Chapter - II

Compliance with Renewable Purchase Obligation and availing benefits of Clean Development Mechanism

1. Renewable Purchase Obligation (RPO)

As a follow up on India's commitment to reduce carbon emission under United Nations Framework Convention on Climate Change (UNFCCC), the Government of India announced (June 2008) a National Action Plan for Climate Change (NAPCC). One of the important measures identified was increasing the share of Renewable Energy (RE) in the total electricity consumption in the country. NAPCC set target of five *per cent* for purchase of electricity generated from RE sources for 2009-10 against the then existing level of around 3.5 *per cent*. This target was to increase by one *per cent* per year for next 10 years i.e. the NAPCC envisaged that RE would constitute 15 *per cent* of the energy mix of India by 2020. National Solar Mission in 2011 further provided that 'within the percentage so made applicable, to start with, the State Electricity Regulatory Commissions (SERCs) shall also reserve a minimum percentage for purchase of solar energy which will go up to 0.25 *per cent* by the end of 2012-2013 and further up to 3 *per cent* by 2022'.

1.1. Authority to set RPO targets

The existing legal framework under Electricity Act 2003 puts the responsibility for promotion of RE on the SERCs. It provides that SERC should ensure 'promotion of 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*[1]*, a percentage of the total consumption of electricity in the area of a distribution licensee*'.

National Tariff Policy 2006 also provides that 'the Appropriate Commission *shall fix a minimum percentage for purchase of energy from such sources taking into account availability of such resources in the region and its impact on retail tariffs'.*

Hence, RPO of distribution companies/ direct buyers of Electricity were to be fixed by SERCs across the States.

1.2. Renewable Energy Certificate (REC)

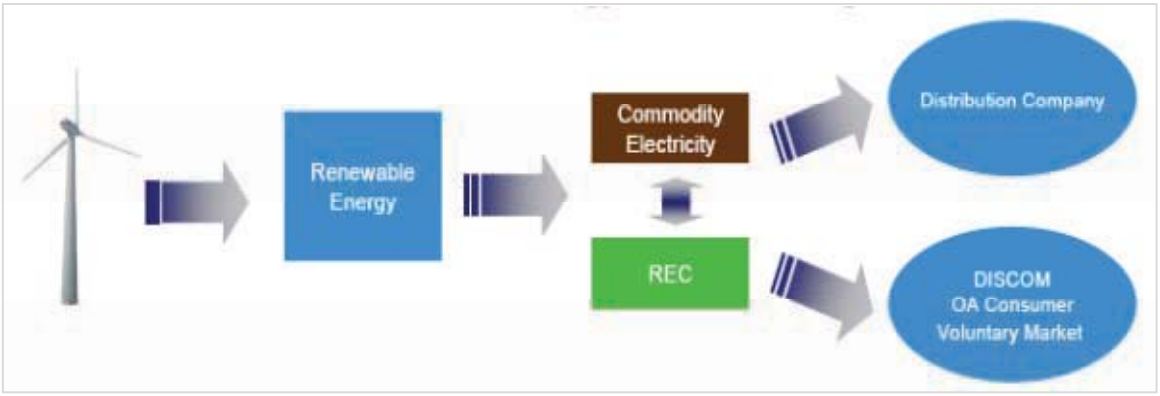
Though India has more than enough RE potential to achieve these targets, availability of RE sources is widely dispersed, and the capacity to meet these targets varies widely from State to State. In some States, the potential for RE is insignificant (e.g. Haryana), whereas some other States have substantial RE sources e.g. wind energy is abundant in Gujarat, Karnataka and Tamil Nadu, solar power is concentrated in the north-west region of the country and small hydro power is concentrated in the States of Himachal Pradesh and Uttarakhand.

[1] Renewable Energy.

MNRE undertook a study (June 2009) and came up with conceptual framework for REC mechanism to possibly address the issue of geographical dispersion of RE resources.

The REC mechanism was based on the premise that the RE generation entails reduction of certain environmental attributes like Green House Gases, apart from electricity generation. Thus, RE generator can sell two different products on account of renewable energy generation. These products are electricity and the associated environmental attributes, in the form of RE Certificate.

Chart 1: REC mechanism



Note: OA-Open Access.

In the proposed mechanism, one REC would be issued to the RE generator for one Mega Watt hour (MWh) electrical energy[2] fed into the grid. The RE generator could sell electricity to the distribution company and associated RECs also to the distribution company or any other obligated entity[3] within the State or outside the State. The REC mechanism would enable obligated entities in any State to procure RECs generated in any of the States in India and surrender the same to satisfy its RPO target. Thus, REC mechanism was supposed to address the issues of scarcity of RE sources in some States which had negligible RPO targets in view of the limited RE potential in the State.

RPO and REC mechanisms were designed as policy instruments to demonstrate commitment and create a demand incentive for the development of RE sources in India.

[2] The solar generating companies registered under REC framework prior to the date of effect of the Third REC Amendment Regulations (1 January 2015) would be eligible for 2.66 REC for one MWh of electricity generated and fed into the grid and this dispensation would be available to such projects for the period upto 31 March 2017, after which the said projects would be eligible for one REC for one MWh of electricity generated.

[3] The entities mandated to purchase a defined quantum of renewable energy of their overall consumption are obligated entities. In a State these may include Distribution Licensees, Captive Consumers, Open Access users etc.

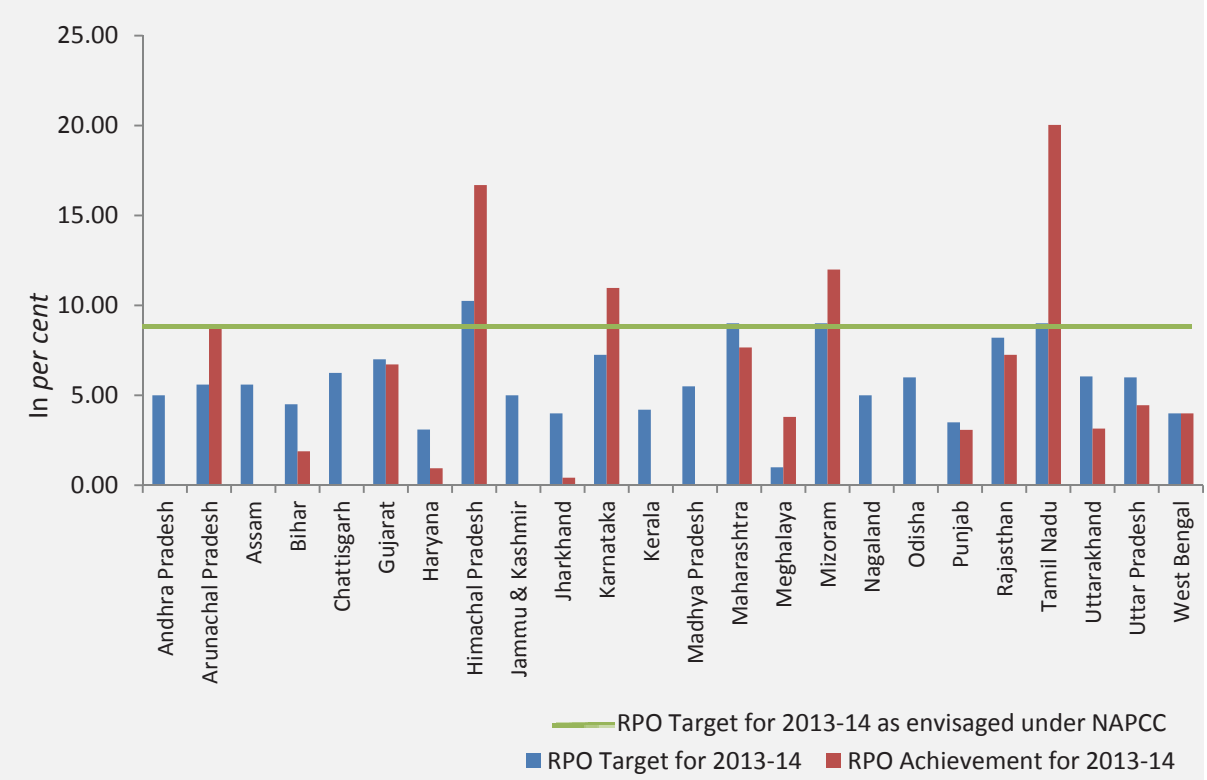
2. Audit Findings

2.1. Shortfall in achieving RPO targets as per NAPCC targets

As stated above the NAPCC targets were to be eight and nine *per cent* for the years 2012-13 and 2013-14 against which the national achievement was only 4.28 and 4.51 *per cent*[4], respectively.

RPO trajectory recommended by NAPCC indicates RPO targets of nine *per cent* for 2013-14. Chart 2 exhibits the targets set for 2013-14 and achievement there against in 24 States sampled.

Chart 2: State wise achievements for RPOs and targets under NAPCC as a percentage of total energy purchased in 2013-14



Source: State Nodal Agencies.

It can be seen from the chart above that even after four years since NAPCC was formulated, only four States (Himachal Pradesh, Karnataka, Mizoram and Tamil Nadu) had been able to achieve their RPO targets in accordance with NAPCC targets.

2.2. State RPO not in keeping with targets set under NAPCC

The targets for RPO set by the SERCs from 2010-11 to 2019-20 in the 24 States test checked in audit are given in **Annexure II**. From the data collected in audit, it was evident that:

[4] Data regarding electricity generation from RE sources was made available by CEA only for the years 2012-13 and 2013-14.

i. In none of the 24 sampled States, except Himachal Pradesh and Tamil Nadu RPO were fixed in sync with the targets set under the National Action Plan on Climate Change;

ii. Only three States[5]set RPO targets for the entire period covered in NAPCC. Setting out RPO targets for a long term i.e. 10 years was required both for setting a road map to meet National commitments as well as to bring policy clarity;

iii. In five of the 24 States, the RPO reported by respective State Nodal Agencies differed from the RPO as per MNRE in these States. The details of differences are given in Table 3.

Table 3: Difference between RPO reported by States and MNRE

State	Year	RPO as per MNRE	RPO as per SNA
Bihar	2011-12	3 *per cent*	2.50 *per cent*
Chhattisgarh	2013-14	5.75 *per cent*	6.25 *per cent*
Mizoram	2013-14	Nil	9 *per cent*
Nagaland	2011-12	7 *per cent*	5 *per cent*
	2012-13	8 *per cent*	5 *per cent*
	2013-14	Nil	5 *per cent*
West Bengal	2011-12	Nil	2 *per cent*
	2012-13	Nil	3 *per cent*

This difference in the data between MNRE and State could hinder proper monitoring and review.

iv. Rajasthan, which had 19 *per cent* of the estimated RE potential of the country, prescribed RPO target upto 2013-14. The RPO were consistently marginally lower than the NAPCC target, though the gap progressively reduced i.e. from one *per cent* in 2011-12 to 0.8 *per cent* in 2013-14;

v. Andhra Pradesh, Gujarat, Jammu & Kashmir and Madhya Pradesh consistently set RPO targets below the target as per NAPCC;

vi. Himachal Pradesh, which has five *per cent* of the estimated RE potential of the country, not only prescribed RPO targets consistently higher than the road map set out in the NAPCC for the entire period of NAPCC; but also surpassed its own targets consistently.

vii. Tamil Nadu, which has four *per cent* of the estimated RE potential of the country, prescribed RPO targets consistently higher than the road map set out in the NAPCC though these have been set out only upto 2015-16 and not the entire period of NAPCC.

viii. Low RE potential States, excepting Mizoram and Nagaland, continued to set substantially lower RPO targets. This indicated that the REC mechanism which was meant to address the issue of disparity in geographical dispersal of RE resources and enable inter-State RE transactions for further promotion and development of RE

[5] Bihar, Himachal Pradesh and Kerala.

sources, had failed to instill confidence in the low RE potential States to set higher RPO targets.

The above analysis indicates the need for greater unity of purpose between the Centre and the States. MNRE stated (May 2015) that the technical document of NAPCC had suggested RPO targets which were not mandatory. Under Electricity Act 2003, the State Regulator was to fix the RPO. The reply needs to be viewed in the context that NAPCC provided the broad framework for RPO compliances to target 15 *per cent* of RE in the energy mix of the country by 2020.

2.3. Status of discharge of Renewable Purchase Obligations

Audit examined the notified RPO across the selected 24 States and their achievements. The status of RPO compliance between 2010-11 and 2013-14 by the 24 States are given in **Annexure III.** Analysis of the data revealed that:

i. Of the 24 States, six States[6] complied with the RPO targets set by the respective State Energy Regulatory Commissions;

ii. Of the six States mentioned above, two States[7] were high potential States. These States not only met the RPO but also exceeded the RPO target set under the NAPCC. Tamil Nadu, which has four *per cent* of the national RE potential, also exceeded the NAPCC targets. Mizoram exceeded the NAPCC targets in 2011-12, 2012-13 and 2013-14. Arunachal Pradesh exceeded these in 2012-13 and 2013-14.

iii. Of the remaining six[8] high RE potential States, the performance of Jammu & Kashmir and Andhra Pradesh was poor. Jammu & Kashmir reported 'Nil' purchase of power from RE sources between 2011-12 to 2013-14, the period for which RPO was notified in the State. Andhra Pradesh reported purchase of electricity from RE sources as 1.75 *per cent* in 2012-13. RPO achievement for 2013-14 was not available. Gujarat, Maharashtra and Rajasthan though not able to achieve the RPO over the years, showed a rising trend in the percentage of electricity purchased from RE sources, which was a positive sign. Madhya Pradesh did not provide the data of RPO adherence.

iv. While Punjab reported a rising trend in the percentage of electricity purchased from RE sources, Assam registered a declining trend.

Inability of RE deficit States to meet their RPO and REC mode contributing in a miniscule manner towards overall compliance[9], indicates poor inclination of the States to meet their targets.

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6 Arunachal Pradesh, Himachal Pradesh, Karnataka, Meghalaya, Mizoram and Tamil Nadu.

7 Himachal Pradesh (36,386 MW) and Karnataka (38,276 MW).

8 Andhra Pradesh, Gujarat, Jammu & Kashmir, Madhya Pradesh, Maharashtra and Rajasthan endowed with 62 *per cent* of the RE potential.

9 Discussed in detail in para 2.4.

2.4. Distribution of purchase of electricity from RE sources and RECs in meeting RPO

The cumulative data of RPO in terms of electricity to be purchased from RE sources, the extent to which it was done directly or through purchase of RECs between 2010 and 2014 is given in **Annexure IV**. From this data collected in audit, it is concluded that:

i. Direct purchase of electricity generated from RE sources was still the preferred option to meet RPO as only 4.77 *per cent* of RPO compliance was through REC mode, whereas 95.23 *per cent* was through direct purchase of electricity from RE sources.

ii. Purchase of RECs was not an attractive option as evident from the fact that despite 17 States falling short of meeting their RPO, only six States reported purchase of RECs, despite RECs being available in the designated exchanges[10]. Gujarat led these States by meeting 43 *per cent* of its RPO through RECs.

2.5. Monitoring of compliances with RPO and penalty for non-compliance

MNRE in its framework for REC mechanism recommended formation/designation of a monitoring committee in the States with the primary objective of monitoring the RPO compliances by designated entities. The monitoring committee was required to secure data on RPO compliances by obligated entities including those which may not be covered in REC mechanism or have on site captive generation. Electricity Act 2003 under Section 142 empowers SERCs to impose penalties for non-compliances of the Act, Rules, Regulations or Provisions. Twenty one States had designated a State agency for submitting a quarterly report to their respective SERCs, indicating RPO compliances and shortfalls. Based on the data received from monitoring committee, SERCs were expected to impose and collect penalties from obligated entities for shortfall.

It was observed that:

i. Rajasthan and Karnataka had not prescribed any rate for levy of penalty, whereas Uttar Pradesh did not even have the provision for penalty in case the obligated entity was not able to meet the RPO.

ii. There was no shortfall in meeting RPO targets in six States. No penalty was collected in 17[11] of the 24 States sampled, which reported shortfall, except collection of a token penalty by Uttarakhand.

iii. Audit estimated penalty leviable on obligated entities for not complying with RPO, based on a conservative assumption that the shortfall in RPO would have been met by buying RECs (non-solar) at the floor price of ₹ 1,500 per REC. The State wise details of the estimate are given in **Annexure V** and indicate that an amount of ₹ 4,234.79 crore was leviable on the obligated entities.

The enforcement of RPO was further diluted by frequent deferring of RPO targets as seen in the cases of Gujarat, Madhya Pradesh, Maharashtra and Uttarakhand.

[10] Discussed in detail in para 3.2.
[11] As per Annexure V.

MNRE stated (May 2015) that the RPO Regulations notified by the respective State Regulator provided for penal provisions for non-compliance of RPO by the obligated entities. These penal provisions were to be invoked by the respective Regulator after taking into consideration the reasons for non-achieving RPO by the obligated entities. It further stated that by not achieving RPOs the distribution companies have not accrued undue benefits because all the power purchased and sold had to be reflected in Annual Revenue Requirements which was approved by SERCs. The reply of the Ministry does not address the issue raised above on non-enforcement of RPO and non-collection of resultant penalties by SERCs as mandated by Electricity Act 2003.

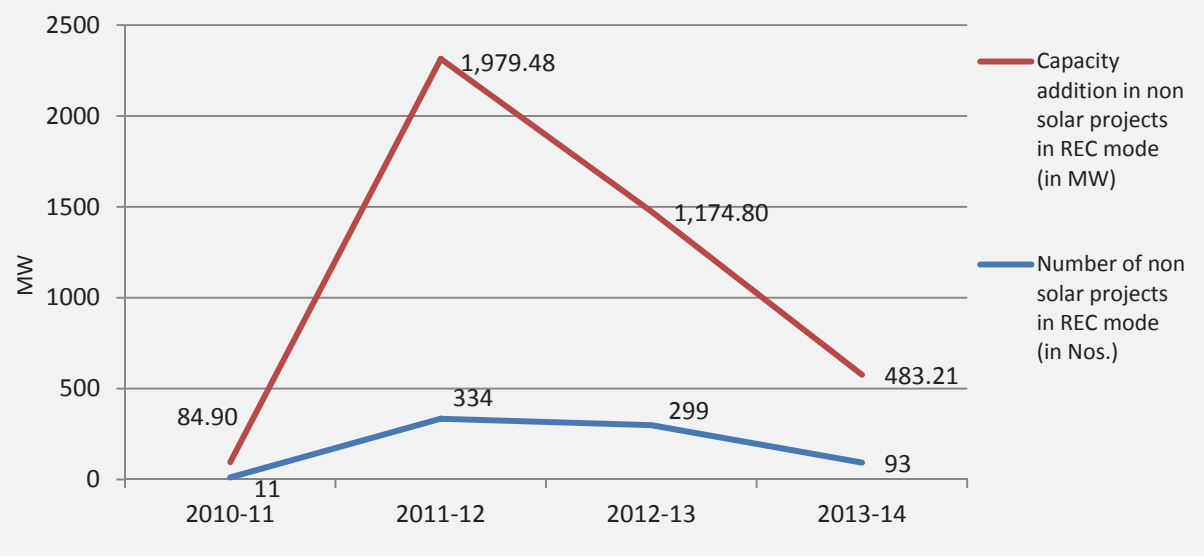
3. Difficulties in RPO compliance

Difficulties in compliance with RPO were posed primarily by REC mechanism not being successful and constraints of infrastructure. These are discussed below:

3.1. Declining trend for projects registered through REC route

MNRE framework for REC mechanism provided that initially RE projects with a minimum of 250 kW capacity were eligible to register in REC mode. It was envisaged that as the REC market matured, off grid technologies could also be considered for inclusion in REC mechanism. Audit observed a declining trend in REC registered projects after an initial spurt, in both solar and non solar mode over the years.

Chart 3: Projects and capacities added in REC mode for non solar category



Source: REC Registry of India.

As can be seen from Chart 3, after an initial thrust towards REC mode, the interest of generators to register under REC mechanism gradually dwindled. The reason for declining interest may be attributed to poor RPO compliances in States. In solar category, only 164 projects (18 *per cent*) with capacity of 368.89 MW (nine *per cent*) had been registered under REC mode since 2012 till date. The State wise list of projects registered under solar and non solar REC mode as on July 2014 is given in **Annexure VI**.

From the trends, it would emerge that the RE participants have gradually lost interest in the REC mechanism.

3.2. Continuously increasing unredeemed RECs

Electricity Act 2003, under Section 66, provides for development of trading markets. Currently RECs are being traded at Indian Energy Exchange and Power Exchange of India Limited. First solar REC was issued in May 2012, whereas first non solar REC was issued in March 2011. Shelf life of RECs was initially kept at one year but Central Electricity Regulatory Commission (CERC) vide order dated February 2013, extended the shelf life to two years. This was further extended by three years in January 2015 on an adhoc basis. RECs were to be issued by REC registry[12] to generators in electronic form within three months of RE generation. Such RECs were to be bought by obligated entities and other voluntary buyers through REC trading platforms.

The details of unredeemed RECs pending in National Load Dispatch Centre[13] (NLDC) are given in Table 4.

Table 4: Details of RECs pending for redemption

Year	No. of RECs pending for redemption at the end of the year
2010-11	108
2011-12	38,545
2012-13	17,76,929
2013-14	56,53,314
2014-15 (till August 2014)	93,64,699

Source: REC Registry of India.

It can be seen from Table 4 that:

i. Due to insufficient RPO compliances, unredeemed RECs have been on an increasing trend. These grew from 108 RECs at the end of 2010-11 to 93.65 lakh RECs as of August 2014. Of the 93.65 lakh RECs pending in August 2014, examination in audit revealed that 5.15 lakh RECs were pending redemption for over a year.

ii. CERC took ad-hoc measures of increasing the shelf life of RECs from initial one year to three years (January 2015).

iii. Uncertain policy environment and poor RPO enforcement led to a situation where 93.65 lakh RECs each valuing at least ₹ 1,500[14] remain unredeemed as of August 2014. Consequently the planned cash flow of REC mode generators was affected.

Huge closing balances of unredeemed RECs at the exchanges require structural and regulatory changes for keeping the viability of REC mechanism as an important growth factor of RE market in India.

[12] REC registry is an online platform governed by National Load Dispatch Centre as a depositary for RECs.
[13] NLDC was the Central Agency for energy accounting and reporting.
[14] Floor price of non-solar REC.

3.3. Supply concentration and transmission constraints

RE was mainly concentrated in a few States and within the State to a few generation pockets. Geographical distribution of such resources caused problems in integrating RE to the grid. RE projects, being location specific cannot be aligned with existing load centres necessarily. The existing grid infrastructure was insufficient at most places to transport renewable power (wind specially) to load centres. State utilities were unable to create sufficient infrastructure for variable power. Hence, construction of new intrastate as well as interstate transmission infrastructure was critical to meet the needs of large scale RE deployment. The matter has been discussed in detail in Chapter IV of this report.

4. Clean Development Mechanism (CDM)

The basic rules for the functioning of the CDM were agreed on at the seventh Conference of Parties (COP-7) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Marrakesh, Morocco in October-November 2001. Projects starting in the year 2000 were eligible to earn Certified Emission Reductions (CERs) if they lead to "real, measurable, and long-term" Green House Gases (GHG) reductions, which were additional to any that would occur in the absence of the CDM project.

At COP-7, it was decided that the following types of projects would qualify for fast-track approval procedures:

- RE projects with output capacity up to 15 MW.
- Energy efficiency improvement projects which reduce energy consumption on the supply and/or demand side by up to 15 Giga Watt hours annually.
- Other project activities that both reduce emissions by sources and directly emit less than 15 kilo tonnes Carbon Dioxide equivalent annually.

While investors profit from CDM projects by obtaining reductions at costs lower than in their own countries, the gains to the developing country host parties are in the form of finance, technology, and sustainable development benefits.

4.1. Introduction of CDM in India

National Action Plan on Climate Change identified possible role of Clean Development Mechanism (CDM)[15] in financing efficient technologies. MNRE perceived it as a new and important window to take up CDM projects with emphasis on households, small enterprises and rural areas. MNRE came up with the framework for programmatic CDM projects in RE in May 2009 and identified seven specific[16] areas for implementation.

[15] Clean Development Mechanism (CDM) was made functional in 2001.

[16] Family Type Biogas Plants programme, Medium and Large Size Biogas Plants programme, Solar Water Heating, Solar Cooking programme, Improved Cook stove programme, Biomass applications in Industry, Village Electrification programme.

4.2. CDM benefits not availed

National Clean Development Mechanism Authority (NCDMA) of India was constituted in 2003 by the Ministry of Environment and Forests, which was the single window clearance for CDM projects in the country. It had devised formats and procedures for submitting the projects for approval under CDM mechanism.

Audit observed that MNRE had not devised any mechanism for claiming of CDM benefits for the grid connected and off-grid RE projects. None of the schemes of MNRE encouraged the developer/ beneficiary to claim the benefits of CDM. There was a lack of awareness with respect to claiming of CDM benefits.

4.3. State wise analysis of status of claiming of CDM benefits

Out of 24 States selected for Audit, 21 did not respond to the Audit queries related to the operationalisation of CDM benefits. The Audit findings with respect of the three States that responded are given below:

Kerala

The Government of India agreed to provide loan to implement Bachat Lamp Yojana in Kerala as part of UNFCCC targets to replace incandescent lamps with Compact Fluorescent Lamps. The repayment was to be made on receipt of fund on sale of carbon credit. If the scheme was not implemented successfully then Kerala State Electricity Board (KSEB) had to bear the cost from its budget and resources. Audit observed that, even though ₹ 52.50 crore was released, KSEB did not claim the benefit under CDM.

Tamil Nadu

i. The Detailed Project Report for the cogeneration plants in the co-operative sugar mills being implemented by Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) envisaged that each of the plant with 172 days of operation with bagasse would fetch around 31,000 Certified Emission Reductions per annum valued at ₹ 40 lakh[17]. Audit observed that TANGEDCO did not even register the plants with UNFCCC for claiming CDM benefits.

   Similarly, none of the 18 Small Hydro Power projects implemented by TANGEDCO, which were entitled for CDM benefits, had availed the benefits so far.

ii. The Tamil Nadu Regulatory Electricity Commission (TNERC), in its Comprehensive Tariff Orders on Wind Energy issued during 2009 stipulated that CDM benefits should be shared between the promoter and the distribution licensee i.e. TANGEDCO, starting from 100 *per cent* to the promoter in the first year till the sharing becomes equal to both the promoter and TANGEDCO in the sixth year.

   Test check of 33 wind, biomass and cogeneration projects which had energy purchase agreements with TANGEDCO and which had received CERs equivalent to 42,97,177 credits from UNFCCC during the period 2007-08 to 2012-13 revealed that in none of these cases, TANGEDCO initiated action for modification of the

[17] At the rate of two Euros per CER.

agreements providing for sharing of CDM benefits as per the directions of TNERC. TANGEDCO neither received nor claimed its share of CDM benefits from the promoters as of March 2014.

West Bengal

According to the NCDMA, carbon credit of ₹ one per kWh of energy generated was available to West Bengal Green Energy Development Corporation Limited (WBGEDCL) from the two MW solar power plants at Jamuria.

Audit observed that WBGEDCL had not applied in prescribed format to NCDMA and could not avail CDM benefits, estimated around ₹ 49.09 lakh, between August 2009 and March 2014.

5. Reduction in use of Liquified Petroleum Gas (LPG) or conventional fuel and Green House Gas (GHG) emissions

Renewable Energy is a clean fuel and its usage is expected to bring reduction in emission of GHGs. MNRE in its various schemes promoting the use of RE articulated reduction in the use of conventional fossil fuels (Kerosene) and reduction in GHG emission as one of the objectives e.g.

i. National Biogas and Manure Management programme, *inter alia*, aimed at providing clean bio-gaseous fuel mainly for cooking purpose and also for other applications for reducing use of LPG and other conventional fuels,

ii. Solar Photovoltaic (SPV) off-grid programme also aimed to reduce the consumption of kerosene for lighting purpose by replacing the kerosene lanterns and wick lamps with SPV systems and to improve the quality of life in rural areas through the use of environment friendly solar lighting systems, which do not need any fossil fuels, do not emit any pollutants and are free from health and fire hazards.

Audit attempted to examine whether there was reduction in use of LPG/ kerosene and other conventional fuels and in emission of GHGs with the adoption of RE based solutions.

As per MNRE, the estimated abatement of Carbon dioxide (a GHG) by installation of RE systems is given in Table 5.

Table 5: Estimated abatement of Carbon dioxide by installation of RE systems

Technology	Achievement (MW)	Annual Electricity generation (MWh)	Carbon Dioxide emission abated (million tonnes)
Grid connected RE power	31,719	7,63,95,055	75
Off-grid/ Decentralised systems	4,039	1,21,15,984	19
Total	**35,758**	**8,85,11,039**	**94**

Audit observed that though estimates were provided by MNRE, no actual calculations of reduction in GHG emissions were made available by MNRE.

MNRE stated (July 2015) that it attempted to calculate reduction in emission by the biogas plants installed in eight States during the period 2007-08 to 2011-12. Reply of MNRE need to be viewed in light of the fact that this exercise was conducted only for biogas plants, whereas, it was not done for other grid and off-grid RE based capacity created.

Audit test checked records of 24 SNAs and found some studies to estimate reduction in GHG emissions. The audit findings are given below.

Jammu & Kashmir

As per the memorandum for Expenditure Finance Committee of MNRE the annual fuel savings with the installation of 25,000 sqm collector area of Solar Water Heating Systems (SWHSs) were estimated as equivalent to 3,000 tonnes of firewood and 400 kilo litres of diesel but actually only 5,509 sqm collector area was installed and actual saving of conventional fuel was not calculated.

Kerala

Agency for Non-conventional Energy and Rural Technologies (ANERT) conducted studies on reduction in use of conventional fuels, wherein targets were fixed each year for reduction of conventional fuels i.e. LPG, kerosene etc. However, achievements were not assessed/analysed during the period 2007-08 to 2009-10.

Meghalaya

No impact assessments were carried out by Meghalaya Non-Conventional and Rural Energy Development Agency (MNREDA) on the Remote Village Electrification (RVE) projects executed under the scheme to ensure reduction in the use of conventional fuel. However, as per the third party monitoring report relating to the electrification of 70 remote villages completed in January 2010, 92 *per cent* of the beneficiaries reported to have spent less amount on lighting fuels like kerosene after installation of SPV lighting systems at their houses. The consumption of kerosene was reported to have declined to one fourth from around 4.77 liters per month to 1.13 liters per month, resulting in a savings of 64.80 kL per year, or approximately ₹ 9.72 lakh.

In the case of electrification of 52 remote villages completed in May 2010, third party monitoring was yet to be conducted. Hence the impact on the use of conventional fuel could not be assessed.

MNRE stated (May 2015) that the evaluation studies were done by independent organizations from time to time as part of monitoring and evaluation of the programme and this subject was included in such studies.

6. Conclusion

Under the National Action Plan for Climate Change, RPO target of five *per cent* was set (2009-10) for contribution of RE in the total electricity consumption of the country, which could be achieved either by directly purchasing electricity generated from RE sources from the grid or through purchase of RECs from other energy rich States. The RPO was to increase

by one *per cent* over the next 10 years so as to reach 15 *per cent* by 2020. During 2012-13 and 2013-14, against the RPO target of eight and nine *per cent* as envisaged under National Action Plan for Climate Change, national achievement was 4.28 and 4.51 *per cent* respectively.

Only two States had fixed RPO in alignment with National Action Plan for Climate Change norms. Only six out of 24 selected States had managed to meet the RPO fixed by respective SERCs. Despite there being a provision for levy of penalty for non-achievement of RPO targets, no penalty was levied by 17 SERCs. Purchase of RECs was not a preferred mode to meet RPO, as only six States opted for purchase of RECs.

Only 4.77 *per cent* of RPO compliance has been through REC mode, whereas 95.23 *per cent* had been through direct purchase of electricity from RE sources.

Poor RPO compliance by States led to decline in registration of projects in REC mode on the one hand and increase in number of unredeemed RECs available in designated exchanges on the other. There were no policy guidelines for unredeemed RECs, which would affect planned cash flow of generators registered for REC regime. As of August 2014, 93,64,699 RECs were lying unredeemed. On a conservative basis each REC was valuing at least ₹ 1,500.

RE projects are capital intensive, long duration investments which ideally should provide relatively steady returns over the life cycle of the project with minimum variability. The lack of long term RPO targets, weak enforcement by SERC coupled with issues related to liquidity and lifetime of RECs creates uncertainty, which is detrimental to the development of the RE sector.

Audit observed that MNRE had not devised any mechanism for claiming of CDM benefits for the grid and off-grid RE projects. MNRE despite being the nodal Ministry for promotion of RE in the country did not take action to formulate guidelines and create awareness of CDM benefits.

7. Recommendations

- *MNRE needs to pursue with the State Electricity Regulatory Commissions for the adoption of Renewable Purchase Obligation targets in alignment with National Action Plan on Climate Change targets. These targets should be enforced, with due monitoring and collection of penalties for default in compliance.*
- *MNRE, being the nodal Ministry should ensure firming up of clear guidelines on the life of Renewable Energy Certificates and management of unredeemed Certificates, in a time bound manner.*
- *MNRE should introduce a comprehensive framework for creating awareness of Clean Development Mechanism and availing benefits under it.*