Chapter 2

Performance Audit

Implementation of Renewable Energy Programme in West Bengal

Chapter 2: Performance Audit

Power and Non-Conventional Energy Sources Department

IMPLEMENTATION OF RENEWABLE ENERGY PROGRAMME IN WEST BENGAL

2.1 Introduction

Renewable Energy (RE) resources include energy of wind, solar, geothermal energy of water, biomass, waste *etc*. These energy resources (i) contribute to better air quality, (ii) reduce reliance on fossil fuels, (iii) curb global warming, (iv) add jobs to the economy and (v) protect environmental values. Harnessing renewable energy sources entails cleaner environment, energy independence and a stronger economy.

National Action Plan for Climate Change (NAPCC)[8] was the first response of Government of India (GoI) to rising greenhouse gas emissions and climate change. It envisaged RE to constitute 15 *per cent* of the energy mix of India by 2020. All states had to draw up State Action Plans on Climate Change (SAPCC), to meet the targets envisaged in NAPCC. In August 2009, GoI made a commitment to UNFCCC[9] to reduce its carbon emission intensity by 20 to 25 *per cent*. Further, in order to meet the commitments to the Paris Accord[10] ratified in 2016, GoI planned to accelerate the development and deployment of RE in the country, by up-scaling of targets for RE capacity addition from 30 GW[11] by 2016-17 to 175 GW by 2021-22. This would have resulted in abatement of 326.22 million tons of CO_2 per year. Further, India is also committed to the Sustainable Development Goals[12] evolved by United Nations. Specifically, Goal Seven requires the governments to "ensure access to affordable, reliable, sustainable and modern energy for all". Government of West Bengal introduced 'Policy on Co-generation and Generation of Electricity from Renewable Sources of Energy' in June 2012 to encourage the growth of RE in the State.

As per the report of Central Electricity Authority[13], as of March 2017, against its potential of 8.97 lakh MW the installed capacity of the country from RE sources was 0.57 lakh MW. This constituted 17.52 *per cent* of the total installed

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[8] *India's first response to climate change issues, issued in 2008 by Government of India to deal with rising emissions and its effect on development.*

[9] *United Nations Framework Convention on Climate Change*

[10] *The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels. India ratified the Paris Agreement (on Climate Change) on 2nd October 2016*

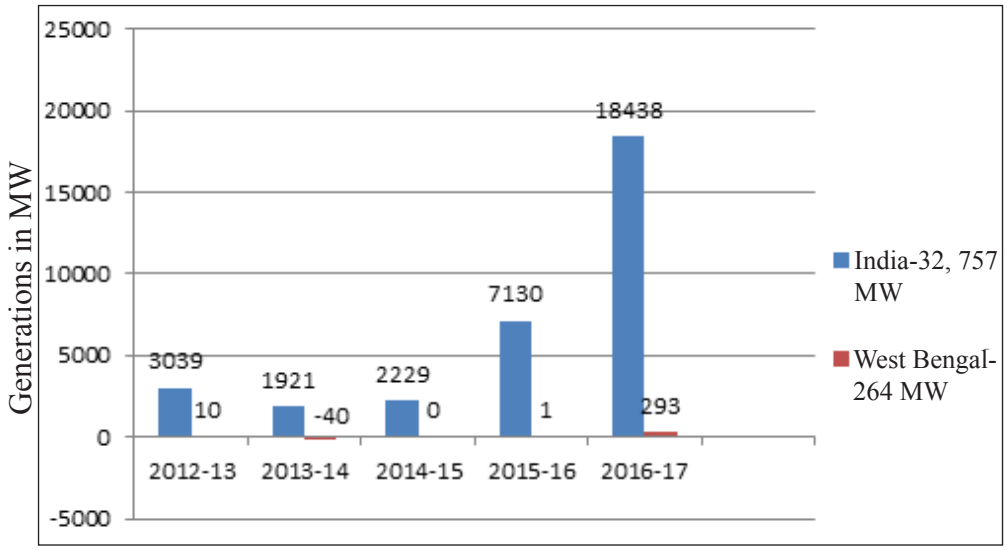
[11] *Giga Watt*

[12] *In 2015, all countries under the UN umbrella adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals.*

[13] *A statutory organization, which plays a lead role in promoting the integrated operations of the regional power grids and the evolution of a national grid.*

capacity (3.27 lakh MW) from all sources[14]. Whereas, in West Bengal, against the potential of 7,222 MW[15] the total installed capacity from RE sources was only 424.64 MW. This constituted 4.08 *per cent* of the total installed capacity (10,383 MW) from all sources and 0.13 *per cent* of the total installed capacity (3.27 lakh MW) of the country. Further, as per the report of the Central Electricity Authority during 2012-17, 264 MW capacity was created through RE sources in the State. Year wise addition/reduction in installed capacity of the Country *vis-á-vis* the State are depicted in the **Chart-2.1**.

Chart-2.1: Year wise addition/reduction in installed capacity of the Country vis-á-vis the State during 2012-13 to 2016-2017



However, as per records of WBREDA, only 35.18 MW was the capacity installed in the State during the period of five years which was 4.15 *per cent* of the target (847 MW) fixed in the Policy.

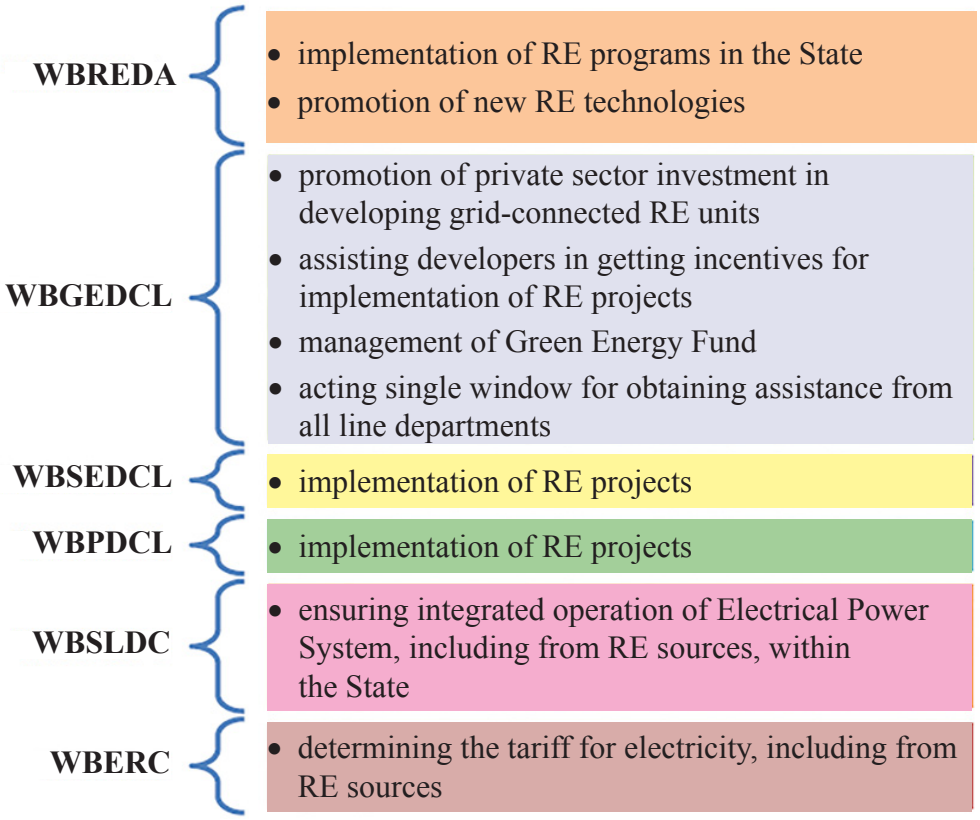
2.2. Organizational set up

The Department of Power & Non-Conventional Energy Sources (Department), Government of West Bengal (GoWB) has overall responsibility for co-ordination, implementation and monitoring of different projects under its RE Programme. The Department implements the RE Programme through two nodal agencies (West Bengal Renewable Energy Development Agency - WBREDA[16], West Bengal Green Energy Development Corporation Limited - WBGEDCL[17]) and two implementing agencies (West Bengal State Electricity Distribution Company Limited - WBSEDCL[18], West Bengal Power Development Corporation Limited - WBPDCL[19]). Besides, West Bengal Electricity Regulatory Commission

[14] *Total 326849 MW from Thermal, Nuclear, Hydro and Renewable Energy Sources*
[15] *As per MNRE report*
[16] *Autonomous body established in 1993*
[17] *State PSU established in August 2007*
[18] *State PSU established in March 2007*
[19] *State PSU established in July 1985*

(WBERC) and West Bengal State Load Despatch Centre (WBSLDC)[20] are functioning as regulatory authorities. Their respective jurisdiction is listed in the **Chart 2.2.**

Chart-2.2: Agency-wise jurisdiction



According to RE Policy, WBREDA was responsible for implementation of RE projects while WBGEDCL was to facilitate private investment, monitor projects and clear infrastructure bottlenecks for implementation of RE projects. However, apart from WBREDA, WBGEDCL, WBSEDCL and WBPDCL also undertook implementation of RE projects.

2.3 Scope and methodology of Audit

The Performance Audit was conducted between February and June 2017. Besides the records of different projects under RE programme planned and implemented by the Department and its agencies[21], the records of West Bengal Electricity Regulatory Commission (WBERC) and West Bengal State Load Despatch Centre (WBSLDC) for the years from 2012-13 to 2016-17 were examined. Audit methodology adopted was analysis of data/ documents available in the different audited entities and joint site inspection. An Entry Conference was held on 27 March 2017 where the audit objectives of this Performance Audit

[20] *An Apex body established in April 2006*

[21] *WBREDA, WBGEDCL, WBSEDCL and WBPDCL*

were discussed in detail with the Department and its implementing agencies. The Exit Conference was held on 19 January 2018 wherein the replies to audit observations and recommendations were discussed with the management. Their replies have been suitably incorporated into the report.

2.4 Audit Objectives

The objectives of this Performance Audit were to assess whether:

- Planning process and policy framework were focused on increasing the generation of renewable energy and achieving the Sustainable Developments Goals;
- Implementation of the planned schemes was effective to meet the targets envisaged in the RE Policy 2012;
- Fund allocation was adequate and financial resources were managed efficiently to harness the RE sources;
- Tariff and other regulatory mechanisms relating to purchase and sale of RE were conducive to development of RE and were adhered to by the agencies; and
- Monitoring, Internal Control and vigilance arrangements were effective.

2.5 Audit criteria

The audit criteria for this Performance Audit were derived from:

- West Bengal Policy on Co-generation and Generation of Electricity from Renewable Sources of Energy, June 2012 (RE Policy June 2012)
- National Action Plan on Climate Change (NAPCC) 2008 / State Action Plan on Climate Change (SAPCC) April 2011 and April 2012
- Sustainable Development Goals[22] evolved by the United Nations
- Guidelines issued by the Ministry of New & Renewable Energy (MNRE)
- West Bengal Electricity Regulatory Commission (Cogeneration and Generation of Electricity from Renewable Sources of Energy) Regulations, 2013 of WBERC
- Mandate of West Bengal Green Energy Development Corporation Limited
- West Bengal Financial Rules, West Bengal Treasury Rules (WBTR)
- Electricity Act 2003

Audit findings

Audit findings related to planning, implementation and monitoring of RE projects in the State are discussed in the succeeding paragraphs.

[22] *In 2015, all countries under the UN umbrella adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals.*

2.6 Planning process and policy framework adopted by the Department/ Nodal Agencies

In 2012, the Department introduced its first ever RE Policy on 'Co-generation[23] and Generation of Electricity from RE Sources'. The objective was to achieve installed capacity of 1040 MW by March 2017 from an existing capacity of 193 MW from RE sources. Consequently, during 12th Five Year Plan (FYP) period (2012-17), 847 MW of capacity was to be created from RE sources. In this regard, audit observed the following:

2.6.1 Discrepancies in assessment of RE potential in different documents

Audit noticed wide variation in source-wise RE potential as assessed in three different documents *viz*. State Action Plan on Climate Change (SAPCC) - April 2012, RE Policy - June 2012 and Annual Reports of MNRE (pertaining to GoWB) for 2014-15 as shown in the **Table 2.1.**

Table 2.1: RE potential as per different documents

	RE Potential		
Source of Renewable Energy	**SAPCC April 2012**	**RE Policy June 2012**	**MNRE Annual Report (2014-15)**
	(in MW)		
Wind	450	450	22
Mini & Small Hydro	300 (Small Hydro)	394	396
Co-generation	Not mentioned	600	Not mentioned
Biomass	350	662	396
Waste to Energy	150	100	148
Solar	16,700	Under Preparation	6,260
Total	**17,950**	**2,206**	**7,222**

(Source: As per RE Policy, SAPCC and MNRE reports)

The figures of RE potential, which appeared in the three documents, were different, even though the inputs were provided by the Department. In reply, the Department accepted (December 2017) that it had not taken up any exclusive study to assess RE Potential in the State and considered various reports, research studies to refer RE potential in the State.

Thus, the varying source-wise RE potential in different documents, indicated that it was arbitrarily assessed and incorporated without actual on-ground verification or any study. Lack of clarity on actual potential hampered preparation of realistic targets for increasing RE in the State.

[23] *Co-generation means a process which simultaneously produces two or more forms of useful energy including electricity from a single fuel source.*

2.6.2 Deficiencies in framing Policy, Plan and Programme

One of the objectives of the RE Policy was to promote and facilitate the growth in generation of electricity from RE sources by optimal utilisation of the RE potential in the State. The Policy also aimed at removing constraints by providing a guiding framework for promotion and development of appropriate RE technologies. Audit noticed following deficiencies in the process of framing the policy, plan and programme by the Department:

- The Department failed to assess the potential of solar energy -one of the most important source of RE- in the State and to incorporate the same in the RE Policy till date (December 2017) as it was stated to be under preparation. As such, necessary directives for harnessing the actual RE potential of solar energy could not be framed in the policy.

- Comprehensive action plan and programme to achieve the targets of the RE policy were not delineated. As such, there was absence of a strategy or road map to translate the targets into action/ projects at ground level. This was evident from the fact that there was a wide gap between the targets (847 MW) in RE Policy and actual achievements (35 MW) during 2012-17 from RE sources. Even though GoWB had appointed nodal agencies for implementation of the plan, the Policy did not include any mandate for them to work out comprehensive action plans and programs to achieve the targets.

- As a part of the MNRE's plan for capacity creation of 175 GW from RE sources for the country, the State had been given (2016) a target of achieving the capacity of 5386 MW by 2022. In the RE Policy of the State, the target to be achieved was 2706 MW by 2022. The Department did not reset the targets in its RE Policy in accordance with the revised targets given by MNRE.

These deficiencies in framing the policy and setting out plans and programs for harnessing RE potential in the State led to non-achievement of the targets of the RE Policy.

The Department stated (December 2017) that the RE sector had undergone spectacular change during last 3-4 years with the introduction of newer technology and it had taken up a fresh exercise in framing a State Solar Policy. It also stated that action was being taken to frame State Energy Plan and State Energy Action Plan for taking holistic view and future action of power sector in the State. However, the Department had set no timelines or modalities regarding this exercise.

2.6.3 Strategy for implementing RE Policy

As per the RE Policy, WBGEDCL was to act as the State Nodal Agency to facilitate private investment and involvement in the RE sector of the State. WBREDA, was *inter alia,* responsible for promotion of new RE technologies through demonstration projects. The Policy defined the roles and responsibilities of WBREDA and WBGEDCL for promotion of green energy in the State. Further WBSEDCL and WBPDCL were also to act as implementing agencies for creation of different RE projects in addition to their primary responsibilities in the conventional power sector.

Audit observed that the Department did not allocate responsibilities with timelines with regard to implementation of the RE Policy. It was also seen that, during the last five years (2012-17) WBREDA had not taken up any activities for (i) promotion of RE technologies (ii) disbursement of subsidy (iii) providing support to developers in formulation, design and proper implementation of off-grid[24] solar and biogas projects. It was seen that seven solar projects pertaining to the year 2012-13 to 2014-15 had not been taken up by WBREDA. The reasons for not taking up the project were non-identification of suitable site, lack of manpower *etc.*, which could have been resolved by strategic planning. As a result, ₹ 14.74 crore remained unutilised as of August 2017.

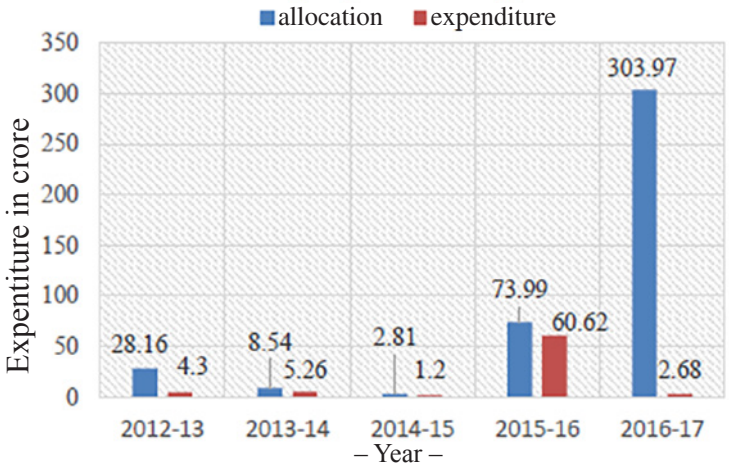
Accepting the Audit observation, the Department stated (December 2017) that the WBGEDCL was in the process of winding up and its activities would be taken up by WBREDA[25]. However, fact remains that Department did not take any step to strengthen WBREDA in view of its poor performance.

2.6.4 Assessment of funds for different RE programmes not done

As per SAPCC, during the 12th FYP period (2012-13 to 2016-17) funds amounting to ₹ 4610[26] crore were required. However, the Plan did not stipulate the sources from which this funding requirement was to be met. Further, RE Policy (Para 10.2) stipulated that the budgetary allocation was to be done in such a way that separate fund reserves were created and kept for different RE technologies. However, it was observed that:

- No separate fund was created for different projects of RE technologies.
- Out of the estimated fund requirement of ₹ 4610 crore, as per SAPCC, during 2012-17, only ₹ 417.47 crore (9.10 *per cent*) was allocated. Out of this only ₹ 74.06 crore (17.74 *per cent*) was utilised as on March 2017 as outlined in **Chart 2.3.**

Chart-2.3: Allocation vis-á-vis expenditure



(Source : As intimated by WBREDA, WBGEDCL, WBSEDCL and WBPDCL)

- Neither the Department nor the nodal/implementing agencies could provide any records indicating the efforts made for bringing in private investment for achieving the targets as planned under SAPCC.

[24] *Standalone power generation for local consumption.*
[25] *As per Department's order issued in November 2017.*
[26] *₹ 2000 crore for 2000 MW from RE sources by 2021, ₹ 2500 crore incentives for Green Energy Producers, ₹ 110 crore for manpower development for installation, Operation and Maintenance.*

In reply, the Department stated (December 2017) that unless additional support be extended, it would be difficult to achieve the target. The reply needs to be seen in view of low utilisation of allotted funds and its failure to create a separate fund for funding different projects of RE. Moreover, the Department was silent about bringing in private investment for harnessing of RE potential as planned in SAPCC.

2.6.5 Green Energy Fund not created

According to the RE Policy[27], WBGEDCL was responsible for creation and management of a Green Energy Fund (GEF) in order to finance various initiatives for development of RE in the State. GEF was to be created by equity contribution by the GoWB and contributions from international donor agencies. GEF was to be tapped from the charges collected from private developers to provide administrative support for obtaining statutory clearances and charges for project assessment *etc*.

Audit, however, observed that WBGEDCL did not take any initiative for creation of the fund. Neither any records relating to any effort made by WBGEDCL were made available for audit.

Accepting the audit observation, the Department stated (December 2017) that a draft Solar Policy was under preparation with a provision of GEF and fresh attempts would be made for creation of GEF.

The fact, however, remains that West Bengal failed to put in serious efforts for creation of GEF.

Good practice

Maharashtra Government, with the objective to implement various RE projects, created Green Cess Fund by levying tax at the rate of eight paisa per unit of electricity sold to the industrial and commercial consumers. During 2007-08 to 2014-15, the State generated ₹ 2315 crore from this source.

2.6.6 Institutional mechanisms to plan and implement the RE projects

Achieving ambitious renewable energy targets requires the presence of enabling infrastructure like laws and codes to support the change from non- renewable to the RE sector. In this regard, audit observed:

2.6.6.1 Building codes not framed and bye-laws not amended

The RE Policy[28] stipulated that building codes should be framed to make it mandatory for the buildings of government establishments, business entities, schools, colleges, hospitals, housing societies, *etc*., to install roof-top Photo Voltaic (PV) devices for generation of solar energy.

[27] *Para 10.1 read with Para 14.2.1.vii*
[28] *Para 6.14, 6.17 and 6.18*

All existing and upcoming commercial and business establishments having more than 1.5 MW of contract demand would be required to install solar roof top systems to meet at least two *per cent* of their total electrical load.

Those entities having a total contract demand of more than 500 KW would be required to install solar rooftop system to meet at least 1.5 *per cent* of their total electrical load.

Installation of PV plants across unused rooftop areas and vacant spaces in the premises of industrial infrastructures coming under the initiative of the State like growth centres, industrial parks *etc*., was to be executed by 2017.

All these changes required a revision in the building bye-laws, under the administrative jurisdiction of the Municipal Affairs Department (MAD). It was observed that WBGEDCL approached (July 2012 and June 2013) the Municipal Affairs Department to issue necessary orders to make suitable changes in the bye-laws of the building code to bring them in conformity with the RE policy. WBGEDCL also submitted (February 2013) Draft bye-laws to the Department for onward transmission to MAD for getting the building bye-laws amended by them. However, as of December 2017, bye-laws of the buildings code had not been amended to facilitate the achievement of the initiatives laid down in the RE policy.

The Department stated (December 2017) that it had introduced West Bengal Energy Conservation Building Code 2016 (WBECBC) which was being amended in line with the Energy Conservation Building Code 2017 published by Bureau of Energy Efficiency, Government of India. It further stated that a draft amendment to building bye-laws in consultation with Urban Development Department and MAD was prepared and expected to be taken up for notification early. However, the fact remains that WBECBC is still to be amended by the Department and sent to Urban Development and Municipal Affairs Departments for incorporation of its provisions in the building bye-laws.

2.6.6.2 Deficiency in clearance mechanism of RE projects

The RE Policy[29] empowered WBGEDCL to act as a Single Window for obtaining clearances for different RE technologies, identifying all the documents required and for developing standard formats. All these standard formats were to be made available on the website of the Nodal Agency.

Audit, however, observed that WBGEDCL was yet to develop any standard format; as such, it could not function as a single window for speedy clearances for different RE technologies. The reasons for not developing the standard format till December 2017 were not furnished to Audit.

[29] *Para 9.3*

RE policy[30] also made WBGEDCL responsible for promotion of private sector investment and involvement in developing grid-connected RE units, assisting developers in getting different incentives for implementation of RE projects *etc*. Accordingly, the Board Meeting of WBGEDCL resolved (September 2012) that it would help the private parties with overall guidance, in line with the RE Policy.

Audit observed that 11 private developers proposed (between August 2011 and July 2014) setting up Grid Connected Solar PV Power Plants at different places in the State with the projected capacity of 233.30 MW. However, only one developer was able to commission a five MW Solar PV Power Plant at Durgapur in March 2013. The projects of other private developers for installation of remaining 228.30 MW could not be materialised due to reasons not on record.

The Department stated (December 2017) that the proposals could not be materialised as all the private developers sought land and higher tariff than that of prevailing rates. It further stated that in view of these constraints, suitable provisions were being proposed in the draft Solar Policy. However, fact remains that the Department had not taken any initiative to assist the private developers in the promotion of RE.

2.6.7 Incorporation of SDGs into Policy

To end poverty in all its dimensions and craft an equal, just and secure world by 2030, 17 Sustainable Development Goals (SDGs) were adopted (September 2015) in the UN General Assembly Summit. India, as a member of UN General Assembly is a signatory to the SDGs, which also have to be followed by all the states across India. In West Bengal, the State Government has put in place a process to implement the SDGs.

One of the goals (SDG–7) -'Affordable and Clean Energy' was to ensure access to affordable, reliable, sustainable and modern energy for all. Two of the five targets set to be achieved under SDG-7 were to:

- ensure universal access to affordable, reliable and modern energy services; and
- increase substantially the share of RE in the global energy mix.

The SAPCC and RE Policy of the State were also not reformulated to achieve the objectives set out in the SDGs. In its absence, the generation of energy through RE sources did not get the attention and focus required as mandated by the SDGs.

Accepting the Audit observation, the Department stated (December 2017) that it had decided to frame Energy Plan and Energy Action Plan for the State to ensure access to affordable, reliable, sustainable, modern and clean energy.

[30] *Para 14.2.1*

2.7 Implementation to meet Policy Targets including Research and Development (R&D) Activities

2.7.1 Achievements vis-á-vis Targets

In order to meet the objectives of NAPCC (June 2008), GoWB set a target in SAPCC (April 2011) for creation of 2000 MW and 3000 MW grid connected installed capacity from RE sources by 2021 and 2031 respectively. SAPCC also proposed incentives for RE producers and facilitating R&D activities during the period of ten years, ending in 2021. Further, MNRE under 'Power for all programme'[31] envisaged (August 2016) the target for West Bengal, for creation of installed capacity of 5,386 MW from RE sources by 2022.

The Department, in the RE Policy of June 2012, set a target for additional installation of 847 MW[32] of RE as short term goal for 12th FYP period. Further, it set a target for 13th FYP period to achieve installed capacity of 2706 MW of RE as a long term goal. However, Audit observed that during the 12th FYP period (2012-17) only 35.18 MW (4.15 *per cent*) capacity of RE was added as against the target of 847 MW, as detailed in **Table 2.2.**

Table 2.2: Targets vis-á-vis achievements

Source of RE	Existing Installed Capacity(in MW) as on June 2012	Target for 12th Plan period (2012-17) (in MW)	Achievement (2012-17) (in MW)	Achievement (in percentage)
Wind Power	2	73	Nil	Nil
Mini & Small Hydro	97	123	Nil	Nil
Co-generation	69	286	Nil	Nil
Biomass	16	224	10.10	02.59
Waste to Energy	7	43	01.00	00.00
Solar	2	98	24.08	24.57
TOTAL	**193**	**847**	**35.18**	**04.15**

(Source: Records of WBREDA)

The very low achievement reflected deficiency in policy formulation and planning by the Department. Further, the approved projects were also ineffectively implemented and failed to meet the targets for installation of capacity of RE from different sources, as discussed in the succeeding paragraphs.

[31] *A joint initiative of GoI and GoWB*

[32] *As in June 2012, the installed capacity was 193 MW which was to be increased to 1040 MW by the end of 12th FYP*

The Department attributed (December 2017) the lower achievements to various factors like low solar insolation, higher land costs, low wind and hydel potential, commercial interests of the Distribution Companies (DISCOMs), *etc*. The reply was not tenable as the potential and targets were fixed in the RE Policy based on the conditions of the State and it was mandatory on the part of DISCOMs to fulfil the power purchase obligations. Moreover, the commercial interests of the DISCOMs were served by fixation of their sales tariff by WBERC after considering the effects of the Renewable Purchase Obligations (RPO)[33].

2.7.1.1 Implementation of Wind Power Projects

As per the RE policy, it was identified that 450 MW of wind power potential existed in the State. During the 12th FYP period, a target for additional installation of 73 MW[34] of energy from wind power was set. Audit observed that the actual achievement during the plan period was nil. Moreover, the existing 2.5 MW wind projects[35] had also stopped functioning and the three approved projects could not be taken up as detailed below:

(a) The wind power project at Ganga Sagar stopped functioning from November 2012 due to availability of conventional energy now in Ganga Sagar Island. The wind power project at Fraserganj had not been operational since May 2016 due to lack of maintenance. Due to dearth of work force in WBREDA, the Department decided (November 2015) to transfer the Wind Farm Project at Fraserganj to WBSEDCL from WBREDA, which was yet (December 2017) to be handed over. It was further observed that in February 2017, WBSEDCL forwarded an estimate amounting to ₹ 72.00 lakh to WBREDA for repair and maintenance of the project but no action was taken by WBREDA for allocating the required funds as of July 2017. Thus, the plant remained non-functional for more than one year due to lack of proper maintenance of the plant.

The Department stated (December 2017) that the existing 2 MW wind farm project at Fraserganj had re-started power generation from November 2017 after repairing. Audit, however, observed that out of total eight wind energy generators, only three with 0.75 MW capacity could be repaired and started operations. Further, due to delay in taking suitable action for repair and maintenance of the project, power generation remained suspended for more than one year (May 2016 to November 2017) which resulted in loss of power generation of 8.62 lakh KwH[36].

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[33] *RPO means obligation to purchase electricity from renewable & co-generation sources by a distribution company.*

[34] *As in June 2012, the installed capacity was 2 MW from Wind Power which was to be increased to 75 MW by the end of 12th FYP*

[35] *Fraserganj (2 MW) and Ganga Sagar (500 KW). While fixing the targets for 12th FYP, the existing installed capacity of wind energy had been taken as 2 MW, in the RE Policy*

[36] *Calculated on the basis of the last five years' generation history of the plant.*

(b) WBREDA proposed (December 2011) to the Department for setting up three grid connected Wind Power Projects[37] with total capacity of one MW at a total cost of ₹ 6.55 crore. WBREDA claimed[38] that the government land for the projects had already been taken into its possession. Accordingly, Department approved (March 2012 and February 2013) the projects for completion by six months. Audit observed that the projects could not be implemented till December 2017 as the land was not under possession of WBREDA. The Department stated (December 2017) that in anticipation of the availability of land, the project was sanctioned, but subsequently surrendered due to non-availability of land.

Thus, WBREDA not only failed to create any additional capacity in the area of power generation through wind projects but also failed to maintain generation of RE from the existing 2.5 MW wind projects at Ganga Sagar and Fraserganj. Discontinuation of RE generation at Ganga Sagar due to availability of conventional energy indicates that generation of RE and environmental concerns were not the priority of the Department. As of December 2017, only 0.75 MW of wind power project was functional in the State.

The Department stated (December 2017) that the wind power potential in West Bengal was only 22 MW. The reply was, however, unfounded as the wind power potential as per RE policy and SAPCC of the State Government was 450 MW. The Department was far from harnessing the full potential of wind power.

2.7.1.2 Implementation of Mini and Small Hydro Power Projects

RE policy stipulated the target of installation of 123 MW during 2012-17 in hydropower in addition to the existing capacity of 97 MW. However, no hydropower capacity was created during the period.

Failure to implement Pedong Small Hydel Project

The construction of Pedong Small Hydel Project of 3 MW capacity was taken up (December 2007) by WBSEDCL at an estimated cost of ₹ 24.77 crore. Audit observed that WBSEDCL identified 9.55 acres of land and applied (February 2009) to the concerned Land Acquisition (LA) Collector for acquisition. It was also seen that the LA collector informed (November 2011) WBSEDCL that Cabinet Approval was required to proceed with the acquisition of land. In April 2012, WBSEDCL made proposal to the Department for obtaining cabinet approval, which was accorded in September 2013. It was further seen that WBSEDCL could not acquire the land due to escalation in the cost of land as a result of time lapse. The project was dropped in June 2016 by WBSEDCL due to cost overrun by ₹ 22.42 crore[39].

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[37] *One at Beguakhali and two at Ganga Sagar Island*

[38] *In the project proposals.*

[39] *Project Cost increased to ₹ 47.19 crore in June 2016 minus Original Project Cost ₹ 24.77 crore in December 2007*

Audit observed that though the project was approved in December 2007, the application for land for the project was made after more than one year, in February 2009. LA collector took 34 months to inform about the need of Cabinet approval for land acquisition. WBSEDCL and the Department took further 22 months to get clearance of the Cabinet for the acquisition of land and further three years for taking the decision to drop the project. Meanwhile, WBSEDCL incurred a total expenditure of ₹ 1.18 crore on pre-construction work[40].

The Department stated (December 2017) that the project, since inception, was fraught with difficulties like political disturbances, extreme remoteness of location, uncertainty in getting Clean Development Mechanism benefit, high market value *etc*. which ultimately made the project unviable. The reply was, however, not acceptable as Audit found prolonged delay at all levels in commencement of the work which led to increase in cost of the project. Further, without resolving the difficulties the project should not have commenced.

As a result, capacity of 3 MW could not be created, and the expenditure of ₹ 1.18 crore incurred on pre-construction work became infructuous.

2.7.1.3 Implementation of Biomass/Co-generation/Waste to Energy Projects

The RE policy set a target to make additions[41] of 224 MW, 43 MW and 286 MW capacity from biomass[42], waste-to-energy[43] and co-generation[44] sources respectively, during the period 2012-17.

As per the RE Policy[45], the nodal agency was required to (i) identify potential sites for establishment of biomass units on Public Private Partnership mode, (ii) classify high rice-producing areas ensuring smooth availability of feedstock, (iii) allocate projects in the pre-defined command areas and (iv) periodically review these projects.

In respect of 'waste to energy'[46], the Municipal Corporations were to identify the land for the projects. For waste to energy projects, promotion of garbage segregation at source was made mandatory for industries, large commercial complexes and large housing societies. Use of bio- degradable waste was to be encouraged for generation of electricity through waste-to-energy power projects as well as preventing soil degradation of the waste dumping ground.

Further, Co-generation Power[47] was targeted to be harnessed through co-generation facilities that were intended to be installed primarily in iron and

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40 *Survey and investigation, preparation of DPR, advance to L&LR etc.*

41 *As in June 2012, the installed capacity was 16 MW(Biomass), 7MW (Waste to energy) and 69 MW (Co-generation) which was to be increased to 240 MW, 50 MW and 355 MW respectively by the end of 12th FYP*

42 *Rice husk is a primary feedstock for biomass projects. Feedstock availability and pricing are the critical determinants of success for biomass plants.*

43 *Energy generated from municipal solid wastes or any other organic or inorganic waste.*

44 *Process which simultaneously produces two or more forms of energy from single source.*

45 *Para 6.4 and 6.5 of the RE Policy*

46 *Para 6.9 to 6.11 of the RE Policy*

47 *Para 6.12 of the RE Policy*

steel, fertiliser and chemical industries having connected load of 2000 KVA and above. These were to produce at least 5 *per cent* of their requirement through captive power plants employing co-generation technology.

Audit, however, observed that only three biomass projects and one 'waste to energy' project were commissioned during the 12th FYP period with capacity of 10.1 MW and one MW respectively. No project was taken up in co-generation. Thus, only two *per cent*[48] of targeted capacity was achieved from these three RE sources.

The Department stated (July 2017) that the achievement was poor as the sale price of power from these RE sources, as fixed by WBERC, was not attractive. As a result, these projects were not viable for the producers. The reply is not tenable as the WBERC had fixed the tariff based on generation costs.

2.7.1.4 Implementation of Solar Power Projects

RE policy had set the target of additional installation[49] of 98 MW during the period of 2012-2017. However, only 37.20 MW[50] of solar energy was installed as of December 2017.

Further, MNRE fixed (April 2016) a target of 500 MW solar power projects to be achieved by the State during the year 2016-17. MNRE advised (May 2016) to plan for tendering of 2000 MW solar power projects during 2016-17 and 2017-18. Against this, audit observed that the achievement in tendering was for creation of only 33.31 MW of solar energy and only 11.18 MW was commissioned.

In reply, the Department stated (December 2017) that projects having installed capacity of 39.2 MW of solar power was installed, 148 MW under progress and 271 MW was upcoming. Thus, the Department failed to achieve the targets as envisaged in the RE Policy. Project-wise analysis of the under achievement is as follows:

(i) Solar Park at Mejia not set up

The RE Policy stipulated[51] that where Government vested land was available, the permission for use of such land for setting up RE project would be given for 30 years or the project life, whichever was less. Vested land would be allocated and transferred to WBGEDCL, which would then lease the land to the RE developers for implementation of projects.

Audit observed that WBGEDCL conducted (September 2012) a field survey in Mejia block, Bankura district and identified 178.9 acres of vested land for setting up of solar power project. It submitted a pre-feasibility report to the

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48 *Achievement of 11.1 MW against the target of 553 MW (224+43+286) = 2 per cent*

49 *As in June 2012, the installed capacity of Solar energy was 2 MW which was to be increased to 100 MW by the end of 12th FYP.*

50 *As of December 2017, total installed capacity of Solar energy was 39.20 MW, which means during the 12th FYP the addition in installed capacity was 37.20 MW.*

51 *Para 9.1 of the RE Policy*

Department in September 2012. Based on the survey, the Department directed (September 2012) WBGEDCL to study the feasibility of grid connectivity and to put up a detailed proposal for developing a Solar Park. However, as of March 2017 WBGEDCL did not submit any proposal.

The Department stated (December 2017) that WBSEDCL had set up a 10 MW solar power project within the available land of 52 acres. However, the Department did not furnish any reasons for non-submission of detailed proposal by WBGEDCL for setting up of the solar park on the entire land of 178.9 acre of vested land.

(ii) Development of Solar Cities Programme not implemented

MNRE launched a programme (February 2008)[52] on "Development of Solar Cities" for the 12th FYP period with the objective to promote the use of RE in urban areas. The programme was to be implemented by urban local bodies through nodal agencies. As per programme guidelines, a maximum of seven solar city projects were to be implemented in the State. MNRE sanctioned (between February 2013 and February 2014) three projects[53] for the State to be completed within three years. As of December 2017, none of the projects had been completed. Audit observed the following:

a) MNRE sanctioned (between February 2013 and February 2014) ₹ 50.00 lakh each for Howrah, New Town and Madhyamgram Solar City projects which were to be implemented by the concerned Municipalities/ Development Authority. MNRE released (between February 2013 and November 2015), ₹ 26.30 lakh each for Madhyamgram and New Town Solar City project and ₹ 4.31 lakh for Howrah for undertaking different preliminary activities like preparation of master plan, setting up solar city cell, *etc*., As per the programme guidelines, the state nodal agencies (WBREDA/ WBGEDCL) were to closely monitor the implementation of these activities.

It was seen that the Madhyamgram Municipality prepared a Master Plan only, at a cost of ₹ 4.15 lakh and submitted alongwith the Utilisation Certificates (UCs), to MNRE through WBREDA. No other activity was taken up and ₹ 22.15 lakh was neither surrendered nor utilised.

New Town Kolkata Development Authority (NKDA) had submitted UC of the full amount of ₹ 26.30 lakh.

Out of ₹ 4.31 lakh received (February 2013) from MNRE, WBGEDCL released (May 2013) ₹ 2.59 lakh to Howrah Municipal Corporation for preparation of master plan. As Howrah Municipal Corporation failed to submit any UCs, MNRE did not release any further funds.

Accepting audit observation, Department stated (December 2017) that (i) completion time had been extended upto December 2017 for Madhyamgram Municipality (ii) NKDA was still working on to fulfil the goal of solar city programme and (iii) Howrah Municipality was being continuously persued to complete the remaining activities.

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[52] *Revised vide MNRE circular No. 5/4/2013-14/SC dated 17 January 2014*

[53] *Madhyamgram Municipality, Newtown Kolkata Development Authority and Howrah Municipal Corporation*

b) Further, the Haldia Municipality had expressed (July 2009) its interest in developing a Solar City and conveyed its decision to appoint WBGEDCL as consultant for preparation of DPR for this project. However, it was observed that WBGEDCL did not take any initiative to include Haldia under the MNRE's Development of Solar Cities Programme, despite the fact that four more cities could have been included in the Programme.

Thus, due to failure in utilization of the released funds, MNRE did not release balance funds as of March 2017. As a result, the project could not be completed and thereby the intended benefits of the project could not be achieved as of December 2017.

(iii) Non-installation of rooftop solar PV power plants under Integrated Power Development Scheme (5 MW)

Power Finance Corporation (PFC), Government of India Undertaking, Ministry of Power, launched (December 2014)[54] Integrated Power Development Scheme (IPDS). The Scheme *inter alia* included installation of Rooftop Solar Photo Voltaic (RSPV) plants on the rooftops of government buildings. For West Bengal, PFC approved (between February 2015 and September 2016) installation of RSPV plants in 121 towns in 18 districts by WBSEDCL. The individual power plant capacity was to be 5 KW or multiples of it, as per availability of roof area. GoI was to contribute 60 *per cent* of the project cost and the balance 40 *per cent* was to be met by WBSEDCL. IPDS also stipulated an additional grant of 15 *per cent* to WBSEDCL for timely completion of the project. WBSEDCL took up (August 2016) the work of RSPV Projects of 5 MW under IPDS at a cost of ₹ 37.50 crore (₹ 75000 per KW) in two phases, during 2016-17 (2 MW) and 2017-18 (3 MW). The project deadline was August 2017. However, as of December 2017, even the tendering for the projects had not been finalised.

Audit observed that as per IPDS guidelines, the work had to be awarded within six months from the date of approval of the project. Since the first approval for installation of RSPV plants in 41 towns was issued in February 2015, work was to be awarded by August 2015. However, WBSEDCL initiated the process and issued NIT after a delay of one year, *i.e.*, in August 2016. WBSEDCL attributed the reasons for non-finalisation of tendering process to participation of insufficient bidders.

The Department stated (December 2017) that PFC had been requested to extend the project deadline. However, no communication had been received from PFC in this regard as of December 2017.

Thus, due to delay in tendering process, the first phase of solar projects of 2 MW capacity for 2016-17 could not be installed even after the lapse of project deadline. Besides, WBSEDCL failed to avail the additional grant of ₹ 5.63 crore (*i.e* 15 *per cent* of the total project cost) for failure of timely completion of the project.

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[54] *GoI OM No. 26/1/2014-APDRP dated 3 December 2014*

(iv) Poor achievement of grid connected Solar PV rooftop power plants for schools

The Department decided (December 2015) to implement a project for the installation of grid connected RSPV plants of 10 KW capacity each in 200 schools. The project was to be funded by the MNRE and the Department in the ratio of 30:70 and was to be implemented by WBSEDCL at an estimated cost of ₹ 15 crore.

WBSEDCL awarded (February 2016) the work to a private agency for installation and comprehensive maintenance (for 5 years), at a cost of ₹ 13.82 crore for completion by August 2016. As of December 2017, only 80 schools (out of 200) had been commissioned with the RSPV plants. Audit observed that the progress of the work was very poor. The contractor pointed out (August 2016) that WBSEDCL did not ensure the availability of requisite infrastructure[55] in the schools before awarding the work.

In reply, the Department stated (December 2017) that initially the project was delayed due to non-availability of funds and delay in conversion into three phase connection. The reply of the Department may be seen in view of the fact that even after receipt of funds in March 2017, only 80 plants could be installed against the targeted installation of 200 plants within six months.

Thus, due to failure of WBSEDCL in ensuring requisite infrastructure in the school, RSPV plants with total 1.20 MW (10 KW x 120) could not be installed in 120 schools even after 16 months from the stipulated date of completion.

(v) Mega Solar PV Projects at Santaldih not implemented

To give more emphasis on harnessing the solar energy potential of the State, the Department entrusted (September 2015) WBSEDCL with taking up three grid connected Solar PV projects (10 MW capacity each) at three locations[56]. The Department accorded (January 2016) administrative approval at a total cost of ₹ 184.52 crore.

WBSEDCL awarded (September 2016) the projects to Bharat Heavy Electrical Limited (BHEL), a Central Public Sector Undertaking at a total cost of ₹ 168.73 crore for completion within 225 days from handing over of the sites. The project at Mejia commissioned in December 2017, whereas, the projects at Chharah and Santaldih were under progress as of February 2018 with the physical progress of 80 *per cent* and 50 *per cent* respectively.

The required land for the site of Santaldih project was within the township of WBPDCL, which agreed to hand over the land. However, due to presence of some buildings/ quarters of WBPDCL within the project site, clear site could not be handed over to BHEL to commence the work. Audit observed that WBPDCL did not undertake demolition of the buildings on the site even after

[55] *Adequate shadow free area, three phase connections, concrete roof instead of asbestos roof, Import-Export energy meter (net meter) etc.*

[56] *Mejia (Bankura), Santaldih (Purulia) and Chharah (Purulia).*

WBSEDCL conveyed the matter to them in March 2016.

The Department stated (December 2017) that land issue had been resolved and the land had been handed over to BHEL in October 2017. It is stated that the project would be completed by June 2018. However, due to lack of co-ordination between the two companies within the same Department, the project commenced after two years of receiving administrative approval.

(vi) Non-implementation of the Scheme for Unemployed Youth and Farmers

MNRE approved (May 2015) a Scheme[57] for installation of 9500 MW grid-connected solar power projects in the country with the central subsidy of ₹ 4750 crore which included installation of 438 MW in West Bengal with the central subsidy of ₹ 219 crore. The scheme envisaged targeting the unemployed youth and farmers as beneficiaries. MNRE requested all states including West Bengal to send a letter of confirmation by July 2015; otherwise, reallocating the share to other states would be considered. The project was to be completed within seven years' period.

Audit observed that the Department did not communicate to MNRE whether it would accept the scheme; reasons for this were not on records. Due to not accepting the opportunity offered by MNRE, the State was not only deprived of the solar PV power projects of 438 MW capacity but also failed to avail the benefits of ₹ 219 crore of the Scheme for the unemployed youths and farmers in the State.

Accepting the audit observation, the Department stated (December 2017) that the Scheme could not be materialised due to shortcomings like (i) tariff determination mechanism taking into account business considerations of the DISCOMs, (ii) escalation of tariff every year upto 10 years, (iii) financial support to DISCOMs *etc.* and a modified proposal was under consideration. However, the concerned records indicated that no such contemplations were made for taking any decision as the proposal itself was submitted to the Chairman & Managing Director, WBSEDCL after expiry of the deadline.

(vii) Installation of Solar PV Power Plants in schools, health centres and colleges

Department of Environment, GoWB decided (June 2015) to install 100 Solar PV systems (SPV)[58] of total 570 KW capacity in different schools, Primary Health Centres and Rural Colleges. It was also envisaged that the 90 SPVs of 5 KW and 10 KW were to be grid-connected[59] with net metering[60] facility. The work was entrusted to WBGEDCL and an amount of ₹ 7.50 crore was sanctioned. WBGEDCL commissioned 100 solar PV systems[61] of 545 KW between May 2015 and September 2016 at a cost of ₹ 6.10 crore. Audit observed that out

[57] *Scheme for Unemployed Youths and Farmers*
[58] *10 nos. 2 KW, 60 nos. 5 KW and 30 nos. 10 KW*
[59] *For sharing the surplus energy generated through SPVs*
[60] *Meter for quantifying the energy shared on the Grid*
[61] *10 nos. 2 KW, 75 nos. 5 KW and 15 nos. 10 KW*

of 100 solar PV systems installed, grid-connectivity was not envisaged for 10 (2 KW capacity) solar PV systems as these were standalone systems, having a battery back-up. Out of remaining 90 SPVs, which were envisaged to be grid-connected with net metering, 76 systems (installed capacity of 455 KW) were not connected to grid. WBGEDCL stated that 15 SPVs (10 KW capacity) did not require to be connected as there was no surplus energy and the energy generated was consumed at the generation sites. Further, in respect to the 61 SPVs (5 KW capacity) it was observed that single phase net meters were not available with WBSEDCL for grid-connectivity. However, WBGEDCL did not take any action for connecting these SPVs to the grid. As a result, the excess energy generated through SPVs remained unutilised.

In reply, the Department stated (December 2017) that pending receipt of the funds from MNRE for conversion from single phase to three phase, these 61 schools were availing solar power during daytime. The reply was, however, not tenable as there was no funds commitment from MNRE and funds required for this project were to be met from the State funds.

(viii) Electrification of remote villages of Sundarban areas under the RVE programme

MNRE accorded (February 2010 and February 2011) sanction to a project[62] proposed by WBREDA, of rural electrification in 18 un-electrified remote villages in Sundarban areas with solar energy. The funding pattern was Central share of ₹ 31.27 crore, State share of ₹ 1.82 crore and the contribution of beneficiaries (villagers) was ₹ 3.68 crore. The project consisted of 26110 units of total 10.50 MW which included Solar PV Home Lighting System to 23845 households and 2265 Street Lighting Systems. The duration of the project was six months for 16 villages and one year for two villages from the date of sanction[63].

Records revealed that MNRE released ₹ 21.59 crore to WBREDA between February 2010 and June 2011 and the State released ₹ 1.22 crore to WBREDA in November 2010. However, despite receipt of funds WBREDA did not commence the project till June 2017. Audit observed that WBREDA invited (January 2012) tenders, but its finalisation was delayed by more than 20 months for no recorded reasons. Thereafter, due to introduction of e-tendering process, the Purchase Committee decided (March 2014) to cancel the tender and advised WBREDA to re-tender through e-tendering mode, however, no action on this was taken by WBREDA. Subsequently, in response to the communications of WBREDA (July 2015 and June 2016), WBSEDCL confirmed (June 2016) that all the 18 villages were expected to be electrified through conventional sources by February 2017. Subsequently, WBREDA in May 2017, decided to close the RVE programme. Meanwhile, WBREDA incurred ₹ 15.97 lakh on finalization of beneficiary list, survey and organizing awareness camp and publicity of RVE programme.

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[62] *Under the Remote Village Electrification (RVE) Programme*

[63] *Two sanctions were issued in February 2010 (16 villages) and February 2011 (2 villages).*

Scrutiny of records further revealed that WBREDA submitted the UC of ₹14.44 crore to MNRE during 2012-13 and 2013-14 although no expenditure had been incurred out of MNRE fund. It was observed that as of July 2017, an amount of ₹ 22.65 crore was lying with the WBREDA.

Accepting the audit observation, WBREDA stated (August 2017) that UCs had been submitted even though no expenditure was incurred. The Department also stated (December 2017) that the Programme was abandoned. Thus, unutilised fund of ₹ 22.65 crore including MNRE funding of ₹ 21.59 crore remained blocked for more than seven years till June 2017.

(ix) Faulty implementation of Solar PV Power plant

WBGEDCL took up (February 2012) a work for construction of additional one MW of Solar PV Power Plant (Phase II) at an estimated cost of ₹ 8.80 crore. Phase-I of this Solar Plant (1.1 MW) at the same site at Jamuria, Burdwan District was commissioned in August 2009. The Phase-II plant was commissioned in March 2012 at a total cost of ₹ 8.68 crore.

Scrutiny of records revealed that the annual average generation of power during the period 2013-14 to 2016-17 was only 6.45 lakh kWh against the estimated generation of 12.50 lakh kWh.

In the 29th Board of Directors' meeting of WBGEDCL (February 2014), while discussing the performance of the Jamuria plant, it was observed that for proper installation of one MW Solar PV Power Plant, a minimum of four acres of land was required. The installation of additional one MW Plant at the same site had created a shadow effect[64]. Since the project of Phase II was technically faulty, it was not possible to achieve full generation.

The Technical Committee, constituted by Board, in its report (February 2014) opined that it was technically not viable to accommodate 2 MW capacity projects in a land measuring 4.92 acres. Considering the available shadow free area in the existing land, the capacity of the project should be reduced to 1.3 MW for efficient generation.

The issue of insufficiency of land was also raised in the WBGEDCL meeting on this project with the executing agency (March 2012) but it was decided to execute the Phase II "for sake of survival of the project".

Thus, due to technically faulty planning of the project by WBGEDCL, there was an average loss of generation of 6.05 lakh kWh power per year during last four years.

In reply, the Department stated (December 2017) that alternative land to accommodate all the solar panels under Phase-II was still not available. However, the fact remains that the decision of taking up the project (Phase-II) without ensuring required shadow free land was faulty and led to loss of generation of solar-based power.

[64] *Shadow area created by existing plant, trees, buildings etc. could not get sufficient sun light*

(x) Non-creation of Centre of Excellence in contravention of RE Policy

The RE policy[65] made WBREDA responsible for creation and management of a Centre of Excellence in association with prominent institutions of the State for monitoring and development of advanced RE courses and Research and Development (R&D) work. The Centre of Excellence was also required to introduce new courses in the area of RE in Government Engineering Colleges besides providing training to the manpower employed in the RE sector and offering fellowships with advanced courses in the field of RE. Audit observed that as of July 2017, no such Centre of Excellence under WBREDA was created even after lapse of five years from issue of the RE Policy.

Instead of establishing a Centre of Excellence, a Memorumdum of Understanding (MOU) was signed (February 2013) between WBREDA and Centre of Excellence of Green Energy and Sensor System (CEGESS)[66] with the objectives to strengthen R&D activities on RE in the State. The scope *inter alia* included various R&D activities like conducting training programmes in different RE sectors, establishing regional solar thermal testing centre, evaluation of PV system, conducting awareness programmes, R&D programmes in field of solar energy *etc*. Audit, however, observed that apart from conducting training programmes and field evaluation of PV systems, no other activities[67] as stipulated in the MOU were carried out. The MOU was also not renewed after its expiry in February 2016.

SAPCC envisaged a requirement of estimated funds amounting to ₹ 110.00 crore for R&D on improved green energy assessment and manpower development during 12th FYP period. The Department, however, released only ₹ 55.00 lakh in September 2014 to WBREDA for taking up one R&D demonstration project *viz*. 'Smart Micro Grid' through CEGESS. The project was on the verge of completion as of December 2017. Thus, activities related to R&D and implementation of newer technologies in RE sector were inadequate during last five years as no Centre of Excellence was established and the Department spent only ₹ 55.00 lakh against the plan of ₹ 110.00 crore during 12th FYP period.

In reply, the Department stated (December 2017) that need of Research and Development in RE Sector would be addressed in the draft Solar Policy which was under preparation.

2.8 Management of financial resources

2.8.1 Poor allocation and low utilisation of funds

Year-wise status of funds received and expenditure incurred in respect of implementation of RE programme in the State during 12th FYP period (2012-17) was as shown in the **Table-2.3.**

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[65] *Para 14.1.1 of RE Policy*

[66] *Established in 2009 under Indian Institute of Engineering Science and Technology, Shibpur formerly known as Bengal Engineering and Science University (BESU)*

[67] *(a) Framing/introduction of new courses on RE at engineering colleges, (b) Framing of Regional Solar Thermal Testing Centre, (c) Review of activities of the Centre of Excellence. (d) Submission of proposal to WBREDA for technical approval / feasibility / viabily of any project for getting fund from WBREDA etc.*

Table 2.3: Funds received *vis-á-vis* utilisation

Year	Funds received (₹ in crore)				Expenditure incurred (₹ in crore)	Utilisation of funds in *per centage*
	MNRE	State	Others[68]	Total		
2012-13	20.35	7.82	—	28.17	4.30	15.26
2013-14	0.26	8.25	0.04	8.55	5.26	61.52
2014-15	1.41	1.32	0.07	2.80	1.20	42.86
2015-16	11.35	56.03	6.62	74.00	60.62	81.92
2016-17	0.17	300.30	3.51	303.98	2.68	0.88
Total	**33.54**	**373.72**	**10.24**	**417.50**	**74.06**	**17.74**

(Source: Records of WBREDA, WBGEDCL, WBSEDCL and WBPDCL)

It is evident from the table that allocation and utilisation of funds was very poor, as only ₹ 417.50 crore was allotted of which only ₹ 74.06 crore was utilised, against the requirement of ₹ 4610 crore as estimated in SAPCC during 12th FYP period. Only 17.74 *per cent* of total fund received was utilised during 2012-13 to 2016-17. Poor utilisation of funds was indicative of slow execution of RE schemes/projects. Reasons for such poor utilisation of funds were deficient planning and execution of different RE schemes as discussed earlier.

In reply, the Department stated (December 2017) that a sum of ₹ 115.50 crore was surrendered by WBREDA in September 2017 from the State Fund. Thus, the fact remains that the WBREDA refunded the amount as it had failed to execute the projects.

Moreover, some financial mismanagement/ irregularities were also noticed in the audit as illustrated in succeeding paragraphs.

2.8.2 Unauthorised diversion of fund by WBREDA

WBREDA had received funds amounting to ₹ 172.11 crore[69] from State Government during the period from 2010-11 to 2016-17 for development and promotion of RE in the State. Records of WBREDA revealed that ₹ 24.65 crore was utilised in different projects on RE and ₹ 147.46 crore remained unspent as of August 2017. Audit observed that WBREDA without obtaining any sanction of the Department, diverted (between December 2015 and February 2016) ₹ 4.67 crore from the unspent funds meant for RE projects, to four local bodies[70] for installation of high/mini mast LED lighting system run by conventional energy.

The diversion of ₹ 4.67 crore to the municipalities for lighting from conventional energy from the funds allotted for RE was unauthorised and irregular.

In reply, the Department stated (December 2017) that WBREDA was requested to reconcile the statement afresh and submit a comprehensive report by January 2018.

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[68] *Funds received from various institutions like municipalities, district libraries etc. for installation of solar PV*

[69] *Includes funds amounting to ₹ 132.31 crore received during 2016-17 for "Alo shree" (a programme of the State Government with the objective to install Grid Connected PV Systems in all government buildings within two years i.e. by 2017-18).*

[70] *Kolkata Municipal Corporation, Rajpur-Sonarpur and Mathabhanga Municipalities and South 24 Parganas Zilla Parishad*

2.8.3 Non-recovery of interest from two co-operative societies

MNRE approved (March 2012) setting up of ten Micro Hydel Projects (100 KW each) in the Darjeeling District through two co-operative societies at a total cost of ₹ 22.60 crore[71]. The project was to be completed by March 2014. As per its approval, if 50 *per cent* of the project was not completed by the stipulated date of completion without any valid reasons, the central assistance had to be refunded, along with interest, at the rate of 10 *per cent* per annum depending on the merit of case.

Scrutiny of records revealed that MNRE released ₹ 4.45 crore (between March 2012 and September 2012) to WBREDA which released (between May and December 2012) ₹ 4.41 crore to the two co-operatives. It was further observed that the progress of the work was very poor since the beginning of the work. As of July 2017, only three projects were nearing completion. WBREDA instructed (August 2013) two co-operative societies to refund the unspent MNRE fund (₹ 1.73 crore) for seven non-started projects along with accrued interest. The co-operative societies refunded (between July 2014 and January 2015) ₹ 1.73 crore of MNRE fund but did not pay any accrued interest.

Thus, due to failure on the part of WBREDA in taking any further steps during last four years, interest amounting to ₹ 31.51 lakh remained unrecovered till December 2017.

In reply, the Department stated (December 2017) that notices were served to deposit the accrued interest.

2.9 Tariff and other regulatory mechanisms relating to purchase and sale of RE

2.9.1 RPO targets for distribution companies vis-á-vis achievement

To increase the share of electricity from non-conventional sources in the total electricity consumption, NAPCC (June 2008) set the Renewable Purchase Obligation (RPO[72]) target to purchase RE of at least five *per cent* of total consumption of electricity in the area of supply by the distribution companies for the year 2009-10. This was to be increased by one *per cent* each year for next 10 years, till the target of 15 *per cent* was reached by 2020.

WBERC Regulation 2010 (August 2010) mandated RPO targets of two *per cent*, three *per cent* and four *per cent* for the years 2010-11, 2011-12 and 2012-13 respectively for the power distribution companies in West Bengal. From 2013-14 onwards the RPO target was to increase by one *per cent* each year till it reaches 10 *per cent*.

Audit observed that the RPO targets fixed in WBERC Regulations 2010 was below the RPO targets fixed in the NAPCC 2008. Moreover, WBERC had further reduced the RPO targets through WBERC Regulations 2013 as detailed in the **Table 2.4.**

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[71] *Central Financial Assistance of ₹ 10.10 crore and ₹ 12.50 crore by the co-operative societies.*

[72] *RPO means obligation to purchase electricity from renewable & co-generation sources by a distribution company.*

Further, the achievements by the five distribution companies[73] were even less than the lower RPO targets fixed by WBERC 2013[74], as detailed in **Table 2.4.**

Table 2.4: Year-wise RPO targets vis-*á*-vis achievement by DISCOMS

(Figures in percentage)

Year	RPO Targets as per NAPCC 2008	RPO Targets as per WBERC Regulations 2010	RPO Targets as per WBERC Regulations 2013	Achievement by the distribution companies				
				WBSEDCL	CESC	DPL	DVC (WB)	IPCL
2012-13	8	4.0	4.0	2.68	0.00	0.00	NA	0.02
2013-14	9	5.0	4.0	3.88	0.80	0.31	0.13	0.09
2014-15	10	6.0	4.5	4.83	0.55	0.36	0.38	0.07
2015-16	11	7.0	5.0	5.48	0.51	0.32	0.23	0.07
2016-17	12	8.0	5.5	Information not available				

(Source: Information compiled from the data provided by WBERC)

WBERC attributed (January 2018) the fixing of lower RPO targets to higher cost of generation of solar power in comparison to the cost of generation of power from coal in the State. Reply is not acceptable since lower targets were in deviation of the NAPCC and the environmental concerns should have been given priority over the commercial aspects.

WBERC attributed (January 2018) non-fulfillment of RPO targets to lack of response from the RE generators. The reply was not tenable as the DISCOMs could fulfill RPO targets by other means as specified in the Regulation such as purchase of Renewable Energy Certificates (RECs)[75], self-generation *etc*.

As such, the objective to reduce dependency on conventional energy and increase the contribution of energy from RE sources into the energy mix could not be achieved. This also meant that CO_2 emissions released from conventional sources could not be reduced.

2.9.2 Non-imposition of penalty on distribution companies for not meeting RPO targets

As per the RE Policy[76], WBERC was to consider allowing the purchase of Renewable Energy Certificates (REC) to achieve the RPO targets by the obligated entities. If the distribution companies failed to comply with the RPO

[73] *WBSEDCL (West Bengal State Electricity Distribution Company Ltd.), DPL (Durgapur Project Ltd.), IPCL (India Power Corporation Ltd.), DVC (Damodar Valley Corporation) and CESC (Calcutta Electricity Supply Corporation)*

[74] *Except WBSEDCL's achievement in 2014-15 and 2015-16*

[75] *Renewable Energy Certificate (REC) is issued to the RE developers by the Central Agency for contributing RE to the Grid. DISCOMS, can also fulfill their RPO by purchasing those certificates.*

[76] *Paras 11.2.5 and 11.2.6 of RE Policy*

targets as provided in the Regulations during any year and failed to purchase the required quantum of RECs, WBERC would direct the companies to deposit a certain amount in the Green Energy Fund. This amount was to be determined by the Commission considering the shortfall of RPO targets. Section 142 of the Electricity Act, 2003 also provides for imposition of penalty on the distribution companies for any violation of the Regulations. As per the WBERC Regulations 2013[77], in case of non-fulfilment of RPO, the Commission may *suo-motu* or on the basis of any application, initiate proceedings as per the Electricity Act, 2003.

Audit, however, noticed that the Commission, never initiated any proceedings and did not impose any penalty on the defaulter distribution companies as per the provision of the Act.

WBERC stated (January 2018) that steps were being taken to review the entire situation to achieve the national aim of 175 GW by 2022. The draft Regulations were being framed for implementation after offering the neccssary formalities as per Act.

Good practice

Maharashtra Electricity Regulatory Commission (MERC) in July 2013 directed all distribution companies to comply with the RPO targets and clear their backlog of previous years, failing which stiff penalties would be imposed on them. It had ordered over 90 entities, including distribution companies to meet their renewable purchase obligation of past four years cumulatively beginning from 2010-11 before 31 March 2014. MERC had also set up a commission for timely collection and review of data with regard to compliance of RPO. The panel set up by MERC would maintain a record of all open-access consumers and captive users and their REC trading.

2.9.3 Non-utilisation of incentive grant received for installing Grid Connected RE capacity

Thirteenth Finance Commission recommended incentive grant of ₹ 5000 crore for all the States for (i) strengthening DISCOMs for procuring RE, (ii) meeting the gap in RPO by procuring RECs, (iii) installing rooftop solar plants in Government buildings *etc*. The criteria for assessment of the quantum of grant was based upon the achievements by the States in capacity addition of RE during the period from April 2010 to March 2014. Accordingly, Ministry of Finance, GoI released (March 2015) a grant-in-aid of ₹ 7.89 crore as Incentive. Audit observed that during 2010-14, the State's achievement in capacity addition was only 11.60 MW which was very poor in comparison to the two neighbouring states *viz* Bihar and Odisha[78].

MNRE requested GoWB (March 2015) to issue necessary instructions for utilization of said incentive grant for the specified purposes. MNRE further requested (April 2015) GoWB to frame an Action Plan for utilisation of the incentive grant and to communicate the same by April 2015. Audit, however,

[77] *Para 4.0 of WBERC Regulations 2013*
[78] *59.52 and 50.83 MW respectively*

observed that the Finance Department, GoWB, after a lapse of six months, requested (October 2015) the Department of Power & Non-Conventional Energy Sources GoWB to send a proposal for the release of the funds. As of July 2017, the Department had not sent any proposal to the Finance Department. As such, ₹ 7.89 crore released as incentive grant by GoI remained unutilized. Moreover, Action Plan as required by MNRE was not prepared and sent to it by the Department.

Thus, the State not only availed very meagre amount of grant (0.16 *per cent* of the total approved grant for all the States) due to poor achievement in capacity addition of RE but also failed to utilise the grant of ₹ 7.89 crore even after a lapse of 30 months from the date of receipt.

2.9.4 Incentives under West Bengal State Support for Industries Schemes

Department of Industries, Commerce and Enterprises, GoWB, introduced two incentive schemes[79] with a view to extend financial support to different units/ agencies for promotion of large and medium – scale industries including units generating RE or producing any items required for generation of RE. However, as of September 2017, no incentives had been disbursed as per provisions of the said two schemes. Only one unit had so far been registered under WBSSIS 2008 for disbursement of incentives which was under process. This indicated that the Department of NES had not taken adequate measure to make private RE developers aware of these incentive schemes.

2.10 Action taken against commitments made in State Action Plan on Climate Change for promotion of Green Energy

2.10.1 Failure to translate SAPCC into action

State Action Plan on Climate Change (SAPCC), prepared in April 2011, (i) identified key concerns due to climate change, (ii) chalked out strategies to mitigate those concerns, and (iii) suggested steps towards energy efficiency and increasing RE mix with the estimated funds required for this in 12th and 13th FYP period.

The SAPCC envisaged that energy demand would increase by 2.5 times by 2021 and the electricity generation sector within the State would be a large contributor to Green House Gas (GHG) emissions. This would create an adverse impact on the environment due to change of climate. That can be mitigated through shift in generation from conventional sources to RE sources. In order to address the climate change concerns, SAPCC outlined the following measures:

- Increasing grid power generation of RE through Solar PV for large-scale power in Purulia and Bankura where wasteland or abandoned mine areas were available.
- Replacing use of grid power with low temperature solar thermal for certain end-uses, *e.g.*, water heating.

[79] *The West Bengal State Support for Industries Schemes (WBSSIS) 2008 and the WBSSIS 2013 in the form of Fixed Capital Investment Subsidy, Interest Subsidy, Waiver of Electricity Duty, Addition Incentive on Generation of Employment, Industrial Promotion Assistance etc.*

- Reduction of anticipated energy and peak demand by promoting use of energy efficient devices through market incentives and other means.
- Risk mitigation of anticipated impacts from Climate Change.

The SAPCC outlined an Action Plan for 12th FYP (2012-13 to 2016-17) with a total estimated outlay of ₹ 4610 crore[80] for production of 2000 MW from RE sources by 2021 with incentives for Green Energy Producers and R&D for improved green energy assessment *etc*.

Audit, however, observed that initiatives taken by the Department along with its agencies were insufficient during the 12th FYP period, vis-*á*-vis the mitigation measures stipulated in the SAPCC as detailed below:

- Only 35.18 MW was created during the 12th FYP period through RE sources.
- Progress in creation of PV solar power in the waste land or abandoned mine areas in Purulia and Bankura was also very poor as only three projects of 30 MW were taken up as of September 2016. Of which, two were yet to be commissioned and one was yet to be commenced as of July 2017.
- Further, no incentive scheme specifically for promotion of RE was framed by the Department in line with the SAPCC to encourage developers for production of green energy. However, incentives were offered under WBSSIS 2008 and 2013 for the RE generation as commented upon in ***Para 2.9.4.***

In reply, the Department stated (December 2017) that it was exploring the idea of utilising waste land/ uncultivable land/fallow land in the remote districts and was also in the process of installing Solar Water Heating System in Hotels. The fact remains that even after a lapse of six years of coming into force of SAPCC, the Department was yet to formulate any strategy to achieve the goals of SAPCC.

Thus, inaction of the Department and the nodal agencies led to possible exposure of risk and threat of increasing GHG emission in the State and its surrounding areas.

2.11 Monitoring, Internal Control and vigilance arrangements

2.11.1 Deficiency in monitoring mechanism and internal control

The RE Policy of June 2012 did not provide for formation and functioning of a Monitoring Cell for overall monitoring and evaluation of different projects. However, the Department, after lapse of three years constituted (September 2015) an RE Cell headed by the Joint Secretary to ensure speedy implementation of the RE policies and programmes of the Department. RE Cell was responsible for monitoring different RE programmes of the nodal agencies, reviewing the status of different sanctioned schemes/ projects and co-ordinating with MNRE and other agencies.

[80] *₹ 2000 crore for 2000 MW from RE sources by 2021, ₹ 2500 crore incentives for Green Energy Producers, ₹ 110 crore for R&D for improved green energy assessment and man power development for installation and O &M*

2.11.2 Monitoring by RE Cell

As of March 2017, only seven meetings were held since constitution (September 2015) of the cell. The scrutiny of the minutes of the RE cell meetings revealed that no tangible results were yielded, as detailed below:

- In the first meeting (September 2015), an Energy Park over a land of about five acres near Eco Park, Newtown was decided to be set up by WBREDA. However, after lapse of more than one and a half year, WBREDA could not even procure the land from WBHIDCO to set up the Energy Park. Further, Handing over of the Wind Farm Project at Fraserganj to WBSEDCL was to be completed by October 2015, but till June 2017 the handing over process had not been completed. The Department stated (December 2017) that land was being procured near Eco-Park. Regarding handing over of the wind farm project at Fraserganj to WBSEDCL, it stated that the project was kept in abeyance as feasibility of a bigger wind project was being carried out. The reply indicated that ad-hoc decisions were being taken. The fact remains that even after two years, the Department could not arrange for the land required for the Energy park.

- Audit further observed that in the second meeting (October 2015), it was decided that WBREDA would submit a report on revival of "Sagar Wind Project" to the Department by November 2015. Again in the fifth meeting (April 2016), WBREDA was requested to submit a comprehensive report alongwith action plan for reviving the project or winding up, as the case may be, by 15th May 2016. However, in the subsequent two meetings held on 9th and 23rd November 2016, no reference was made in this regard. In reply, the Department stated (December 2017) that WBREDA had submitted a report which was being studied further for necessary action.

Thus, RE cell failed to perform its monitoring role and as a result, implementation of the projects suffered.

2.11.3 Lapses in Monitoring by the Department and the Nodal Agencies

- The Department and its agencies (WBREDA & WBGEDCL) did not evolve any Monitoring Mechanism to monitor and evaluate the workings of different RE projects taken up during last five years.

- Further, independent evaluation of the workings of the RE Projects was not done by engaging an authorised third party/ consultant by the Department or its agencies. In reply, the Department stated (December 2017) that the matter was noted for future guidance.

- An updated database of the installed RE system is an important tool for monitoring and taking appropriate action. However, the Department did not maintain any database of the same. In absence of any database, it was not possible to ascertain the updated status of the total installed RE systems and taking remedial action, if any. The Department accepted (December 2017) the audit observation and stated that it was noted for future guidance.

- No internal audit wing was in place to conduct the internal audit of the activities of the Department and its agencies.

As such, there were perceived weaknesses in the monitoring and evaluation mechanism. This affected achieving the targets in the long run.

2.12 Conclusion

Inspite of huge potential of renewable energy in the State, the achievement was very poor. This was due to (i) deficiency in the policy and absence of suitable strategy to implement the policy objective; (ii) poor implementation; (iii) non-conducive tariff and regulatory mechanisms relating to purchase and sale of RE; and (iv) inadequate monitoring. During 2012-17, only 35.18 MW (4.15 *per cent*) of RE was installed against the target of 847 MW envisaged in the RE Policy. Potential of solar energy in the State was yet to be assessed, as such, necessary directives for harnessing the actual potential of solar energy could not be framed in the policy.

Assessment of gap in funding was not carried out to access private entities in this field for implementation of projects. The Department could not develop a single window system for facilitating clearance and also take any step for promotion of private sector investment. The Department and its Nodal Agencies did not take any initiative to make any policy, plan and programme and issue any orders and guidelines with a view to achieving the targets under SDGs.

Progress of the projects was also very poor due to unsatisfactory performance by the implementing agencies. In many solar projects, actual generation through RE could not be assessed as the installed plants were yet to be connected to grid. Activities related to R&D and implementation of new technologies in RE sector were inadequate. Only 17.74 *per cent* of allocation was utilised during 2012-13 to 2016-17.

The distribution companies in the State failed to achieve RPO targets. The Department and its agencies had not evolved an effective monitoring mechanism

2.13 Recommendations

- The Department needs to prepare a comprehensive action plan and devise appropriate strategy, with targets and timelines, after assessing the actual RE potential of the State after on-ground verification.
- The Department needs to create the Green Energy Fund by tapping various sources to finance projects for development of RE in the State.
- The Department needs to develop a single window system for facilitating clearance for promotion of private sector investment and also to assist the developers in getting different incentives for implementation of RE projects.
- The Department needs to take up the matter with WBERC to evolve an appropriate price and benefits for developers to make the projects of biogas, waste to energy and co-generation viable and achieve the targets set in the RE policy.
- In order to increase the share of electricity from non-conventional sources in the total electricity consumption, West Bengal Electricity Regulatory Commission should ensure strict compliance of the Renewable Energy Purchase Obligations by the distribution companies.