 Summary of CUF of Wind, Solar and SHP plants

A summary of number of projects, capacity and average CUF of solar, wind and small hydro plants registered under REC mechanism for different years is given in Table 38.

Table 38: CUF of wind, solar and Small hydro plants

Energy Source →	Solar			Wind			Small Hydro		
Year ↓	No. of Projects	Total Capacity (MW)	Average CUF	No. of Projects	Total Capacity (MW)	Average CUF	No. of Projects	Total Capacity (MW)	Average CUF
2012	-	-	-	127	719	22.3	8	92	39.8
2013	9	20	17.5	360	1,641	19.3	14	115	40.6
2014	122	278	19	258	1,529	17.8	14	150	47.2
2015	214	461	17.9	286	1,637	15.7	17	159	48.4
2016	252	518	18.2	270	1,584	20.1	15	106	40.4
2017	239	505	17.8	219	1,546	20.6	16	99	42.4

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7. REC Market design

REC is a market-based instrument to promote renewable energy and facilitate compliance of RPO of obligated entities.

The REC market segment covers two categories of certificates, solar and non-solar, which are issued to eligible entities for generation of electricity based on solar and non-solar renewable energy sources, respectively. The REC market segment is operated in accordance with the Power Market Regulations and REC Regulations read with the detailed procedure for accreditation, registration, issuance and redemption of RECs approved by the Commission.

The following sections covers the salient features, regulatory provisions, and changes in the REC market design.

7.1 Salient features of REC Market Design

Auction type:	Closed, double sided auction where both the sellers and buyers participate anonymously
Bidding:	Anonymous
Participation:	Voluntary
Price formation:	Uniform price auction
Price caps:	Floor and ceiling prices notified by the CERC from time to time
Standard contract:	1 REC equivalent to 1 MWh

7.2 Regulatory provisions of REC Market design

The relevant extracts from the applicable CERC Regulations are given below.

i. Power Market Regulations, 2010

Quote

4. These regulations shall apply to the following types of contracts:

v. Any new contracts linked with electricity generated from renewable sources, e.g. Renewable Energy Certificates (REC), etc. transacted on Power Exchange.

7.(2) The Commission may, prior to granting such authorization to Exchanges as specified in Regulation 6, examine the following and such other parameters of such contracts as considered appropriate having particular regard to the following: -

(i) Type of contract (day ahead, term ahead etc.);

(ii) Price Discovery methodology and matching rules proposed....

Unquote

- ii. Terms and conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation Regulations, 2010.

Quote

(2) The Certificate issued to eligible entity by the Central Agency may be placed for dealing in any of the Power Exchanges as the Certificate holder may consider appropriate, and such Certificate shall be available for dealing in accordance with the rules and byelaws of such Power Exchange:

Provided that the Power Exchanges shall obtain prior approval of the Commission on the rules and byelaws including the mechanism for discovery of price of the Certificates in the Power Exchange.

Unquote

7.3 Regulatory changes in REC Market design

Modification in price discovery methodology and matching rules in Renewable Energy Certificate Market have been carried out by the Hon'ble Commission based on the market feedback. The changes carried out are briefly mentioned below.

- i. CERC vide order in petition No. 147/MP/2012 dated July 06, 2012 modified the methodology of discovery of equilibrium price. The earlier methodology was that if there is more than one price point at which maximum tradable volume is same and the balance surplus quantity is also same, the process randomizes solution between the two prices. However, the modified methodology envisaged simple arithmetic average between two points of buyer's price or seller's price in case of overlap of the demand and supply curves. The resulting solution was more equitable to the buyers and sellers as compared to the randomized solution.
- ii. During the last few years, in the REC market segment, the supply was much higher than the demand and the market was clearing at the floor price. The algorithm for determining equilibrium price and matching rules for selection of the order/volume in REC market segment was based on "Price time priority", i.e. when more than one order is having the same price, the order placed earlier in time would get the priority. It was observed that during the initial few trading sessions, sellers who placed their bids in the initial period of bidding window only were able to sell the RECs. The REC mechanism also intends to make up the additional revenue requirement for the 'green component' and thus, there was a need for making the mechanism more equitable.
- iii. CERC vide order dated October 26, 2012 in petition No. 231/MP/2012 mentioned the following:

"6. The proposed methodology is a modification in the allocation principle of RECs for the successful participants. The need for allocation of RECs has arisen due to the present market condition where the REC supply is much higher than the demand and there is a floor price below which the REC prices cannot go down. Hence as in a normal market operation the supply quantity does not go down with

reduction in price. This leads to a situation where there is higher supply than the cleared volume and the need to allocate the RECs among the suppliers arises. The proposed allocation principle of first clearing all participants who have quoted a price better than the market clearing price and thereafter pro-rating the allocation quantity based on the quantity quoted by the participants at the market clearing price passes the test of equitable allocation to all the successful participants.”

CERC, while approving the ‘price-pro-rata’ rule, directed that the market design change should be implemented from October 31, 2012.

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8. Trading of RECs on Power Exchanges

“The most important single central fact about a free market is that no exchange takes place unless both parties benefit.” ~ Milton Friedman

8.1 Total traded RECs (Non-solar & Solar)

Trading of RECs started in March 2011. Till March 2018, 83 trading sessions have been held. The value of transactions has crossed Rs 6,057 crore.

Further, trading of RECs in the previous eight financial years shows a rising transaction volume. Over 4.61 crore RECs have been issued (~3.8 crore non-solar and ~77 lakh solar) by the Central Agency. Out of total issued RECs, ~3.7 crore RECs have been redeemed through power exchanges and ~15 lakh RECs have been self-retained by the renewable energy generators. The monthly breakup of traded RECs is available on <https://recregistryindia.nic.in/index.php/general/publics/recs>

The renewable energy generators who had placed more bids for sale than RECs available in their respective accounts, have been declared as defaulters. Their bids have not been included in the transaction of RECs by power exchanges. The list of such defaulters is available on <https://recregistryindia.nic.in/index.php/general/publics/defaulters>

The yearly trend of RECs issued, RECs traded through PXs and RECs self-retained are given in Figure 30. From the graph, it may be inferred that, redemption of RECs increased since launch of the mechanism, and issuance of RECs reduced considerably after FY 2015-16 owing to a change in eligibility conditions pertaining to captive power plants.

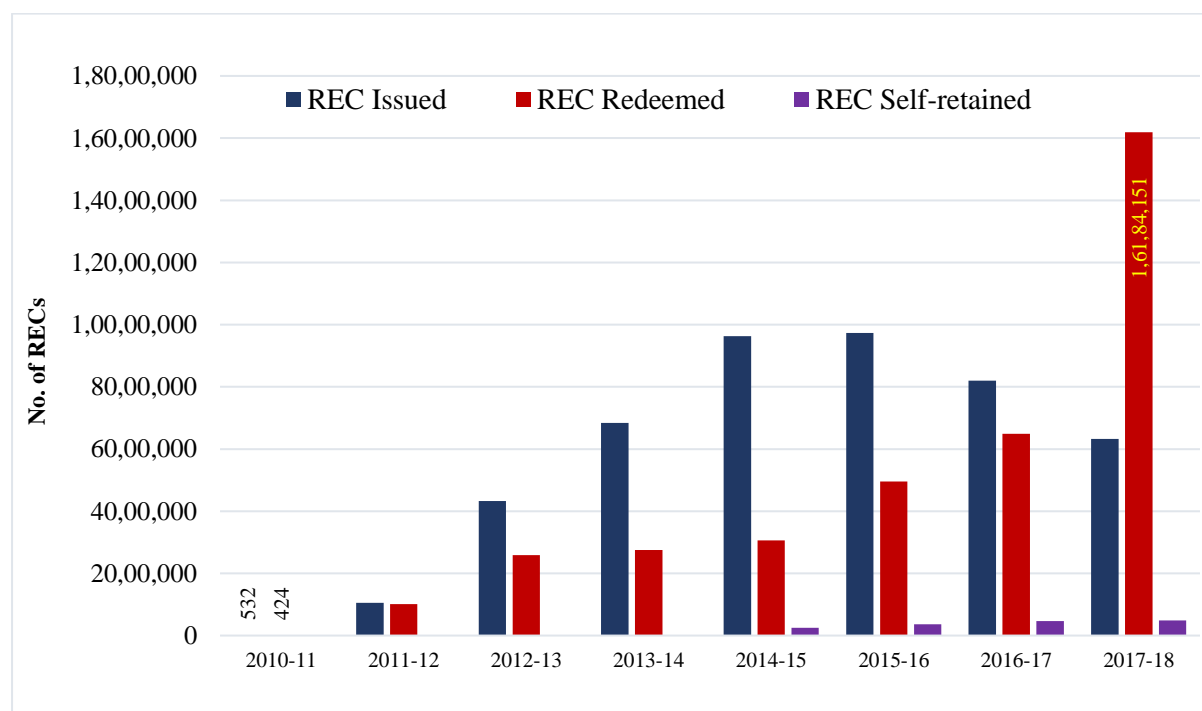


Figure 30: Financial year-wise details of RECs issued, redeemed and self-retained

The month-wise trend of trading of RECs on IEX and PXIL is shown in Figure 31.

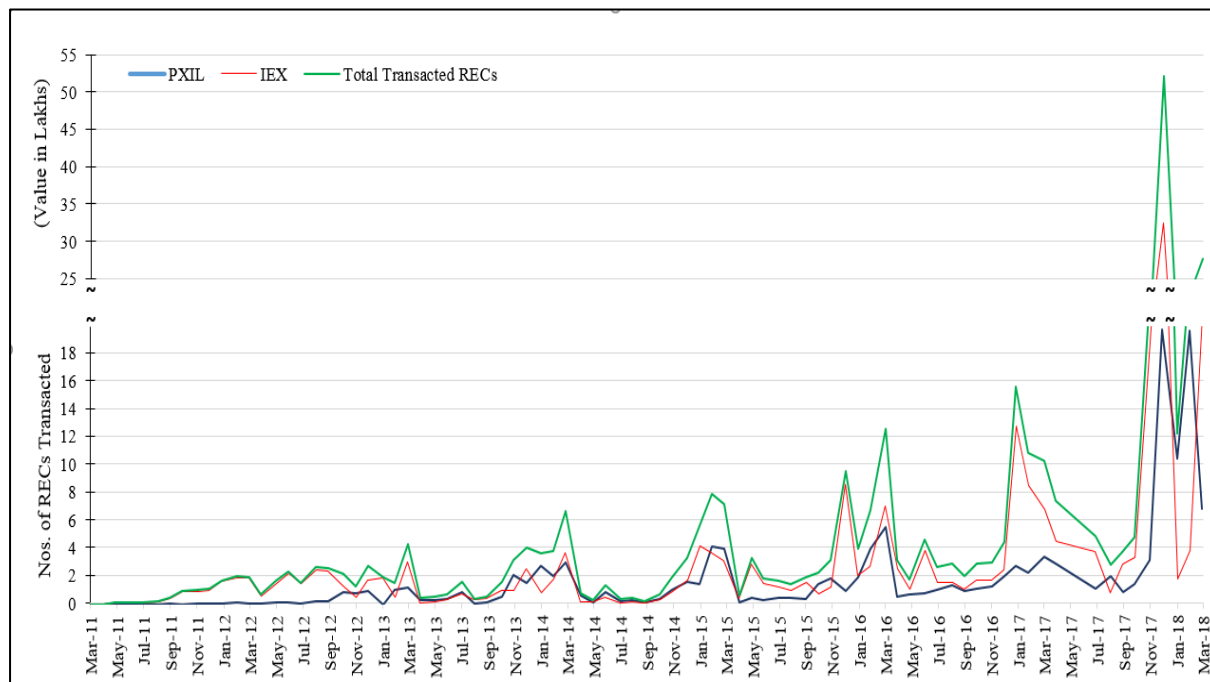


Figure 31: PXs wise monthly transaction of RECs

The month-wise trend of trading RECs on IEX and PXIL is given in Table 39.

Table 39: Financial year wise market clearing volume and value of transactions till March-2018

FY	Market clearing Volume (No. of RECs)									Value of Transactions (Rs. Lakh)		
	IEX			PXIL			Total Non-solar	Total Solar	Total Redeemed	Total		
	Non-solar	Solar	Total	Non-solar	Solar	Total				Non-solar	Solar	Total
2010-11	150	0	150	274	0	274	424	0	424	12	0	12
2011-12	951,008	0	951,008	64,266	0	64,266	1,015,274	0	1,015,274	28,622	0	28,622
2012-13	1,980,546	10,443	1,990,989	595,255	3,570	598,825	2,575,801	14,013	2,589,814	43,862	1,785	45,648
2013-14	1,271,267	53,056	1,324,323	1,410,747	13,624	1,424,371	2,682,014	66,680	2,748,694	40,230	6,295	46,526
2014-15	1,446,963	100,661	1,547,624	1,451,459	62,839	1,514,298	2,898,422	163,500	3,061,922	43,476	6,738	50,214
2015-16	2,673,434	465,456	3,138,890	1,633,518	182,745	1,816,263	4,306,952	648,201	4,955,153	64,604	22,687	87,291
2016-17	4,214,538	404,081	4,618,619	1,716,187	152,933	1,869,120	5,930,725	557,014	6,487,739	88,961	19,495	108,456
2017-18	9,240,720	88,533	9,329,253	6,735,029	119,869	6,854,898	15,975,749	208,402	16,184,151	236,944	2,084	239,028
TOTAL	21,778,626	1,122,230	22,900,856	13,606,735	535,580	14,142,315	35,385,361	1,657,810	37,043,171	546,713	59,085	605,798

8.2 Details of trading of non-solar RECs

Trading of non-solar RECs started in March 2011. Since then, more than 3.5 crore RECs have been redeemed through power exchanges having Rs 5,467 crore transaction value. About 14

lakh RECs have been self-retained by the renewable energy generators. The trends of Market Clearing Volume (MCV) and Market Clearing Price (MCP) discovered at IEX and PXIL, along with the applicable floor and forbearance prices (given at Table 5) are shown in Figure 32.

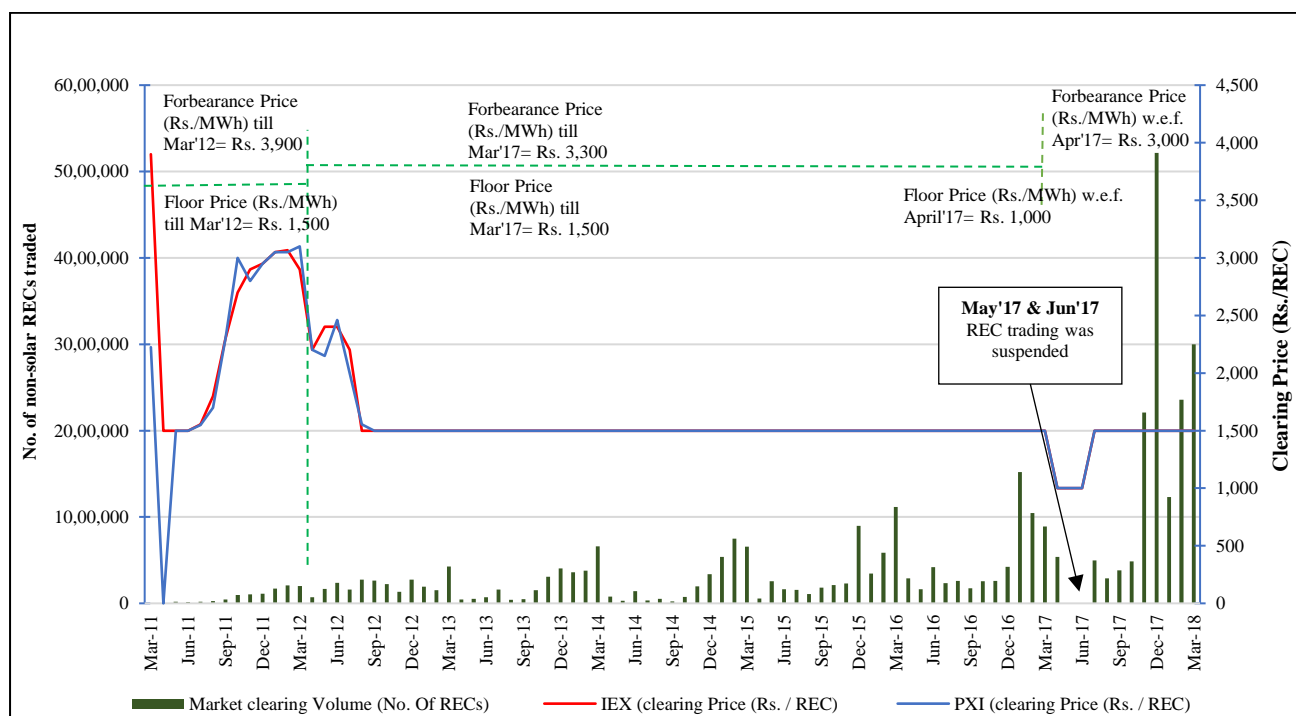


Figure 32: Trend of trading of non-solar RECs at Power exchanges

The monthly trend of clearing ratio (ratio of no. of RECs traded/sale bids) for non-solar RECs is shown in Figure 33.

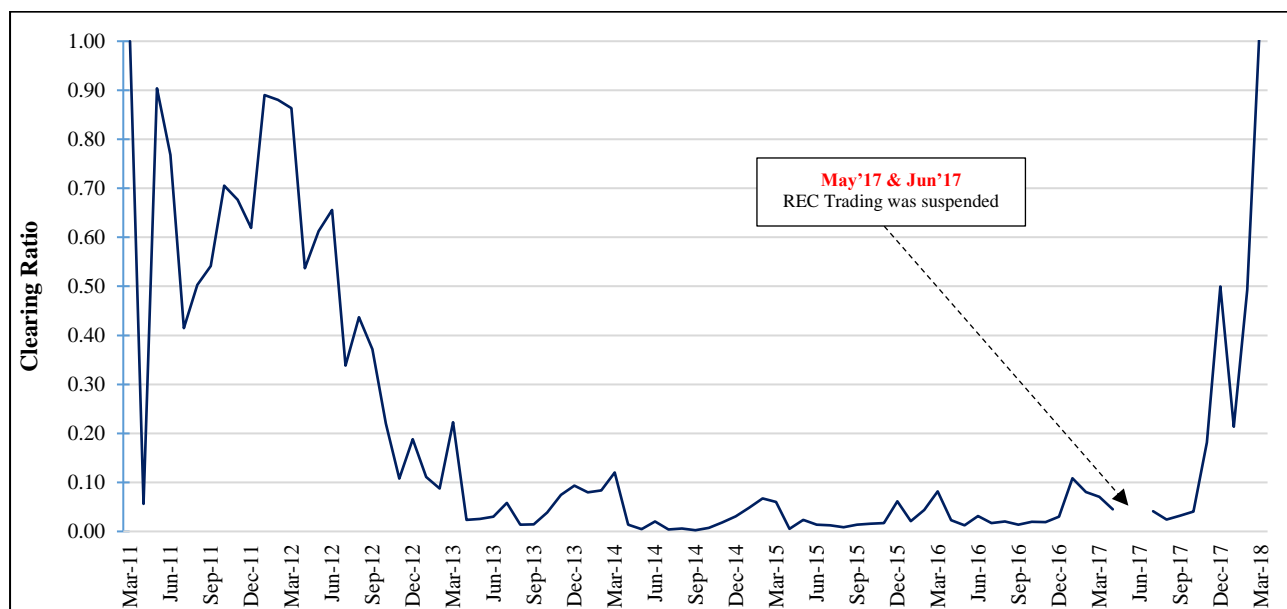


Figure 33: Clearing ratio of transaction of non-solar RECs

The purchase of non-solar RECs increased in recent times due to enforcement of RPO by concerned SERCs and the same is highest in 2017-18 wherein 92% of issued RECs, purchased by the obligated entities. The graph indicating the number of RECs issued, RECs cleared,

closing balance and percentage of REC's cleared over issued REC's is shown in the Figure 34.

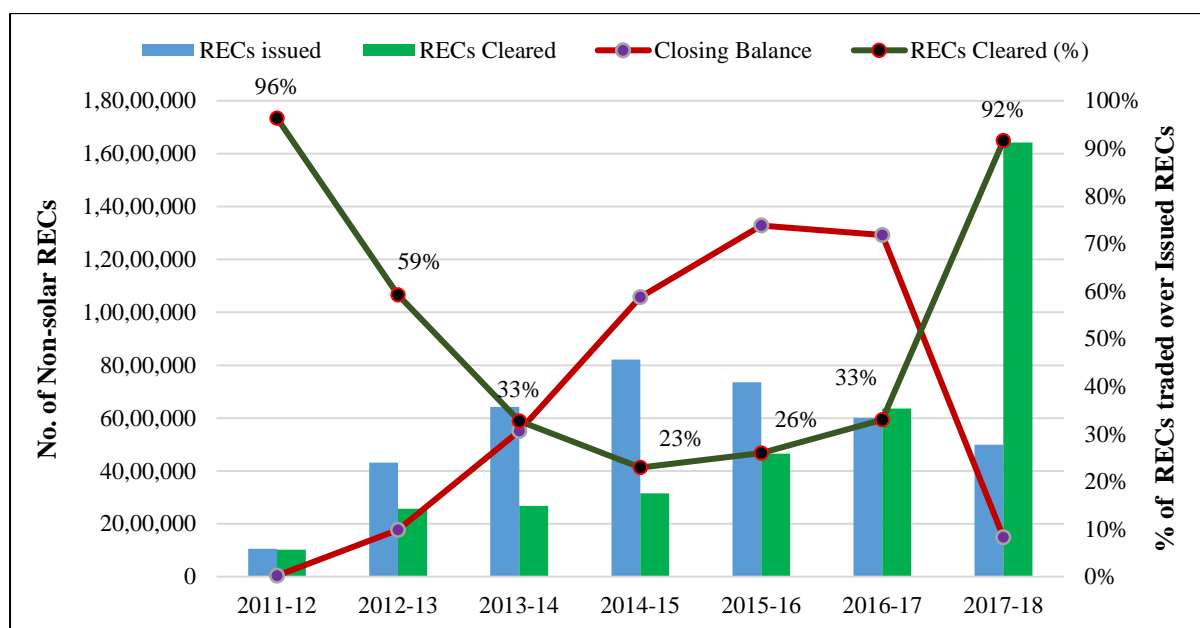


Figure 34: FY-wise % of non-solar REC's traded over Issued REC's

8.3 Details of trading of Solar REC's

Trading of solar REC's started in May 2012. Since then, more than 16 lakh solar REC's have been redeemed through power exchanges, and ~82,000 REC's have been self-retained by the renewable energy generators. The trends in MCV and MCP discovered at IEX and PXIL, along with the applicable floor and forbearance prices (given at Table 6) are shown in Figure 35.

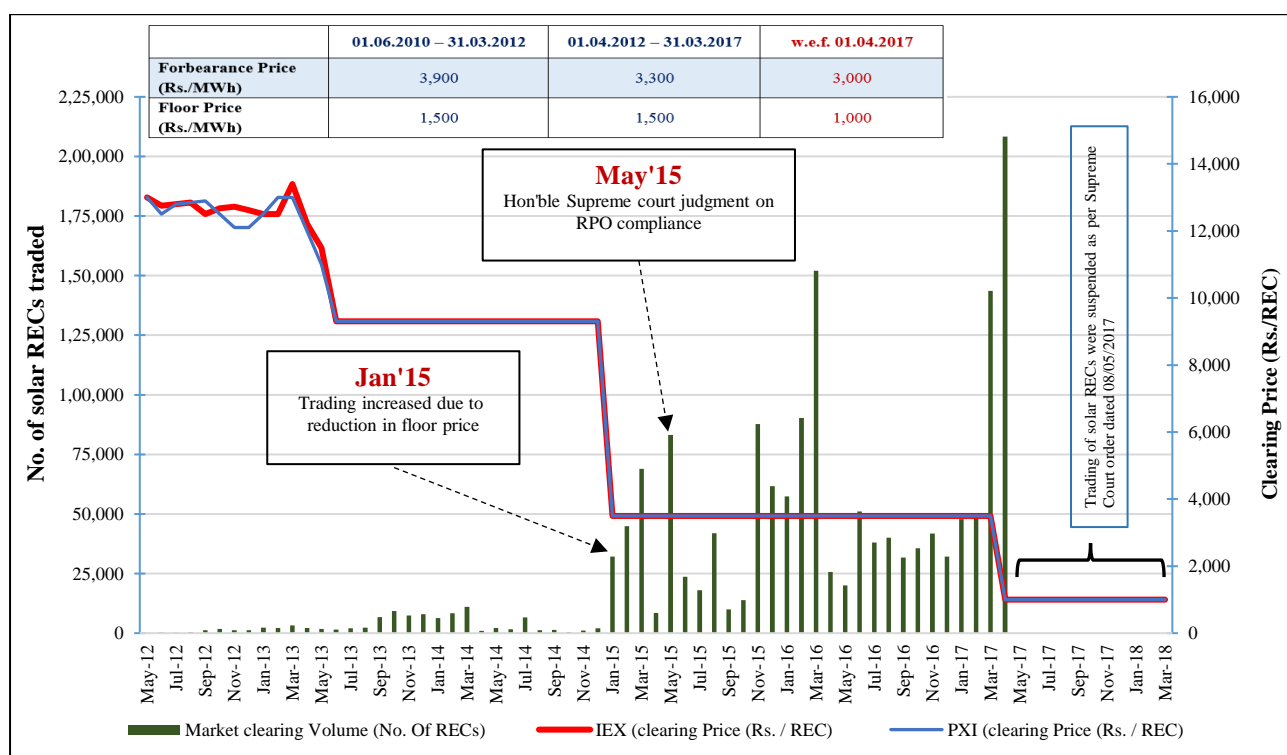


Figure 35: Trend of trading of solar REC's at power exchanges

The monthly trend of clearing ratio (ratio of no. of RECs traded/sale bids) for solar RECs is shown in Figure 36.

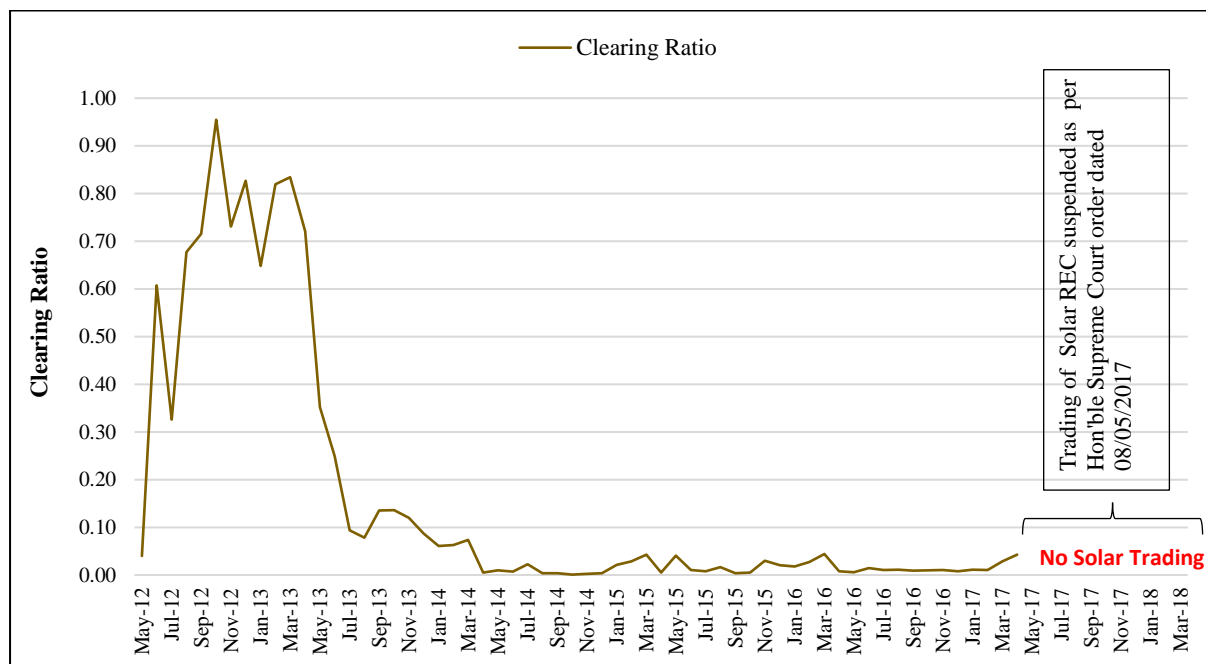


Figure 36: Clearing ratio of transaction of solar REC

Since the new prices (Floor and Forbearance Prices) will be applicable from 1st April, 2017, March will see minimum demand reaches at 4%, as the obligated entities will have an option to comply with RPO compliance in the next FY. The graph indicating the number of RECs issued, RECs cleared, closing balance and percentage of RECs cleared over issued RECs is shown in the Figure 37.

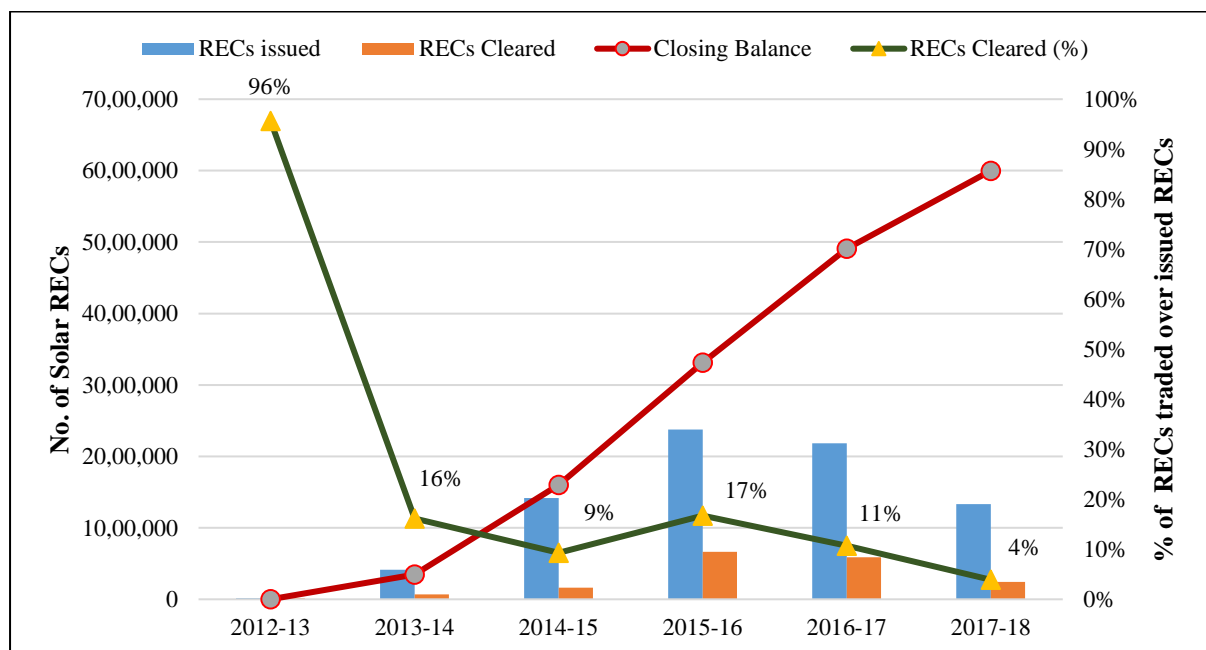


Figure 37: FY-wise % of solar RECs traded over Issued RECs

8.4 Analysis of Buyers of RECs

As per the Electricity Act 2003, the RPO on consumption of energy is determined by the respective SERCs. As per the Regulations, Distribution companies, Captive Power Plants (CPP), and Open Access (OA) consumers are obligated entities.

Since launch of the trading, distribution companies purchased ~61 % of the total RECs redeemed. The rest was purchased by both CPPs/ OA consumers in the past 7 years. Fiscal-wise details of RECs purchased by obligated entities is given in Table 40.

Table 40: Financial Year wise purchase of RECs by obligated entities

Type of Buyer	2011-12*	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	769,986	2,037,013	2,075,604	2,396,711	2,051,278	3,412,651	9,756,733	22,499,976	60.7
OA/CPP	245,698	532,151	671,346	663,232	2,901,010	3,073,112	6,426,872	14,513,421	39.2
Voluntary	14	20,650	1,744	1,979	2,865	1,976	546	29,774	0.1
Total	1,015,698	2,589,814	2,748,694	3,061,922	4,955,153	6,487,739	16,184,151	37,043,171	100

* Include 424 RECs Purchased by OA consumer / CPP and Voluntary in March 2011

The annual trend of participation of ratio of DISCOMs, OA & CPP is shown in Figure 38.

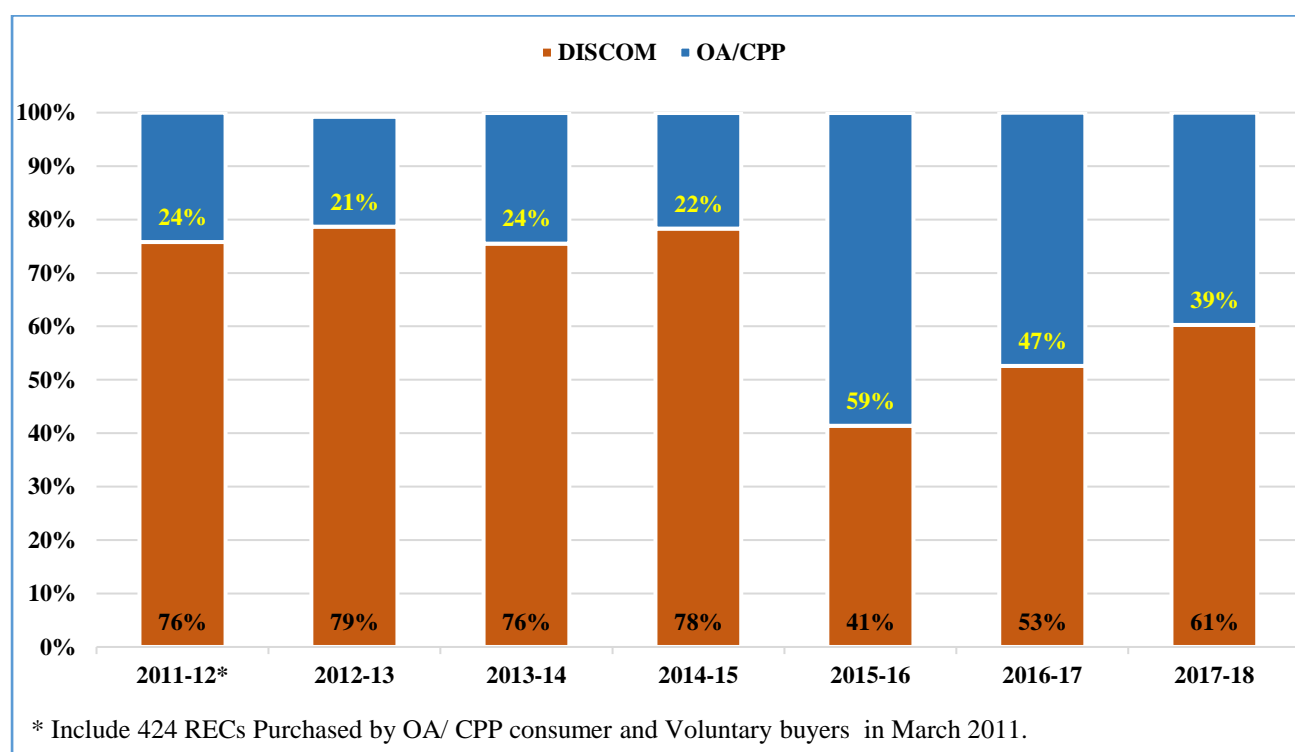


Figure 38: Yearly trend of participation ratio of DISCOMs, OA consumers & CPPs

Since, REC is a pan-India mechanism, stakeholders and voluntary buyers from 30 States/UTs have purchased more than 37 million RECs through Power Exchanges up to March 31, 2018. The States whose entities (DISCOM, CPP, OA consumers and volunteers) purchased RECs are

given at Table 41.

Table 41: Financial year-wise purchase of REC's by Entities of different States

S. No.	State / FY	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total
1	Andhra Pradesh	0	0	99,910	99,694	66,706	86,563	112,107	143,335	608,315
2	Assam	0	0	536	94	62,519	8,325	187,964	151,955	411,393
3	Bihar	0	0	1	0	0	0	228	1,705,966	1,706,195
4	Chandigarh	0	10,752	55,087	58,092	43,750	53,400	28,300	22,000	271,381
5	Chhattisgarh	0	35,746	14,493	109,991	100,723	93,887	105,973	654,216	1,115,029
6	Dadra and Nagar Haveli	0	58,000	90,000	40,000	115,824	117,538	296,041	8,048	725,451
7	Daman and Diu	0	750	4,700	17,630	90,809	180,242	30,423	96,568	421,122
8	Delhi	0	2	17,972	654	1,974	2,855	529,520	2,008,323	2,561,300
9	Goa	0	0	0	0	85,000	120,000	0	57,000	262,000
10	Gujarat	274	423,726	271,321	370,905	778,137	1,017,392	1,125,773	945,398	4,932,926
11	Haryana	0	0	11,993	10,034	1,231	28,184	20,736	15,728	87,906
12	Himachal Pradesh	0	0	1,827	5,897	2,147	46,617	36,057	25,657	118,202
13	Jharkhand	0	50,888	141,267	26,366	104,866	204,332	188,224	809,824	1,525,767
14	Karnataka	0	1,237	67,518	52,589	64,845	155,613	113,758	187,302	642,862
15	Kerala	0	0	0	0	0	0	117,636	8,468	126,104
16	Madhya Pradesh	0	7,355	25,135	42,948	45,568	119,677	58,210	1,332,662	1,631,555
17	Maharashtra	148	276,924	1,240,451	1,044,886	975,135	1,076,748	1,771,637	4,992,486	11,378,415
18	Manipur	0	0	0	0	0	3,997	0	0	3,997
19	Meghalaya	0	0	0	0	0	13,442	6,767	12,481	32,690
20	Mizoram	0	0	0	0	1,055	1,105	1,000	0	3,160
21	Odisha	0	79,999	47,256	50,985	60,730	166,168	222,086	1,616,878	2,244,102
22	Puducherry	0	0	48,000	112,000	108,690	65,000	717	98,327	432,734
23	Punjab	0	43,933	334,142	535,691	41,044	78,182	127,710	85,846	1,246,548
24	Rajasthan	0	100	36,828	110,259	144,840	1,106,880	614,858	291,515	2,305,280
25	Tamil Nadu	0	23,403	72,115	37,650	22,439	153,307	181,468	216,158	706,540
26	Telangana	0	0	97	362	4,179	35,862	61,760	52,316	154,576
27	Tripura	0	0	0	297	0	0	0	0	297
28	Uttar Pradesh	0	2,454	3,989	5,791	4,592	1,586	1,639	132,300	152,351
29	Uttarakhand	0	0	3,836	14,413	133,653	16,751	179,867	83,426	431,946
30	West Bengal	2	5	1,340	1,466	1,466	1,500	367,280	429,968	803,027
	Total	424	1,015,274	2,589,814	2,748,694	3,061,922	4,955,153	6,487,739	16,184,151	37,043,171

It has been observed that DISCOMs as a category purchased ~61% of total RECs. The list of these DISCOMs is given at Table 42.

Table 42: RECs purchased by DISCOMs

S. No.	DISCOMs	State	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total
1	Assam Power Distribution Company Limited	Assam	0	0	0	0	62,500	0	1,31,324	1,06,496	3,00,320
2	Bihar State Power Holding Company Limited- Patna	Bihar	0	0	0	0	0	0	0	10,00,841	10,00,841
3	North Bihar Power Distribution Company Limited	Bihar	0	0	0	0	0	0	0	3,46,796	3,46,796
4	South Bihar Power Distribution Company Limited	Bihar	0	0	0	0	0	0	0	3,58,218	3,58,218
5	Electricity Wing of Engineering Dept UT Chandigarh	Chandigarh	0	10,752	55,087	58,092	43,750	53,400	28,300	22,000	2,71,381
6	Jindal Steel and Power Ltd Distribution License	Chhattisgarh	0	0	0	66,869	49,556	0	0	91,615	2,08,040
7	Dadra and Nagar Haveli Power distribution company	Dadra and Nagar Haveli	0	58,000	90,000	40,000	1,15,000	90,000	2,10,000	0	6,03,000
8	Electrical Dept UT Daman and Diu	Daman and Diu	0	750	4,700	13,200	79,733	1,65,379	13,334	85,008	3,62,104
9	BSES Rajdhani Power Limited	Delhi	0	0	0	0	0	0	3,33,332	0	3,33,332
10	BSES Yamuna Power Limited	Delhi	0	0	0	0	0	0	20,000	46,660	66,660
11	Tata Power Delhi Distribution Limited/ NDPL	Delhi	0	0	0	0	0	0	1,66,666	19,53,276	21,19,942
12	Electricity Department Government of Goa	Goa	0	0	0	0	85,000	1,20,000	0	57,000	2,62,000
13	Gujarat Urja Vikas Nigam Limited	Gujarat	0	0	0	0	1,50,000	0	0	0	1,50,000
14	Torrent Power Limited - Ahmedabad Distribution	Gujarat	0	2,88,587	1,93,770	2,45,765	4,17,800	4,09,720	2,89,404	30,322	18,75,368
15	Torrent Power Limited - Dahej Distribution	Gujarat	0	3,000	1,000	4,155	12,065	22,720	18,600	0	61,540
16	Torrent Power Limited - Surat Distribution	Gujarat	0	1,31,835	76,551	1,19,795	1,97,200	1,68,590	9,000	1,76,831	8,79,802
17	Himachal Pradesh State Electricity Board Ltd	Himachal Pradesh	0	0	0	0	0	0	3,863	0	3,863
18	Damodar Valley Corporation Jharkhand	Jharkhand	0	0	1,704	1,866	1,866	1,832	1,25,990	1,51,067	2,84,325
19	Tata Steel Limited Power Distribution Licensee	Jharkhand	0	0	73,571	12,000	78,000	1,65,500	50,000	1,37,527	5,16,598
20	Kerala State Electricity Board Limited	Kerala	0	0	0	0	0	0	1,00,000	0	1,00,000
21	Brihan Mumbai Electric Supply & Transport Unde	Maharashtra	148	1,000	4,39,884	2,20,000	1,76,000	1,25,000	2,17,060	3,76,811	15,55,903
22	Maharashtra State Electricity Distribution Company Limited	Maharashtra	0	0	0	0	1,00,000	0	6,66,000	41,01,944	48,67,944
23	Reliance Infrastructure Limited	Maharashtra	0	87,529	5,04,750	4,24,200	5,44,910	5,74,435	4,40,332	0	25,76,156
24	The Tata Power Company Limited	Maharashtra	0	1,88,385	2,61,306	2,72,566	48,000	83,100	0	74,968	9,28,325
25	Manipur State Power Distribution Company Limited	Manipur	0	0	0	0	0	3,997	0	0	3,997
26	Meghalaya Power Distribution Corporation Limited	Meghalaya	0	0	0	0	0	0	2,000	375	2,375
27	Power and Electricity Department Government of Mizoram	Mizoram	0	0	0	0	1,055	1,105	1,000	0	3,160
28	Electricity Department Government of Puducherry	Puducherry	0	0	48,000	1,12,000	1,08,690	65,000	0	97,259	4,30,949
29	Punjab State Power Corporation Limited	Punjab	0	0	2,85,350	4,83,333	0	0	66,666	61,751	8,97,100
30	Tripura State Electricity Corporation Limited	Tripura	0	0	0	297	0	0	0	0	297
31	Uttarakhand Power Corporation Limited	Uttarakhand	0	0	0	0	1,24,120	0	1,52,500	50,000	3,26,620
32	Damodar Valley Corporation West Bengal	West Bengal	0	0	1,340	1,466	1,466	1,500	3,67,280	4,29,968	8,03,020
Total			148	7,69,838	20,37,013	20,75,604	23,96,711	20,51,278	34,12,651	97,56,733	2,24,99,976

The list of state whose DISCOMs had purchased RECs are given in Table 43.

Table 43: State-wise breakup of RECs Purchased by DISCOMs

S. No.	State \ FY	2011-12*	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total
1	Assam	0	0	0	62,500	0	131,324	106,496	300,320
2	Bihar	0	0	0	0	0	0	1,705,855	1,705,855
3	Chandigarh	10,752	55,087	58,092	43,750	53,400	28,300	22,000	271,381
4	Chhattisgarh	0	0	66,869	49,556	0	0	91,615	208,040
5	Dadra and Nagar Haveli	58,000	90,000	40,000	115,000	90,000	210,000	0	603,000
6	Daman and Diu	750	4,700	13,200	79,733	165,379	13,334	85,008	362,104
7	Delhi	0	0	0	0	0	519,998	1,999,936	2,519,934
8	Goa	0	0	0	85,000	120,000	0	57,000	262,000
9	Gujarat	423,422	271,321	369,715	777,065	601,030	317,004	207,153	2,966,710
10	Himachal Pradesh	0	0	0	0	0	3,863	0	3,863
11	Jharkhand	0	75,275	13,866	79,866	167,332	175,990	288,594	800,923
12	Kerala	0	0	0	0	0	100,000	0	100,000
13	Maharashtra	277,062	1,205,940	916,766	868,910	782,535	1,323,392	4,553,723	9,928,328
14	Manipur	0	0	0	0	3,997	0	0	3,997
15	Meghalaya	0	0	0	0	0	2,000	375	2,375
16	Mizoram	0	0	0	1,055	1,105	1,000	0	3,160
17	Pondicherry	0	48,000	112,000	108,690	65,000	0	97,259	430,949
18	Punjab	0	285,350	483,333	0	0	66,666	61,751	897,100
19	Tripura	0	0	297	0	0	0	0	297
20	Uttarakhand	0	0	0	124,120	0	152,500	50,000	326,620
21	West Bengal	0	1,340	1,466	1,466	1,500	367,280	429,968	803,020
Total		769,986	2,037,013	2,075,604	2,396,711	2,051,278	3,412,651	9,756,733	22,499,976

* Including 148 RECs purchased by a DISCOM of Maharashtra in March 2011

8.5 Voluntary Buyers of RECs

More than 27,000 RECs were purchased by central public-sector enterprises due to inclusion of purchase of RECs under Corporate social Responsibility (CSR) by department of public enterprises (DPE) in 2012-13. A copy of the department's guidelines is attached at **Annexure-V**.

Further, 8,732 RECs were purchased by individuals, 20,911 RECs by the other companies/institutions, and 575 by the World Bank country office. Moreover, it is pertinent to mention that **POSOCO** itself has purchased 7,564 RECs under its corporate social responsibility with regard to promotion of renewables in the country. The list of voluntary buyers is attached at **Annexure-VI**. The year-wise summary of RECs purchased by voluntary buyers is given in Table 44.

Table 44: Financial year-wise purchase of RECs by voluntary buyers

S. No.	FY	No. of RECs Purchased		
		Solar	Non-solar	Total
1	2010-11	0	2	2
2	2011-12	0	12	12
3	2012-13	0	20,650	20,650
4	2013-14	0	1,744	1,744
5	2014-15	603	1,376	1,979
6	2015-16	698	2,167	2,865
7	2016-17	570	1,406	1,976
8	2017-18	1	545	546
TOTAL		1,872	27,902	29,774

8.6 RECs vis a vis market development

8.6.1 Growth in number of buyers, sellers and trading of RECs

REC mechanism has played an important role in the development of the market for renewables in the country. Large number of buyers, sellers and traders participated in the REC trading process, details of the same are given in Table 45.

Table 45: Number of Buyers, Sellers and number of RECs traded on Power Exchanges

Financial Year	Number of buyers of RECs		Number of sellers of RECs		Transacted RECs		Total Transected RECs
	PXIL	IEX	PXIL	IEX	PXIL	IEX	
2010-11	1	2	1	1	274	150	424
2011-12	38	359	39	158	64,266	951,008	1,015,274
2012-13	158	644	279	404	598,825	1,990,989	2,589,814
2013-14	179	904	447	597	1,424,371	1,324,323	2,748,694
2014-15	158	663	628	750	1,514,298	1,547,624	3,061,922
2015-16	240	1,092	679	833	1,816,263	3,138,890	4,955,153
2016-17	378	1,382	699	889	1,869,120	4,618,619	6,487,739
2017-18	234	938	685	915	6,854,898	9,329,253	16,184,151
Total Number of RECs transacted through PXs					14,142,315	22,900,856	37,043,171

The trend of number of buyers and sellers participating in the monthly trading process are shown in Figure 39 and Figure 40 for non-solar and solar RECs respectively. The RPO compliance is being done by SERCs on yearly basis. In this regard it has been observed that

large number of buyers had purchased RECs in the last quarter (Dec-Jan) of every year.

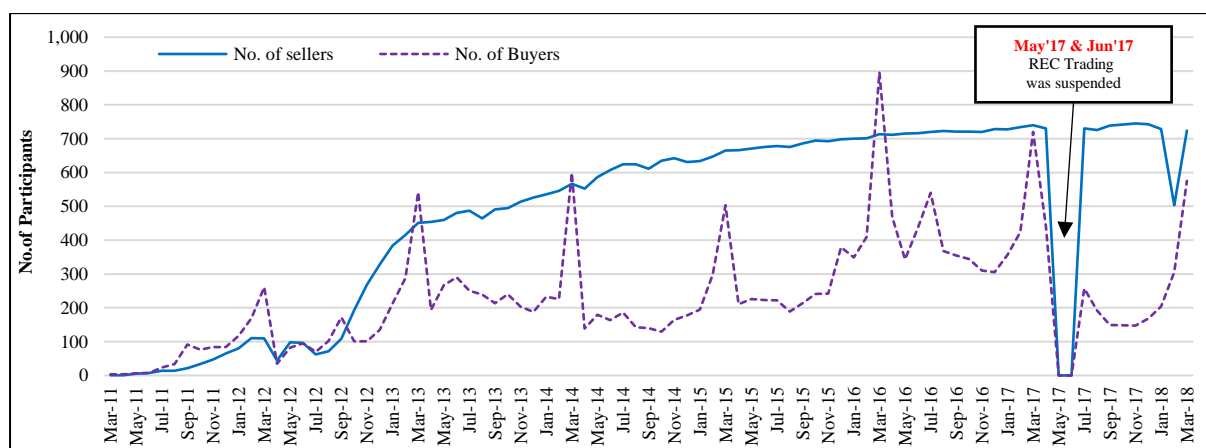


Figure 39: Participants – number of Sellers & Buyers in monthly trading (Non-solar)

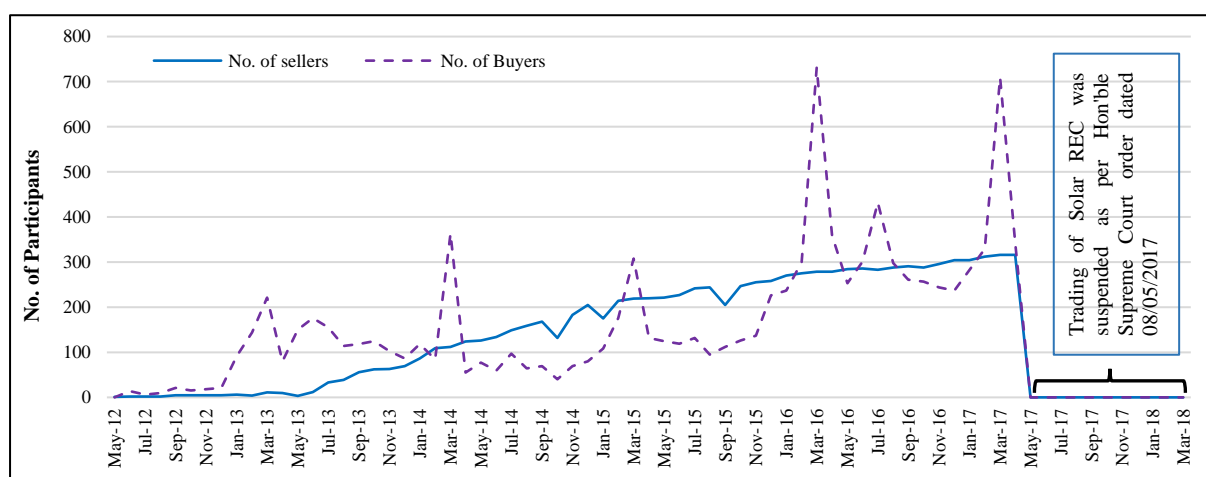


Figure 40: Participants – Number of Sellers & Buyers in monthly trading (Solar)

8.6.2 RECs purchased by DISCOMs, OA consumers, CPPs and Voluntary Buyers

More than 3000 obligated entities have purchased RECs through Power Exchanges. The FY-wise detailed breakup of RECs purchased by DISCOMs, OA consumers and CPPs are given in the Table 46.

Table 46: RECs purchased by the DISCOM /OA /CPP and voluntary Buyers

Buyer Type FY ↓	DISCOM			OA/CPP			Voluntary			Total RECs Purchased
	Solar	Non-solar	No. of Participants	Solar	Non-solar	No. of Participants	Solar	Non-solar	No. of Participants	
2010-11	0	148	1	0	274	1	0	2	1	424
2011-12	0	769,838	9	0	245,424	351	0	12	3	1,015,274
2012-13	4,832	2,032,181	14	9,181	522,970	714	0	20,650	11	2,589,814
2013-14	32,086	2,043,518	16	34,594	636,752	958	0	1,744	3	2,748,694
2014-15	102,684	2,294,027	20	60,213	603,019	727	603	1,376	2	3,061,922
2015-16	280,355	1,770,923	16	367,148	2,533,862	1,180	698	2,167	4	4,955,153
2016-17	113,786	3,298,865	22	442,658	2,630,454	1,581	570	1,406	8	6,487,739
2017-18	20,375	9,736,358	22	188,026	6,238,846	1,045	1	545	4	16,184,151

The Power Exchange-wise analysis of the number of DISCOMs participated in the purchase of RECs are given in the Figure 41.

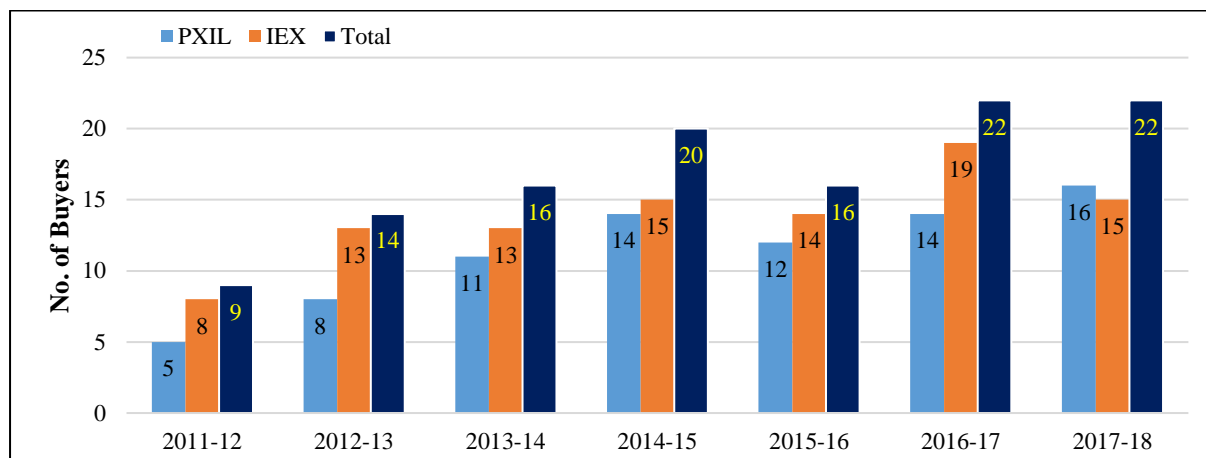


Figure 41: No. of DISCOMs participated in trading of RECs at PXs

The Power-exchange-wise analysis of the number of OA consumers and CPPs participated in the purchase of RECs are given in the Figure 42.

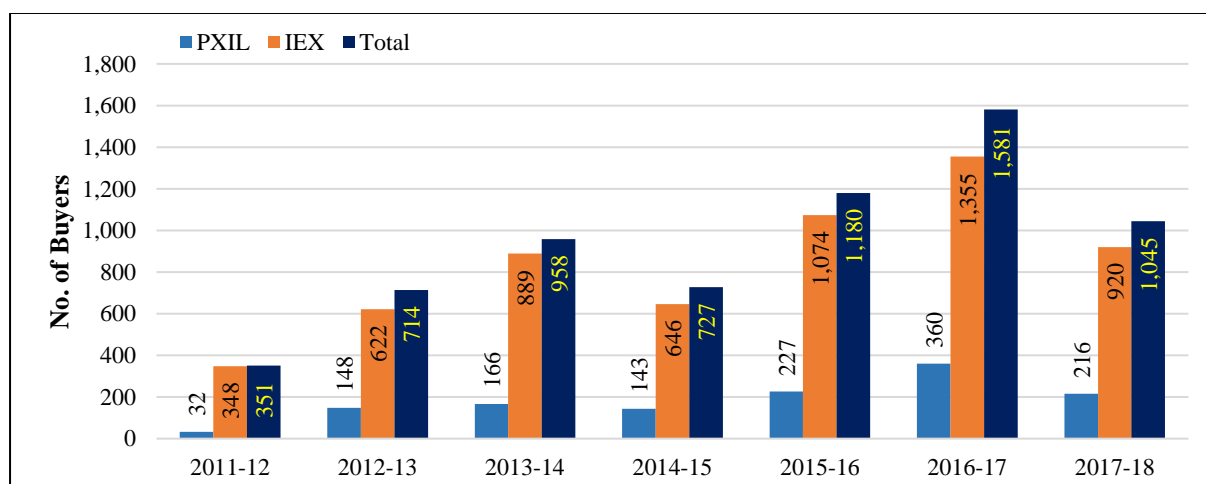


Figure 42: No. of OA/CPP participated in trading of RECs at PXs

The FY-wise analysis of the number of RECs purchased by DISCOMs are given in the Figure 43.

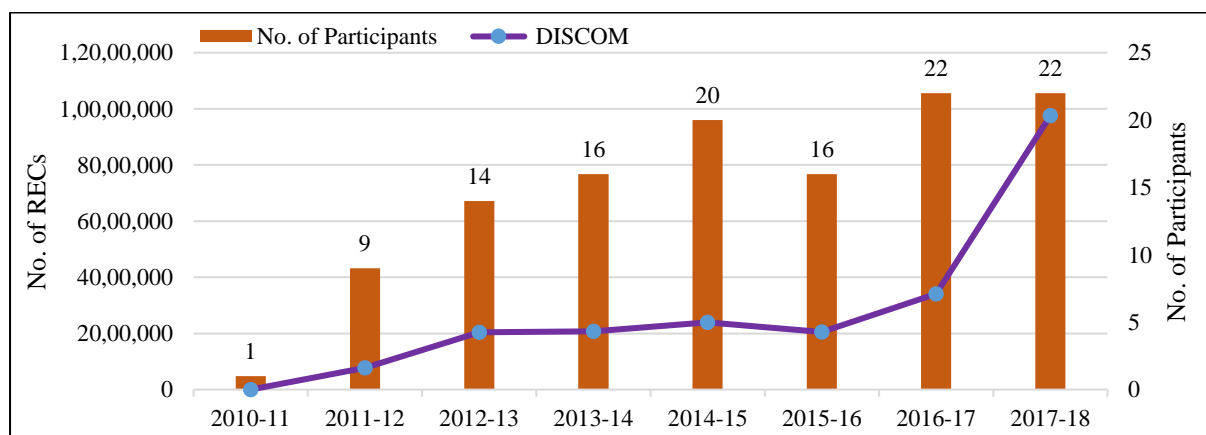


Figure 43: FY-wise no. of RECs purchased by DISCOMs

The FY-wise analysis of the number of RECs purchased by OA consumers and CPPs are given in the Figure 44.

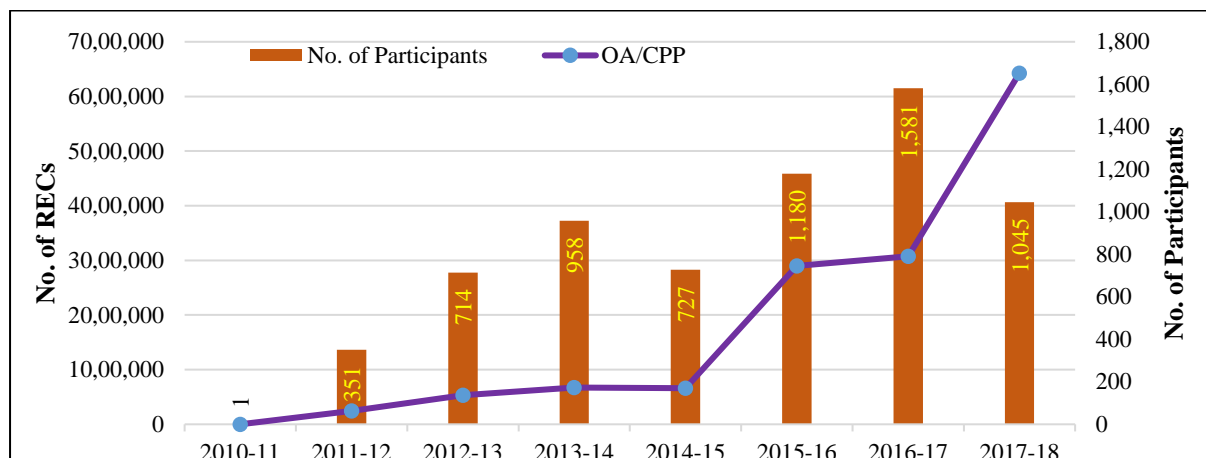


Figure 44: FY-wise no. of RECs purchased by OA/CPP consumers

Since launch of the mechanism more than 4.6 crore RECs have been issued and upto 31.03.2018, and more than 3.7 crore RECs have been purchased by the Obligated entities through Power Exchanges. The trend of the issuance and redemption of RECs has been illustrated in the Figure 45.

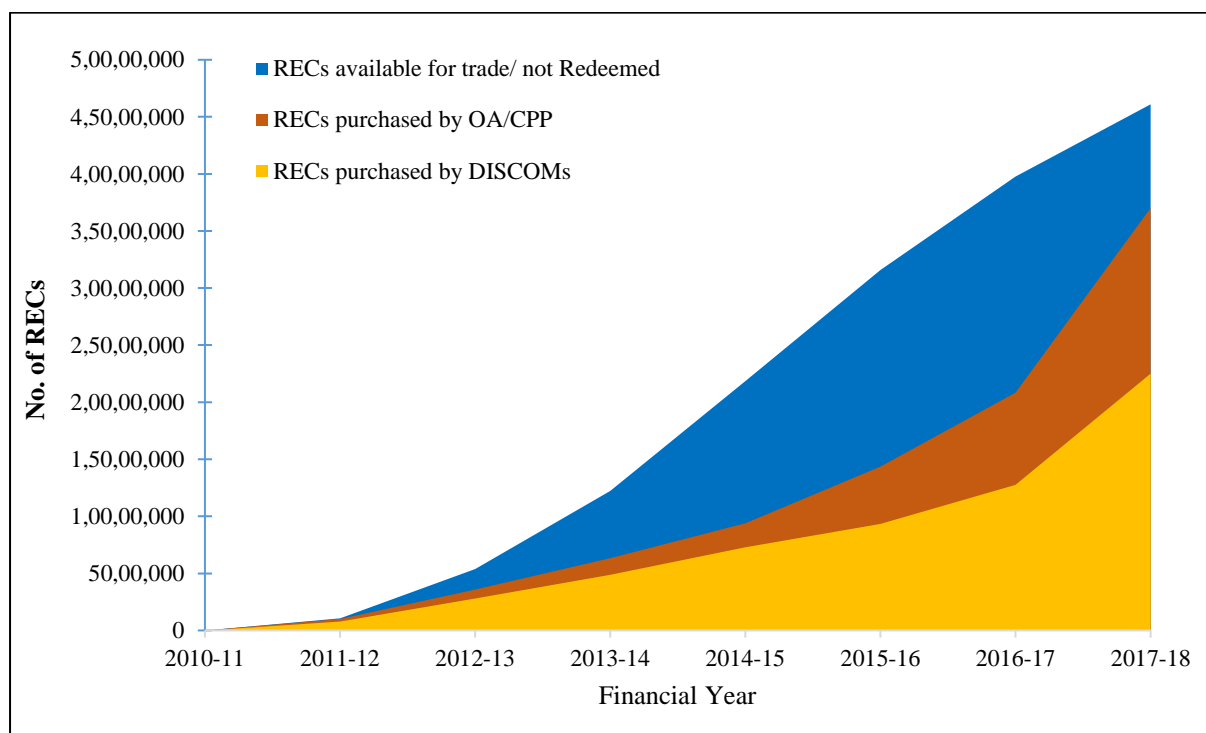


Figure 45: Issuance and Redemption of RECs

The Figure indicates how the composition of number of RECs purchased has changed over time. The top line of the figure, bounding the blue area above, shows the total issuance of RECs in the fiscal years ending 2011 through 2018. The yellow area at bottom shows the total RECs purchased by DISCOMs, and the dark red area indicates the total RECs purchased by the OA/CPP.

8.7 Month-wise value of REC transactions

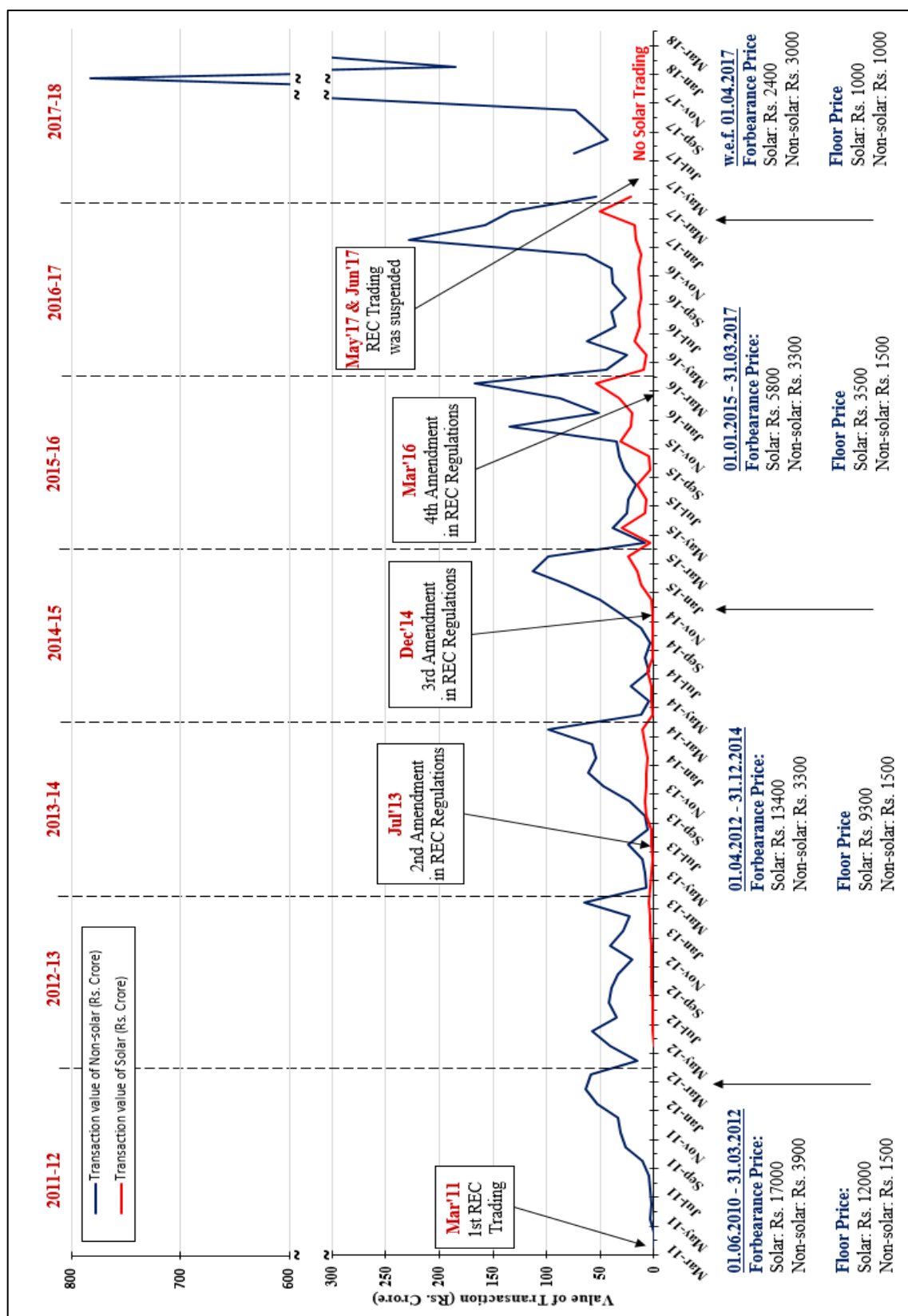


Figure 46: Month wise value of RECs transaction

X

9. State/UT-wise analysis of Accredited and Registered projects, RECs issued, RECs traded and types of buyers

“Numbers have important story to tell. They rely on you to give them a voice” ~ Stephen Few

The current status of state-wise details of accreditation and registration are available at https://www.recregistryindia.nic.in/index.php/general/publics/State_Source_Wise_Accr_Status

List of State Agencies and SLDCs are attached at **Annexure-VII** and **Annexure-VIII** respectively.

9.1 Andhra Pradesh

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Biomass	1	6	0	0	1	6	0	0	0	0	0	0
2	Small Hydro	1	1	0	0	1	1	0	0	15,995	15,995	0	0
3	Solar PV	16	36	0	0	16	36	0	0	241,117	47,345	6,768	187,004
4	Wind	14	125	0	0	14	125	0	0	1,053,865	629,993	198,152	225,720
	Total	32	168	0	0	32	168	0	0	1,310,977	693,333	204,920	412,724

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	0	0	0.0
OA/CPP	0	97,310	99,694	66,706	86,563	112,107	143,335	605,715	99.6
Voluntary	0	2,600	0	0	0	0	0	2,600	0.4
Total	0	99,910	99,694	66,706	86,563	112,107	143,335	608,315	100

9.2 Assam

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	62,500	0	131,324	106,496	300,320	73.0
OA/CPP	0	536	94	19	8,325	56,640	45,459	111,073	27.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	536	94	62,519	8,325	187,964	151,955	411,393	100

9.3 Bihar

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Bio-fuel cogeneration	5	29	2	11	5	29	4	23	151,432	147,141	0	4,291
2	Biomass	1	4	1	4	1	4	1	4	34,403	34,403	0	0
	Total	6	33	3	15	6	33	5	27	185,835	181,544	0	4,291

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	1,705,855	1,705,855	100.0
OA/CPP	0	0	0	0	0	228	111	339	0.0
Voluntary	0	1	0	0	0	0	0	1	0.0
Total	0	1	0	0	0	228	1,705,966	1,706,195	100

9.4 Chandigarh

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	10,752	55,087	58,092	43,750	53,400	28,300	22,000	271,381	100.0
OA/CPP	0	0	0	0	0	0	0	0	0.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	10,752	55,087	58,092	43,750	53,400	28,300	22,000	271,381	100

9.5 Chhattisgarh

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Bio-fuel cogeneration	1	3	1	3	1	3	1	3	51,366	51,366	0	0
2	Biomass	13	133	12	113	10	111	9	91	1,762,591	1,762,128	0	463
3	Solar PV	4	9	3	5	4	9	3	5	15,562	4,051	0	11,511
	Total	18	144	16	120	15	123	13	98	1,829,519	1,817,545	0	11,974

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	66,869	49,556	0	0	91,615	208,040	18.7
OA/CPP	35,746	14,493	43,122	51,167	93,887	105,973	562,601	906,989	81.3
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	35,746	14,493	109,991	100,723	93,887	105,973	654,216	1,115,029	100

9.6 Dadra and Nagar Haveli

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	58,000	90,000	40,000	115,000	90,000	210,000	0	603,000	83.1
OA/CPP	0	0	0	824	27,538	86,041	8,048	122,451	16.9
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	58,000	90,000	40,000	115,824	117,538	296,041	8,048	725,451	100

9.7 Daman and Diu

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	750	4,700	13,200	79,733	165,379	13,334	85,008	362,104	86.0
OA/CPP	0	0	4,430	11,076	14,863	17,089	11,560	59,018	14.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	750	4,700	17,630	90,809	180,242	30,423	96,568	421,122	100

9.8 Delhi

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Solar PV	3	10	1	2	3	10	1	2	19,600	0	0	19,600
2	Urban or Municipal Waste	2	16	2	16	1	8	1	8	72,892	72,892	0	0
	Total	5	26	3	18	4	18	2	10	92,492	72,892	0	19,600

Continued...

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	519,998	1,999,936	2,519,934	98.4
OA/CPP	0	0	0	0	0	7,658	8,387	16,045	0.6
Voluntary	2	17,972	654	1,974	2,855	1,864	0	25,321	1.0
Total	2	17,972	654	1,974	2,855	529,520	2,008,323	2,561,300	100

9.9 Goa

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	85,000	120,000	0	57,000	262,000	100.0
OA/CPP	0	0	0	0	0	0	0	0	0.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	0	0	85,000	120,000	0	57,000	262,000	100

9.10 Gujarat

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Bio-fuel cogeneration	7	25	1	4	7	25	1	4	258,262	256,978	0	1,284
2	Biomass	3	15	2	11	3	15	3	15	75,542	75,539	0	3
3	Solar PV	8	17	3	5	6	10	2	4	16,783	863	0	15,920
4	Wind	53	443	21	216	47	389	15	162	3,149,894	2,955,308	182,691	11,895
	Total	71	500	27	237	63	439	21	185	3,500,481	3,288,688	182,691	29,102

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	423,422	271,321	369,715	777,065	601,030	317,004	207,153	2,966,710	60.1
OA/CPP	578	0	1,190	1,072	416,362	808,769	738,245	1,966,216	39.9
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	424,000	271,321	370,905	778,137	1,017,392	1,125,773	945,398	4,932,926	100

*Include 274 nos. of RECs purchased by DISCOM in FY 2010-11

9.11 Haryana

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Bio-fuel cogeneration	2	7	0	0	2	7	1	4	44,078	36,104	0	7,974
2	Biomass	9	25	4	12	8	22	4	12	141,857	123,874	0	17,983
3	Solar PV	1	1	0	0	1	1	0	0	0	0	0	0
	Total	12	33	4	12	11	30	5	16	185,935	159,978	0	25,957

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	0	0	0.0
OA/CPP	0	11,993	10,034	1,231	28,184	20,736	15,728	87,906	100.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	11,993	10,034	1,231	28,184	20,736	15,728	87,906	100

9.12 Himachal Pradesh

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Small Hydro	18	155	5	61	16	137	3	43	1,594,846	1,594,222	331	293
2	DISCOM	1	0	0	0	1	0	0	0	550,020	0	0	550,020
	Total	19	155	5	61	17	137	3	43	2,144,866	1,594,222	331	550,313

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	3,863	0	3,863	3.3
OA/CPP	0	1,827	5,897	2,147	46,617	32,194	25,657	114,339	96.7
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	1,827	5,897	2,147	46,617	36,057	25,657	118,202	100

9.13 Jammu and Kashmir

Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
Small Hydro	7	70	2	18	7	70	6	55	447,278	440,517	0	6,761
Total	7	70	2	18	7	70	6	55	447,278	440,517	0	6,761

9.14 Jharkhand

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	75,275	13,866	79,866	167,332	175,990	288,594	800,923	52.5
OA/CPP	50,883	65,992	12,500	25,000	37,000	12,234	521,230	724,839	47.5
Voluntary	5	0	0	0	0	0	0	5	0.0
Total	50,888	141,267	26,366	104,866	204,332	188,224	809,824	1,525,767	100

9.15 Karnataka

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Biomass	2	20	0	0	1	10	0	0	189,770	90,439	90,735	8,596
2	Small Hydro	3	28	1	18	2	10	0	0	101,000	101,000	0	0
3	Solar Thermal	1	3	1	3	0	0	0	0	0	0	0	0
4	Wind	24	184	13	77	15	131	4	25	745,095	740,972	0	4,123
	Total	30	234	15	98	18	151	4	25	1,035,865	932,411	90,735	12,719

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	0	0	0.0
OA/CPP	1,237	67,518	52,589	64,840	155,608	113,755	186,897	642,444	99.9
Voluntary	0	0	0	5	5	3	405	418	0.1
Total	1,237	67,518	52,589	64,845	155,613	113,758	187,302	642,862	100

9.16 Kerala

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Biomass	1	2	1	2	1	2	1	2	25,064	25,064	0	0
2	Small Hydro	1	21	1	21	1	21	1	21	149,738	149,738	0	0
3	Solar PV	1	1	0	0	1	1	0	0	2,564	0	1,069	1,495
	Total	3	24	2	23	3	24	2	23	177,366	174,802	1,069	1,495

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	100,000	0	100,000	79.3
OA/CPP	0	0	0	0	0	17,636	8,468	26,104	20.7
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	0	0	0	0	117,636	8,468	126,104	100

9.17 Madhya Pradesh

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Biomass	5	44	5	44	4	38	3	35	10,220	10,220	0	0
2	Small Hydro	3	29	2	16	3	29	2	16	308,067	307,867	200	0
3	Solar PV	102	189	1	3	100	185	1	3	1,951,974	426,370	25,576	1,500,028
4	Wind	3	9	2	3	3	9	2	3	45,853	40,212	0	5,641
	Total	113	272	10	66	110	261	8	56	2,316,114	784,669	25,776	1,505,669

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	0	0	0.0
OA/CPP	7,355	25,124	42,948	45,568	119,677	58,210	1,332,662	1,631,544	100.0
Voluntary	0	11	0	0	0	0	0	11	0.0
Total	7,355	25,135	42,948	45,568	119,677	58,210	1,332,662	1,631,555	100

9.18 Maharashtra

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Bio-fuel cogeneration	53	429	24	188	45	353	15	117	972,237	963,752	0	8,485
2	Biogas	2	3	1	2	1	2	1	2	16,843	9,970	5,010	1,863
3	Biomass	18	185	11	118	15	132	10	105	451,497	451,495	0	2
4	Small Hydro	15	65	5	33	13	48	3	17	488,195	481,565	6,085	545
5	Solar PV	76	118	3	3	64	101	2	2	738,620	164,460	413	573,747
6	Wind	333	683	157	208	317	661	156	206	3,488,224	3,223,567	232,734	31,923
7	DISCOM	1	0	0	0	1	0	0	0	84,847	10,402	0	74,445
	Total	498	1483	201	551	456	1297	187	448	6,240,463	5,305,211	244,242	691,010

Type of Buyer	2011-12*	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	277,062	1,205,940	916,766	868,910	782,535	1,323,392	4,553,723	9,928,328	87.3
OA/CPP	10	34,511	127,030	106,225	294,208	448,231	438,622	1,448,837	12.7
Voluntary	0	0	1,090	0	5	14	141	1,250	0.0
Total	277,072	1,240,451	1,044,886	975,135	1,076,748	1,771,637	4,992,486	11,378,415	100
*Include 148 nos. of RECs purchased by DISCOM in FY 2010-11									

9.19 Manipur

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	3,997	0	0	3,997	100.0
OA/CPP	0	0	0	0	0	0	0	0	0.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	0	0	0	3,997	0	0	3,997	100

9.20 Meghalaya

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	2,000	375	2,375	7.3
OA/CPP	0	0	0	0	13,442	4,767	12,106	30,315	92.7
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	0	0	0	13,442	6,767	12,481	32,690	100

9.21 Mizoram

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	1,055	1,105	1,000	0	3,160	100.0
OA/CPP	0	0	0	0	0	0	0	0	0.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	0	0	1,055	1,105	1,000	0	3,160	100

9.22 Nagaland

Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
Small Hydro	1	24	1	24	1	24	1	24	278,084	278,084	0	0

9.23 Odisha

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Biomass	3	38	1	5	2	30	1	5	791,082	791,076	0	6
2	Solar PV	4	6	1	1	3	5	0	0	48,544	7,308	26,227	15,009
	Total	7	44	2	6	5	35	1	5	839,626	798,384	26,227	15,015

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	0	0	0.0
OA/CPP	79,999	47,256	50,985	60,730	166,168	222,086	1,616,878	2,244,102	100.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	79,999	47,256	50,985	60,730	166,168	222,086	1,616,878	2,244,102	100

9.24 Pondicherry

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	48,000	112,000	108,690	65,000	0	97,259	430,949	99.6
OA/CPP	0	0	0	0	0	717	1,068	1,785	0.4
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	48,000	112,000	108,690	65,000	717	98,327	432,734	100

9.25 Punjab

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Bio-fuel cogeneration	8	95	2	46	8	95	7	90	378,785	373,791	4,987	7
2	Biomass	3	24	1	11	3	24	2	14	453,557	417,123	36,433	1
	Total	11	119	3	57	11	119	9	105	832,342	790,914	41,420	8

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	285,350	483,333	0	0	66,666	61,751	897,100	72.0
OA/CPP	43,933	48,792	52,358	41,044	78,182	61,044	24,095	349,448	28.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	43,933	334,142	535,691	41,044	78,182	127,710	85,846	1,246,548	100

9.26 Rajasthan

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Biomass	1	10	1	10	1	10	1	10	56,142	56,142	0	0
2	Solar PV	106	240	1	0	105	239	1	0	3,261,821	741,289	21,688	2,498,844
3	Wind	31	398	9	37	31	398	9	37	1,045,454	498,570	147,979	398,905
	Total	138	648	11	47	137	647	11	47	4,363,417	1,296,001	169,667	2,897,749

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	0	0	0.0
OA/CPP	100	36,828	110,259	144,840	1,106,880	614,858	291,515	2,305,280	100.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	100	36,828	110,259	144,840	1,106,880	614,858	291,515	2,305,280	100

9.27 Tamil Nadu

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Bio-fuel cogeneration	1	10	0	0	1	10	0	0	36,652	36,652	0	0
2	Biomass	20	195	10	114	19	177	9	96	2,339,844	2,302,185	0	37,659
3	Solar PV	61	127	4	15	59	126	3	5	1,126,233	225,661	381	900,191
4	Wind	241	1092	64	161	237	1068	65	181	8,616,814	8,001,413	562,871	52,530
	Total	323	1423	78	290	316	1380	77	282	12,119,543	10,565,911	563,252	990,380

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Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	0	0	0.0
OA/CPP	23,403	72,049	37,650	22,439	153,307	181,373	216,158	706,379	100.0
Voluntary	0	66	0	0	0	95	0	161	0.0
Total	23,403	72,115	37,650	22,439	153,307	181,468	216,158	706,540	100

9.28 Telangana

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Biomass	1	4	0	0	1	4	0	0	0	0	0	0
2	Small Hydro	1	24	0	0	1	24	0	0	0	0	0	0
3	Solar PV	10	28	0	0	10	28	0	0	214,470	36,131	417	177,922
	Total	12	56	0	0	12	56	0	0	214,470	36,131	417	177,922

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	0	0	0.0
OA/CPP	0	97	362	4,179	35,862	61,760	52,316	154,576	100.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	97	362	4,179	35,862	61,760	52,316	154,576	100

9.29 Tripura

Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
Solar PV	2	10	1	5	1	5	0	0	13,365	0	0	13,365

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	297	0	0	0	0	297	100.0
OA/CPP	0	0	0	0	0	0	0	0	0.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	0	297	0	0	0	0	297	100

9.30 Uttar Pradesh

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Bio-fuel cogeneration	50	554	3	32	50	554	33	420	5,109,148	4,998,731	14	110,403
2	Biomass	20	274	3	47	20	274	6	81	1,989,435	1,961,854	11,785	15,796
	Total	70	828	6	79	70	828	39	500	7,098,583	6,960,585	11,799	126,199

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	0	0	0	0	0	0.0
OA/CPP	2,454	3,989	5,791	4,592	1,586	1,639	132,300	152,351	100.0
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	2,454	3,989	5,791	4,592	1,586	1,639	132,300	152,351	100

9.31 Uttarakhand

S. No.	Source	Total Accredited till 31.03.2018		Accreditation Revoked/Expired		Total Registered till 31.03.2018		Registration Revoked/Expired		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)				
1	Bio-fuel cogeneration	9	64	2	20	9	64	5	46	282,284	282,253	0	31
2	Biomass	3	66	1	28	3	66	2	56	239,738	239,737	0	1
3	Small Hydro	4	76	3	72	2	48	1	24	349,359	349,359	0	0
	Total	16	206	6	120	14	177	8	126	871,381	871,349	0	32

Type of Buyer	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	0	0	124,120	0	152,500	50,000	326,620	75.6
OA/CPP	0	3,836	14,413	9,533	16,751	27,367	33,426	105,326	24.4
Voluntary	0	0	0	0	0	0	0	0	0.0
Total	0	3,836	14,413	133,653	16,751	179,867	83,426	431,946	100

9.32 West Bengal

Type of Buyer	2011-12*	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total	% of total REC Purchased
DISCOM	0	1,340	1,466	1,466	1,500	367,280	429,968	803,020	100.0
OA/CPP	0	0	0	0	0	0	0	0	0.0
Voluntary	7	0	0	0	0	0	0	7	0.0
Total	7	1,340	1,466	1,466	1,500	367,280	429,968	803,027	100

*Include 2 nos. of RECs purchased by voluntary buyer in FY 2010-11

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10. Experience of compliance audit of RE projects registered under REC mechanism

“A lack of transparency results in distrust and a deep sense of insecurity” ~ Dalai Lama

10.1 Provisions in CERC REC Regulations for compliance audit

The REC Regulations 2010, wherein REC mechanism envisages compliance audit of the mechanism. The relevant clauses of the Regulations are extracted below:

“13. Appointment of compliance auditors:

- (1) The Commission may, in consultation with the Central Agency, appoint from time to time compliance auditors to inquire into and report on the compliance of these Regulations by the person applying for registration, or on the compliance by the renewable energy generators in regard to the eligibility of the Certificates and all matters connected thereto.*
- (2) The compliance auditor shall have the qualifications and experience as contained in the Schedule to these Regulations: Provided that the Commission may by order amend the Schedule from time to time.*
- (3) The Commission may from time to time fix the remuneration and charges payable to such auditors and all such amount payable shall be met out of the funds which the Central Agency may collect from the eligible entities.”*

10.2 Empanelment of the Compliance Auditors (CA) (2013-15)

As required under the aforesaid **Regulation 13(1)**, Terms of Reference (TOR) for empanelment of Compliance Auditors were prepared by CERC in consultation with the Central Agency. Subsequently, technical bids for "Empanelment of Compliance Auditor in the area of REC mechanism" were invited by CERC. Which were evaluated the bids and vide order dated July 06, 2012, empaneled Compliance Auditors for a period of 2 years.

10.3 Remuneration and charges payable to CA

In view of aforesaid REC Regulation 13(3), the Commission shall fix remuneration and charges payable to the Compliance Auditors. In pursuance of this, the Commission directed Central Agency to propose remuneration and charges payable to the Compliance Auditors based on the assessment of man-hour effort/requirement for the possible assignments and with due consideration of the requirements for auditing generating stations based on various RE technologies, location of the project etc. Accordingly, the Central Agency invited bids from the empaneled Compliance Auditors. Subsequently, the Central Agency recommended the fee & charges to be paid to the auditors. CERC vide order dated April 22, 2013, notified the fee & charges be paid to the auditors.

10.4 Selection criteria for Compliance Audit of RE Projects

The Central Agency selected about 100 projects for the compliance audit based on following criteria:

- Project with all types of RE technologies
- At least one project from each state.
- Few projects which have been registered for self-consumption.
- Project with maximum capacity from some states.
- Few Projects to which maximum RECs have been issued
- Few Projects whose application for issuance of RECs has been intermittent.
- Few Projects to which zero REC have been issued after registration.

10.5 Compliance audit methodology

The Central Agency had given a checklist to all auditors so that important provisions of the CERC REC Regulations are checked during the audit. The steps taken by the auditors in the audit process as shown in Figure 47.

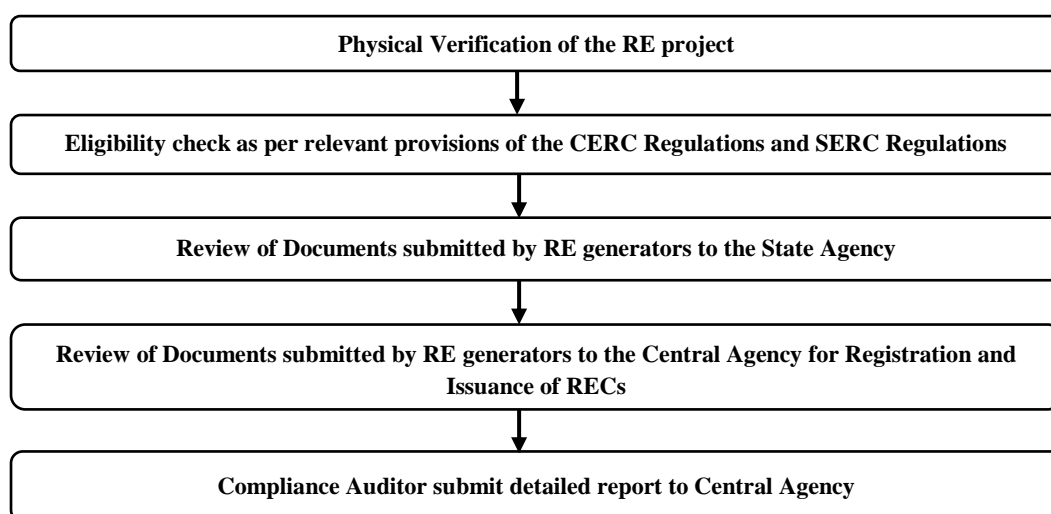


Figure 47: Steps taken by Auditors for Compliance Audit of projects

10.6 Observations of compliance auditors on audited projects

The projects for compliance audit were selected on sample basis and awarded to the Compliance Auditors. The Auditors raised observations regarding (i) lack of documentation regarding usages of fossil fuel in co-gen/bagasse plants (ii) difference between the accredited and registered plant capacity and the capacity mentioned in the application at the time of registration (iii) sealing of meters (iv) benefit of waiver of electricity duty (v) generation meters installed but auxiliary consumption meters not installed etc.

On the basis of observations on compliance audit, the Central Agency has sought clarifications from the concerned generators/State Agencies/SLDCs, and taken appropriate action wherever required.

10.7 Compliance audit of RE projects (2018-20)

The Hon'ble CERC, vide order dated June 6, 2017 for the next phase of compliance audit, has empaneled seven compliance auditors. Based on the financial bids received from the selected auditing agencies, the central agency recommended the fee and charges to be paid to the auditors. CERC, vide order dated April 19, 2018, notified fee and charges to be paid to the auditors. The Central Agency is in the process of assigning RE projects to the auditors for compliance audit.

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11. Important Orders of the Hon'ble Supreme Court and Hon'ble APTEL regarding RPO compliance and trading of RECs

"We won't have a society if we destroy the environment." ~ Margaret Mead

11.1 Hon'ble APTEL order dated April 20, 2015

Hon'ble APTEL vide order ([O.P. No. 1, 2 and 4 of 2013, IA No. 291 and 420 of 2013](#)) regarding the petition filed by Indian Wind Energy Association (IWEA) and Indian Wind Turbine Manufacturers Association (IWTMA) with regard to enforcement of RPO, inter-alia directed the following:

- SERCs should decide RPO targets before commencement of Multi Year Tariff (MYT) period.
- Preferential tariff for renewable energy for a financial year should be in place before the commencement of the financial year and no vacuum to be left between control periods.
- If DISCOMs are not able to tie up RE procurement to meet RPO targets, it may plan to purchase RECs to meet its RPO.
- Monitoring of RPO compliance should be carried out periodically as provided in the concerned regulations.
- Carry forward / review should be allowed strictly as per the provisions of the regulations, in view of availability of REC.
- SERC are bound by their own regulations and must act strictly in terms of their regulations.
- In case of default, penal provision as provided by state regulations should be exercised. Power to relax and exempt RPO should be exercised judiciously under exceptional circumstances

The above-mentioned directions of Hon'ble APTEL highlighted the important role of RECs in the RPO compliance.

11.2 Hon'ble Supreme court judgment on C.A. no. - 4417/2015- dated May 13, 2015

The case is related with the applicability of Rajasthan Electricity Regulatory Commission (RERC) regulations on Captive Power Plants (CPP) and open access consumers. In the judgement, the Hon'ble Supreme Court ruled that RPO on captive and open access consumers is justified and interpreted it in the context of Article 51A (g) and Article 21 of the Constitution. Article 51A (g) cast a fundamental duty on the citizen to protect and improve the natural environment, and Article 21 inter-alia provided the citizen with the right to live a healthy life.

In the above-mentioned order, the Hon'ble Supreme Court also gives obligated entities the option of purchasing RECs to comply with RPO regulations.

11.3 Change in the floor and forbearance price of Solar and Non-solar REC

Hon'ble CERC vide order dated March 30, 2017, reduced the floor and forbearance Price (w.e.f. April 01, 2017).

Table 47: Floor and forbearance price of REC

	Prices prevalent before the order dated 30.03.2017		Prices after the order dated 30.03.2017 w.e.f. 01.04.2017	
	Non - solar REC	Solar REC	Non - solar REC	Solar REC
Forbearance Price (Rs. /MWh)	3,300	5,800	3,000	2,400
Floor Price (Rs. /MWh)	1,500	3,500	1,000	1,000

Many stakeholders through Indian Wind Power Association (IWPA) and Green Energy Association filed a petition before the Appellate Tribunal for Electricity (APTEL) for a stay on the CERC order dated March 30, 2017. However, APTEL declined any interim stay order and held that APTEL will give an order only after hearing the matter. Subsequently, associations filed a petition before the Hon'ble Supreme Court against the above-mentioned CERC order dated March 30, 2017. The Hon'ble Supreme Court (SC) vide interim order dated May 8, 2017, stayed the trading of RECs at power exchanges. Accordingly, there was no trading of RECs for two months in May 2017 and June 2017.

In response to stay of trading of RECs, IWPA filed petition in the Hon'ble Supreme Court for modification of the stay order of non-solar RECs. Hon'ble Supreme Court vide order dated July 14, 2017, inter-alia allowed the trading of non-solar RECs at Power Exchanges at prices determined vide CERC order dated March 30, 2017, wherein the seller will get the price at new rates i.e. Rs. 1000/REC and Buyer will pay Rs. 1500/REC. The difference of Rs. 500 per REC shall be deposited with CERC by Power Exchanges till the matter was pending for decision, and the Hon'ble Supreme Court referred the matter to Hon'ble APTEL. Accordingly, trading of non-solar RECs started since July 2017 and no trading for solar RECs resumed as resumption of trading was given only for non-solar RECs.

Hon'ble APTEL vide order dated April 12, 2018 rejected the petitions against the CERC Order regarding reduction in floor and forbearance price and decided that the trading of RECs (solar and non-solar) shall be carried out as per Hon'ble CERC order dated March 30, 2017. Accordingly, the trading of solar RECs (which was stopped since May 2017) along with non-solar RECs, has started in the month of April 2018 as per rates notified vide CERC order dated March 30, 2017.

Subsequent to the APTEL order, IWPA filed a petition in the Hon'ble Supreme Court, and the Hon'ble Court in its interim order dated May 14, 2018, directed that ***"...Interim orders dated 08.05.2017 and 14.07.2017 to continue. However, we clarify that this interim order will not apply to RECs issued on or after 01.04.2017..."***. Subsequently, non-solar RECs issued up to March 30, 2017, are being traded as per the old rates and RECs (solar & non-solar) which were issued after April 01, 2018 are being traded as per rates notified vide order dated March 30, 2017.

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12. Impact of the REC mechanism

“There's no greater gift than thinking that you had some impact on the world, for the better.” ~ Gloria Steinem

The impact of REC mechanism is huge in terms of investment facilitation, market development, RPO compliance and market for voluntary buyers etc. Some of the important benefits accrued from the implementation of the REC mechanism are given below:

12.1 REC mechanism facilitates investment in the RE sector

REC mechanism has provided an additional avenue to RE generator(s) to sell the generated power locally to DISCOM and/or open access consumer(s), and RE generator may receive RECs against the power sold to such buyers.

As on March 31, 2018, total capacity of 6,022 MW (including projects revoked / expired) has been registered under REC mechanism. **Subsequent to notification of CERC Regulations on January 14, 2010**, more than **4,360 MW** (including revoked/expired) have been commissioned and registered under the REC mechanism, amounting to capital investment of more than Rs. 23,000 crores, as per the normative capital cost notified by the CERC in the RE tariff regulations. Moreover, number of registered projects, number of transactions, traded value of RECs which is about Rs. 6,057 crores gave signal to investors for investment in the RE sector.

12.2 Facilitates RPO Compliance

The REC mechanism has created a pan India market which facilitated the compliance of RPO by obligated entities which include the DISCOMs, CPPs, and Open Access consumers. It would have been **quite difficult** for **small obligated entities like CPPs / Open Access consumers** to comply with the SERC's RPO Regulations **without the REC mechanism**. It is pertinent to mention that more than 3,000 obligated entities have purchased ~ 3.7 crore RECs for RPO compliance.

12.3 Inter-State renewable energy transactions

The REC mechanism is facilitating the inter-state transaction of renewable energy by **Regional entities** as per the **CERC DSM** (Deviation Settlement Mechanism and related matters) **Regulations**, 2015 and amendments thereof. As the contracts for sale of energy are being done on the basis of scheduled energy, therefore, to maintain the integrity of RPO compliance on the basis of actual energy injected into the Grid, RECs are being used for settlement of deviations between contracted energy (scheduled) and actual energy injected into the grid. Any shortfall in renewable energy generation is being balanced through purchase of equivalent solar and non-solar RECs by RLDCs/NLDC by utilizing funds from the respective Pool Account at the end of each financial year.

While RECs have been issued to projects located in **21 States/ UTs**, RECs purchased by obligated entities of **30 States/ UTs** that shows REC mechanism is facilitating inter-State transaction of RECs for RPO compliance.

It is pertinent to mention that RE generators are also permitted to **self-retain RECs** to offset RPO as a consumer for their **consumption units** located in **different parts of the country**. In this regard, RE generators from 14 States have retained more than 16 lakh RECs which has also facilitated inter-state RE transactions.

12.4 Development of market for voluntary buyers

About 30,000 RECs have been purchased by voluntary buyers including companies, institutions and individuals. The stakeholders' response demonstrates the potential of the voluntary market in India. To further exploit the potential of the voluntary market, appropriate regulatory and policy instruments are required to increase the purchase of RECs by volunteers.

12.5 Advantage of REC vs purchase of RE for RPO compliance

It has been observed that REC as a market instrument has an advantage over direct purchase of Renewable Energy (RE) for RPO compliance by the obligated entities. Moreover, the Hon'ble Supreme Court/ APTEL/ SERCs have also recognized REC as an instrument in the concerned orders to meet RPO compliance by purchase of RECs, in case of shortfall/difficulty in purchase of RE power. Advantages of RECs over RE purchase for RPO compliance are given in Table 48.

Table 48: Advantage of REC over direct purchase of Renewable Energy(RE) for RPO compliance

S. No.	Particular	Compliance of RPO by Purchase of	
		Renewable Energy	REC(s)
1.	Technology Agnostic	Specific RE Tech.	Yes
2.	Competition among different RE technologies	Not Possible	Possible
3.	Transaction Costs	High	Low
4.	Flexibility in procurement in terms of timing	Yes	No
5.	Location Dependent	Yes	No
6.	Exit Load, Barrier for Utility/ Beneficiary/Developer/generator	Significant barrier / only option to terminate the existing PPA	Freedom and flexibility to purchase in terms of quantum / timing

12.6 Stakeholders involvement through transparency

REC mechanism has been implemented through an on-line web portal, and CERC/SERCs/State Agencies have login facility in the REC web application to access the MIS reports for information and appropriate action, if required. Further, CERC Regulations, Orders, Procedures and reports also are available in the public domain on REC website for wide publicity and transparency in the implementation of the REC mechanism.

12.7 Impetus for implementing Energy Saving Certificate (ESCerts) Registry

Implementation of REC mechanism by NLDC, POSOCO has also set an exemplary benchmark before stakeholders. On the basis of experience of management of REC Registry, Ministry of Power has entrusted the function of Registry of ESCerts to POSOCO and authorized it to establish the necessary framework to discharge the functions under the Perform Achieve Trade (PAT) mechanism. In this regard, communication from MOP is attached at Annexure-IX.

Under the PAT Cycle-I, 383 nos. of Designated Consumers (DCs) have been registered and about 13 Lakh ESCerts have been successfully traded through CERC approved Power Exchange in 17 trading sessions amounting to transactions of about Rs. 100 crore.

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13. The International REC Standard (I-REC Standard) and relevance for India

“You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.” ~ R. Buckminster Fuller

The International REC Standard (**I-REC Standard**) is a non-profit foundation with the goal of empowering electricity purchasers with the ability to make renewable consumption choices in any part of the world. I-REC Standard foundation facilitates the ability to purchase and sell renewable electricity for consumers, traders, brokers, electricity suppliers, electricity generators and national governments.

The **International REC (I-REC)** is an attribute-tracking system that supports tracking compliance with governmental renewable energy requirements, as well as voluntary consumers to track and verify progress towards their environmental goals. This allows tracking the attributes of (renewable) electricity production from its location of generation to its place of consumption. Particulars such as the location of the electricity generator, the type of primary energy input, the date of commissioning, the installed capacity, the volume and timing of electricity production, are all factual attributes that can be tracked with the I-REC attribute tracking system. This tracking takes place in the form of a digital statement, or I-REC standard certificate (shortened to ‘an I-REC’) which is based on one MWh of electricity production from a single, generation facility. Ownership of this digital statement allows consumers of electricity to claim the attributes of a particular generating facility.

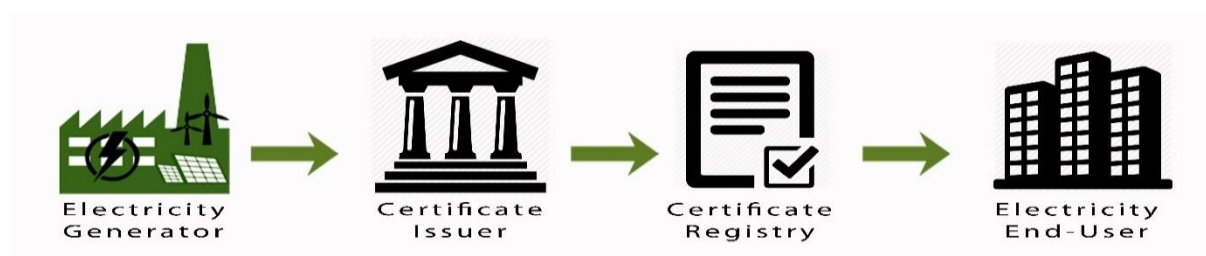


Figure 48: I-REC process

Steps involved in the I-REC process:

- Registering the generating facility with I-REC
- Producing renewable electricity
- Application for I-RECs
- Submitting meter readings
- Issuing I-RECs by issuer
- Book keeping by Registry
- Trading of I-RECs
- Redemption of I-RECs
- Claiming the attributes of an I-REC

In some instances, when the local issuer is not available, the issuer of last resort, known as the Rest of the World (RotW) issuer can provide the services needed to continue the issuance of I-RECs in a specific location or region of a country. Currently, Green Certificates Company, a UK based company has been authorized by the I-REC Standard to act as a RotW issuer where no local issuer is appointed.

Source: <http://www.internationalrec.org>

Relevance for Indian companies

The I-REC Standard has authorized the Rest of the World (RotW) issuer to issue I-RECs in India. The I-REC Standard board allowed the issuance of I-RECs in India as long as these I-RECs do not interact with existing RPO mechanisms. For this reason, the issuer in India is restricted to issuing of I-RECs from renewable energy generation from hydro plants having installed capacity >25 MW. The first market player to make use of the I-REC Standard in India was Stat Kraft. Indian companies, as volunteer, may involve in the I-REC process for promotion of green energy.

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14. Challenges and Way Forward

“Let us sacrifice our today so that our children can have a better tomorrow.” ~ A. P. J. Abdul Kalam

More than 37 million RECs have been traded on Power Exchanges. About 1.6 million RECs have been self-retained by the RE generator to meet the RPO of their consumption units located in different States. Further, inventory overhang of about 7 million RECs is a cause of concern for the stakeholders. The issues that need to be addressed and the way forward with regard to a smooth functioning of the REC mechanism are discussed below:

i. RPO Compliance

Non-compliance of the RPO by the obligated entities and subsequent buildup of the REC inventory is a cause of concern for the stakeholders. Therefore, strict enforcement of RPO compliance is sine qua non for vibrant REC market in the country.

As per, Electricity (Amendment) Bill 2014, obligated entities may be mandated to “procure electricity from or any **market instrument** representing the renewable energy sources for meeting their RPO”. The focus on market instrument in the amended bill will also facilitate the purchase of RECs by the obligated entities.

Recently, MNRE has setup an **RPO compliance cell**, which will coordinate with the authorities concerned for periodic reporting and apprise the authorities for compliance of the RPO. The RPO compliance cell will help SERCs to enforce the compliance of RPO regulations.

ii. Mismatch between Demand and Supply of RECs

In the REC market, supply of RECs is more in comparison to demand. Accordingly, sell bids outnumber the buy bids; therefore, the floor price becomes the market clearing price both for solar RECs and non-solar RECs since June 2013 & September 2012 respectively. This has skewed the discovery of prices of REC at Power Exchange(s). With the increasing instance of compliance of RPO by the obligated entities, it is expected that price discovery will improve at Power Exchanges i.e. MCP will be more than the floor price of the RECs in future.

iii. Limited voluntary market

About 30,0000 RECs have been purchased by Voluntary buyers, most of the RECs were purchased by Central Public-Sector Enterprises due to inclusion of purchase of RECs under Corporate social Responsibility (CSR) by DPE in 2012-13. Due to the absence of such guidelines in the ensuing years, voluntary procurement of RECs reduced considerably. Therefore, policy and regulatory interventions are required to recognize voluntary purchase of RECs by the companies as a CSR activity.

iv. Capacity building

Central Agency has conducted about 27 workshops, and more than 1500 officials from State Agencies, SLDCs, RLDCs and NLDC have participated in the workshops. However, more capacity building workshops at the regional level are required to sensitize the open access and captive consumers about compliance of RPO as per the relevant SERCs regulations.

v. Reduction in the floor and forbearance price of Solar and Non-solar REC

The reduction in floor and forbearance price has reduced the compliance cost, and created interest among obligated entities to procure RECs to meet the RPO as per the concerned SERCs Regulations. While buyers are upbeat about the reduction in the floor and forbearance price, however, sellers are reluctant to sell their RECs at the reduced rates, so few of the RE generators have approached the Hon'ble Supreme Court against them and the matter is still pending with the Hon'ble Court.

vi. Enforcement of RPO by SERCs

Some SERCs have taken the non-compliance of RPO, as a serious matter and exercised the penal provisions under the concerned RPO regulations. Further, the Hon'ble Supreme Court in its judgement dated May 13, 2018 has upheld the RPO regulations of the Rajasthan Electricity Regulatory Commission (RERC) regarding the RPO compliance by CPP/OA consumers. Some of the SERCs have imposed penalties for non-compliance of RPO regulations/orders and details are given in Table 49. These developments have created a renewed hope among stakeholders regarding RPO compliance including trading of RECs at power exchanges.

Table 49: Orders of SERCs regarding non-compliance of RPO

S. No.	SERC	Date of Order	Case No./ Petition No.	Remarks / important points of the Order
1.	BERC	30.06.2017	16/2016	BERC imposed a token penalty of Rs. 25000/- each to the respondents NBPDC and SBPDCL. Further, BERC also directed SBPDCL and NBPDC to purchase Solar and Non-Solar RECs equivalent to cumulative shortfall of Solar and Non-Solar RPO till the end of FY 2014-15 and an additional penalty at the rate of Rs.3000/- per day each for the duration of continued failures.
2.	MPERC	20.10.2017	14/2014	The MPERC imposed a token penalty of Rs. 25,000 on the respondent (M.P. Power Management Co. Ltd.) towards non-compliance of the solar RPO for FY 2012-13 and 2013-14.
3.	JERC (Goa & UTs)	26.07.2017	175/2015	The JERC directed respondent to comply with its current RPO by March 31, 2017 and clear backlog for the FY 2010-11 to FY 2013-14 in three equal installments within a period of three years, and submit quarterly progress report to the Commission.
4.	UERC	22.01.2014 12.01.2017	Suo-moto proceedings & order dated 11.09.2013	UPCL was directed to procure RECs for unmet RPO of 59.12 MU of non-solar sources for FY 2011-12 within 2 months. The pending procurement of RECs, as per order dated September 11, 2013 be done expeditiously but before March 31, 2014. UPCL was directed to meet the remaining RPO for FY 2015-16 either through purchase of energy from RE sources or through purchase of RECs by March 31, 2017 along with ensuring compliances of RPO specified for FY 2016-17. Further, UPCL was directed to submit the action plan for meeting the unmet RPO for the period up to FY 2016-17 and for the ensuing FY 2017-18 & FY 2018.

S. No.	SERC	Date of Order	Case No./ Petition No.	Remarks / important points of the Order
5.	MERC	14.09.2016	16 of 2016	The Commission directed MSEDCL to meet the shortfall against its stand-alone Solar and Non-Solar (excluding Mini/Micro Hydro) RPO targets for FY 2014-15. Further, MSEDCL shall constitute a separate 'RPO Regulatory Charges Fund' and shall be utilized by MSEDCL to purchase Solar and Non-Solar RECs and/or to procure renewable power so as to fully meet the shortfall, by the end of March 2017.

vii. Modification in the REC design framework

The REC mechanism was designed in 2010. At that point of time, there was huge difference between the cost of green energy and brown energy. Therefore, stakeholders have shown their interest in the mechanism. However, the cost of wind/solar energy (green energy) reduced considerably in recent times; therefore, obligated entities prefer to purchase green energy over RECs, so that they can meet the requirement.

Since launch of this mechanism, more than 400 projects have been revoked on the request of RE generators, or revoked by the Central Agency due to the change in the eligibility conditions, or registration got expired due to non-renewal of certificate after the end of five years. Moreover, the interest of RE generators in the mechanism have decreased in subsequent years due to increasing inventory of RECs sellers and trading of RECs at the floor price.

In view of the above, many stakeholders have suggested to relook the REC design framework with regard to REC trading, vintage multiplier factor, long-term visibility of floor and forbearance price etc.

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13. Shri Kaushik Dey
14. Shri Mohit Joshi
15. Shri Kailash Chand Saini
16. Shri Sumanta Sadhukhan
17. Shri Ankit Gupta, CERC
18. Shri Vivek Aggarwal, CRISIL
19. Shri Alok Kumar, CRISIL
20. Shri Praveen Kumar, CRISIL
21. Shri Saurabh Kumar, CRISIL
22. Shri Rohit Verma, CRISIL

With support from all RLDCs, SLDCs and State Agencies

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18. Annexures

18.1 CERC REC Regulations updated up to 4th Amendments

CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

No. L-1/12/2010-CERC

Dated: 14th January,

2010

NOTIFICATION

In exercise of powers conferred under sub-section (1) of Section 178 and Section 66 read with clause (y) of sub-section (2) of Section 178 of the Electricity Act, 2003 and all other powers enabling it in this behalf, and after previous publication, the Central Electricity Regulatory Commission hereby makes the following regulations for the development of market in power from Non-Conventional Energy Sources by issuance of transferable and saleable credit certificates:

1. Short title and commencement and extent of application

- (i) These Regulations may be called the Central Electricity Regulatory Commission (Terms and Conditions for Recognition and Issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010.
- (ii) These Regulations shall come into force from the date of their notification in the Official Gazette.
- (iii) These Regulations shall apply throughout India except the State of Jammu and Kashmir.

2. Definitions and Interpretation:

- 1) In these Regulations, unless the context otherwise requires,
 - a) 'Act' means the 'Electricity Act, 2003 (36 of 2003);
 - b) 'Central Agency' means the agency as may be designated by the Commission under clause of Regulation 3;
 - c) 'Certificate' means the renewable energy certificate issued by the Central Agency in accordance with the procedures laid down by it and under the provisions specified in these regulations;
 - d) 'Commission' means the Central Electricity Regulatory Commission referred to in subsection of Section 76 of the Act;
 - e) 'eligible entity' means the entity eligible to receive the certificates under these regulations;
 - f) 'floor price' means the minimum price as determined by the Commission in accordance with these regulations at and above which the certificate can be dealt in the power exchange;
 - g) 'forbearance price' means the ceiling price as determined by the Commission in accordance with these regulations within which only the certificates can be dealt in the power exchange;
 - h) 'MNRE' means the Ministry of New and Renewable Energy;
 - i) 'obligated entity' means the entity mandated under clause (e) of sub-section (1) of Section 86 of the Act to fulfil the renewable purchase obligation;

- j) 'Power Exchange' means that power exchange which operates with the approval of the Commission;
 - k) []
 - l) 'renewable energy sources' means renewable sources such as small hydro, wind, solar including its integration with combined cycle, biomass, bio fuel cogeneration, urban or municipal waste and such other sources as recognized or approved by MNRE;
 - m) 'renewable purchase obligation' means the requirement specified by the State Commissions under clause (e) of sub-section (1) of Section 86 of the Act, for the obligated entity to purchase electricity from renewable energy sources;
 - n) 'State Agency' means the agency in the concerned state as may be designated by the State Commission to act as the agency for accreditation and recommending the renewable energy projects for registration and to undertake such functions as may be specified under clause (e) of sub-section (1) of Section 86 of the Act;
 - o) 'State Commission' means the State Commission referred to in sub-section (64) of Section 2 of the Act and includes a Joint Commission referred to in sub-section (1) of Section 83 of the Act;
 - p) 'Year' means a financial year.
- 2) Words and expressions used in these Regulations and not defined herein but defined in the Act or any other regulations issued by the Commission, shall have the same meaning assigned to them respectively in the Act, or such other regulations issued by the Commission.

3. Central Agency and its functions:

- 1) The Commission shall designate an agency as the Central Agency after satisfying itself that the said agency has the required capability of performing its functions as provided under these regulations.
- 2) The functions of the Central Agency will be to undertake:
 - (i) registration of eligible entities,
 - (ii) issuance of certificates,
 - (iii) maintaining and settling accounts in respect of certificates,
 - (iv) repository of transactions in certificates, and
 - (v) such other functions incidental to the implementation of renewable energy certificate mechanism as may be assigned by the Commission from time to time.
- 3) Subject to provisions of these regulations, the Central Agency, with approval of the Commission and after inviting comments from the State Agency shall issue a detailed procedure for registration of eligible entities, verification of generation of electricity and its injection into the grid by the eligible entity, issuance of certificates and other relevant and residual matters:

Provided that the detailed procedure shall be prepared by the Central Agency and submitted to the Commission for approval within sixty days from the date of notification of these regulations:

Provided further that while preparing the detailed procedure the Central Agency shall give three weeks' time to the State Agency and other stakeholders for comments:

Provided also that the Commission may at any time either on its own motion or on an application or representation made by any interested party direct the Central Agency to modify, add or delete any of the provisions of the detailed procedure as deemed appropriate and upon such directions by the Commission the detailed procedure shall be implemented with such modifications.

- 4) The Commission may issue directions to the Central Agency in regard to the discharge of its functions and the Central Agency shall always act in accordance with the directions issued by the Commission.

4. Categories of Certificates:

- 1) There shall be two categories of certificates, viz., solar certificates issued to eligible entities for generation of electricity based on solar as renewable energy source, and non-solar certificates issued to eligible entities for generation of electricity based on renewable energy sources other than solar:
- 2) The solar certificate shall be sold to the obligated entities to enable them to meet their renewable purchase obligation for solar, and non-solar certificate shall be sold to the obligated entities to enable them to meet their obligation for purchase from renewable energy sources other than solar.

5. Eligibility and Registration for Certificates:

- 1) A generating company engaged in generation of electricity from renewable energy sources shall be eligible to apply for registration for issuance of and dealing in Certificates if it fulfils the following conditions:
 - a. it has obtained accreditation from the State Agency;
 - [(b) it does not have any power purchase agreement for the capacity related to such generation to sell electricity, with the obligated entity for the purpose of meeting its renewable purchase obligation, at a tariff determined under section 62 or adopted under Section 63 of the Act by the Appropriate Commission:

Provided that in case of renewable energy sources-based co-generation plants, the connected load capacity as assessed or sanctioned by the concerned distribution licensee, shall be considered as the capacity for captive consumption for the purpose of issue of certificates, irrespective of the capacity of such plants covered under the power purchase agreement.]2

- c. it sells the electricity generated either (i) to the distribution licensee of the area in which the eligible entity is located, [at the pooled cost of power purchase of such distribution licensee as determined by the appropriate commission]3 (ii) to any other licensee or to an open access consumer at a mutually agreed price, or through power exchange at market determined price.

Explanation. - for the purpose of these regulations 'Pooled Cost of Purchase' means the weighted average pooled price at which the distribution licensee has purchased the electricity including cost of self-generation, if any, in the previous year from all the energy suppliers long-term and short-term, but excluding those based on renewable energy sources, as the case may be.

[Provided that such a generating company having entered into a power purchase agreement for sale of electricity, with the obligated entity for the purpose of meeting its renewable purchase obligation, at a tariff determined under Section 62 or adopted under section 63 of the Act by the Appropriate Commission shall not, in case of pre-mature termination of the agreement, be eligible for participating in the Renewable Energy Certificate (REC) scheme for a period of three years from the date of termination of such agreement or till the scheduled date of expiry of power purchase agreement whichever is earlier ,if any order or ruling is found to have been passed by an Appropriate Commission or a competent court against the generating company for material breach of the terms and conditions of the said power purchase agreement:

[]4

[Provided further that a renewable energy generator selling electricity component to third party through open access shall be eligible for the entire energy generated from such plant for participating in the REC scheme subject to the condition that such generator does not avail or does not propose to avail any benefit in the form of concessional/promotional transmission or wheeling charges or banking facility benefit:

Provided also that if such a renewable energy generator forgoes on its own, the benefits of concessional/promotional transmission or wheeling charges or banking facility benefit, it shall become eligible for participating in the REC scheme only after the date of forgoing such benefits:

Provided also that the above-mentioned condition for renewable energy generator selling electricity component to third party through open access for participating in the REC scheme shall not apply if the benefits given to such renewable energy generator in the form of concessional transmission or wheeling charges and/or banking facility benefit are withdrawn by the concerned State Electricity Regulatory Commission and/or the State Government:

Provided also that if any dispute arises as to whether a renewable energy generator has availed such concessional/promotional benefits, the same shall be referred to the Appropriate Commission for decision.

Explanation: For the purpose of this Regulation, the expression “banking facility benefit” shall mean only such banking facility whereby any renewable energy generator gets the benefit of utilizing the banked energy at any time (including peak hours) even when it has injected into grid during off-peak hours.”]5

- [(d) It does not sell electricity generated from the plant, either directly or through trader, to an obligated entity for compliance of the renewable purchase obligation by such entity.]6
- [(1A) A distribution licensee shall be eligible to apply for registration with the Central Agency for issuance of and dealing in Certificates if it fulfils the following conditions:
 - (a) It has procured renewable energy, in the previous financial year, at a tariff determined under Section 62 or adopted under Section 63 of the Act, in excess of the renewable

purchase obligation as may be specified by the Appropriate Commission or in the National Action Plan on Climate Change or in the Tariff

Policy, whichever is higher:

Provided that the renewable purchase obligation as may be specified for a year, by the Appropriate Commission should not be lower than that for the previous financial year.

Provided further that any shortfall in procurement against the non-solar or solar power procurement obligation set by the Appropriate Commission in the previous three years, including the shortfall waived or carried forward by the said Commission, shall be adjusted first and only the remaining additional procurement beyond the threshold renewable purchase obligation - being that specified by the Appropriate Commission or in the National Action Plan Climate Change or in the Tariff Policy, whichever is higher - shall be considered for issuance of RECs to the distribution licensees.

- b) It has obtained a certification from the Appropriate Commission, towards procurement of renewable energy as provided in sub - clause (a) of this regulation.]7

[(1B) A Captive Generating Plant (CGP) based on renewable energy sources, including renewable energy generating plant not fulfilling the conditions of CGP as prescribed in the Electricity Rules, 2005 but having self-consumption, shall not be eligible for participating in the REC scheme for the energy generated from such plant to the extent of self-consumption, if such a plant:

- a) has been commissioned prior to 29th September 2010 or after 31st March 2016; or
- b) is not registered with Central Agency under REC scheme on or before 30th June 2016.

Provided that a CGP based on renewable energy sources, including renewable energy generating plant not fulfilling the conditions of CGP as prescribed in the Electricity Rules, 2005 but having self-consumption, and fulfilling both the following conditions:

- a) having date of commissioning between 29th September 2010 and 31st March 2016; and
- b) registered with Central Agency under REC scheme on or before 30th June 2016

shall be eligible for the entire energy generated from such plant for participating in the REC scheme subject to the condition that such plant does not avail or does not propose to avail any benefit in the form of concessional/promotional transmission or wheeling charges and/or banking facility benefit:

Provided further that if such plant meeting the eligibility criteria for REC, forgoes on its own, the benefits of concessional transmission or wheeling charges and/or banking facility benefit, it shall become eligible for participating in the REC scheme only after a period of three years has elapsed from the date of forgoing such benefits:

Provided also that the above-mentioned condition for participating in the REC scheme shall not apply if the benefits given to such plant in the form of concessional transmission or wheeling charges and or banking facility benefit are withdrawn by the concerned State Electricity Regulatory Commission and/or the State Government:

Provided also that if any dispute arises as to whether a CGP or any other renewable energy generator has availed such concessional/promotional benefits, the same shall be referred to the Appropriate Commission for decision.

Explanation: - For the purpose of this regulation, the expression „banking facility benefit“ shall mean only such banking facility whereby the CGP or any other renewable energy generator gets the benefit of utilizing the banked energy at any time (including peak hours) even when it has injected into grid during off-peak hours.]8

- 2) The generating company [or the distribution licensee, as the case may be]9 after fulfilling the eligibility criteria as provided in clause (1) of this regulation may apply for registration with the Central Agency in such manner as may be provided in the detailed procedure:
- 3) The Central Agency shall accord registration to such applicant within fifteen days from the date of application for such registration.
Provided that an applicant shall be given a reasonable opportunity of being heard before his application is rejected with reasons to be recorded in writing.
- 4) A person aggrieved by the order of the Central Agency under proviso to clause (3) of this regulation may appeal before the Commission within fifteen days from the date of such order, and the Commission may pass order, as deemed appropriate on such appeal.

6. Revocation of Registration

- 1) If the Central Agency, after making an enquiry or based on the report of the Compliance Auditors, is satisfied that public interests so require, it may revoke registration of the eligible entity in any of the following cases, namely: -
 - a) where the eligible entity, in the opinion of the Central Agency, makes wilful and prolonged default in doing anything required of him by or under these regulations;
 - b) where the eligible entity breaks any of the terms and conditions of its accreditation or registration, the breach of which is expressly declared by such accreditation or registration to render it liable to revocation;
 - c) where the eligible entity fails within the period required in this behalf by the Central Agency - (i) to show, to the satisfaction of the Central Agency, that it is in a position fully and efficiently to discharge the duties and obligations imposed on it by its accreditation or registration; or (ii) to make the deposit or furnish the security, or pay the fees or other charges required by its accreditation or registration.
- 2) The Central Agency before revoking the registration under Clause (1) of this regulation shall give to the eligible entity reasonable opportunity for being heard.
- 3) Notwithstanding the provisions of sub-regulations (2) and (3) above, the Commission may from time to time direct the Central Agency to initiate enquiry and/or revocation process if the Commission deems it fit where any or all of the conditions as at clauses (a) to (c) of sub- regulation (1) exist.
- 4) A person aggrieved by the order of the Central Agency under proviso to clause (1) of this regulation may appeal before the Commission within fifteen days of such order being communicated, and the Commission may pass order, as deemed appropriate on such appeal.

7. Denomination and issuance of Certificates

- 1) [The eligible entity [other than distribution licensee] 10 shall apply to the Central Agency for certificates within six months from the corresponding generation from eligible renewable energy projects:

Provided that the application for issuance of certificates may be made on 10th, 20th and last day of the month.]11

[(1A) The eligible distribution licensees shall apply to the Central Agency for Certificates within three months from the date of obtaining the certification, as provided in clause (1 A) of the Regulation 5, from the concerned Appropriate Commission.]12

- 2) The Certificates shall be issued to the eligible entity after the Central Agency duly satisfies itself that all the conditions for issuance of Certificate, as may be stipulated in the detailed procedure, are complied with by the eligible entity:
- 3) The Certificates shall be issued by the Central Agency within fifteen days from the date of application by the eligible entities.
- 4) The Certificates shall be issued to the eligible entity on the basis of the units of electricity generated from renewable energy sources and injected into the Grid [or deemed to be injected in case of self-consumption by eligible [captive generating plant]13]14 and duly accounted in the Energy Accounting System as per the Indian Electricity Grid Code or the State Grid Code as the case may be, and the directions of the authorities constituted under the Act to oversee scheduling and dispatch and energy accounting, or based on written communication of distribution licensee to the concerned State Load Dispatch Centre with regard to the energy input by renewable energy generators which are not covered under the existing scheduling and dispatch procedures.
- 5) The process of certifying the energy injection shall be as stipulated in the detailed procedures to be issued by the Central agency.

[(6) Each Certificate issued shall represent one Megawatt hour of electricity generated from renewable energy source e and injected or deemed to be injected (in case of self-consumption by eligible [captive generating plant]15 into the grid.)16

[(7) The Commission shall determine through a separate order, the quantum of Certificate to be issued to the eligible entities being the solar generating companies registered under REC framework prior to 1st January 2015, for one Megawatt hour of electricity generated and injected into the grid or deemed to be injected (in case of self-consumption by eligible CGP) into the grid as per the following formula:

Vintage Multiplier=Floor Price of Base Year / Current Year Floor Price Where,

- i. "Base year" means the year 2012-13 being the year in which the floor price was determined for solar REC for a period of five years"

- 8) The vintage multiplier as specified in clause (7) of this Regulation shall be provided to the solar generating companies registered under REC framework prior 1st January 2015 and shall be applicable [for the existing and future solar RECs]17 for the period from 1st January 2015 up to 31st March 2017, after which such projects shall be eligible for one REC for one megawatt hour of electricity generated.]18

8. Dealing in the certificates

- 1) [Unless otherwise specifically permitted by the Commission by order, the certificate shall be dealt only through the power exchange and not in any other manner except as provided in clause (3) of this regulation.]¹⁹
- 2) The Certificate issued to eligible entity by the Central Agency may be placed for dealing in any of the Power Exchanges as the Certificate holder may consider appropriate, and such Certificate shall be available for dealing in accordance with the rules and byelaws of such Power Exchange.

Provided that the Power Exchanges shall obtain prior approval of the Commission on the rules and byelaws including the mechanism for discovery of price of the Certificates in the Power Exchange.

[(3) An eligible renewable energy generator including an eligible captive generating plant shall be permitted to retain the certificates for offsetting its renewable purchase obligation as a consumer subject to certification and verification by the concerned State Agency:]²⁰

9. Pricing of Certificate

- 1) The price of Certificate shall be as discovered in the Power Exchange:
Provided that the Commission may, in consultation with the Central Agency and Forum of Regulators from time to time provide for the floor price and forbearance price separately for solar and non-solar Certificates.
- 2) The Commission while determining the floor price and forbearance price, shall be guided inter alia by the following principles:
 - a) Variation in cost of generation of different renewable energy technologies falling under solar and non-solar category, across States in the country;
 - b) Variation in the Pooled Cost of Purchase across States in the country;
 - c) Expected electricity generation from renewable energy sources including: -
 - (i) expected renewable energy capacity under [tariff, for sale of electricity to an obligated entity for the purpose of meeting its renewable purchase obligations, determined under Section 62 or adopted under Section 63 of the Act by the Appropriate Commission.]²¹
 - (ii) expected renewable energy capacity under mechanism of certificates;
 - d) Renewable purchase obligation targets set by various State Commissions.

10. Validity and extinction of Certificates

- 1) [[After registration, the renewable energy generation plant shall be eligible for issuance of Certificates under these Regulations from the date of commercial operation or from the date of registration of such plant by the Central Agency whichever is later:

[Provided further that the Certificate issued under these regulations shall remain valid for one thousand and ninety-five days from the date of issuance:

Provided that the RECs which expired in the financial year 2014-15 and the RECs issued till the date of effect of CERC (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) (Third

Amendment) Regulations, 2014 shall remain valid for one thousand and ninety-five days from the date of issuance or up to 31st March 2017, whichever is later.

Provided also that the Certificate issued to an eligible entity for the electricity generated at a time when such entity fulfilled the eligibility criteria for accreditation, shall remain valid for the said period of one thousand and ninety-five days, even if accreditation of such entity is revoked at a later date:]]22

Provided that where an eligible entity has obtained accreditation and registration on the basis of false information or by suppressing material information and the accreditation of such entity is revoked at a later date, the Certificates already issued to such entity but not redeemed shall stand revoked from the date of issue of such Certificates and in respect of Certificates already redeemed, such entity shall deposit the amount realized from sale of such Certificates along with the interest with the Central Agency at the rate of two (2) percent in excess of the applicable State Bank of India Base rate per annum.]]23

- 2) Subject to the time limit as provided in clause (1) of this Regulation, a Certificate shall be deemed to have been extinguished after it has been exchanged by way of sale and purchase in the Power Exchange.

11. Fees and charges:

- 1) The Commission may from time to time, based on the proposal in this regard from the Central Agency, determine, by order, the fees and charges payable by the eligible entities for participation in the scheme for registration, eligibility of certificates, issuance of certificates and other matters connected therewith.
- 2) The fees and charges payable under these regulations may include one-time registration fee and charges, annual fee and charges, the transaction fee and charges for issue of certificate and charges for dealing in the certificate in accordance with these regulations, as the Commission may consider appropriate.
- 3) The fees and charges paid by the eligible entities shall be collected by the Central Agency and utilised for the purpose of meeting the cost and expense towards the remuneration payable to the compliance auditors, the officers, employees, consultants and representatives engaged to perform the functions under these regulations.

12. Funding for capacity building of State Agency:

- 1) The Commission may, by order, provide for a certain percentage of the proceeds from the sale of Certificates for the purpose of training and capacity building of the State Agencies and other facilitative mechanisms for the implementation and monitoring of the detailed procedures issued by the Central Agency.
- 2) The proceeds as provided under clause (1) of this regulation shall be collected by the power exchange and transferred to the Commission or such agency as may be directed by the Commission.

13. Appointment of compliance auditors:

- 1) The Commission may, in consultation with the Central Agency, appoint from time to time compliance auditors to inquire into and report on the compliance of these

Regulations by the person applying for registration, or on the compliance by the renewable energy generators in regard to the eligibility of the Certificates and all matters connected thereto.

- 2) The compliance auditor shall have the qualifications and experience as contained in the Schedule to these Regulations:

Provided that the Commission may by order amend the Schedule from time to time.

- 3) The Commission may from time to time fix the remuneration and charges payable to such auditors and all such amount payable shall be met out of the funds which the Central Agency may collect from the eligible entities.

14. Power to give directions:

The Commission may from time to time issue such directions and orders as considered appropriate for the implementation of these regulations and for the development of market in power for Renewable Energy Sources.

15. Power to Relax:

The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected may relax any of the provisions of these regulations on its own motion or on an application made before it by an interested person.

Sd/-
(Alok Kumar)
Secretary

Schedule

Qualification of Auditors

The auditor could be an individual person or a firm having persons with qualification and experience in the following areas:

- a. Finance or accounts or commerce, and
- b. having qualifications and experience in the field of engineering with specialisation in generation, transmission or distribution of electricity, experience that demonstrates an adequate understanding of the electricity sector, institutions involved including Regulatory Commission, utilities, government institutions, State agencies and their roles and responsibilities.

Note:

The Central Electricity Regulatory Commission (Terms and Conditions for Recognition and Issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 were notified in Part III, Section 4, No. 26 of the Gazette of India (Extraordinary) dated 18.1.2010 and amended vide: -

- a) First Amendment Regulations, 2010 published in Part III, Section 4, No. 249 of the Gazette of India (Extraordinary) dated 01.10.2010.
- b) Second Amendment Regulations, 2013 published in Part III, Section 4, No. 192 of the Gazette of India (Extraordinary) dated 11.7.2013.
- c) Third Amendment Regulations, 2014 published in Part III, Section 4, No. 380 of the Gazette of India (Extraordinary) dated 31.12.2014.
- d) Corrigendum dated 27.01.2015.
- e) Fourth Amendment Regulations, 2016 published in Part III, Section 4, No. 112 of the Gazette of India (Extraordinary) dated 30.03.2016.

References:

- [1] Deleted vide Second Amendment Regulations, 2013 w.e.f. 11.7.20
- [2] Substituted vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013
- [3] Substituted vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013
- [4] Initially added vide First Amendment Regulations, 2010 w.e.f. 1.10.2010 and later substituted vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013 and later deleted vide Fourth Amendment Regulations, 2016 w.e.f. 30.3.2016
- [5] Added vide Fourth Amendment Regulations, 2016 w.e.f. 30.3.2016
- [6] Added vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013
- [7] Added vide Third Amendment Regulations, 2014 w.e.f. 1.01.2015
- [8] Inserted vide Fourth Amendment Regulations, 2016 w.e.f. 30.3.2016
- [9] Added vide Third Amendment Regulations, 2014 w.e.f. 1.01.2015
- [10] Added vide Third Amendment Regulations, 2014 w.e.f. 1.01.2015
- [11] Substituted vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013
- [12] Added vide Third Amendment Regulations, 2014 w.e.f. 1.01.2015
- [13] Substituted vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013
- [14] Added vide First Amendment Regulations, 2010 w.e.f. 1.10.2010
- [15] Substituted vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013
- [16] Substituted vide First Amendment Regulations, 2010 w.e.f. 1.10.2010
- [17] Inserted vide Corrigendum dated 27.01.2015
- [18] Added vide Third Amendment Regulations, 2014 w.e.f. 1.01.2015
- [19] Substituted vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013
- [20] Added vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013 later substituted vide Fourth Amendment Regulations, 2016 w.e.f. 30.3.2016)
- [21] Substituted vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013
- [22] Substituted vide Third Amendment Regulations, 2014 w.e.f. 1.01.2015
- [23] Substituted vide Second Amendment Regulations, 2013 w.e.f. 11.7.2013

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Annexure- II

18.2 List of SERCs/JERCs Regulations and orders regarding RPO

Table 50: List of SERC Regulations and Amendments

S. No.	State	Name of Regulations /Orders	Date of Notification
1	Andhra Pradesh	APERC Renewal Purchase Obligation (Compliance by Purchase of Renewable Energy / Renewable Energy Certificates) Regulation, 2017	31.03.2017
		APERC Renewable Power Purchase Obligation (Compliance by purchase of Renewable Energy/Renewable Energy Certificates) Regulations, 2012 (Regulation No. 1 of 2012).	21.03.2012
2	Arunachal Pradesh	Renewable Power purchase Obligation and Its Compliance Regulation (2 nd Amendment) 2016	05.10.2016
		Renewable Power purchase Obligation and Its Compliance Regulation (1 st Amendment) 2016	25.02.2016
		Arunachal Pradesh State Electricity Regulatory Commission (Renewable Power Purchase Obligation and its Compliance) Regulations, 2012	11.04.2012
3	Assam	AERC (Renewable Purchase Obligation and its compliance) Regulations, 2010, (2 nd Amendment), 2017	14.03.2017
		AERC (Renewable Purchase Obligation and its Compliance) Regulations, 2010, (Amendment), 2015	15.10.2015
		AERC (Renewable Purchase Obligation and its Compliance) Regulations, 2010	02.11.2010
4	Bihar	Bihar Electricity Regulatory Commission (Renewable Purchase Obligation, its compliance and REC Framework Implementation) (2 nd Amendment) Regulations, 2017	29.03.2017
		Bihar Electricity Regulatory Commission (Renewable Purchase Obligation, its compliance and REC Framework Implementation) (1 st Amendment) Regulations, 2012	07.09.2012
		Bihar Electricity Regulatory Commission (Renewable Purchase Obligation, its Compliance and REC Framework Implementation) Regulations, 2010	16.11.2010
5	Chandigarh, Lakshadweep, Andaman & Nicobar Islands, Goa, Daman & Diu, Dadra & Nagar Haveli, Puducherry	Joint Electricity Regulatory Commission for State of Goa & Union Territories (Procurement of Renewable Energy), Third Amendment Regulations, 2016.	22.08.2016
		Joint Electricity Regulatory Commission (Procurement of Renewable Energy) (Second Amendment), Regulations, 2015	22.12.2015
		Joint Electricity Regulatory Commission for state of Goa & Union Territories (Procurement of Renewable energy) Regulations, 2010.	30.11.2010

S. No.	State	Name of Regulations /Orders	Date of Notification
6	Chhattisgarh	Chhattisgarh State Electricity Regulatory Commission (Renewable Purchase Obligation and REC framework Implementation) Regulations, 2016	01.12.2016
		Chhattisgarh State Electricity Regulatory Commission (Renewable Purchase Obligation and REC framework Implementation) (First Amendment) Regulations, 2013	18.09.2014
		Chhattisgarh State Electricity Regulatory Commission (Renewable Purchase Obligation and REC framework Implementation) Regulations, 2013	18.09.2013
		Chhattisgarh State Electricity Regulatory Commission (Renewable Purchase Obligation and REC framework Implementation) (First Amendment) Regulations, 2013	21.05.2013
		Chhattisgarh State Electricity Regulatory Commission (Renewable Purchase Obligation and REC framework Implementation) Regulations, 2011	04.03.2011
7	Delhi	Delhi Electricity Regulatory Commission (Renewable Purchase Obligation and Renewable Energy Certificate Framework Implementation) Regulations, 2012	01.10.2012
8	Gujarat	Gujarat Electricity Regulatory Commission (Procurement of Energy from Renewable Sources) (Second Amendment) Regulations, 2018.	21.04.2018
		Gujarat Electricity Regulatory Commission (Procurement of Energy from Renewable Sources) (First Amendment) Regulations, 2014.	04.03.2014
		Procurement of Energy from Renewable Sources Regulations, 2010	17.04.2010
9	Haryana	Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulation, 2010 (5th Amendment) Regulations, 2016.	05.10.2016
		HERC (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2010	04.08.2015
		HERC (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulation, 2010 (3rd Amendment) Regulations, 2014	15.07.2014
		HERC (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy	25.11.2011

S. No.	State	Name of Regulations /Orders	Date of Notification
		Certificate) Regulations, 2010 (2 nd Amendment) Regulations, 2011	
		HERC (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2010 (1 st Amendment) Regulations, 2011.	05.09.2011
		HERC (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2010	03.02.2011
10	Himachal Pradesh	HPERC (Renewable Power Purchase Obligation and its Compliance) (4 th Amendment) Regulations, 2017	06.12.2017
		HPERC (Renewable Power Purchase Obligation and its Compliance) (3 rd Amendment) Regulations, 2017	24.03.2017
		HPERC (Renewable Power Purchase Obligation and its Compliance) (2 nd Amendment) Regulation, 2016	30.03.2016
		HPERC (Renewable Power Purchase Obligation and its Compliance) (1 st Amendment) Regulation, 2011	03.10.2011
		HPERC (Renewable Power Purchase Obligation and its Compliance) Regulations, 2010	26.05.2010
11	Jammu and Kashmir	JKSERC Hereby Revises the Renewable Power Purchase Obligations (RPO) targets from FYs 2015-16 & 2016-17 and specifies the RPO for FY 2017-18 onwards up to FY 2021-22	05.08.2015
		JKSERC (Renewable Power Purchase Obligation, its compliance and REC framework implementation) Regulations, 2011, under the caption "Renewable Purchase Obligation (RPO) Target	05.03.2013
		J&KSERC (Renewable Power Purchase obligation, its compliance and REC frame work implementation) Regulations, 2011	11.03.2011
12	Jharkhand	JSERC (Renewable Energy Purchase Obligation and its Compliance) Regulations 2016	28.09.2016
		JSERC (Renewable Purchase Obligation and Its Compliance - First Amendment) Regulations, 2012.	29.11.2012
		JSERC (Renewable purchase obligation and its compliance) Regulations, 2010.	31.07.2010
13	Karnataka	5 th Amendment to KERC (Procurement of Energy from Renewable Sources) Regulations, 2017	15.02.2018
		4 th Amendment to KERC (Procurement of Energy from Renewable Sources) Regulations, 2016	21.02.2017
		3 rd Amendment to KERC (Procurement of Energy from Renewable Sources) Regulations, 2015	16.11.2015
		Order on Compliance of Renewable Purchase Obligation by Purchase of energy through Green Tariff	21.09.2012

S. No.	State	Name of Regulations /Orders	Date of Notification
		2 nd Amendment to KERC (Procurement of Energy from Renewable Sources) Regulations, 2012	14.09.2012
		1 st Amendment to KERC (Procurement of Energy from Renewable Sources) Regulations, 2011	20.12.2011
		KERC (Procurement of Energy from Renewable Sources) Regulations, 2011	16.03.2011
14	Kerala	The Kerala State Electricity Regulatory Commission (Renewable Energy) Amendment Regulations, 2017	02.11.2017
		Kerala State Electricity Regulatory Commission (Renewable Energy) Regulations, 2015.	11.11.2015
		Kerala State Electricity Regulatory Commission (Power Procurement from Renewable Sources by Distribution Licensee) Regulations, 2013	01.01.2013
		Kerala State Electricity Regulatory Commission (Renewable Purchase Obligation and its Compliance) Regulations, 2010.	23.11.2010
		Kerala State Electricity Regulatory Commission ((Power Procurement from Renewable Sources by Distribution Licensee) Second Amendment Regulation, 2010.	22.11.2010
		KSERC (Power Procurement from Solar Plants by Distribution Licensees) Regulation 2009	01.01.2009
		(Power Procurement from Renewable Sources by Distribution Licensees) (First Amendment) Regulations, 2008	18.11.2008
		Kerala State Electricity Regulatory Commission (Power Procurement from Renewable Sources by Distribution Licensee) Regulations, 2006	24.06.2006
15	Madhya Pradesh	7th amendment to MPERC (Cogeneration and Generation of Electricity from renewable sources of energy) (Revision-I) Regulations, 2010	17.11.2017
		6th amendment to Madhya Pradesh Electricity Regulatory Commission (Cogeneration and Generation of Electricity from Renewable Sources of Energy) (Revision-I) Regulations, 2010 [ARG-33(I)(vi) of 2017]	01.09.2017
		5th amendment to MPERC (Cogeneration and Generation of Electricity from Renewable Sources of Energy) (Revision-I) Regulations, 2010 [ARG-33(I)(v) of 2015]	02.10.2015
		4th amendment to MPERC (Cogeneration and Generation of Electricity from Renewable Sources of Energy) (Revision-I) Regulations, 2010 [ARG-33 (I) iv of 2015]	15.05.2015
		3rd Amendment/ Addendum to MPERC (Cogeneration and Generation of Electricity from	28.11.2014

S. No.	State	Name of Regulations /Orders	Date of Notification
		Renewable Sources of Energy) (Revision-I) Regulations, 2010.	
		2nd Amendment/ Addendum to MPERC (Cogeneration and Generation of Electricity from Renewable Sources of Energy) (Revision-I) Regulations, 2010.	20.04.2012
		1st Amendment MPERC (Cogeneration and Generation of Electricity from Renewable Sources of Energy) (Revision-I) Regulations, 2010.	08.07.2011
		MPERC (Cogeneration and Generation of Electricity from Renewable Sources of Energy) Regulations, 2010 (Revision-I)	19.11.2010
		MPERC (Cogeneration and Generation of Electricity from Renewable Sources of Energy) Regulation	07.11.2008
16	Maharashtra	Maharashtra Electricity Regulatory Commission (Renewable Purchase Obligation, its Compliance and Implementation of Renewable Energy Certificate Framework) Regulations, 2016	30.03.2016
		Maharashtra Electricity Regulatory Commission (Renewable Purchase Obligation, Its Compliance And Implementation Of Rec Framework) Regulations, 2010	07.06.2010
17	Manipur, Mizoram	Joint Electricity Regulatory Commission for the States of Manipur & Mizoram (Renewable Purchase Obligation and its Compliance) Regulations, 2010.	05.05.2010
		joint Electricity Regulatory Commission for Manipur And Mizoram order dated 05.03.2014 regarding Renewable Purchase Obligation of Licensee	05.03.2014
18	Meghalaya	The M.S.E.R.C. (Renewable Purchase Obligation & its Compliance) Regulations, 2015	12.03.2015
		The M.S.E.R.C. (Renewal Energy Purchase Obligation and Compliance) Regulations, 2010	21.12.2010
19	Nagaland	NERC (Renewable Purchase Obligation and its Compliance) Regulations, 2011	29.08.2011
20	Odisha	Gazette notification on OREDA as State Agency for accreditation and recommending the renewable energy projects for registration and to undertake functions under the OERC (Procurement of Energy from Renewable sources and its Compliance) Regulations, 2015 (Gazette No. 910 dated 16th March 2017)	16.03.2017
		Gazette Notification of OERC (Procurement of Energy Renewable Sources and its Compliance) Regulations, 2015	01.08.2015
		OERC (Renewable and Co-generation Purchase Obligation and its Compliance) Regulations, 2010 (Gazette No. - 2076 dated 14-12-2010).	30.09.2010

S. No.	State	Name of Regulations /Orders	Date of Notification
21	Punjab	Punjab State Electricity Regulatory Commission (Renewable Purchase Obligation and its compliance) (Amendment- 1) Regulations, 2015	06.05.2015
		Punjab State Electricity Regulatory Commission (Punjab State Grid Code) Regulations, 2013	14.02.2013
		Punjab State Electricity Regulatory Commission (Renewable Purchase Obligation and its compliance) Regulations, 2011	03.06.2011
22	Rajasthan	RERC (Renewable Energy Certificate and Renewable Purchase Obligation Compliance Framework) (First Amendment) Regulations, 2016	15.03.2016
		RERC (Renewable Energy Obligation) (Third Amendment) Regulations, 2015	18.03.2015
		RERC (Renewable Energy Obligation) 2nd Amendment) Regulations, 2014	30.05.2014
		RERC (Renewable Energy Obligation) (1st Amendment) Regulations, 2011	24.05.2011
		Renewable Energy Certificate and Renewable Purchase Obligation Compliance Framework Regulations, 2010	23.12.2010
		RERC (Renewable Energy Obligation) Regulations, 2007	28.03.2007
23	Sikkim	Sikkim State Electricity Regulatory Commission (Renewable Energy Purchase Obligation and its Compliance) Regulations, 2013.	23.09.2013
		Sikkim State Electricity Regulatory Commission (Renewable Energy Purchase Obligation and its Compliance) (First Amendment) Regulations, 2017.	24.03.2017
24	Tamil Nadu	Amendment to the Tamil Nadu Electricity Regulatory Commission (Renewable Energy Purchase Obligation) Regulations, 2010	07.03.2016
		Amendment to the Tamil Nadu Electricity Regulatory Commission (Renewable Energy Purchase Obligation) Regulations, 2010	21.01.2013
		Tamil Nadu Electricity Regulatory Commission (Renewable Energy Purchase Obligation) Regulations, 2011	10.08.2011
		Tamil Nadu Electricity Regulatory Commission (Renewable Energy Purchase Obligation) Regulations, 2010	07.12.2010
25	Telangana	TSERC Renewal Purchase Obligation (Compliance by Purchase of Renewable Energy / Renewable Energy Certificates) Regulation, 2018	02.05.2018
26	Tripura	1st Amendment of Renewable Energy Regulation, 2016	21.11.2016
		Gazette Notified for "Renewable Energy Regulation-2015(MYT)	18.12.2015

S. No.	State	Name of Regulations /Orders	Date of Notification
		T.E.R.C. (Renewable Purchase Obligation and its compliance) Regulations, 2009	09.11.2009
27	Uttar Pradesh	Suo-Moto Proceedings to Review the regulatory obligation of purchase of quantum of energy from renewable sources achieved by obligated entities viz. Distribution Licensees, Captive Users and Open Access consumers in the State	18.12.2017
		UPERC (Compliance of Renewable Purchase Obligation) Regulations, 2010	20.11.2010
28	Uttarakhand	UERC (Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) (Sixth Amendment) Regulations, 2017. (Amendment to Principal Regulations, 2013)	08.09.2017
		UERC (Tariff and other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) (Fifth Amendment) Regulations, 2016.	29.04.2016
		UERC (Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) (Fourth Amendment) Regulations, 2015.	09.09.2015
		UERC (Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) (Third Amendment) Regulations, 2015.	21.07.2015
		UERC (Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) (Second Amendment), Regulations, 2014	20.06.2014
		UERC (Compliance of Renewable Purchase Obligation) (First Amendment) Regulations, 2013	20.12.2013
		UERC (Compliance of Renewable Purchase Obligation) Regulations, 2010	03.11.2010
29	West Bengal	West Bengal Electricity Regulatory Commission (Cogeneration and Generation of Electricity from Renewable Sources of Energy) Regulations, 2013	22.03.2013

Annexure-III

18.3 List of Capacity Building workshops

S. No.	Date	Participants from	Venue	No. of State Agencies/SLDCs participated
1	06-09-2010	SLDC, State Agency, SERC, NLDC	NLDC, New Delhi	13
2	18-10-2010	SLDC, NLDC	NLDC, New Delhi	11
3	24-12-2010	State Agencies	NLDC, New Delhi	8
4	24-02-2011	State Agencies	NLDC, New Delhi	10
5	14-03-2011 & 15-03-2011	RLDC, NLDC, RTS	NLDC, New Delhi	7
6	25-04-2011	SERCs, SLDCs & State Agencies	SRLDC, Bangalore	8
7	10-05-2011	SERCs, SLDCs & State Agencies	NLDC, New Delhi	6
8	06-11-2011	SERCs, SLDCs & State Agencies	WRLDC, Mumbai	9
9	24-06-2011	All Stake holders	India International Centre, New Delhi	10
10	06-07-2011	SERCs, SLDCs & State Agencies	ERLDC, Kolkata	9
11	10-08-2011 to 12-08-2011	Open for all	Pragati Maidan, New Delhi	13
12	08-09-2011	CERC, SERCs, NLDC, State Agencies & SLDCs	NLDC, New Delhi	10
13	12-12-2011	CERC, SERCs, NLDC, State Agencies & SLDCs	ERLDC, Kolkata	7
14	05-02-2012 to 07-02-2012	Open for all	Coimbatore	9
15	22-02-2012	CERC, NLDC, State Agencies & SLDC	NLDC, New Delhi	8
16	27-04-2012	State Agencies	NLDC, New Delhi	12
17	19-11-2012	SERCs, State Agencies & SLDCs	NLDC, New Delhi	10
18	03-04-2013 to 05-04-2013	Open for all	Pragati Maidan, New Delhi	9
19	05-06-2014	SLDCs, State Agencies, NLDC & RLDCs	NLDC and RLDCs connected through video conferencing	13
20	19-09-2014	SLDCs, State Agencies, NLDC & RLDCs	NLDC, New Delhi & RLDCs connected through video conferencing	13

S. No.	Date	Participants from	Venue	No. of State Agencies/SLDCs participated
21	20-03-2015	SLDCs, State Agencies, NLDC & RLDCs	NLDC, New Delhi & RLDC connected through video conferencing	10
22	23-07-2015	SLDCs, State Agencies, NLDC & RLDCs	NLDC, New Delhi & RLDC connected through video conferencing	10
23	11-12-2015	SLDCs, State Agencies, NLDC & RLDCs	NLDC, New Delhi & RLDC connected through video conferencing	7
24	11-03-2016	SLDCs, State Agencies, NLDC & RLDCs	NLDC, New Delhi & RLDC connected through video conferencing	6
25	29-04-2016	SLDCs, State Agencies, NLDC & RLDCs	NLDC, New Delhi & RLDC connected through video conferencing	6
26	07-04-2017	SLDCs, State Agencies, NLDC & RLDCs	NLDC, New Delhi & RLDC connected through video conferencing	11
27	15-09-2017	SLDCs, State Agencies, NLDC & RLDCs	NLDC, New Delhi & RLDC connected through video conferencing	8

Annexure- IV

18.4 List of RE projects registered under REC mechanism (as on March 31, 2018)

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
1	Vish Wind Infrastructure LLP	Andhra Pradesh	Wind	6.4	05-10-12
2	Vish Wind Infrastructure LLP	Andhra Pradesh	Wind	1.6	05-10-12
3	Tadas Wind Energy Limited	Andhra Pradesh	Wind	12.8	11-10-12
4	Tadas Wind Energy Limited	Andhra Pradesh	Wind	3.2	11-10-12
5	Tadas Wind Energy Limited	Andhra Pradesh	Wind	6.4	11-10-12
6	Tadas Wind Energy Limited	Andhra Pradesh	Wind	9.6	11-10-12
7	Tadas Wind Energy Limited	Andhra Pradesh	Wind	8	11-10-12
8	Tadas Wind Energy Limited	Andhra Pradesh	Wind	8	11-10-12
9	Tadas Wind Energy Limited	Andhra Pradesh	Wind	2.4	11-10-12
10	Vish Wind Infrastructure LLP	Andhra Pradesh	Wind	12.8	11-10-12
11	National Aluminium Company Limited	Andhra Pradesh	Wind	50.4	03-04-13
12	The KCP Limited	Andhra Pradesh	Solar PV	1.15	10-05-13
13	Oil Country Tubular Limited	Andhra Pradesh	Wind	0.8	07-06-13
14	Sukaso Ceracolors Private Limited	Andhra Pradesh	Wind	1.6	07-06-13
15	Protectron Electromech Private Limited	Andhra Pradesh	Wind	0.8	21-06-13
16	B.G.Channappa	Andhra Pradesh	Solar PV	4	25-11-13
17	Valuelabs LLP	Andhra Pradesh	Solar PV	5	09-12-13
18	SEI Sriram Power Private Limited	Andhra Pradesh	Solar PV	10	13-12-13
19	Manihamsa Power Projects Limited	Andhra Pradesh	Small Hydro	1.48	23-05-14
20	Sri City Private Limited	Andhra Pradesh	Solar PV	3	14-08-14
21	Indira Power Private Limited	Andhra Pradesh	Solar PV	0.7	13-04-15
22	Trimex Sands Private Limited	Andhra Pradesh	Solar PV	1	24-06-16
23	Ravali Spinnes Private Limited	Andhra Pradesh	Solar PV	0.844	29-06-16
24	Bharathi Solar Power	Andhra Pradesh	Solar PV	1	30-06-16
25	Sri Vijaya Visakha Milk Producers Company Limited	Andhra Pradesh	Solar PV	1.5	30-06-16
26	Indo National Limited	Andhra Pradesh	Solar PV	1	25-10-16
27	Savitha Renewable Energy Private Limited	Andhra Pradesh	Solar PV	1	25-10-16
28	Meda Sreedhar	Andhra Pradesh	Solar PV	2	21-02-17
29	Prakasha Motors	Andhra Pradesh	Solar PV	1	09-03-17
30	Solarays Eco Energy Inc.	Andhra Pradesh	Solar PV	2	05-04-17
31	NSS Solar Power	Andhra Pradesh	Solar PV	1	17-05-17
32	Roshni Powertech Private Limited	Andhra Pradesh	Biomass	6	02-02-18
33	Upper Ganges Sugar & Industries Limited Unit: Hasanpur Sugar Mills.	Bihar	Bio-fuel cogeneration	6	02-06-15
34	Godawari Power and Ispat Limited	Chhattisgarh	Biomass	20	10-01-12
35	Rajaram Maize Products (Solar Power Division)	Chhattisgarh	Solar PV	4.8	29-06-16

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
36	Delhi International Airport Private Limited	Delhi	Solar PV	5	30-06-16
37	Delhi International Airport Private Limited	Delhi	Solar PV	2.84	30-06-16
38	Vish Wind Infrastructure LLP	Gujarat	Wind	1.6	12-01-11
39	M/S Wind World Wind Resources Development Private Limited	Gujarat	Wind	3.2	19-05-11
40	GMR Renewable Energy Limited	Gujarat	Wind	2.1	18-07-11
41	M/S Wind World Wind Resources Development Private Limited	Gujarat	Wind	6.4	29-08-11
42	Vish Wind Infrastructure LLP	Gujarat	Wind	24	29-08-11
43	Vish Wind Infrastructure LLP	Gujarat	Wind	6.4	13-10-11
44	Paharpur Cooling Towers Limited	Gujarat	Wind	6.4	02-11-11
45	Kaizen Switchgear Products	Gujarat	Wind	2.1	09-11-11
46	Gamma Green Power Private Limited	Gujarat	Wind	4	29-11-11
47	Harmony Estates Private Limited	Gujarat	Wind	2	05-03-12
48	Vish Wind Infrastructure LLP	Gujarat	Wind	23.2	15-03-12
49	Vijai Minerals	Gujarat	Wind	0.25	19-03-12
50	Paharpur Cooling Towers Limited	Gujarat	Wind	1.6	29-03-12
51	Renew Wind Energy (Rajkot) Private Limited	Gujarat	Wind	25.2	04-04-12
52	Vish Wind Infrastructure LLP	Gujarat	Wind	11.2	02-05-12
53	Vish Wind Infrastructure LLP	Gujarat	Wind	14.4	02-05-12
54	Vaayu Infrastructure LLP	Gujarat	Wind	2.4	08-05-12
55	Ratedi Wind Power Limited	Gujarat	Wind	12	18-05-12
56	Bharat Forge Limited	Gujarat	Wind	2	13-06-12
57	Kalyani Carpenter Special Steels Private Limited	Gujarat	Wind	4	19-06-12
58	Shree Ganesh Khand Udyog Sahkari Mandli Limited	Gujarat	Bio-fuel cogeneration	3	29-06-12
59	Hotel Rajputana Palace	Gujarat	Wind	0.25	11-07-12
60	Krishna International Exim	Gujarat	Wind	0.25	16-07-12
61	Bindu Vayu Urja Private Limited	Gujarat	Wind	8.4	30-07-12
62	M/S Bindu Vayu Urja Private Limited	Gujarat	Wind	8.4	31-07-12
63	Vish Wind Infrastructure LLP	Gujarat	Wind	1.6	24-08-12
64	Sahakari Khand Udhog Mandal Limited Gandevi	Gujarat	Bio-fuel cogeneration	4	05-07-13
65	Shree Maroli Vibhag Khand Udyog Sahakari Mandli Limited	Gujarat	Bio-fuel cogeneration	3	28-08-13
66	Shree Khedut Sahakari Khand Udyog Manadli Limited, Pandvai	Gujarat	Bio-fuel cogeneration	3	17-09-13
67	Shree Chalthan Vibhag Khand Udyog Sahakari Mandli Limited	Gujarat	Bio-fuel cogeneration	4	18-02-14
68	Shree Narmada Khand Udyog Sahakari Mandli Limited	Gujarat	Bio-fuel cogeneration	3.8	27-03-14
69	Gujarat Fluorochemicals Limited	Gujarat	Wind	12	14-08-14
70	Baroda Moulds & Dies	Gujarat	Solar PV	0.25	08-05-15
71	Electrical Controls & Systems	Gujarat	Solar PV	0.5	08-05-15
72	Kaizen Switchgear Products	Gujarat	Solar PV	0.75	08-05-15
73	SJVN Limited	Gujarat	Solar PV	5	23-03-17

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
74	CEPCO Industries Private Limited	Gujarat	Wind	5.6	28-08-17
75	CEPCO Industries Private Limited	Gujarat	Wind	5.6	28-08-17
76	Enn Enn Corp Limited	Gujarat	Wind	2.1	08-11-17
77	Enn Enn Corp Limited	Gujarat	Wind	4.2	08-11-17
78	Enn Enn Corp Limited	Gujarat	Wind	6.3	08-11-17
79	Continuum Wind Energy (India) Private Limited	Gujarat	Wind	18	25-01-18
80	Goel International Private Limited	Haryana	Biomass	3	24-01-13
81	Best Foods Limited	Haryana	Biomass	6	17-02-14
82	SSA International Limited	Haryana	Biomass	1.06	07-03-14
83	Chanderpur Renewal Power Company Private Limited	Haryana	Biomass	0.74	21-09-15
84	Maruti Suzuki India Limited	Haryana	Solar PV	1	25-10-16
85	Haryana Liquors Private Limited	Haryana	Bio-fuel cogeneration	2.5	03-01-17
86	Kapil Mohan And Associates Hydro Power Private Limited	Himachal Pradesh	Small Hydro	4	07-07-11
87	Tejassarnika Hydro Energies Private Limited	Himachal Pradesh	Small Hydro	12	28-07-11
88	Ginni Global Limited	Himachal Pradesh	Small Hydro	5	13-10-11
89	Ranga Raju Warehousing Private Limited	Himachal Pradesh	Small Hydro	14	15-03-12
90	Kapil Mohan And Associates Hydro Power Private Limited	Himachal Pradesh	Small Hydro	9	29-03-12
91	Batot Hydro Power Limited	Himachal Pradesh	Small Hydro	3.5	22-05-12
92	Kurmi Energy Private Limited	Himachal Pradesh	Small Hydro	8.01	26-03-14
93	Usaka Hydro Powers Private Limited	Himachal Pradesh	Small Hydro	2.5	04-04-14
94	Gangdari Hydro Power Private Limited	Himachal Pradesh	Small Hydro	16	25-04-14
95	Prodigy Hydro Power Private Limited	Himachal Pradesh	Small Hydro	6	17-02-16
96	Sai Engineering Foundation	Himachal Pradesh	Small Hydro	5	07-09-16
97	Winsome Textile Industries Limited	Himachal Pradesh	Small Hydro	3.5	26-07-17
98	Padhas Hydel Projects Private Limited	Himachal Pradesh	Small Hydro	5	05-09-17
99	Choudhary Power Projects Private Limited	Jammu and Kashmir	Small Hydro	15	20-11-13
100	Tadas Wind Energy Limited	Karnataka	Wind	19.2	10-07-12
101	Tadas Wind Energy Limited	Karnataka	Wind	31.2	10-07-12
102	Tadas Wind Energy Limited	Karnataka	Wind	16	10-07-12
103	Vish Wind Infrastructure LLP	Karnataka	Wind	1.6	11-07-12
104	Tadas Wind Energy Limited	Karnataka	Wind	5.6	27-07-12
105	Tadas Wind Energy Limited	Karnataka	Wind	4.8	27-07-12
106	Tadas Wind Energy Limited	Karnataka	Wind	2.4	27-07-12
107	Tadas Wind Energy Limited	Karnataka	Wind	16	27-07-12
108	Canara P.C.C. Poles	Karnataka	Wind	0.85	16-10-12
109	Sai Nireeha Power Project Private Limited	Karnataka	Small Hydro	5	12-11-12
110	Tadas Wind Energy Limited	Karnataka	Wind	4.8	20-03-13
111	Sree Minerals	Karnataka	Wind	4.2	09-04-13
112	Gokak Power & Energy Limited	Karnataka	Small Hydro	4.5	08-08-13

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
113	Grasim Industries Limited	Karnataka	Biomass	10	31-01-14
114	Hindalco Industries Limited	Kerala	Solar PV	1	29-06-16
115	Ujaas Energy Limited	Madhya Pradesh	Solar PV	2	04-04-12
116	M/S Gupta Sons	Madhya Pradesh	Solar PV	0.5	22-05-12
117	Omega Renk Bearings Private Limited	Madhya Pradesh	Solar PV	0.105	14-06-12
118	Deepak Spinners Limited	Madhya Pradesh	Solar PV	1	08-01-13
119	Star Delta Transformers Limited	Madhya Pradesh	Solar PV	0.5	08-01-13
120	Saboo Industries	Madhya Pradesh	Solar PV	0.5	19-02-13
121	Saboo Sodium Chloro Limited	Madhya Pradesh	Solar PV	1	19-02-13
122	Tuhina Enterprises	Madhya Pradesh	Solar PV	1	19-02-13
123	Agarwal Jewellers	Madhya Pradesh	Solar PV	0.5	08-03-13
124	Omega Renk Bearings Private Limited	Madhya Pradesh	Solar PV	0.695	10-04-13
125	Pearl Green Energy Private Limited	Madhya Pradesh	Solar PV	1	12-04-13
126	Banco Construction Private Limited	Madhya Pradesh	Solar PV	1	15-04-13
127	Bansal and Company	Madhya Pradesh	Solar PV	1	23-04-13
128	Lanxess India Private Limited	Madhya Pradesh	Biomass	3.95	03-05-13
129	GI Power Corporation Limited	Madhya Pradesh	Wind	5.98	10-05-13
130	Atul Sharma	Madhya Pradesh	Solar PV	1	14-05-13
131	Centex Fabrics - Export Unit	Madhya Pradesh	Solar PV	1.25	14-05-13
132	Hindustan Platinum Private Limited	Madhya Pradesh	Solar PV	1.25	14-05-13
133	SRS Engineers	Madhya Pradesh	Solar PV	0.63	14-05-13
134	Eastman International	Madhya Pradesh	Solar PV	2	17-05-13
135	Friends Salt Works & Allied Industries	Madhya Pradesh	Solar PV	2.5	17-05-13
136	Gupta Sons	Madhya Pradesh	Solar PV	1.25	17-05-13
137	Omega Renk Bearings Private Limited	Madhya Pradesh	Solar PV	0.655	17-05-13
138	Rsquare Shri Sai Baba Hospitality Private Limited	Madhya Pradesh	Solar PV	0.5	17-05-13
139	Gautam Freight Private Limited	Madhya Pradesh	Solar PV	1.25	20-05-13
140	Systematic Enterprises Private Limited	Madhya Pradesh	Solar PV	0.63	20-05-13
141	Friends Salt Works & Allied Industries	Madhya Pradesh	Solar PV	2.5	21-05-13
142	Aditya Marine Limited	Madhya Pradesh	Solar PV	0.63	23-05-13
143	Friends Salt Works & Allied Industries	Madhya Pradesh	Solar PV	5	29-05-13
144	Active Solar LLP	Madhya Pradesh	Solar PV	1.25	04-06-13
145	Bonaterra Green Houses LLP	Madhya Pradesh	Solar PV	0.63	04-06-13
146	Bhadresh Trading Corporation Limited	Madhya Pradesh	Solar PV	5	21-08-13
147	Ujaas Energy Limited	Madhya Pradesh	Solar PV	5	16-09-13
148	Ujaas Energy Limited	Madhya Pradesh	Solar PV	7	16-09-13
149	M/S Birla Corporation Limited, Unit- Satna Cement Works	Madhya Pradesh	Solar PV	1.5	28-10-13
150	Sai Saburi Urja Private Limited	Madhya Pradesh	Solar PV	1	08-11-13
151	Deepak Industries Limited	Madhya Pradesh	Solar PV	5	11-11-13

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
152	Hindustan Platinum Private Limited	Madhya Pradesh	Solar PV	2.5	11-11-13
153	Indra Vidhya Power	Madhya Pradesh	Solar PV	0.63	11-11-13
154	KRLB Limited	Madhya Pradesh	Solar PV	6.63	11-11-13
155	Sanpower Solar LLP	Madhya Pradesh	Solar PV	0.63	11-11-13
156	Sharma Industries	Madhya Pradesh	Solar PV	0.63	11-11-13
157	Avon Cycles Limited	Madhya Pradesh	Solar PV	1.25	20-11-13
158	IPF - Vikram India Limited	Madhya Pradesh	Solar PV	1.25	20-11-13
159	Ranjanben P. Chovtia	Madhya Pradesh	Solar PV	0.63	20-11-13
160	Suryashakti Enterprises	Madhya Pradesh	Solar PV	0.5	20-11-13
161	Ankit Gems Private Limited	Madhya Pradesh	Solar PV	1.25	25-11-13
162	Flow Devices Systems	Madhya Pradesh	Solar PV	0.63	25-11-13
163	GTC Power Private Limited	Madhya Pradesh	Solar PV	0.63	25-11-13
164	Gujarat Apollo Industries Limited	Madhya Pradesh	Solar PV	1	25-11-13
165	Neevya Solar LLP	Madhya Pradesh	Solar PV	0.63	25-11-13
166	Neel Properties	Madhya Pradesh	Solar PV	1	02-12-13
167	Shree Balaji Enterprises	Madhya Pradesh	Solar PV	2	03-12-13
168	Vikram Urethane Private Limited	Madhya Pradesh	Solar PV	1.25	21-02-14
169	Windsor Exports	Madhya Pradesh	Solar PV	4	04-04-14
170	Avon Cycles Limited	Madhya Pradesh	Solar PV	1	16-04-14
171	Dhar Automotives Private Limited	Madhya Pradesh	Solar PV	1.25	16-04-14
172	Narmada Switchgear Private Limited	Madhya Pradesh	Solar PV	2	16-04-14
173	Eastman International	Madhya Pradesh	Solar PV	2	22-04-14
174	Dharampal Premchand Limited	Madhya Pradesh	Solar PV	1.25	25-04-14
175	J.K. Minerals	Madhya Pradesh	Solar PV	0.63	25-04-14
176	Seattle Power Solutions Private Limited	Madhya Pradesh	Solar PV	0.63	25-04-14
177	Shriji Polymers (India) Limited	Madhya Pradesh	Solar PV	1	25-04-14
178	SKP Bearing Industries	Madhya Pradesh	Solar PV	0.63	25-04-14
179	Agromet India	Madhya Pradesh	Solar PV	1.25	28-04-14
180	Eastman International	Madhya Pradesh	Solar PV	3	28-04-14
181	Hue Green Energy	Madhya Pradesh	Solar PV	2	28-04-14
182	Friends Salt Works & Allied Industries	Madhya Pradesh	Solar PV	6	30-04-14
183	Friends Salt Works & Allied Industries	Madhya Pradesh	Solar PV	6	30-04-14
184	Kandla Agro & Chemicals Private Limited	Madhya Pradesh	Solar PV	2	01-05-14
185	KRBL Limited	Madhya Pradesh	Solar PV	5.6	01-05-14
186	Oswal Salt & Chemical Industries	Madhya Pradesh	Solar PV	2.5	01-05-14
187	M/S Vivaan Solar Private Limited	Madhya Pradesh	Solar PV	2.4	02-05-14
188	Porwal Auto Components Limited	Madhya Pradesh	Solar PV	1.5	05-05-14
189	Shriji Polymers (India) Limited	Madhya Pradesh	Solar PV	2	31-10-14
190	Aditya Marine Limited	Madhya Pradesh	Solar PV	0.6	13-04-15

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
191	Anand Laddha	Madhya Pradesh	Solar PV	0.2	13-04-15
192	Gujarat Ambuja Exports Limited	Madhya Pradesh	Solar PV	1	15-04-15
193	Vijay Dhirajlal Gandhi	Madhya Pradesh	Solar PV	0.5	15-04-15
194	Atul Sharma	Madhya Pradesh	Solar PV	1.25	20-04-15
195	Avon Cycles Limited	Madhya Pradesh	Solar PV	0.63	01-05-15
196	Narmada Switchgear Private Limited	Madhya Pradesh	Solar PV	2	01-05-15
197	Manas Power and Infrastructure	Madhya Pradesh	Solar PV	1	19-05-15
198	Adhya Renewable Energy	Madhya Pradesh	Solar PV	2	02-11-15
199	Dharampal Premchand Limited	Madhya Pradesh	Solar PV	5	02-11-15
200	Harsh Renewable Energy	Madhya Pradesh	Solar PV	0.63	02-11-15
201	Aditya Marine Limited	Madhya Pradesh	Solar PV	1	11-03-16
202	Avon Cycles Limited	Madhya Pradesh	Solar PV	1	08-04-16
203	Cicago Commodities Private Limited	Madhya Pradesh	Solar PV	1	08-04-16
204	Paharimata Commodities Private Limited	Madhya Pradesh	Solar PV	0.5	08-04-16
205	Sunrays Solar Energy System Private Limited	Madhya Pradesh	Solar PV	0.63	08-04-16
206	Trbex Impex Private Limited	Madhya Pradesh	Solar PV	1	10-05-16
207	Narmada Switchgear Private Limited	Madhya Pradesh	Solar PV	3	17-05-16
208	Friends Salt Works & Allied Industries	Madhya Pradesh	Solar PV	6	27-05-16
209	Friends Salt Works & Allied Industries	Madhya Pradesh	Solar PV	6	27-05-16
210	Makson Healthcare Private Limited	Madhya Pradesh	Solar PV	0.63	27-05-16
211	Shriji Polymers (India) Limited	Madhya Pradesh	Solar PV	1	27-05-16
212	Eastman International	Madhya Pradesh	Solar PV	4	03-06-16
213	Seattle Power Solutions Private Limited	Madhya Pradesh	Solar PV	0.63	03-06-16
214	Eastman International	Madhya Pradesh	Solar PV	10	08-06-16
215	Vippy Industries Limited	Madhya Pradesh	Solar PV	1	27-06-16
216	HEG Limited	Madhya Pradesh	Small Hydro	13.5	15-12-17
217	Navalakha Translines	Maharashtra	Wind	1	14-03-11
218	Navalakha Translines	Maharashtra	Wind	2.1	14-03-11
219	Bajaj Finserv Limited	Maharashtra	Wind	9.8	17-03-11
220	Bajaj Finserv Limited	Maharashtra	Wind	10	17-03-11
221	Bajaj Finserv Limited	Maharashtra	Wind	9.8	17-03-11
222	Bajaj Finserv Limited	Maharashtra	Wind	9.8	17-03-11
223	Bajaj Finserv Limited	Maharashtra	Wind	9.8	17-03-11
224	Bajaj Finserv Limited	Maharashtra	Wind	6	17-03-11
225	Bajaj Finserv Limited	Maharashtra	Wind	10	29-03-11
226	Shree Tatyasaheb Kore Warana Sahakari Navshakti Nirman Sanstha Limited	Maharashtra	Small Hydro	2	01-04-11
227	Shree Tatyasaheb Kore Warana Sahakari Navshakti Nirman Sanstha Limited	Maharashtra	Small Hydro	2.5	01-04-11
228	Shree Tatyasaheb Kore Warana Sahakari Navshakti Nirman Sanstha Limited	Maharashtra	Small Hydro	1.5	01-04-11
229	Vindhyachal Hydro Power Private Limited	Maharashtra	Small Hydro	3	08-04-11

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
230	Vindhyachal Hydro Power Private Limited	Maharashtra	Small Hydro	3	08-04-11
231	Gangamai Industries and Constructions Limited	Maharashtra	Wind	1.25	14-06-11
232	Serum Institute of India Limited	Maharashtra	Wind	4	30-06-11
233	Serum Institute of India Limited	Maharashtra	Wind	21	30-06-11
234	Serum Institute of India Limited	Maharashtra	Wind	10.5	30-06-11
235	Siddhayu Ayurvedic Research Foundation Private Limited	Maharashtra	Wind	3.75	30-06-11
236	Siddhayu Ayurvedic Research Foundation Private Limited	Maharashtra	Wind	3.6	30-06-11
237	Siddhayu Ayurvedic Research Foundation Private Limited	Maharashtra	Wind	4.25	30-06-11
238	M/S. Wind World (India) Limited	Maharashtra	Wind	8.4	15-07-11
239	M/S. Wind World (India) Limited	Maharashtra	Wind	12.6	15-07-11
240	BF Utilities Limited	Maharashtra	Wind	2.07	19-07-11
241	BF Utilities Limited	Maharashtra	Wind	6.9	19-07-11
242	BF Utilities Limited	Maharashtra	Wind	2.76	19-07-11
243	BF Utilities Limited	Maharashtra	Wind	6.6	19-07-11
244	Savita Oil Technologies Limited	Maharashtra	Wind	1.5	29-07-11
245	Savita Oil Technologies Limited	Maharashtra	Wind	0.75	29-07-11
246	Savita Oil Technologies Limited	Maharashtra	Wind	0.75	29-07-11
247	Jaychandra Agro Ind. Private Limited	Maharashtra	Wind	0.6	12-08-11
248	J M Industries	Maharashtra	Wind	0.8	19-08-11
249	M/S Dhariwal Industries Private Limited	Maharashtra	Wind	5.25	25-08-11
250	M/S.Dhariwal Industries Private Limited	Maharashtra	Wind	1.75	25-08-11
251	Pudumjee Pulp & Paper Mills Limited	Maharashtra	Wind	1.25	29-08-11
252	Pudumjee Pulp & Paper Mills Limited	Maharashtra	Wind	1.25	29-08-11
253	Deccan Industrial Explosive Private Limited	Maharashtra	Wind	0.35	30-08-11
254	M/S.Dhariwal Industries Private Limited	Maharashtra	Wind	3.15	30-08-11
255	Peethambra Granites Private Limited	Maharashtra	Wind	2.5	13-09-11
256	Abhay Shah	Maharashtra	Wind	0.35	24-09-11
257	Advik Hi-Tech Private Limited	Maharashtra	Wind	1.25	24-09-11
258	Karma Energy Limited	Maharashtra	Wind	4.5	24-09-11
259	Karma Energy Limited	Maharashtra	Wind	4.5	24-09-11
260	Sai Service Private Limited	Maharashtra	Wind	1.25	24-09-11
261	Sai Service Private Limited	Maharashtra	Wind	1.5	24-09-11
262	Weizmann Limited	Maharashtra	Wind	4.5	24-09-11
263	Weizmann Limited	Maharashtra	Wind	4.5	24-09-11
264	Advik Hi-Tech Private Limited	Maharashtra	Wind	1.5	30-09-11
265	Sharada Erectors Private Limited	Maharashtra	Wind	1.4	30-09-11
266	Sharada Erectors Private Limited	Maharashtra	Wind	1.4	30-09-11
267	Siddhayu Ayurvedic Research Foundation Private Limited	Maharashtra	Wind	1.25	24-10-11

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
268	D. J. Malpani	Maharashtra	Wind	2.5	02-11-11
269	Giriraj Enterprises	Maharashtra	Wind	2.5	02-11-11
270	Giriraj Enterprises	Maharashtra	Wind	3	02-11-11
271	M/S D. J. Malpani	Maharashtra	Wind	3	02-11-11
272	Gandhi & Associates	Maharashtra	Wind	1.25	18-11-11
273	M/S Gandhi & Associates	Maharashtra	Wind	1.25	18-11-11
274	M/S. Sun-N-Sand Hotels(Shirdi) Private Limited	Maharashtra	Wind	1	18-11-11
275	M/S. Sun-N-Sand Hotels Private Limited	Maharashtra	Wind	2	22-11-11
276	Chaphalkar Brothers	Maharashtra	Wind	1.25	24-11-11
277	Chaphalkar Brothers	Maharashtra	Wind	1.25	24-11-11
278	R. M. Mohite Industries Limited	Maharashtra	Small Hydro	10	24-11-11
279	M/S Persistent Systems Limited	Maharashtra	Wind	2.1	25-11-11
280	The Tata Power Company Limited	Maharashtra	Wind	8	25-11-11
281	The Tata Power Company Limited	Maharashtra	Wind	9	25-11-11
282	Surana Ventures Limited	Maharashtra	Wind	1.65	30-11-11
283	M/S Shrirang Kisanlal Sarda	Maharashtra	Wind	2	01-12-11
284	M/S. D.J. Malpani	Maharashtra	Wind	1.75	01-12-11
285	M/S. Sun-N-Sand Hotels Private Limited	Maharashtra	Wind	1.2	16-12-11
286	Kirloskar Industries Limited	Maharashtra	Wind	5.6	28-12-11
287	Shirke Infrastructure	Maharashtra	Wind	1.5	28-12-11
288	Siddharth Properties	Maharashtra	Wind	1.25	30-12-11
289	Serum Institute Of India Limited	Maharashtra	Wind	2.1	02-01-12
290	Osho Developers	Maharashtra	Wind	1.5	09-01-12
291	M/S. Olam Agro India Private Limited	Maharashtra	Bio-fuel cogeneration	4.775	11-01-12
292	Uday Joshi & Associates	Maharashtra	Wind	1.25	13-01-12
293	ICC Realty [India] Private Limited	Maharashtra	Wind	6	20-01-12
294	Shree Siddhivinayak Cotspin Private Limited	Maharashtra	Wind	1.25	27-01-12
295	Ajeet Seeds Limited	Maharashtra	Wind	1.25	02-02-12
296	Ajeet Seeds Limited	Maharashtra	Wind	1.25	02-02-12
297	Metaltek Techno Project (I) Private Limited	Maharashtra	Wind	0.8	09-02-12
298	ICC Realty [India] Private Limited	Maharashtra	Wind	2	17-02-12
299	Jagadish. P. Deshpande	Maharashtra	Wind	0.8	28-02-12
300	M/S Ts Wind Power Developers	Maharashtra	Wind	3	28-02-12
301	Nav Gases And Chemicals	Maharashtra	Wind	1.5	28-02-12
302	Navalakha Translines	Maharashtra	Wind	1.5	02-03-12
303	Shri Dnyaneshwar Sahakari Sakhar Karkhana Limited	Maharashtra	Biomass	4.5	05-03-12
304	M/S Ideal Detonators Private Limited	Maharashtra	Wind	1.5	06-03-12
305	Shalimar Hotel Private Limited	Maharashtra	Wind	0.8	13-03-12
306	M/S.Dhariwal Industries Private Limited	Maharashtra	Wind	7	14-03-12

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
307	Medilink Services	Maharashtra	Wind	1.5	23-03-12
308	Shree Siddhivinayak Cotspin Private Limited	Maharashtra	Wind	1.25	02-04-12
309	Ashok Iron Works Private Limited	Maharashtra	Wind	1.25	20-04-12
310	M/S B.G. Chitale	Maharashtra	Wind	1.25	20-04-12
311	ITC Limited	Maharashtra	Wind	2.1	04-05-12
312	ITC Limited	Maharashtra	Wind	2.1	04-05-12
313	ITC Limited	Maharashtra	Wind	2.1	04-05-12
314	Jagadish. P. Deshpande	Maharashtra	Wind	0.8	08-05-12
315	Mula Sahakari Sakhar Karkhana Limited, Sonai	Maharashtra	Biomass	7.5	11-05-12
316	ADCC Infocad Private Limited	Maharashtra	Wind	1.25	15-05-12
317	Gangamai Industries & Constructions Limited	Maharashtra	Bio-fuel cogeneration	6	18-05-12
318	Jain Irrigation Systems Limited,	Maharashtra	Solar PV	8.5	22-05-12
319	Om Horizon Infrastructure	Maharashtra	Wind	0.85	24-05-12
320	Menon & Menon Limited	Maharashtra	Wind	1.25	30-05-12
321	Samarth Sahakari Sakhar Karkhana Limited	Maharashtra	Biomass	5	19-06-12
322	Shri Charbhuj Sales Corporation	Maharashtra	Wind	0.35	22-06-12
323	Jaibalaji Business Corporation Private Limited	Maharashtra	Solar PV	1	25-06-12
324	Giriraj Enterprises	Maharashtra	Wind	10	10-07-12
325	Sanjay D. Ghodawat HUF	Maharashtra	Wind	0.35	10-07-12
326	D J Malpani	Maharashtra	Wind	4.25	16-07-12
327	Ghodawat Energy Private Limited	Maharashtra	Wind	0.69	19-07-12
328	Ghodawat Energy Private Limited	Maharashtra	Wind	1.38	19-07-12
329	Ghodawat Energy Private Limited	Maharashtra	Wind	1.38	19-07-12
330	Ghodawat Energy Private Limited	Maharashtra	Wind	0.35	19-07-12
331	Shirke Infrastructure	Maharashtra	Wind	1.5	20-07-12
332	P.G. Mercantile Private Limited	Maharashtra	Wind	2	09-08-12
333	Ushdev International Limited	Maharashtra	Wind	8	03-09-12
334	Vikas Sahakari Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	7.64	13-09-12
335	Vitthalrao Shinde Sahakari Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	7.76	20-09-12
336	Purna Sahakari Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	2.37	16-10-12
337	Shreenath Mhaskoba Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	4.545	26-10-12
338	Sonhira Sahakari Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	6.5	26-10-12
339	Vishwasrao Naik S. S.K. Limited	Maharashtra	Bio-fuel cogeneration	2	06-11-12
340	City Corporation Limited	Maharashtra	Wind	1.7	05-02-13
341	Sanjay D. Ghodawat HUF	Maharashtra	Wind	0.23	14-03-13
342	Giriraj Enterprises	Maharashtra	Solar PV	6.65	03-04-13
343	Meru Industries	Maharashtra	Wind	2.5	08-04-13
344	M/S Dhar Automotives Private Limited	Maharashtra	Wind	1	29-04-13
345	M/S Dhar Automotives Private Limited	Maharashtra	Wind	1	29-04-13

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
346	M/S S. K. Oil Industries	Maharashtra	Wind	0.225	29-04-13
347	M/S V.H. Aparadh Hotels Private Limited	Maharashtra	Wind	0.5	29-04-13
348	M/S Ratnaparkhe Construction	Maharashtra	Wind	0.225	06-05-13
349	Vikram Tea Processor Private Limited	Maharashtra	Solar PV	1	15-05-13
350	New Patel Saw Mill	Maharashtra	Solar PV	1	23-05-13
351	Dr. D. H. Patel	Maharashtra	Solar PV	1	27-05-13
352	Patel Wood Syndicate	Maharashtra	Solar PV	1	27-05-13
353	Serum Institute of India Limited	Maharashtra	Wind	6.3	29-05-13
354	Serum Institute of India Limited	Maharashtra	Wind	2.1	29-05-13
355	Accesset Ventures	Maharashtra	Solar PV	2	12-06-13
356	Hotel Golden Emerald	Maharashtra	Solar PV	1	12-06-13
357	M/S J.M. Industries	Maharashtra	Solar PV	1	12-06-13
358	Medilink Services	Maharashtra	Solar PV	1	12-06-13
359	Nav Gases and Chemicals	Maharashtra	Solar PV	1	12-06-13
360	Navalakha Translines	Maharashtra	Solar PV	1	12-06-13
361	Ts Wind Power Developers	Maharashtra	Solar PV	1	28-06-13
362	Siddhanath Sugar Mills Limited	Maharashtra	Bio-fuel cogeneration	2	20-08-13
363	The Tata Power Company Limited	Maharashtra	Wind	5.25	28-08-13
364	The Tata Power Company Limited	Maharashtra	Wind	7.35	29-08-13
365	The Tata Power Company Limited	Maharashtra	Wind	7.35	29-08-13
366	The Tata Power Company Limited	Maharashtra	Wind	1	29-08-13
367	Vitthal Corporation Limited	Maharashtra	Bio-fuel cogeneration	5	17-09-13
368	Chaphalkar Brothers Pune	Maharashtra	Solar PV	1.2	28-10-13
369	Hotel Leelaventure Limited	Maharashtra	Wind	4.5	28-10-13
370	Saidpur Jute Co. Limited	Maharashtra	Solar PV	0.6	28-10-13
371	Shri Shankar Sahakari Sakhar Karkhana Limited Sadashivnagar	Maharashtra	Bio-fuel cogeneration	2.673	28-10-13
372	Govindram Shobharam & Co.	Maharashtra	Solar PV	0.6	30-10-13
373	Parekh Medisales Private Limited	Maharashtra	Solar PV	0.6	30-10-13
374	Saraswati Industries	Maharashtra	Solar PV	0.6	30-10-13
375	Agrawal Minerals (Goa) Private Limited	Maharashtra	Solar PV	4	06-11-13
376	Hemant Group	Maharashtra	Solar PV	1.2	06-11-13
377	The Malegaon Sahakari Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	6.3	06-11-13
378	Bothara Agro Equipments Private Limited	Maharashtra	Solar PV	1	11-11-13
379	Patodia Forgings & Gears Limited	Maharashtra	Solar PV	0.6	11-11-13
380	Persistent Systems Limited	Maharashtra	Wind	2.1	13-11-13
381	VVF Limited	Maharashtra	Wind	3.5	20-11-13
382	Gurudnyanankit Energy Private Limited	Maharashtra	Solar PV	0.6	21-11-13
383	ITC Limited	Maharashtra	Wind	6	25-11-13
384	Bharat Forge Limited	Maharashtra	Wind	4	02-12-13

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
385	Liberty Oil Mills Limited	Maharashtra	Wind	2.4	18-12-13
386	Sarla Performance Fibers Limited	Maharashtra	Wind	4	18-12-13
387	Star Flexi Pack Industries	Maharashtra	Wind	0.23	15-01-14
388	Star Flexi Pack Industries	Maharashtra	Wind	0.23	15-01-14
389	Topaz Investments Private Limited	Maharashtra	Wind	1.65	15-01-14
390	Gangadhar Narsingdas Agrawal	Maharashtra	Solar PV	1	03-02-14
391	Daksha Infrastructure Private Limited	Maharashtra	Solar PV	2	11-02-14
392	Suma Shilp Limited	Maharashtra	Solar PV	2.4	11-02-14
393	Advik Hi-Tech Private Limited	Maharashtra	Solar PV	0.6	12-02-14
394	Standard Greases Private Limited	Maharashtra	Wind	0.35	18-02-14
395	Khuda Gawah Investements Private Limited	Maharashtra	Wind	0.35	21-02-14
396	Nalini Properties Private Limited	Maharashtra	Wind	0.35	21-02-14
397	Emerson Climate Technologies (India) Limited	Maharashtra	Wind	2.4	25-02-14
398	Juniper Hotels Private Limited	Maharashtra	Wind	2	28-02-14
399	Sable Waghire And Company Private Limited	Maharashtra	Wind	0.35	28-02-14
400	B. G. Shirke Construction Technology Private Limited	Maharashtra	Wind	1.75	07-03-14
401	Ghodawat Energy Private Limited	Maharashtra	Wind	0.23	26-03-14
402	Ghodawat Energy Private Limited	Maharashtra	Wind	0.35	26-03-14
403	Ghodawat Energy Private Limited	Maharashtra	Wind	3.5	26-03-14
404	M/S Z F Steering Gear (India) Limited	Maharashtra	Wind	5	26-03-14
405	M/S Z F Steering Gear (India) Limited	Maharashtra	Wind	1	26-03-14
406	Ghodawat Energy Private Limited	Maharashtra	Wind	4.9	07-04-14
407	Pooja Renewable Energy Private Limited	Maharashtra	Solar PV	0.7	18-04-14
408	Varroc Engineering Private Limited	Maharashtra	Solar PV	5	18-04-14
409	Gaurav Agro Pipes	Maharashtra	Solar PV	1	22-04-14
410	Klassic Wheels Private Limited	Maharashtra	Solar PV	1	22-04-14
411	Paras Pvc Pipes & Fittings Private Limited	Maharashtra	Solar PV	0.6	22-04-14
412	Triveni Sangam Holdings & Trading Co. Private Limited	Maharashtra	Solar PV	1.2	22-04-14
413	Kisan Veer Satara Sahakari Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	6.98	06-05-14
414	Navalakha Translines	Maharashtra	Solar PV	2	16-05-14
415	Finolex Cables Limited	Maharashtra	Solar PV	5	19-05-14
416	Emerson Climate Technologies (India) Limited	Maharashtra	Wind	0.6	23-05-14
417	Serum Institute of India Limited	Maharashtra	Wind	4.2	23-05-14
418	Serum Institute of India Limited	Maharashtra	Wind	6.3	23-05-14
419	Emerson Climate Technologies (India) Limited	Maharashtra	Wind	0.46	30-05-14
420	Global Metal & Energy Private Limited	Maharashtra	Wind	1.7	21-10-14
421	Global Metal & Energy Private Limited	Maharashtra	Wind	0.85	21-10-14
422	Paranjape Autocast Private Limited	Maharashtra	Wind	0.23	11-11-14
423	Paranjape Autocast Private Limited	Maharashtra	Wind	0.23	11-11-14

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
424	Shri Dudhganga Vedganga Sahakari Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	12.186	11-11-14
425	UNI Deritend Limited	Maharashtra	Wind	2.4	14-11-14
426	Majalgaon Sahakari Sakhar Karkhana Limited	Maharashtra	Biomass	6	01-12-14
427	Akshay Enterprises	Maharashtra	Solar PV	1	08-12-14
428	Baramati Agro Limited	Maharashtra	Bio-fuel cogeneration	5.66	12-12-14
429	Caspro Metal Industries Private Limited	Maharashtra	Solar PV	0.8	02-01-15
430	Chhatrapati Sambhaji Raje Sakhar Udyog Limited	Maharashtra	Bio-fuel cogeneration	3	02-01-15
431	Mazda Colours Limited	Maharashtra	Wind	1.25	02-01-15
432	Hemant Group	Maharashtra	Solar PV	1.2	07-01-15
433	Shree Tatyasaheb Kore Warana Sahakari Navshakti Nirman Sanstha Limited	Maharashtra	Small Hydro	2.5	07-01-15
434	Zenith Industrial Rubber Products Private Limited	Maharashtra	Solar PV	0.57	07-01-15
435	M/S B G Chitale	Maharashtra	Wind	1.2	09-01-15
436	M/S Vikasratna V. D. M. S. S. K. Limited	Maharashtra	Bio-fuel cogeneration	7.2	09-01-15
437	Uma Corporation	Maharashtra	Solar PV	1	22-01-15
438	Lokmat Media Private Limited	Maharashtra	Solar PV	0.324	30-01-15
439	Urkankur Shree Datta Power Company Limited	Maharashtra	Bio-fuel cogeneration	16.754	06-02-15
440	Urkankur Shree Tatyasaheb Kore Warana Power Company Limited	Maharashtra	Bio-fuel cogeneration	25.259	06-02-15
441	M/S Modern India Limited	Maharashtra	Solar PV	3	12-02-15
442	M/S Morris Energy Limited	Maharashtra	Solar PV	2	12-02-15
443	RYB Power Electricals Private Limited	Maharashtra	Solar PV	1	27-02-15
444	Lokmat Media Private Limited	Maharashtra	Solar PV	0.258	26-03-15
445	Savita Oil Technologies Limited	Maharashtra	Wind	1.05	20-04-15
446	Gadre Marine Export Private Limited	Maharashtra	Wind	1.25	31-12-15
447	Kasturi Foundry Private Limited	Maharashtra	Solar PV	1	31-12-15
448	Siporex India Private Limited	Maharashtra	Wind	0.5	05-01-16
449	Krishna Valley Power Private Limited	Maharashtra	Small Hydro	1	13-01-16
450	Sahyadri Renewable Energy Private Limited	Maharashtra	Small Hydro	1.5	13-01-16
451	Nipur Chemicals Limited	Maharashtra	Solar PV	1	05-02-16
452	Rashtriya Chemicals and Fertilizers Limited	Maharashtra	Solar PV	2	05-02-16
453	Shirke Infrastructure	Maharashtra	Wind	0.75	24-02-16
454	Shirke Recreation Enterprises	Maharashtra	Wind	2	24-02-16
455	The Saswad Mali Sugar Factory Limited	Maharashtra	Bio-fuel cogeneration	12.056	24-02-16
456	Metalman Auto Private Limited	Maharashtra	Solar PV	1	04-03-16
457	Ushdev Engitech Limited	Maharashtra	Wind	1	07-03-16
458	Ushdev Engitech Limited	Maharashtra	Wind	2.8	07-03-16
459	Udagiri Sugar & Power Limited	Maharashtra	Biomass	4.5	09-03-16
460	Jagruti Sugar & Allied Industries Limited	Maharashtra	Bio-fuel cogeneration	3.6	08-04-16
461	Dalmia Bharat Sugar and Industries Limited	Maharashtra	Bio-fuel cogeneration	13.225	23-05-16
462	Shri Ambalika Sugar Private Limited	Maharashtra	Bio-fuel cogeneration	5.587	02-06-16

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
463	ED Steels Private Limited	Maharashtra	Solar PV	1	24-06-16
464	Ashok Sahakari Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	4.558	29-06-16
465	S.M.S.M.P.S.S.K. Limited	Maharashtra	Bio-fuel cogeneration	25.124	29-06-16
466	Indreshwar Sugar Mills Limited	Maharashtra	Bio-fuel cogeneration	3.27	30-06-16
467	Neera Bhima Sahakari Sakhar Karkhana Limited	Maharashtra	Bio-fuel cogeneration	6.027	30-06-16
468	NSL Sugars Limited Unit Iii Jay Mahesh	Maharashtra	Bio-fuel cogeneration	12.5	30-06-16
469	Sahakarmaharshi Bhausaheb Thorat SSKL, Amrutnagar	Maharashtra	Bio-fuel cogeneration	8.75	30-06-16
470	Swaraj India Agro Limited	Maharashtra	Bio-fuel cogeneration	6.36	30-06-16
471	Namrata Services	Maharashtra	Solar PV	2	19-07-16
472	S. R. Thorat Milk Products Private Limited	Maharashtra	Solar PV	2	23-01-17
473	S. R. Thorat Milk Products Private Limited	Maharashtra	Solar PV	3	23-01-17
474	Gaurav Agro Pipes	Maharashtra	Solar PV	1	21-02-17
475	Madhav Vasistha Hydro Power Private Limited	Maharashtra	Small Hydro	4.5	03-03-17
476	Manikanchan Solar Park	Maharashtra	Solar PV	1	09-03-17
477	Yash Promotors & Builders	Maharashtra	Solar PV	1	25-04-17
478	H & L Energy Solutions	Maharashtra	Solar PV	1	17-05-17
479	Nav Gases and Chemicals	Maharashtra	Solar PV	1	17-05-17
480	Hemant Group	Maharashtra	Solar PV	0.6	23-05-17
481	M/S Morries Energy Limited	Maharashtra	Solar PV	3	03-01-18
482	M/S. D. J. Malpani	Maharashtra	Wind	0.7	23-03-18
483	M/S. D. J. Malpani	Maharashtra	Wind	0.7	23-03-18
484	Panama Solar Energy Godawari Private Limited	Maharashtra	Solar PV	5	23-03-18
485	OCL India Limited	Odisha	Solar PV	2.5	20-05-13
486	J. K. Paper Mills	Odisha	Biomass	25	05-09-13
487	Mahanadi Coalfields Limited	Odisha	Solar PV	2	14-11-14
488	K I S S	Odisha	Solar PV	0.5	06-11-15
489	Satia Industries Limited	Punjab	Biomass	10	01-02-13
490	NV Distilleries & Breweries Private Limited	Punjab	Bio-fuel cogeneration	4.67	07-08-15
491	M/S.Dhariwal Industries Private Limited	Rajasthan	Wind	8.4	30-05-11
492	Tarini Minerals (P) Limited	Rajasthan	Wind	6	18-11-11
493	Altrade Minerals Private Limited	Rajasthan	Wind	3	24-11-11
494	Tarini Minerals (P) Limited	Rajasthan	Wind	3	30-11-11
495	Paharpur Cooling Towers Limited	Rajasthan	Wind	6.3	13-03-12
496	M/S. Indrani Patnaik	Rajasthan	Wind	15	29-03-12
497	Kanoria Chemicals & Industries Limited	Rajasthan	Solar PV	5	20-04-12
498	National Engineering Industries Limited	Rajasthan	Wind	1.25	19-06-12
499	M/S HIL Limited	Rajasthan	Wind	2.5	30-07-12
500	Sagar Powertex Private Limited	Rajasthan	Wind	1.25	26-09-12
501	Impact Solar Power Private Limited	Rajasthan	Solar PV	1.5	25-02-13

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
502	Giriraj Enterprises	Rajasthan	Solar PV	19	21-03-13
503	Giriraj Enterprises	Rajasthan	Solar PV	11	21-03-13
504	Giriraj Enterprises	Rajasthan	Solar PV	3	21-03-13
505	BMD Private Limited	Rajasthan	Solar PV	5	01-04-13
506	Hasya Enterprises Private Limited	Rajasthan	Solar PV	0.1	02-04-13
507	Chartered Gold Financial Services Private Limited	Rajasthan	Solar PV	0.9	08-04-13
508	D J Malpani	Rajasthan	Solar PV	13	08-04-13
509	Dindayal Commodities Private Limited	Rajasthan	Solar PV	1	08-04-13
510	Lahoti Overseas Limited	Rajasthan	Solar PV	2	08-04-13
511	Aman Home Appliances Private Limited	Rajasthan	Solar PV	1	26-04-13
512	Viney Corporation Private Limited	Rajasthan	Solar PV	1	26-04-13
513	Rajasthan Patrika Private Limited	Rajasthan	Solar PV	2	10-05-13
514	Sanjiv Prakashan	Rajasthan	Solar PV	2	17-05-13
515	Raj Overseas	Rajasthan	Solar PV	1	27-05-13
516	Manidhari Gums and Chemicals (Unit MGC Power)	Rajasthan	Solar PV	1	30-05-13
517	Shri Giriraj Energy Private Limited	Rajasthan	Solar PV	1	31-05-13
518	K C India Limited (Unit Sukhlal Solaire Power)	Rajasthan	Solar PV	3	05-06-13
519	Kishan Gopal Rungta Private Limited	Rajasthan	Solar PV	1	12-06-13
520	CEPCO Industries Private Limited	Rajasthan	Solar PV	1	17-06-13
521	Chandram Solar Power Private Limited	Rajasthan	Solar PV	1	18-06-13
522	Navkar Woollens Private Limited	Rajasthan	Solar PV	1	28-06-13
523	Bikaji Foods International Limited	Rajasthan	Solar PV	0.25	19-07-13
524	National Aluminium Company Limited	Rajasthan	Wind	47.6	10-09-13
525	Jai Mangal Infrapowers Private Limited	Rajasthan	Solar PV	5	26-09-13
526	DESIGNCO	Rajasthan	Solar PV	2	14-10-13
527	Prakash Powers	Rajasthan	Solar PV	1	14-10-13
528	Rajasthan Patrika Private Limited	Rajasthan	Solar PV	5	14-10-13
529	Real Step Infrastructure Private Limited	Rajasthan	Solar PV	0.25	17-10-13
530	Alliance Land Developers Private Limited	Rajasthan	Solar PV	2	24-10-13
531	SOL Energy	Rajasthan	Solar PV	0.5	24-10-13
532	Raj Overseas	Rajasthan	Solar PV	1	30-10-13
533	Lohia Developers (India) Private Limited	Rajasthan	Solar PV	2.5	31-10-13
534	Lohia Gramin Vikas Private Limited	Rajasthan	Solar PV	1	31-10-13
535	Kshitij Synergy Corp (P) Limited	Rajasthan	Solar PV	2.5	06-11-13
536	K C India Limited (Unit Sukhlal Solaire Power)	Rajasthan	Solar PV	2	08-11-13
537	Bhansali International	Rajasthan	Solar PV	1	20-11-13
538	Jai Bharat Gum and Chemicals Limited	Rajasthan	Solar PV	5	20-11-13
539	Jainsons Agrochem Industries	Rajasthan	Solar PV	1	20-11-13
540	Jainsons (India) Industries	Rajasthan	Solar PV	1	20-11-13

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
541	Neelkanth Gum and Chemicals	Rajasthan	Solar PV	3	20-11-13
542	Shree Ram Industries	Rajasthan	Solar PV	5	20-11-13
543	Shri Om Agro Products	Rajasthan	Solar PV	3	20-11-13
544	Suncity Sheets Private Limited	Rajasthan	Solar PV	1	20-11-13
545	Sunita Minechem Industries (Herbal)	Rajasthan	Solar PV	1	20-11-13
546	Suncity Strips and Tubes Private Limited	Rajasthan	Solar PV	1	25-11-13
547	Rajasthan Gum Private Limited	Rajasthan	Solar PV	8	02-12-13
548	Apeiron Renewable Energy Private Limited	Rajasthan	Solar PV	1.25	27-12-13
549	Bharat Power Inc	Rajasthan	Solar PV	2	03-01-14
550	Oswal Woollen Mills Limited	Rajasthan	Solar PV	5	03-01-14
551	JK Lakshmi Cement Limited	Rajasthan	Solar PV	6	15-01-14
552	Royal Electricals	Rajasthan	Solar PV	0.25	11-02-14
553	Saraf Export Palace	Rajasthan	Solar PV	3	11-02-14
554	Autobat Batteries Private Limited	Rajasthan	Solar PV	0.25	13-02-14
555	Sunstone Engineering Industries Private Limited	Rajasthan	Solar PV	0.5	18-02-14
556	U.P. Ceramics And Potteries Private Limited	Rajasthan	Solar PV	2	18-02-14
557	Oil India Limited	Rajasthan	Solar PV	5	21-02-14
558	Saboo Engineers Private Limited	Rajasthan	Solar PV	1	21-03-14
559	Inox Renewables Limited	Rajasthan	Wind	12	06-05-14
560	DESIGNCO	Rajasthan	Solar PV	2.5	16-05-14
561	Murarka Suitings Private Limited	Rajasthan	Solar PV	1	16-05-14
562	Rays Power Experts Private Limited	Rajasthan	Solar PV	1	16-05-14
563	Tect Power Private Limited	Rajasthan	Solar PV	0.25	16-05-14
564	Lohia Gramin Vikas Private Limited	Rajasthan	Solar PV	1	20-05-14
565	Nolaram Dulichand Dal Mills	Rajasthan	Solar PV	2	20-05-14
566	Tirupati Microtech Private Limited	Rajasthan	Solar PV	1	23-05-14
567	Bikaji Foods International Limited	Rajasthan	Solar PV	1	26-05-14
568	Pritam Hospital	Rajasthan	Solar PV	0.25	27-05-14
569	Viney Corporation Private Limited	Rajasthan	Solar PV	1	30-05-14
570	M/S K.K. Enterprises	Rajasthan	Solar PV	0.5	20-06-14
571	Sir Kasturchand Daga Solar Power Inc	Rajasthan	Solar PV	1	20-06-14
572	SNCA Energy & Infrastructure Private Limited	Rajasthan	Solar PV	1	04-07-14
573	Ghodawat Realty Private Limited	Rajasthan	Solar PV	7	16-07-14
574	CEPCO Industries Private Limited	Rajasthan	Solar PV	4	25-07-14
575	Trimex Sands Private Limited	Rajasthan	Solar PV	9	08-08-14
576	Ghodawat Textiles	Rajasthan	Solar PV	1	19-09-14
577	Blow Packaging India Private Limited	Rajasthan	Solar PV	1	16-10-14
578	Sir Kasturchand Daga Solaire Inc	Rajasthan	Solar PV	1	16-10-14
579	Moss Energy Private Limited	Rajasthan	Solar PV	0.1	21-10-14

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
580	DESIGNCO	Rajasthan	Solar PV	2.5	21-11-14
581	Sharma Industries	Rajasthan	Solar PV	2	21-11-14
582	Mayur Dye Chem Intermediates Limited	Rajasthan	Solar PV	2	27-11-14
583	Laxmi Publications Private Limited	Rajasthan	Solar PV	0.5	12-12-14
584	Vyomnath Power	Rajasthan	Solar PV	1	26-12-14
585	Solar Energy Made Easy	Rajasthan	Solar PV	1	07-01-15
586	Solar Power Made Easy	Rajasthan	Solar PV	1	07-01-15
587	Atapi Power	Rajasthan	Solar PV	0.5	20-01-15
588	Rajasthan State Mines & Minerals Limited	Rajasthan	Solar PV	5	30-01-15
589	Hotel Hilltop Palace	Rajasthan	Solar PV	0.5	13-05-15
590	Rajdarshan Hotels Private Limited	Rajasthan	Solar PV	0.5	13-05-15
591	Fluidcon Engineers	Rajasthan	Solar PV	1	14-05-15
592	Naveen Distributors	Rajasthan	Solar PV	0.5	14-05-15
593	Nahar Colours And Coating Limited	Rajasthan	Solar PV	1	08-07-15
594	Orient Glazes Limited	Rajasthan	Solar PV	1	08-07-15
595	Ridhu Solar	Rajasthan	Solar PV	1	06-08-15
596	Oil India Limited	Rajasthan	Solar PV	9	01-04-16
597	Saraf Export Palace	Rajasthan	Solar PV	3	03-06-16
598	Tithal Trading Private Limited	Rajasthan	Solar PV	1	03-06-16
599	National Aluminium Company Limited	Rajasthan	Wind	50	22-09-16
600	Agrawal Trading Company	Rajasthan	Solar PV	1	21-11-16
601	SCNA Energy & Infrastructure Private Limited	Rajasthan	Solar PV	1	07-12-16
602	Hindustan Petroleum Corporation Limited	Rajasthan	Wind	50.4	29-12-16
603	Indian Oil Corporation Limited	Rajasthan	Wind	23.1	20-03-17
604	Indian Oil Corporation Limited	Rajasthan	Wind	25.2	20-03-17
605	NHPC Limited	Rajasthan	Wind	50	23-03-17
606	BG Wind Power Limited	Rajasthan	Wind	20	30-03-17
607	Indian Oil Corporation Limited	Rajasthan	Wind	24	06-04-17
608	Blow Packaging (India) Private Limited	Rajasthan	Solar PV	2	12-04-17
609	Saraf Export Palace	Rajasthan	Solar PV	3	12-04-17
610	Tirupati Microtech Private Limited	Rajasthan	Solar PV	1	12-04-17
611	Naveen Distributors	Rajasthan	Solar PV	1	02-06-17
612	Sunstone Engineering Industries Private Limited	Rajasthan	Wind	0.6	13-06-17
613	Darshan Roadlines Private Limited	Rajasthan	Wind	4	06-10-17
614	Jivraj Tea Limited	Rajasthan	Wind	1.5	18-01-18
615	National Enterprises	Rajasthan	Wind	6	07-02-18
616	RH Prasad And Company Private Limited	Rajasthan	Solar PV	0.25	15-02-18
617	Green Infra BTV Limited	Tamil Nadu	Wind	14.4	02-05-11
618	Ajeya Civil Constructions	Tamil Nadu	Wind	0.8	16-05-11

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
619	Simran Wind Project Limited	Tamil Nadu	Wind	15	08-06-11
620	Simran Wind Project Limited	Tamil Nadu	Wind	8.4	08-06-11
621	Simran Wind Project Limited	Tamil Nadu	Wind	4.5	08-06-11
622	Anu Cashews	Tamil Nadu	Wind	0.8	14-06-11
623	Vaayu (India) Power Corporation Private Limited	Tamil Nadu	Wind	12	17-06-11
624	TVH Energy Resource Private Limited	Tamil Nadu	Wind	15	21-06-11
625	TVH Energy Resource Private Limited	Tamil Nadu	Wind	7.5	07-07-11
626	Annai Constructions	Tamil Nadu	Wind	0.8	19-07-11
627	Simran Wind Project Limited	Tamil Nadu	Wind	16.8	19-07-11
628	Simran Wind Project Limited	Tamil Nadu	Wind	20.7	19-07-11
629	Simran Wind Project Limited	Tamil Nadu	Wind	25.5	19-07-11
630	Weizmann Forex Limited	Tamil Nadu	Wind	3.6	19-07-11
631	Vaayu (India) Power Corporation Private Limited	Tamil Nadu	Wind	16.8	20-07-11
632	Armstrong Spinning Mills Private Limited	Tamil Nadu	Wind	1.5	19-08-11
633	Rangamma Steels and Malleables	Tamil Nadu	Wind	0.6	19-08-11
634	Shiny Knitwear	Tamil Nadu	Wind	0.85	26-08-11
635	Paharpur Cooling Towers Limited	Tamil Nadu	Wind	9.6	29-08-11
636	Grace Infrastructure Private Limited,	Tamil Nadu	Wind	7.5	30-08-11
637	Grace Infrastructure Private Limited,	Tamil Nadu	Wind	4.5	30-08-11
638	Simran Wind Project Limited	Tamil Nadu	Wind	10.5	20-09-11
639	Simran Wind Project Limited	Tamil Nadu	Wind	4.2	13-10-11
640	Synergy Shakthi Renewable Energy Limited	Tamil Nadu	Biomass	10	14-10-11
641	Beta Wind Farm Private Limited	Tamil Nadu	Wind	27.2	08-11-11
642	ETA Powergen Private Limited	Tamil Nadu	Biomass	10	24-11-11
643	Vaibhavxmi Clean Energy LLP	Tamil Nadu	Wind	4.5	24-11-11
644	The Tata Power Company Limited	Tamil Nadu	Wind	21	30-11-11
645	Shriram Powergen Private Limited	Tamil Nadu	Biomass	7.5	09-12-11
646	Savita Oil Technologies Limited	Tamil Nadu	Wind	2.5	14-12-11
647	Savita Oil Technologies Limited	Tamil Nadu	Wind	2.5	14-12-11
648	Vetal Textiles & Electronics Private Limited	Tamil Nadu	Wind	0.85	14-12-11
649	EMPEE Distilleries Limited	Tamil Nadu	Biomass	10	20-12-11
650	Vaibhavxmi Clean Energy LLP	Tamil Nadu	Wind	1.5	20-12-11
651	Gujarat Gems Private Limited	Tamil Nadu	Wind	1.25	22-12-11
652	M/S Morries Energy Limited	Tamil Nadu	Wind	2.1	22-12-11
653	The Tata Power Company Limited	Tamil Nadu	Wind	19.5	28-12-11
654	Beta Wind Farm Private Limited	Tamil Nadu	Wind	9.9	30-12-11
655	BRT Spinners Private Limited	Tamil Nadu	Wind	1.5	30-12-11
656	Global Powertech Equipments Private Limited	Tamil Nadu	Biomass	7.5	30-12-11
657	Simran Wind Project Limited	Tamil Nadu	Wind	6.3	02-01-12

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
658	Shri Renuga Textiles Limited - Unit II	Tamil Nadu	Biomass	4	13-01-12
659	Paharpur Cooling Towers Limited	Tamil Nadu	Wind	5.6	27-01-12
660	Aquasub Engineering	Tamil Nadu	Wind	3	02-02-12
661	Beta Wind Farm Private Limited	Tamil Nadu	Wind	8.25	09-02-12
662	M/S.Sheela Clinic	Tamil Nadu	Wind	1.25	14-02-12
663	Rajasthan Gum Private Limited	Tamil Nadu	Wind	1.5	14-02-12
664	TCP Limited	Tamil Nadu	Biomass	6	17-02-12
665	Frost International Limited	Tamil Nadu	Wind	0.85	23-02-12
666	Frost International Limited	Tamil Nadu	Wind	0.85	23-02-12
667	Frost International Limited	Tamil Nadu	Wind	0.85	23-02-12
668	Hariprasath Textiles Private Limited	Tamil Nadu	Wind	0.85	06-03-12
669	Surana Corporation Limited	Tamil Nadu	Wind	1.5	13-03-12
670	Beta Wind Farm Private Limited	Tamil Nadu	Wind	4.95	15-03-12
671	The Tata Power Company Limited	Tamil Nadu	Wind	9	19-03-12
672	Surana Corporation Limited	Tamil Nadu	Wind	1.25	20-03-12
673	Sri Shanmugavel Mills Private Limited	Tamil Nadu	Wind	0.85	23-03-12
674	SRS Ispatt Private Limited	Tamil Nadu	Wind	0.75	10-04-12
675	Swelect Energy Systems Limited	Tamil Nadu	Solar PV	1.055	10-04-12
676	Natesan Synchrocones Private Limited	Tamil Nadu	Wind	0.6	20-04-12
677	Natesan Synchrocones Private Limited	Tamil Nadu	Wind	0.6	20-04-12
678	GMR Power Infra Limited	Tamil Nadu	Wind	1.25	26-04-12
679	Surana Corporation Limited	Tamil Nadu	Wind	0.75	02-05-12
680	Gail (India) Limited	Tamil Nadu	Wind	24.65	07-05-12
681	Gail (India) Limited	Tamil Nadu	Wind	6.3	07-05-12
682	Gail (India) Limited	Tamil Nadu	Wind	4.2	07-05-12
683	Gail (India) Limited	Tamil Nadu	Wind	25.5	14-05-12
684	Beta Wind Farm Private Limited	Tamil Nadu	Wind	9.9	15-05-12
685	Centex Fabrics- Export Unit	Tamil Nadu	Wind	1.5	18-05-12
686	Oswal Infrastructures & Power (Prop: Oswal Woollen Mills Limited)	Tamil Nadu	Wind	2.1	18-05-12
687	Sivaraj Spinning Mills Private Limited	Tamil Nadu	Wind	1.7	24-05-12
688	Sudhan Spinning Mills Private Limited	Tamil Nadu	Wind	3.4	24-05-12
689	Beta Wind Farm Private Limited	Tamil Nadu	Wind	27	25-05-12
690	PGSD Engineering Llp	Tamil Nadu	Wind	2.5	28-05-12
691	PGSD Engineering Llp	Tamil Nadu	Wind	1	28-05-12
692	Beta Wind Farm Private Limited	Tamil Nadu	Wind	3.6	08-06-12
693	Ratedi Wind Power Private Limited	Tamil Nadu	Wind	12	13-06-12
694	V.R Varadaraj	Tamil Nadu	Wind	0.8	13-06-12
695	Jupiter Knitting Company	Tamil Nadu	Wind	0.85	19-06-12
696	Kasturi Estates Private Limited	Tamil Nadu	Wind	1.5	19-06-12

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
697	RR Associates	Tamil Nadu	Wind	0.25	19-06-12
698	RR Associates	Tamil Nadu	Wind	0.25	19-06-12
699	MM Forgings Limited	Tamil Nadu	Wind	4.2	20-06-12
700	Beta Wind Farm Private Limited	Tamil Nadu	Wind	7.65	22-06-12
701	Aruna Alloy Steels Private Limited	Tamil Nadu	Wind	2	25-06-12
702	M/S Ashok Wind Energy	Tamil Nadu	Wind	0.85	25-06-12
703	Peethambra Granites Private Limited	Tamil Nadu	Wind	0.8	25-06-12
704	Kasturi & Sons Limited	Tamil Nadu	Wind	2.5	29-06-12
705	Neha Sharma	Tamil Nadu	Wind	0.8	29-06-12
706	Atul Sharma	Tamil Nadu	Wind	0.8	10-07-12
707	Green Infra Wind Power Projects Limited	Tamil Nadu	Wind	24	10-07-12
708	Tamra Dhatu Udyog Private Limited	Tamil Nadu	Wind	2.1	10-07-12
709	Jupiter Knitting Company	Tamil Nadu	Wind	0.85	11-07-12
710	Pan India Impex	Tamil Nadu	Wind	0.85	13-07-12
711	Minit Engineers India Private Limited	Tamil Nadu	Wind	0.6	16-07-12
712	PPS Enviro Power Private Limited	Tamil Nadu	Wind	1.2	16-07-12
713	Mr. M. Thiagarajan	Tamil Nadu	Wind	0.75	19-07-12
714	Neha Sharma	Tamil Nadu	Wind	0.8	19-07-12
715	PKPN Spinning Mills (P) Limited	Tamil Nadu	Wind	2	19-07-12
716	Parkkot Maritima Agencies Private Limited	Tamil Nadu	Wind	2.1	20-07-12
717	Theni Guru Krishna Textile Mills (P) Limited	Tamil Nadu	Wind	2	24-07-12
718	JVS Export	Tamil Nadu	Wind	1.25	27-07-12
719	Flow Link Systems Private Limited	Tamil Nadu	Wind	2	02-08-12
720	Dev International	Tamil Nadu	Wind	1.6	07-08-12
721	DM Solar Farm Private Limited	Tamil Nadu	Wind	1.5	09-08-12
722	Salem Shri Krishnaa Construction Compaany (P) Limited	Tamil Nadu	Wind	0.75	09-08-12
723	Promech Industries Private.Limited	Tamil Nadu	Wind	0.6	13-08-12
724	Beta Wind Farm Private Limited	Tamil Nadu	Wind	11.2	22-08-12
725	Loyal Textile Mills Limited	Tamil Nadu	Wind	4	23-08-12
726	Saravana Finance Private Limited	Tamil Nadu	Wind	0.25	04-09-12
727	PGSD Engineering Llp	Tamil Nadu	Wind	1	05-09-12
728	Sree Shyamala Estates	Tamil Nadu	Wind	0.25	13-09-12
729	PPS Enviro Power Private Limited	Tamil Nadu	Wind	4.5	17-09-12
730	Chiranjilal Spinners Private Limited	Tamil Nadu	Wind	0.85	20-09-12
731	Beta Wind Farm Private Limited	Tamil Nadu	Wind	4.8	21-09-12
732	Madras Hardtools Private Limited	Tamil Nadu	Wind	0.5	05-10-12
733	Theni Guru Krishna Textile Mills (P) Limited,	Tamil Nadu	Wind	0.85	07-11-12
734	Rajkumar Impex (P) Limited	Tamil Nadu	Biomass	6	06-12-12
735	Ajeya Civil Constructions	Tamil Nadu	Wind	0.8	07-12-12

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
736	Kasturi & Sons Limited	Tamil Nadu	Wind	0.85	07-12-12
737	Yesskay Renewable Venture Private Limited	Tamil Nadu	Wind	1.5	19-02-13
738	Beta Wind Farm Private Limited	Tamil Nadu	Wind	0.85	20-02-13
739	Beta Wind Farm Private Limited	Tamil Nadu	Wind	3.2	20-02-13
740	Leo Fasteners	Tamil Nadu	Wind	4	20-02-13
741	Annapoorani Yarns	Tamil Nadu	Wind	1	21-02-13
742	Grace Infrastructure Private Limited,	Tamil Nadu	Wind	12	06-03-13
743	Lakshmi Machine Works Limited	Tamil Nadu	Wind	8.85	22-03-13
744	M/S.Mirra And Mirra Industries	Tamil Nadu	Wind	0.25	10-04-13
745	Armstrong Power Systems Private Limited	Tamil Nadu	Wind	1.5	03-05-13
746	Armstrong Power Systems Private Limited	Tamil Nadu	Wind	2.75	10-05-13
747	Beta Wind Farm Private Limited	Tamil Nadu	Wind	4.8	15-05-13
748	Bansal Windmills Private Limited	Tamil Nadu	Wind	4	29-05-13
749	Alpine Knits India (P) Limited	Tamil Nadu	Solar PV	1	30-05-13
750	Opulent Ventures Private Limited	Tamil Nadu	Wind	0.75	18-06-13
751	Free Look Fashions	Tamil Nadu	Solar PV	1	26-06-13
752	Gajaananda Jewellery Mart India Private Limited	Tamil Nadu	Solar PV	1	28-06-13
753	Sathy Silks Private Limited	Tamil Nadu	Solar PV	1	28-06-13
754	Eagle Earth Movers Private Limited	Tamil Nadu	Wind	1.5	01-08-13
755	Eagle Wind Energy Private Limited	Tamil Nadu	Wind	1.5	01-08-13
756	Kala Exim Private Limited	Tamil Nadu	Wind	0.25	08-08-13
757	Vaayu Renewable Energy (Tapti) Private Limited	Tamil Nadu	Wind	14.4	27-09-13
758	Beta Wind Farm Private Limited	Tamil Nadu	Wind	6	20-11-13
759	PPS Enviro Power Private Limited	Tamil Nadu	Wind	4	20-11-13
760	JVS Export	Tamil Nadu	Solar PV	5	02-12-13
761	Karur K.C.P. Packagings Limited	Tamil Nadu	Biomass	10	09-12-13
762	TVH Energy Resource Private Limited	Tamil Nadu	Wind	2.1	12-12-13
763	TVH Energy Resource Private Limited	Tamil Nadu	Wind	2.1	12-12-13
764	Cheenu Enterprises	Tamil Nadu	Solar PV	2	13-12-13
765	M M Forgings Limited	Tamil Nadu	Solar PV	1.8	13-12-13
766	Armstrong Spinning Mills Private Limited	Tamil Nadu	Solar PV	1	08-01-14
767	Super Auto Forge Private Limited	Tamil Nadu	Solar PV	1	08-01-14
768	Natesan Precision Components Private Limited	Tamil Nadu	Wind	0.25	09-01-14
769	Tamilnadu Gears and Shafts Corporation	Tamil Nadu	Wind	0.25	09-01-14
770	Sansar Green Energy Private Limited	Tamil Nadu	Wind	0.6	07-02-14
771	Sri Kumarswamy Mineral Exports Private Limited	Tamil Nadu	Wind	10.5	21-02-14
772	The Madras Medical Mission	Tamil Nadu	Wind	1.5	10-03-14
773	Apex Coco and Solar Energy Limited	Tamil Nadu	Solar PV	5	12-03-14
774	Apex Coco and Solar Energy Limited	Tamil Nadu	Solar PV	15	12-03-14

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
775	SRG Apparels Private Limited	Tamil Nadu	Solar PV	1	12-03-14
776	Inox Renewables Limited	Tamil Nadu	Wind	2	04-04-14
777	Bharat Heavy Electricals Limited, Ranipet	Tamil Nadu	Solar PV	5	05-05-14
778	Flow Link Systems Private Limited	Tamil Nadu	Solar PV	1.26	16-05-14
779	Ultra Cosmic Solar Energy Private Limited	Tamil Nadu	Solar PV	1	16-05-14
780	Swelect Energy Systems Limited	Tamil Nadu	Solar PV	10	23-05-14
781	Yajur Energy Solutions Private Limited	Tamil Nadu	Solar PV	1	06-06-14
782	Amex Alloys Private Limited	Tamil Nadu	Solar PV	2	18-06-14
783	KKV Agro Powers Limited	Tamil Nadu	Solar PV	1	25-06-14
784	Sathy Silks Private Limited	Tamil Nadu	Solar PV	1	25-06-14
785	The KTM Jewellery Limited	Tamil Nadu	Solar PV	1	25-06-14
786	Space Textiles Private Limited	Tamil Nadu	Solar PV	1	30-06-14
787	Sri Vinayaga Green Power Generation Private Limited	Tamil Nadu	Solar PV	5	30-06-14
788	Gomathy International	Tamil Nadu	Solar PV	1	04-07-14
789	Mytrah Vayu Manjira Private Limited	Tamil Nadu	Wind	45	04-07-14
790	SCM International Impex P Limited	Tamil Nadu	Solar PV	1	04-07-14
791	Sri Sivajothi Spinning Mills Private Limited	Tamil Nadu	Solar PV	1	16-07-14
792	IM Gears Private Limited	Tamil Nadu	Solar PV	0.9	18-07-14
793	Fab Colours	Tamil Nadu	Solar PV	1	22-07-14
794	Raagam Exports	Tamil Nadu	Solar PV	1	22-07-14
795	Shri Lakshmi Textile Processors	Tamil Nadu	Solar PV	1	24-07-14
796	Sulochana Cotton Spinning Mills Private Limited	Tamil Nadu	Solar PV	2	25-07-14
797	Asian Fabricx Private Limited	Tamil Nadu	Solar PV	3	14-08-14
798	M/S. Lotus Clean Power Venture Private Limited	Tamil Nadu	Wind	18.9	12-09-14
799	K. Subramanian	Tamil Nadu	Solar PV	0.4	31-10-14
800	Naga Limited	Tamil Nadu	Solar PV	0.6	18-11-14
801	Asian Fabricx Private Limited	Tamil Nadu	Solar PV	1.5	17-12-14
802	Sri Kumarswamy Mineral Exports Private Limited	Tamil Nadu	Wind	11.25	26-12-14
803	Asian Fabricx Private Limited	Tamil Nadu	Solar PV	3	07-01-15
804	Karur Sree Rama Trading (P) Limited	Tamil Nadu	Solar PV	1	07-01-15
805	M/S Sri Ranganathar Industries Private Limited - Unit - II	Tamil Nadu	Solar PV	1	30-01-15
806	Ponni Sugars (Erode) Limited	Tamil Nadu	Bio-fuel cogeneration	9.5	19-03-15
807	Siva Electric Generation Private Limited	Tamil Nadu	Wind	0.85	20-05-15
808	IM Gears Private Limited	Tamil Nadu	Solar PV	1	13-08-15
809	Amirthaa Green Infra Private Limited	Tamil Nadu	Solar PV	3	26-08-15
810	Basant Wind Farms Private Limited	Tamil Nadu	Wind	2	26-08-15
811	Basant Wind Farms Private Limited	Tamil Nadu	Wind	0.8	26-08-15
812	Etica Developers Private Limited	Tamil Nadu	Solar PV	1	07-09-15
813	Grace Infrastructure Private Limited	Tamil Nadu	Wind	12	28-09-15

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
814	Super Auto Forge Private Limited	Tamil Nadu	Solar PV	0.9	28-09-15
815	Sei Arjun Power Private Limited	Tamil Nadu	Solar PV	6.3	01-10-15
816	Echanda Urja Private Limited	Tamil Nadu	Wind	18	07-10-15
817	Echanda Urja Private Limited	Tamil Nadu	Wind	12	07-10-15
818	Echanda Urja Private Limited	Tamil Nadu	Wind	6	07-10-15
819	Echanda Urja Private Limited	Tamil Nadu	Wind	13.5	07-10-15
820	Echanda Urja Private Limited	Tamil Nadu	Wind	4.5	07-10-15
821	Echanda Urja Private Limited	Tamil Nadu	Wind	7.5	07-10-15
822	Gayatri Green Power Private Limited	Tamil Nadu	Biomass	10	21-10-15
823	Sakthi Murugan Agro Foods Limited	Tamil Nadu	Solar PV	1	28-10-15
824	Sakthi Murugan Roller Flour Mills Limited	Tamil Nadu	Solar PV	1	28-10-15
825	Grace Infrastructure Private Limited	Tamil Nadu	Wind	7.5	09-12-15
826	R.G.S. Green Power Private Limited	Tamil Nadu	Wind	0.25	23-12-15
827	R.G.S. Green Power Private Limited	Tamil Nadu	Wind	0.75	23-12-15
828	Shri Dhanalakshmi Spintex Private Limited	Tamil Nadu	Wind	12	23-12-15
829	Armstrong Power Systems Private Limited	Tamil Nadu	Wind	1.5	28-12-15
830	Kovai Medical Center and Hospital Limited	Tamil Nadu	Solar PV	4	13-01-16
831	Krishnapoultry Tex Mill (India) Private Limited	Tamil Nadu	Wind	0.6	14-01-16
832	Super Auto Forge Private Limited	Tamil Nadu	Solar PV	0.9	29-01-16
833	GHCL Limited	Tamil Nadu	Wind	4.2	04-03-16
834	Rane TRW Steering Systems Private Limited	Tamil Nadu	Solar PV	1	17-03-16
835	Hindustan Petroleum Corporation Limited	Tamil Nadu	Solar PV	0.258	12-05-16
836	P. Duraisamy Maharaja Rice Mills Private Limited	Tamil Nadu	Solar PV	1	27-05-16
837	Anugraha Fashion Mill Private Limited	Tamil Nadu	Solar PV	1.2	08-06-16
838	GHCL Limited	Tamil Nadu	Wind	2.1	08-06-16
839	Sulochana Cotton Spinning Mills Private Limited	Tamil Nadu	Solar PV	0.5	14-06-16
840	Swelect Green Energy Solutions Private Limited	Tamil Nadu	Solar PV	1	24-06-16
841	Swelect Green Energy Solutions Private Limited	Tamil Nadu	Solar PV	1	24-06-16
842	Vaayu Renewable Energy (Godavari) Private Limited	Tamil Nadu	Wind	5.6	30-06-16
843	Swelect Green Energy Solutions Private Limited	Tamil Nadu	Solar PV	10	08-07-16
844	Rai Bahadur Seth Shreeram Narasingdas Private Limited	Tamil Nadu	Wind	4	08-11-16
845	MGM Green Energy Limited	Tamil Nadu	Wind	3.4	21-11-16
846	MGM Green Energy Limited	Tamil Nadu	Wind	2.1	21-11-16
847	Gajaananda Jewellery Mart India Private Limited	Tamil Nadu	Wind	0.75	29-12-16
848	SRB Consultancy Private Limited	Tamil Nadu	Wind	2.1	27-02-17
849	NAC Jewellers Private Limited	Tamil Nadu	Wind	7.5	20-07-17
850	Poysha Power Generation Private Limited	Tamil Nadu	Wind	7.5	20-07-17
851	Sasi Anand Spinning Mills (India) Private Limited	Tamil Nadu	Wind	0.85	20-07-17
852	Dr. Shanthi Balasubramaniam	Tamil Nadu	Wind	0.25	18-12-17

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
853	M/S.Citron Ecopower Private, Limited	Tamil Nadu	Wind	1.5	20-12-17
854	M/S.Citron Ecopower Private Limited	Tamil Nadu	Wind	7.5	20-12-17
855	Viswaradha Enterprises	Tamil Nadu	Wind	0.25	15-01-18
856	Arhyama Solar Power Private Limited	Telangana	Solar PV	6	14-03-14
857	Bhagyanagar India Limited	Telangana	Solar PV	5	19-03-14
858	Heritage Foods Limited	Telangana	Solar PV	2.04	31-03-14
859	Peritus Corporation Private Limited	Telangana	Solar PV	2	20-04-15
860	Varp Power Private Limited	Telangana	Solar PV	1	08-05-15
861	Visaka Industries Limited	Telangana	Solar PV	2	13-05-15
862	Surana Solar Systems Private Limited	Telangana	Solar PV	4.76	15-10-15
863	Jaya Bharat Energy Private Limited	Telangana	Solar PV	1	16-11-15
864	Halo Energie Private Limited	Telangana	Solar PV	1.89	24-06-16
865	Pennar Industries Limited	Telangana	Solar PV	2.5	30-06-16
866	SNS Starch Limited	Telangana	Biomass	4	30-06-16
867	SLS Power Corporation Limited	Telangana	Small Hydro	24	30-11-17
868	North Eastern Electric Power Corporation Limited	Tripura	Solar PV	4.982	17-03-15
869	Dalmia Bharat Sugar & Industries Limited	Uttar Pradesh	Biomass	10	19-08-11
870	Dalmia Bharat Sugar and Industries Limited	Uttar Pradesh	Biomass	10	19-08-11
871	Dalmia Bharat Sugar & Industries Limited	Uttar Pradesh	Biomass	10	26-08-11
872	L.H. Sugar Factories Limited, Pilibhit	Uttar Pradesh	Biomass	15	29-08-11
873	Parle Biscuits Private Limited (Sugar Division)	Uttar Pradesh	Biomass	9.2	13-09-11
874	Triveni Engineering & Industries Limited Unit Deoband	Uttar Pradesh	Bio-fuel cogeneration	5.83	27-09-11
875	DCM Shriram Limited-Ajbapur	Uttar Pradesh	Bio-fuel cogeneration	14	08-10-11
876	DCM Shriram Limited-Hariawan	Uttar Pradesh	Bio-fuel cogeneration	10	08-10-11
877	DCM Shriram Limited-Loni	Uttar Pradesh	Bio-fuel cogeneration	10	08-10-11
878	Mawana Sugars Limited (Unit: Mawana Sugar Works)	Uttar Pradesh	Biomass	31.5	13-10-11
879	Mawana Sugars Limited (Unit: Titawi Sugar Complex)	Uttar Pradesh	Biomass	22	13-10-11
880	Mawana Sugars Limited (Unit: Nanglamal Sugar Complex)	Uttar Pradesh	Biomass	12.4	13-10-11
881	Wave Industries Private Limited	Uttar Pradesh	Bio-fuel cogeneration	10	11-11-11
882	K.M. Sugar Mills Limited	Uttar Pradesh	Bio-fuel cogeneration	8	18-11-11
883	Usher Eco Power Limited	Uttar Pradesh	Biomass	4	06-05-14
884	Kesar Enterprises Limited	Uttar Pradesh	Biomass	12	15-05-14
885	Uttam Sugar Mills Limited	Uttar Pradesh	Bio-fuel cogeneration	10	01-12-14
886	Novel Sugar Limited	Uttar Pradesh	Bio-fuel cogeneration	4	03-12-14
887	Yadu Sugar Limited	Uttar Pradesh	Bio-fuel cogeneration	7	03-12-14
888	M/S Triveni Engineering & Industries Limited	Uttar Pradesh	Bio-fuel cogeneration	8	12-12-14
889	M/S Triveni Engineering & Industries Limited	Uttar Pradesh	Bio-fuel cogeneration	7	12-12-14
890	DSM SUGAR RAJPURA (A Unit of Dhampur Sugar Mills Limited)	Uttar Pradesh	Bio-fuel cogeneration	7.55	25-06-15

S. No.	Name of RE Projects	State	Source	Capacity (MW)	Date of Registration
891	M/S Gobind Sugar Mills Limited	Uttar Pradesh	Bio-fuel cogeneration	8	23-03-16
892	Triveni Engineering & Industries Limited	Uttar Pradesh	Bio-fuel cogeneration	6	02-06-16
893	India Glycols Limited	Uttar Pradesh	Biomass	4	08-06-16
894	Balrampur Chini Mills Limited	Uttar Pradesh	Bio-fuel cogeneration	5	24-06-16
895	DCM Shriram Industries Limited	Uttar Pradesh	Biomass	24	27-06-16
896	Rana Power Limited	Uttar Pradesh	Bio-fuel cogeneration	9	27-06-16
897	Simbhaoli Power Private Limited, Unit- Simbhaoli,	Uttar Pradesh	Biomass	17	25-10-16
898	Simbhaoli Power Private Limited Unit - Chilwaria	Uttar Pradesh	Biomass	12	25-10-16
899	Mankapur Chini Mills	Uttar Pradesh	Bio-fuel cogeneration	5	16-01-17
900	Siddheshwari Paper Udyog Private Limited	Uttarakhand	Bio-fuel cogeneration	6	11-11-14
901	Bhilangana Hydro Power Limited	Uttarakhand	Small Hydro	24	16-09-15
902	Bahl Paper Mills Limited	Uttarakhand	Bio-fuel cogeneration	4	12-10-15
903	Lakshmi Sugar Mills Company Private Limited	Uttarakhand	Bio-fuel cogeneration	6.6	24-06-16
904	Gujarat Ambuja Exports Limited	Uttarakhand	Bio-fuel cogeneration	0.945	30-06-16
905	Roquette Riddhi Siddhi Private Limited	Uttarakhand	Biomass	10	30-06-16

Annexure-V

18.5 DPE guidelines for CPSEs regarding purchase of RECs

No. 3 (11)/2011-DPE (MOU)
Government of India
Ministry of Heavy Industries & Public Enterprises
Department of Public Enterprises
Web-site : <http://www.dpemou.nic.in/>
E-mail: mou-dpe@nic.in

Public Enterprises Bhavan,
Block No. 14, 3rd Floor,
CGO Complex, Lodhi Road,
New Delhi -110 003
Dated : 19th December, 2011

OFFICE MEMORANDUM

Subject: **Addendum to Guidelines on Sustainable Development for the year 2012-13.**

This has the reference to Sustainable Development Guidelines for the CPSEs issued vide DPE's O.M. No. 3(9)/2010-DPE (MoU) dated 23rd September, 2011 read with Guidelines on MoU between CPSE and Government / Ministry Department for the year 2012-13 issued vide DPE's O.M. No. 3(11)/2011-DPE(MoU) dated 31.10.2011.

The undersigned is directed to inform that following changes / modifications are made in **Sustainable Development / Memorandum of Understanding Guidelines** which may be noted for compliance.

Reference page no.	Existing para / clause / points	To be read as / modified as
3	'Energy Management' under Schedule A	'Energy Management and Promotion of Renewable Energy' under Schedule A
6	Para no. (c) Energy Management: CPSE shall be expected to implement measures to optimize usage of energy and increase energy efficiency throughout the organization, in the form of both fuel and electricity. CPSEs may consult the Bureau of Energy Efficiency's Guidelines on Energy Efficiency while deciding on projects/activities under energy management. Projects / activities related to renewable energy / alternative energy would also be considered under Energy Management.	Para no. (c) Energy Management and Promotion of Renewable Energy. CPSE shall be expected to implement measures to optimize usage of energy and increase energy efficiency throughout the organization, in the form of both fuel and electricity. CPSEs may consult the Bureau of Energy Efficiency's Guidelines on Energy Efficiency while deciding on projects/activities under energy management. Projects / activities related to renewable energy / alternative energy / voluntary procurement of Renewable Energy Certificates (RECs) would also be considered under Energy Management.

7	<p>Para no. (a) Carbon Management:</p> <p>CPSE can implement carbon management measures across its activities and operations in a phased manner. Carbon management measures would include steps to reduce carbon intensity of organizations activities / operations. Projects / activities under carbon management can also be linked to appropriate missions of National Action Plan on Climate Change and / sectoral initiatives such as those by the steel and cement sectors.</p>	<p>Para no. (a) Carbon Management:</p> <p>CPSE can implement carbon management measures across its activities and operations in a phased manner. Carbon management measures would include steps to reduce carbon intensity of organizations activities / operations. Projects / activities under carbon management can also be linked to appropriate missions of National Action Plan on Climate Change and / sectoral initiatives such as those by the steel and cement sectors. <i>CPSEs may purchase RECs to offset their Carbon Footprints.</i></p>
20	<p>Bulletpoint 'Renewable /Cleaner / Alternative Energy Usage' under 'Energy Management' heading.</p>	<p>Bulletpoint 'Renewable / Cleaner / Alternative Energy Usage / Voluntary procurement of Renewable Energy Certificates (RECs)' under heading '<i>Energy Management and Promotion of Renewable Energy</i>'.</p>
25	<p>New Addition</p>	<p>To be added after bulleted points of Energy Management under separate heading as 'Renewable Energy':</p> <ul style="list-style-type: none"> • Renewable Energy <ul style="list-style-type: none"> • Project Objective(s): promote utilization of Renewable Energy. • MPI: Resource allocation for setting up of RE generation projects and / or Voluntary procurement of RECs. • OPI: Percentage of total electricity used from renewable energy either through purchase of RE or RECs.

The addendum to the SD guidelines are in bold, italic, underlined and shaded form and available at DPE's website <http://dpemou.nic.in/> on home page under the heading 'MoU 2012-13'.


 19.12.2011
 (J R Panigrahi)
 Director (MoU)
 Tel.: 011- 2436 0841

To :

1. Secretaries of all Administrative Ministries / Departments
2. Chief Executives of all CPSEs

Annexure- VI

18.6 List of Voluntary Buyers

S. No.	Name of Voluntary Buyer	State	Number of RECs Purchased			Number of times participated in trading of RECs
			Solar	Non-solar	Total	
1	Rural Electrification Corporation Limited	Delhi	0	16,400	16,400	1
2	Power System Operation Corporation Ltd	Delhi	1,854	5,710	7,564	10
3	NMDC LTD	Andhra Pradesh	0	2,500	2,500	1
4	TATA Services Ltd	Maharashtra	0	1,090	1,090	1
5	Security Printing and Mining Corporation of India Ltd	Delhi	0	667	667	1
6	World Bank Country Office	Delhi	0	575	575	1
7	Aditya Birla Fashion and Retail Limited	Karnataka	0	405	405	1
8	Indian Renewable Energy Development Agency Ltd	Delhi	0	100	100	1
9	Rashtriya Ispat Nigam Limited	Andhra Pradesh	0	100	100	1
10	Sierra ODC Private Limited	Tamil Nadu	0	95	95	1
11	Reliance Retail Ltd	Maharashtra	0	71	71	1
12	Ennore Port Ltd	Tamil Nadu	0	66	66	1
13	Kimberly Clark Lever Private Limited	Maharashtra	0	63	63	1
14	Customized Energy Solutions India Pvt Ltd	Maharashtra	2	14	16	4
15	Reconnect Energy Trading	Karnataka	13	0	13	3
16	EKI Energy Services Ltd	Madhya Pradesh	0	11	11	1
17	Aman Taragi	Delhi	1	4	5	1
18	Indian Energy Exchange Ltd	Delhi	0	5	5	1
19	Manikaran Power Ltd.	Jharkhand	0	5	5	1
20	Manikaran Power Trading Ltd.	West Bengal	0	5	5	1
21	Mikhail Harry Dhaul	Maharashtra	1	4	5	1
22	Nikhil Vedprakash	Maharashtra	1	4	5	1
23	Neo Remark Marketing Services LLP Brand Remark	Delhi	0	4	4	3
24	Manikaran Thermal Power Pvt. Ltd.	West Bengal	0	2	2	1
25	Dipanshu Gupta	Delhi	0	1	1	1
26	Sumit Kumar	Bihar	0	1	1	1
		TOTAL	1,872	27,902	29,774	

Annexure- VII

18.7 List of State Agencies for accreditation of the RE projects

S. No.	State Name	Agency Name	Agency Address	Agency Website
1	Andhra Pradesh	AP State Load Dispatch Centre	VIDYUT SOUDHA, Gunadala, Vijayawada, AP- 520004	http://www.aptransco.gov.in
2	Assam	Assam Energy Development Agency	APDCL, Bijulee Bhawan, Paltanbazar, Guwahati-1	www.assamrenewable.org
3	Bihar	Bihar Renewable Energy Development Agency	3rd Floor Sone Bhawan Birchand Patel Path, Patna- 800001	http://www.breda.bih.nic.in
4	Chhattisgarh	Chhattisgarh State Renewable Energy Development Agency	2nd Floor, CSERC Building, Shanti Nagar, Raipur, Raipur- 492001	http://www.credacg.org
5	Dadra & Nagar Haveli	Development and Planning Officer, Administration of DNH	Department of Information Technology, 207,208 Second Floor, Secretariat, 66 KVA Road, Amli, Silvassa – 396230	http://dnh.nic.in/
6	Daman & Diu	Science & Technology Department, Daman	Office of the Principal Scientific Officer, Fort Area, P.O. Moti Daman Pin: 396 220	https://www.daman.nic.in/science-technology.aspx
7	Delhi	Energy Efficiency & Renewable Energy Management Centre	IInd Floor, E-Wing, GPO Building, Vikas Bhawan-II, Civil lines, Delhi- 110054	http://www.environment.delhigovt.nic.in
8	Goa	The Goa Energy Development Agency (GEDA)	Office of the Member Secretary, 5th Floor, Goa -IDC Building ,Patto-Panaji-Goa	http://geda.goa.gov.in
9	Gujarat	Gujarat Energy Development Agency	Block No-11, 4th Floor, Udyog bhavan, Gandhinagar- 382017	http://www.geda.org.in
10	Haryana	Haryana Renewable Energy Development Agency (HAREDA)	Akshay Urja Bhawan, Institutional Plot No.1, Sector 17, Panchkula -134109	http://www.hareda.gov.in
11	Himachal Pradesh	Directorate of Energy (DOE)	Shanti Bhawan, Sector-VI, Phase-III, New-Shimla, Shimla- 171009	http://admis.hp.nic.in/doe
12	Jammu and Kashmir	Jammu & Kashmir Energy Development Agency	Science Technology Department Tawanai Ghar, Iqra Colony, Bemina, Srinagar- 190018	http://www.jakeda.jk.gov.in
13	Jharkhand	Jharkhand Renewable Energy Development Agency	328/B, Road No. 4, Ashok Nagar, Ranchi - 834002	http://www.jreda.com
14	Karnataka	SLDC, KPTCL	28, Race course Cross Road, Bangalore- 560009	http://kptclsldc.com/
15	Kerala	ANERT	PMG - Law College Road Thiruvananthapuram- 695033	http://www.anert.gov.in
16	Madhya Pradesh	MP Urja Vikas Nigam Limited Bhopal	Urja Bhawan, Shivaji Nagar, 5 No. Bus stop, Link Road-2, Bhopal- 462013	www.mprenewable.nic.in
17	Maharashtra	Maharashtra Energy Development Agency (MEDA)	2nd Floor, Mhada Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune – 411006	http://www.mahaurja.com

S. No.	State Name	Agency Name	Agency Address	Agency Website
18	Manipur	Manipur renewable energy development agency	2nd Floor, South Block, Secured Office Complex, A.T Line, Near Hotel Imphal, Imphal-795001	http://manireda.com/
19	Meghalaya	Meghalaya Non-Conventional & Rural Energy Development Agency (MNREDA)	Meghalaya Non-Conventional & Rural Energy, Near BSF Camp, P.O. Mawpat, Shillong- 793012	www.mnreda.gov.in
20	Mizoram	Zoram Energy Development Agency	ZEDA Building, Above 132kV sub station Zuangtui, Aizawl- 796017	https://zeda.mizoram.gov.in
21	Nagaland	Department of New & Renewable Energy, Govt. of Nagaland	Old Industries Office, Upper Chandmari, Kohima- 797001	http://www.nrengl.nic.in
22	Odisha	Orissa Renewable Energy Development Agency	S/59, Mancheswar Industrial Estate, Post-Rasulgarh, Bhubaneswar - 751010	http://www.oredaorissa.com
23	Pondicherry	Renewable Energy Agency Pondicherry (REAP)	REAP, Bunglow No 2, A.F.T Premises, Cuddalore Main Road, Mudaliarpur, Puducherry- 605004	
24	Punjab	Punjab Energy Development Agency	Plot No. 1 & 2, Sector 33D, Chandigarh-160020	http://www.peda.gov.in
25	Rajasthan	Rajasthan Renewable Energy Corporation Limited	E-166, Yudhisthir Marg, C-Scheme Jaipur- 302001	http://www.rrecl.com
26	Tamil Nadu	Tamil Nadu Transmission Corporation Limited (TANTRANSCO), State Load Despatch Centre	144 Anna Salai, Chennai- 600002	http://tneblde.org
27	Telangana	Telangana State Agency (SLDC)	611 A Block, SLDC of the State of Telangana (TSSLDC), TSTRANSCO, Vidyut Soudha, Khairatabad, Hyderabad-500082	http://www.tsslde.in
28	Tripura	Tripura Renewable Energy Development Agency	Vigyan Bhawan, Pandit Nehru Complex, Gorkhabasti, Agartala, West Tripura District, Agartala- 799006	http://www.treda.nic.in
29	Uttar Pradesh	Uttar Pradesh New and Renewable Development Agency	UPNEDA, Vibhuti Khand, Gomti Nagar, Lucknow- 226010	http://neda.up.nic.in
30	Uttarakhand	Uttarakhand Renewable Energy Development Agency (URED)	Energy Park Campus, Industrial Area, Patel Nagar, Dehradun - 248001	http://www.ureda.nic.in
31	West Bengal	West Bengal State Load Despatch Centre	P.O. Danesh Seikh Lane, Howrah- 711109	http://www.wbslde.in

Annexure- VIII

18.8 List of SLDCs which issue EIRs to eligible RE generators

S. No	State Name	Agency Name	Agency Address	Agency Website
1	Andhra Pradesh	AP State Load Dispatch Center	3rd Floor, APSLDC Building, VIDYUT SOUDHA, Gunadala, Vijayawada, AP- 520004	http://www.aptransco.gov.in
2	Assam	State Load Despatch Centre, Assam	SLDC Complex, AEGCL, Kahilipara, Guwahati- 781019	http://www.aegcsldc.org
3	Bihar	SLDC, BSEB, Patna	Bihar State Power Holding Company Limited, Vidyut Bhawan, Jawahar Lal Nehru Marg, Patna- 800021	http://www.bsptcl.in/
4	Chhattisgarh	Chhattisgarh State Load Despatch Centre	C.E(LD), State Load Despatch Centre, CSPTCL, Daganiya-HQ, Raipur, Chhattisgarh, Raipur- 492013	www.sldccg.gov.in
5	Delhi	Delhi, SLDC	33kV, Sub Station Building, Minto Road, New Delhi- 110002	http://www.delhisldc.org
6	Gujarat	SLDC Gotri Vadodara, Gujarat	132kV Gotri s/s compound, Opposite Kalpvruk Complex, Gotri Road, Vadodara, Vadodara- 390021	https://www.sldcguj.com
7	Haryana	Haryana SLDC, HVPNL, Sewah Panipat	XEN/LD & PC, SLDC Complex, Sewah Panipat- 132103	http://www.haryanasldc.org
8	Himachal Pradesh	Shimla	SE (SLDC), HP Load despatch society, SLDC complex, Totu, Shimla- 171011	http://hpsldc.org
9	Jammu and Kashmir	J&K Gladni, Jammu	SLDC Building, 220 kV Grid Station Narwal, Jammu- 180004	http://www.jkpdd.gov.in/
10	Jharkhand	Jharkhand State Electricity Board (JSEB)	Kushai Colony, Doranda, Ranchi- 834002	http://www.jusnl.in/
11	Karnataka	SLDC, KPTCL	28, Race course Cross Road, Bangalore- 560009	http://www.kptcl.com/Ldcmenu.htm
12	Kerala	State Load Despatch Centre, Kalamassery	Executive Engineer O/o Chief Engineer, (Transmission), System Operation, Kalamassery- 683503	www.sldckerala.com
13	Madhya Pradesh	State Load Despatch Centre, MPPTCL, Jabalpur	O/o Chief Engineer (SLDC), MPPTCL, Nayagaon, Jabalpur, Madhya Pradesh- 482008	http://www.sldcmpindia.com
14	Maharashtra	Chief Engineer, SLDC, Airoli, Navi Mumbai,	Airoli, Thane-Belapur Road, - 400708 022-27601931 Ext.2005, Navi Mumbai -400708	www.mahasldc.in
15	Meghalaya	SLDC Meghalaya	132 kV, NEHU Substation Complex, Umjarain, Shillong- 793022	www.meeclsldc.nic.in
16	Mizoram	Mizoram State Load Despatch Centre	Mizoram State Load Despatch Centre Circle, Power House Complex, Electric Veng, Aizawl- 796001	https://sldc.mizoram.gov.in/

S. No.	State Name	Agency Name	Agency Address	Agency Website
17	Nagaland	Department of Power, Government of Nagaland	SLDC Nagaland, Electricity Colony, Full Nagarjan Dimapur, Nagaland, Dimapur- 797112	https://www.dopn.gov.in/
18	Odisha	State Load despatch Center, OPTCL, BBSR	Gridco Colony Po-Mancheswar Railway Colony, BBSR, Bhubaneswar- 751070	www.sldcorissa.org.in
19	Pondicherry	System Control Centre, Electricity Department, Puducherry	137, Nethaji Subhash Chandra Bose Salai, Electricity Department, Puducherry- 605001	https://electricity.py.gov.in/
20	Punjab	Punjab SLDC Ablowal, Patiala	SLDC Building, near 220KV Grid Substation, PSTCL, Ablowal, Patiala, Ablowal- 147001	www.punjabslldc.org
21	Rajasthan	Rajasthan SLDC	State Load Despatch Centre, Rajasthan Rajya Vidyut Prasaran Nigam Limited, Ajmer Road, Heerapura, Jaipur- 302024	http://www.rajsldc.com
22	Tamil Nadu	Tamil Nadu Transmission Corporation Limited (TANTRANSCO), State Load Despatch Centre	144 Anna Salai, Chennai- 600002	http://tneblldc.org
23	Telangana	Telangana SLDC	Chief Engineer, Room No 611 A Block, SLDC of the State of Telangana (TSSLDC), TSTRANSCO, Vidyut Soudha, Khairatabad, Hyderabad-500082	www.tssldc.in
24	Tripura	State Load Despatch Centre, Agartala	79 tilla, Kunjaban, Agartala, Tripura (West), Agartala- 799006	http://www.tsecl.nic.in
25	Uttar Pradesh	SLDC-UP	Power System, UP Power Transmission Corporation Ltd., 5th Floor, Shakti Bhawan, 14 Ashok Marg, Lucknow- 226001	http://www.upslldc.org
26	Uttarakhand	SLDC, Uttarakhand	Dy. General Manager (System Operation), 400 KV Substation, Veerbhadra, Rishikesh- 249202	http://www.ptcul.org
27	West Bengal	West Bengal State Load Despatch Centre	P.O. Danesh Seikh Lane, Howrah- 711109	http://www.wbsldc.in

Annexure- VIII

18.9 MOP order for establishment of ESCerts Registry



No.10/4/2015
Government of India
Ministry of Power

'F' Wing, IInd Floor, Nirman Bhavan
New Delhi – 110 011

Date: 5/1/2016

To,

The Chief Executive Officer,
Power System Operation Corporation Ltd.,
B-9, Qutab Institutional Area,
Katwaria Sarai,
New Delhi -110016

Subject: Direction to POSOCO to discharge the function of Registry for trading/exchange of Energy Saving Certificates (ESCerts) under Perform Achieve and Trade (PAT) Scheme-reg.

Sir,

I am directed to refer to the above subject and to say that for facilitation of Trading/Exchange of Energy Saving Certificates on Power Exchange under the Perform Achieve and Trade (PAT) scheme (which is a market based mechanism to enhance cost effectiveness of improvements in energy efficiency in energy intensive large industries and facilitates through certification of energy savings) under National Mission for Enhanced Energy Efficiency (NMEEE), Power System Operation Corporation (POSOCO) shall discharge the functions of a Registry.

Direction to POSOCO by the Central Government to discharge the functions of Registry for trading/exchange of Energy Saving Certificates (ESCerts) under Perform Achieve and Trade (PAT) Scheme is as follows:

Whereas the Central Government in the Ministry of Power inter-alia launched the Perform Achieve and Trade (PAT) Scheme under the National Mission for Enhanced Energy Efficiency (NMEEE), a market based mechanism to enhance the cost effectiveness of improvements in energy efficiency in the energy intensive large industries on 30th March, 2012.

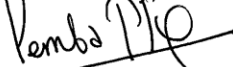
Whereas the Central Government in the Ministry of Power vide Energy Conservation Rules, 2012 dated 30th March, 2012 specified the Energy Consumption norms and standards for the 478 DCs for the period from 2012-2015 covering 8 sectors Aluminium, Chlor-Alkali, Textile, Pulp & Paper, Iron & Steel, Fertilizer, Cement and Thermal Power plants under the **Energy Conservation Rules 2012** (common parlance being PAT Rules) notified on 30th March 2012.



Whereas section 14A (1) of the Energy Conservation Act, 2001 and Rule 12 of the PAT Rule 2012 give powers to the Central Government to issue Energy Saving Certificate (ESCerts) in electronic form, each ESCert being equivalent to one metric ton of oil equivalent of energy (toe) consumed and the Power exchanges are designated as the trading platforms through which the ESCerts shall be traded and regulated by the Central Electricity Regulatory Commission (CERC).

And, Whereas considering the experience of Power System Operation Corporation (POSOCO) with regards to Renewable Energy Certificate (REC) trading and management of integrated operation of Regional and National Power Systems with reliability, security and economy, the Ministry of Power, Government of India, has agreed to assign the function of Registry of ESCert trading to the POSOCO and accordingly issue this order to authorize POSOCO to establish the necessary framework for this purpose.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'P.T. Bhutia', is written over the typed name.

(P.T. Bhutia)

Director EC

[Tele-fax : 23063497]


Copy to :

- i) **DG, BEE**
- ii) **Director (R&R)**
- iii) **Director (Transmission)**

Notes

Notes


REC Portal Home page | www.recregistryindia.nic.in



भारतीय अक्षय ऊर्जा प्रमाणपत्र पंजीकरण
RENEWABLE ENERGY CERTIFICATE REGISTRY OF INDIA

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[कार्यप्रणाली / Procedures](#)
[आरई जेनरेटर / RE Generators](#)
[डिस्कॉम / DISCOM](#)
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What is REC?
The Electricity Act, 2003, the policies framed under the Act, as also the National Action Plan on Climate Change (NAPCC) provide for a roadmap for increasing the share of renewable in the total generation capacity in the country. However, Renewable Energy (RE) sources are not evenly spread across different parts of the country. [Read More >>](#)

REC Summary

Month, Year	Opening Balance (A)	REC Issued (B)	No. of REC. Redeemed through Power Exchanges (C)	RECs retained by RE Generators (D)	Total E=(C+D)	Closing Balance (F=A+B-E)
Aug, 2017	18439740	385527	289505	6162	295667	18296000
Sep, 2017	18529600	478338	382007	27493	409500	18596438
Oct, 2017	18596438	564523	487105	42471	529576	18631385
Nov, 2017	18631385	620311	2207822	53215	2260837	16990859
Dec, 2017	16990859	837960	5217189	104415	5321604	12507215
Jan, 2018	12507215	667587	1230826	55514	1286340	11888462
Feb, 2018	11888462	336128	2358396	25004	2383400	9841190
Mar, 2018	9841190	492681	2769433	72153	2841586	7492285
Apr, 2018	7492285	330789	1062661	28704	1091366	6731709
May, 2018	6731709	508088	1316021	27109	1343130	5896667
June, 2018	5896667	559772	896229	63960	960189	5496250
Jul, 2018	5496250	411421	1618069	52150	1670219	4237452
Total:		47908872	41936151	1734669	43670620	

Total Signed Up RE Generators Till Now - 3161

Steps for REC

2 of 4 [1](#) [2](#) [3](#) [4](#)

step 2 Registration

The basic procedure for registration of the RE generation project shall cover following steps:
STEP 1: An application for availing registration shall be made by the RE Generating Company to the Central Agency, as defined under Clause 2(1) (b) of the CERC REC Regulations. [Read More >>](#)

Log In

Password

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[Forget/Reset Password](#)

[Sign Up RE Generators](#)


[Sign Up Discom](#)

Related Links

- MIRE
- IMP
- CERC
- FOR
- Central Agency/NLDC
- SERCs
- State Agencies
- Power Exchange

Visitor Number - 7027842

Photo Gallery





Power System Operation Corporation Limited (POSOCO)

(A Government of India Enterprise)

1st Floor, B-9, Qutab Institutional Area, Katwaria Sarai,
New Delhi – 110016

Email: nldc.rec@posoco.in

Website: www.posoco.in , www.recregistryindia.nic.in