

Chapter II

Performance Audit of Government Companies

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2.1 Restructured Accelerated Power Development and Reform Programme as implemented by the Maharashtra State Electricity Distribution Company Limited

Executive Summary

Introduction

The Government of India introduced (2008) R-APDRP with the aim of restoring the commercial viability of the distribution sector by substantially reducing the Aggregate Technical and Commercial losses, adoption of Information Technology in energy accounting/auditing and consumer services; augmentation and strengthening of the distribution network and establishment of Supervisory Control & Data Acquisition System (SCADA)/Distribution Management System in large towns. The programme has been taken up in two parts, Part A and Part B, apart from SCADA.

(Paragraphs 2.1.1, 2.1.2 and 2.1.3)

Part A Projects

Part A projects include the projects for establishment of Base Line Data, IT applications for Energy Accounting/Auditing and IT Based Consumer Service centres. Under Part A, the project was declared as “Go-Live” (October 2014) in all 128 towns.

It was observed that due to high percentage of non-working modems installed on feeders and Distribution Transformer Centres (DTCs), the Company could not generate complete Reports regarding energy input on the Feeders and DTCs in the Data Centre.

(Paragraph 2.1.17)

Part B Projects

The Part B includes regular strengthening and augmentation projects of the distribution network in order to reduce and sustain AT&C losses below 15 *per cent*.

The progress of work in 40 out of 120 towns (33.30 *per cent*) was below 75 *per cent* indicating poor implementation of the Scheme in these towns. Delay in land acquisition for substations, re-tendering of works and non-co-ordination with related agencies caused delay in overall implementation of the Part B works. The issues relating to land acquisition for Part B works were not monitored adequately by the Company. The Company did not levy Liquidated Damages of ₹ 3.83 crore from contractors.

(Paragraphs 2.1.19 and 2.1.26)

Supervisory Control & Data Acquisition System (SCADA)

There existed co-ordination issues with external agencies resulted in delay in implementation of SCADA works.

(Paragraph 2.1.33)

Aggregate Technical & Commercial (AT&C) losses

The AT&C losses of the Company had come down from 24.60 per cent in 2008-09 to 18.71 per cent during 2014-15.

AT&C losses in only 47 out of 128 towns were below 15 per cent. However, in 24 towns losses had increased over the base line figures. It was seen that implementation was poor in the Marathwada region of the State covering 27 towns, where the AT&C losses were very high (more than 45 per cent) in 17 towns.

(Paragraph 2.1.36)

Introduction

2.1.1 The Government of India (GoI) during the period from May 2002 to March 2007 implemented the Accelerated Power Development Reforms Programme (APDRP) to leverage the reforms in power sector through the State Governments. APDRP scheme was modified (2008) during the XIth Plan as 'Restructured Accelerated Power Development and Reform Programme (R-APDRP)'.

Objectives of R-APDRP

2.1.2 The programme was introduced with the aim of restoring the commercial viability of the distribution sector by substantially reducing the Aggregate Technical and Commercial (AT&C) losses, establishment of reliable and automated system for collection of baseline¹ data and adoption of IT in energy accounting/auditing and consumer services, augmentation and strengthening of the distribution network and establishment of Supervisory Control & Data Acquisition System/Distribution Management System (SCADA/DMS) in large towns.

Scope of the Programme

2.1.3 The Programme has been taken up in two parts, Part A and Part B, apart from SCADA. Part A and Part B projects are being implemented in Urban Areas-Towns and Cities with a population of more than 30 thousand as per 2001 census. SCADA/DMS system is being implemented in Project areas having a population over four lakh and annual energy input of 350 Million Units (MUs).

Implementing agencies

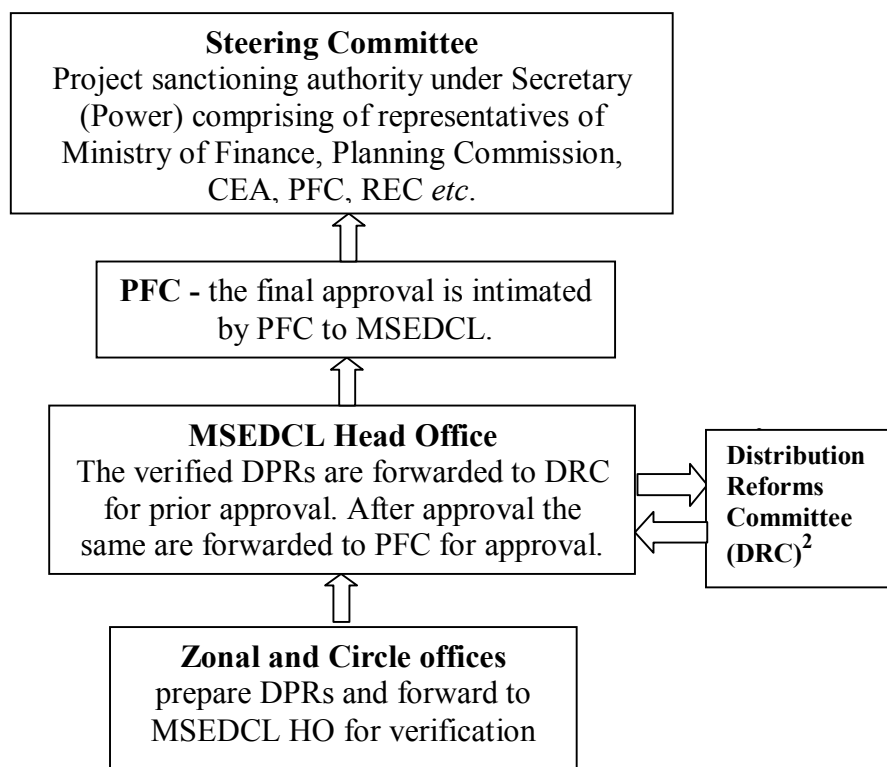
2.1.4 The Ministry of Power (MoP) has designated the Power Finance Corporation (PFC) as the nodal agency for implementation and monitoring of the Programme. PFC is entrusted with the work of co-ordinating with the main stakeholders involved such as MoP, R-APDRP Steering Committee, Central Electricity Authority (CEA), Financial Institutions and State Utilities.

¹ Starting figure of AT&C losses of the project area as verified by independent agency appointed by MoP through PFC

In Maharashtra, the Distribution Utility, namely the Maharashtra State Electricity Distribution Company Limited (Company), which was set up in June 2005 is the implementing agency for the Programme.

Procedure for Approval of Projects

2.1.5 The R-APDRP Detailed Project Reports (DPRs) are prepared in accordance with the Guidelines received from the MoP. The flow chart below explains the approval process:



Funding mechanism

2.1.6 The funding mechanism as per R-APDRP Guidelines is as follows:

| Sl. No. | Particulars | Part A (including SCADA Part A) | Part B (including SCADA Part B) |
|---------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Loan from GoI through PFC | 100 per cent | 25 per cent |
| 2 | Loan component to be arranged by the utility from Financial institutions | Nil | 75 per cent (Availed from REC by Company) |
| 3 | Eligibility for conversion of loan into grant | Entire (100 per cent) loan shall be converted into grant on completion of Project duly verified by Independent Agency appointed by MoP / PFC. | Up to 50 per cent loan is eligible for conversion into grant in five annual tranches on achieving and sustaining 15 per cent AT&C loss in the project area (town). The loan from PFC (25 per cent) will be converted first into grants followed by the loan from external sources (75 per cent) (REC). |

(Source: R-APDRP Scheme guidelines)

² The Distribution Reforms Committee is constituted by the State Government under the chairmanship of Principal Secretary (Energy) to recommend project proposals and monitor the Scheme at State level

Scope of audit and objectives

2.1.7 The Performance Audit (PA) conducted during the period May to October 2015, covered the implementation of the R-APDRP programme during the period 1 April 2009 to 31 March 2015. In Maharashtra, the Scheme was implemented in 128 towns for Part A, 120 towns for Part B and eight towns for SCADA, of which 32 towns under Part A and 31 towns under Part B were selected for detailed audit. Under SCADA, 100 *per cent i.e.* eight towns were selected for audit.

2.1.8 The audit objectives of the PA were to assess whether:

- Planning and implementation of programme was appropriate to achieve efficiency, economy and effectiveness;
- Funds received from MoP were commensurate with the progress of work and execution of the projects was as envisaged in the scheme guidelines;
- Mechanism for monitoring of the projects was adequate and stringent to ensure adherence to timelines; and
- The programme succeeded in reduction of AT&C losses as envisaged.

Audit criteria and methodology

2.1.9 The audit criteria adopted for achieving the stated audit objectives were derived from the following documents:

- R-APDRP Guidelines issued by MoP;
- Provisions in DPRs of the Projects;
- Relevant instructions and directives from PFC;
- Contract agreements and detailed work orders; and
- Relevant Rules/Procedures and directives of MSEDCL.

2.1.10 The audit methodology adopted for attaining the objectives involved explaining audit objectives to the Management during an Entry Conference held in July 2015, analysis of data/records with reference to audit criteria, issue of audit enquiries and draft Performance Audit Report to the Management/Government for their comments. The draft PA Report was issued (November 2015) to the Company and Government. The replies of the Company (January 2016) which was endorsed by the Government (February 2016) have been considered while finalising the PA Report. The audit findings were also discussed in an Exit Conference (December 2015) wherein the representatives of the Company were present.

Acknowledgement

2.1.11 Audit acknowledges the co-operation and assistance extended by the Company at various stages of conducting the Performance Audit.

Audit findings

Fund Management under R-APDRP

2.1.12 The details of funds approved by PFC, received by the Company and expenditure incurred by the Company as on November 2015 are given in the table below:

(₹ in crore)

| Year | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | Total |
|-----------------------------------------------------|---------|----------|---------|---------|---------|---------|---------|----------|
| Part A (PFC) | | | | | | | | |
| Approval of PFC | 315.44 | | | | | | | 315.44 |
| Received by Company | | 191.96 | | | | | | 191.96 |
| Expenditure booked by Company | 208.43 | | | | | | | 208.43 |
| Part B (PFC + REC) (Including SCADA enabling works) | | | | | | | | |
| Approval of PFC | | 3,076.96 | -- | -- | -- | 34.67 | -- | 3,111.63 |
| Received by Company from PFC | | 138.34 | 295.53 | 27.68 | | | | 461.55 |
| Received by Company from REC | | | | 0.17 | 245.86 | 389.23 | 137.85 | 773.11 |
| Expenditure booked by Company | | 1,341.09 | | | | | | 1,341.09 |
| SCADA (Part A) (PFC) | | | | | | | | |
| Approval of PFC | | | 161.62 | | | | | 161.62 |
| Received by Company | | | 48.49 | | | | | 48.49 |
| Expenditure booked by Company | | | 31.98 | | | | | 31.98 |

(Source: Information furnished by Loan section and SB (cash) section of the Company)

The total expenditure (under Part A, Part B and SCADA) as of November 2015 was ₹ 1,581.50 crore while corresponding total disbursements received from PFC and REC till November 2015 were ₹ 1,475.11 crore. Thus, an amount of ₹ 106.39 crore had been expended by Company from its internal sources.

The Company accepted that it had incurred expenditure from its internal sources as there was revision in scope of work in some of the towns. Further, next tranche/installment from PFC in respect of Part A and balance release from REC for Part B works was awaited (January 2016).

Non maintenance of separate bank account

2.1.13 As per Scheme Guidelines, the Company was required to open a separate Bank account (Escrow account) for receipt and utilisation of funds under R-APDRP. We observed that Company had been maintaining a separate bank account only for the purpose of receipt of funds from PFC. The funds received from PFC were, after maintaining a minimum balance, automatically transferred through standing instruction to another Operative account which

was a common account for all other schemes, O&M and other expenses of Company. This was contrary to the Guidelines of the Scheme.

The Company assured that henceforth scheme guidelines would be adhered to for future schemes.

Delays in refund of loan

2.1.14 PFC released ₹ 61.45 crore in 2009-10 and 2010-11 being total of 30 *per cent* and 15 *per cent* sanctioned loan amount for Part A and Part B respectively for Jalgaon, Aurangabad, Nagpur and Kolhapur towns. These towns were subsequently cancelled (2011-12) either due to Distribution Franchisee arrangement³ or losses being below 15 *per cent* which was not intimated by the Company to PFC. The Company, however, neither refunded to PFC nor adjusted the loans against future releases of PFC. The Company retained the funds upto 2014-15 and subsequently, refunded ₹ 81.24 crore to PFC which included interest of ₹ 19.79 crore⁴.

The Company stated that the R-APDRP funds had been utilised for its other activities since the interest charged by banks on overdraft facility was higher than the interest rate charged by PFC under the scheme. Thus, the reply itself indicated a clear violation of scheme guidelines and the terms and conditions of the Quadripartite Agreement.

In Greater Mumbai town under Part B of the scheme, ₹ 0.99 crore was imposed (December 2013) as interim penalty by Company on the contractor after termination of the contract. The amount recovered had not been adjusted in the future releases by PFC as laid down in the Guidelines.

The Company assured that the penalty would be adjusted against the final instalment of 10 *per cent* from PFC on closure of the scheme.

Implementation of Part A

2.1.15 Part A includes the projects for establishment of Base Line Data, IT applications for Energy Accounting/Auditing and IT Based Consumer Service centres.

The verification of Baseline data by Third Party Independent Evaluating Agency (TPIEA)-M/s ICRA confirmed that ring fencing and proper placing of import/export meters was done for accounting input/output energy and further certified the AT&C loss for each town for the year 2012-13.

Under Part A, the project was declared as “Go-Live” (October 2014) in all 128 towns. As against ₹ 356.96 crore amount projected in DPR for Part A works submitted by the Company to PFC, the Steering Committee had sanctioned

³ An agreement for sale of power by the Company to a Distribution Franchisee for further retail distribution to consumers on its behalf

⁴ This includes repayment of ₹ 1.18 crore under Part A projects and ₹ 18.61 crore under Part B projects

₹ 315.44 crore, of which, ₹ 231.61 crore was the awarded cost of the projects; and ₹ 208.43 crore was expended till November 2015.

2.1.16 PFC had appointed (March 2013) M/s Price Water house Coopers Private Limited (PwC) as the TPIEA for verification of completion of the projects under Part A.

The Company stated that field visits to all towns had been completed by September 2015 and initial draft reports of some projects were under review of PFC while the reports for the remaining projects were under preparation.

The findings noticed during the award of works under Part-A are discussed below:

Low network availability and high percentage of non-working modems

2.1.17 During joint inspection (October 2015) of the Company's Data Centre, it was observed that the data links provided under Part A of the scheme were not working effectively. The percentage of non-working modems installed on feeders and Distribution Transformer Centres (DTCs) ranged between 35 to 40 *per cent*. As a result, the data regarding energy input on the feeders and DTCs could not be completely generated in the Data Centre. Although all the requisite modules had been integrated, the completeness of the system was not in accordance with the intended objectives of the scheme. Thus, the projected "Go-Live" status of the Part A did not reflect the true picture of the project.

The Company stated that 52.30 *per cent* meters were active on DTCs as on December 2015. Efforts were taken to rectify the inactiveness by instructing the concerned officials to resolve the matter. For improvement of link availability, penalties were imposed for link down on *pro-rata* basis and they had recovered ₹ 1.06 crore till date. Further, by forming an umbrella of service providers, the link issues would be resolved.

Utilisation of meters purchased under R-APDRP scheme for non R-APDRP towns

2.1.18 The Company issued (September 2012) Letter of Award (LoA) and extension order (May 2014) for purchase of Feeder/Cross-Over/HT consumers fully Automated Meter Reading (AMR) compatible meters for various R-APDRP towns totaling ₹ 1.16 crore. We observed that in Latur town, seven Feeder meters and three HT consumer meters received under the extension order were issued (July 2014 to January 2015) to sub-divisions for purposes other than for R-APDRP.

The Company stated that all the HT consumers in Latur town were having AMR compatible meters. Out of the above, some meters were used in non APDRP areas because of urgency. The reply was not convincing as diversion of R-APDRP meters to other schemes was not permitted as per Scheme Guidelines.

Implementation of Part B

2.1.19 Part B includes regular strengthening and augmentation projects of the distribution network in order to reduce and sustain AT&C losses below 15 per cent.

The Part B projects were to be completed within three years from the date of sanctioning of the project which was subsequently extended upto 2014. Presently, 80 out of 120 projects were further granted extension upto June 2016 to March 2017.

Against ₹ 3,111.63 crore amount projected in DPRs submitted by the Company to PFC, the Steering Committee had sanctioned entire amount. Of this, ₹ 1,719.57 crore was the amount of award of project to the contractors, whereas ₹ 1,341.09 crore was the expenditure reported till November 2015.

Details of the percentage of completion of works in 120 towns as on November 2015 where Part B was implemented was as under.

| Percentage of completion | | | |
|--------------------------|------------------------------|-----------------------------|-----------------------|
| 100 per cent | 75 to less than 100 per cent | 50 to less than 75 per cent | Less than 50 per cent |
| 50 | 30 | 30 | 10 ⁵ |

It could be observed that the physical progress of 40 towns (33.30 per cent) was below 75 per cent which indicated poor implementation of the scheme in these towns. The delays were attributed mainly to:

- Non acquisition of land for sub-stations by the Company in eight towns (Amravati, Akola, Beed, Ichalkaranji, Solapur, Sangli, Ratnagiri and Talegaon towns).
- Inordinate delay in allied works such as LT power supply and construction of compound wall for sub-station, delay in stoppage of work on forest land and non-finalisation of fresh tender after termination of earlier contract (Greater Mumbai town).
- Award of works (Vasai, Virar, Nalasopara, Dahanu and Palghar towns) to a contractor who had already shown poor performance in earlier works.
- Delay in getting road digging permission from municipal authority (Chandrapur), Right of Way problems (Wardha), Contractor lagging (Dondaicha, Sirpur, Bhusawal, Nalasopara, Vita) and repeated hailstorms and natural calamities (Tasgaon).

The deficiencies noticed in implementation of Part B of the projects are discussed below;

Award of Part B works before verification of Baseline AT&C losses

2.1.20 The contracts under Part B were awarded in 2011-2012 while the verification of Baseline data was done by the TPIEA (M/s ICRA) only in 2012-13. Awarding of work before verification of baseline figures was not in accordance with the Scheme guidelines.

⁵ Bhusawal, Chandrapur, Dondaicha, Ichalkaranji, Sangli, Sirpur, Tasgaon, Nalasopara, Vita and Wardha

The Company stated that due to unavailability of proper identification of boundary at the town during the period 2008-09, the base line losses could not be ascertained at that time. The work of fixing boundary meters was completed by the end of year 2011 and base line losses were fixed, thereafter. It was further replied that the matter was in the knowledge of GoI/PFC. However, the reply was not convincing as the works were awarded before the proper baseline figures of technical losses established, against the scheme Guidelines.

Delay in procurement and handing over of land to contractors for 33/11KV substations / Switching Station

2.1.21 Contracts were awarded under Part B, for construction of 33/11 KV/ 22/11 KV substations for which land had to be acquired and handed over by the Company to the contractors. We observed that, there were delays ranging from 14 to 47 months in acquisition and handing over of land after award of work by Company, thereby delaying the completion of the Part B works as detailed below:

| Sl. No. | Name of project | Location | Date of LoA | Date of handing over land to contractor | Status | Delay in months |
|---------|-----------------|-----------------------------------------------------------------|--------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| 1 | Talegaon | Talegaon (Sub-station later changed to 22 KV switching station) | March 2012 | December 2014 | Possession received by Company in April 2014. The Switching station had been commissioned in October 2015. | 33 months (including 8 months on the part of Company) |
| 2 | Amravati | Congress Nagar | January 2012 | March 2014 | Work was in progress. | 26 months |
| 3 | Amravati | Saturna | January 2012 | Land was not in possession till date. | Land was not in possession of Company till date (December 2015). | 47 months |
| 4 | Akola | PKV (Washim road) | January 2012 | Land had not been taken over by Contractor. | Land in possession since 26 August 2015 but Contractor refused to take possession as contractual period had ended. | 44 months |
| 5 | Solapur | Rajendra Chowk | January 2012 | Land not taken over by Contractor. | Land in possession since 25 November 2014 but Contractor refused to take possession since contractual period already over (December 2015). | 34 months |
| 6 | Sangli | Shinde Mala | January 2012 | Land not in possession till date | Land was not in possession till date (December 2015). | 47 months |
| 7 | Ichalkaranji | Shahapur | January 2012 | 05 March 2013 | Construction was not started till December 2015. The Company had directed to delete the sub-station and include additional transformer in existing substation. | 14 months |
| 8 | Ichalkaranji | Niramay | January 2012 | October 2014 | Construction not started till December 2015. Due to Court case, the location of the sub-station changed to Ichalkaranji Division premises. | 33 months |
| 9 | Ratnagiri | Ratnagiri | May 2012 | 16 January 2014 | The sub-station was commissioned in January 2015. | 20 months |
| 10 | Beed | Khapar-Pangri | January 2012 | 02 June 2014 | Work was in progress but stopped twice mid-way due to approach road problems. | 28 months |
| 11 | Osmanabad | Kakade Plot | January 2012 | 06 June 2014 | Contractor not ready to execute the work due to delay in handing over of land. | Work is abandoned by Company. |

(Source: Files of the Company relating to land acquisition and construction of sub-stations)

- In Beed town, although land was handed over in June 2014, work could not be taken up immediately due to space constraints as construction of six feeders was not feasible. This issue was sorted out after a lapse of five months. Work was commenced in September 2014 but immediately stopped by Company due to approach road issues and the work was held up for nearly 12 months. Work resumed in June 2015 and was in progress (December 2015).
- In Sangli and Ichalkaranji towns, the land could not be acquired/work could not be commenced due to various reasons such as cancellation of reservation by Municipal Corporation, pending Court case filed by land owner, land need filling *etc.* The works were awarded to contractors without a reasonable assurance about the availability of land resulting in delay in overall implementation of the projects.
- Poor monitoring on part of the Company was evident, since the possession of land was not handed over to the contractor by sorting out land related issues for execution of sub-station works.

Non-replacements of defective Transformers

2.1.22 As per the terms and conditions of Contract, 'Defect correction Period' means the period for correction of the defect by the Contractor, beginning from receipt of the Notice from the Employer to the Contractor and extending upto 14 days thereafter.

In Ratnagiri and Chiplun towns, we observed that 16 transformers installed from May 2012 onwards by the Part B contractor had failed during the period July 2013 to July 2015. Although, the Company had issued notice to the Contractor for replacement of the defective transformers, none of the failed transformers were replaced/repared by the contractor within the prescribed period of 14 days from receipt of the notice. The transformers were replaced after delays ranging from 5 to 396 days and the Company did not take any action against the contractor for delay in replacement of the transformers.

The Company stated that the necessary penalties would be deducted at the time of closure and instructions had been issued to all field officers to adhere to the period of replacement of failed distribution transformers.

Delay of tender resulting in delay in completion of the project

2.1.23 In Greater Mumbai town, due to poor progress of contract (tender cost ₹ 97.67 crore) even after project completion date (February 2014), the Company issued notice (April 2014) for deletion of scope of works not commenced by the contractor. Tenders for the deleted works costing approximately ₹ 26.22 crore were invited (April 2014) which were to be finalised at the Zonal level by September 2014.

We observed that even after lapse of one and half years from the date of invitation of tender, not a single letter of award (LoA) was issued by the Company (November 2015). Due to this, the entire works covered under the

new tender such as 22KV switching substations, High Tension (HT) line, Low Tension (LT) line, LT cable and Transformer augmentation were pending. As a result, the implementation of Part B works under this tender did not commence and the technical losses could not be arrested.

The Company stated that the process of allotting contract of balance work to other contractors was in progress. The fact was, however, that the Company was getting similar other works executed under various schemes and hence could have got the work done from any of its contractors in order to speed up the progress. As a result, the implementation of Part B in this town remained behind schedule.

Delay in completion of works of Switching station at Talegaon

2.1.24 The scope of the Part B works in Talegaon town included the work of 22KV Switching station which comprised of installation and commissioning of 22KV Bay in 110/22 KV Extra High Voltage (EHV) substation belonging to Maharashtra State Electricity Transmission Company (MSETCL). This work was commenced by Company after MSETCL had given permission for the work in November 2014. Since February 2015, the Company, however, stopped the work due to difference in the specifications of equipments as per Company's norms *vis-a-vis* norms of MSETCL in whose premises the Bay was to be constructed. Due to this, though the work of switching station was nearing completion, the commissioning was pending construction of the Bay in MSETCL substation. The field office of the Company approached (June 2015) the Corporate office for necessary co-ordination and the matter was resolved in September 2015. This resulted in delay of four months in completion of works.

The Company stated that the delay occurred due to variation in their specifications of 22KV feeder bay and specification of MSETCL. The fact remained that there was absence of co-ordination which resulted in overall delay of more than a year in the completion of the project.

Inordinate delay in allied works resulted in non-commissioning of completed sub-station

2.1.25 In Greater Mumbai town, the work of erection and commissioning of 22/11 KV Neptune sub-station was completed in April 2014. Permission for cable laying activity was received from the municipal authority in the last week of April 2014. However, due to delay in receipt of permission from the builder through whose plot cables were to be laid, the work of laying cables was completed only in December 2014.

The Company, however, decided (December 2014) to construct brick wall boundary in place of barbed wire fencing (which was in the scope of original work) as barbed fencing was felt inadequate in view of surrounding slum areas. The Company invited tenders at an additional cost of ₹ 0.16 crore for the compound wall and got it completed in August 2015. Due to delay in laying of cables and non construction of the compound wall, the completed sub-station could be commissioned only in August 2015.

The Company stated that in R-APDRP scheme, civil activities were framed on model estimate basis and not individual site basis. So, item of compound wall was not included in the scope of work. The reply was not convincing as the requirement of compound wall could have been assessed simultaneously at the time of construction of sub-station and included in freezing proposal *i.e.* revision in the work orders, which was not done. The requirement was assessed only after completion of the sub-station resulting in idling of the sub-station and incurring expenditure from its own resources.

Non-imposition of Liquidated Damages on contractors as per contract conditions

2.1.26 As per the terms and conditions of Contract, the Company was entitled to recover Liquidated Damages (LD) at the rate of 0.5 *per cent* of the contract price of the work per week or part thereof as penalty for delay in completion of the works. In one case, in Greater Mumbai town, Company terminated (July 2013) a contract after part completion due to poor progress. It was noticed that Company short levied liquidated damages by ₹ 3.44 crore for non completion of work by the stipulated dates and in another case in the same town, where there was also inordinate delay of five months on the part of contractor in completing the works, the LD of ₹ 0.39 crore was not levied by Company.

The Company stated that only interim penalty was applicable in the above two cases and the same would be recovered. The reply was not acceptable as the first contract was short terminated and contractual period ended upon termination whereas in the second case, the scheduled date of completion of particular work was February 2015. Thus, the LD were applicable from February 2015 onwards. The total amount of such short levy/non levy for the two works worked out to ₹ 3.83 crore.

Extra expenditure due to re-tendering and award of work

2.1.27 The Company foreclosed and re-tendered the work for five towns (Vasai, Virar, Nalasopara, Dahanu and Palghar) and awarded the work (December 2014) to the same contractor who was executing the work as a sub-contractor of the earlier contractor. Further, the rate quoted by the new contractor was higher than the rate quoted by original contractor resulting in net increase of 0.17 *per cent* of the cost of the contract which worked out to ₹ 0.28 crore for which even the risk and cost notice had not been issued to the earlier contractor. Besides, awarding the work to the same contractor who had shown poor progress earlier did not serve the purpose of foreclosing and re-tendering, as evident from the fact that on the stipulated date of completion (December 2015), the contractor had completed only 77 *per cent* of work.

The Company stated that it had not given approval for sub-contracting the work in the earlier contract. It was also replied that the notice of risk and cost, interim penalty and LD would be issued to earlier contractor shortly and recovered from retention money. The fact was, however, that it was evident from the numerous correspondences made by the Company officials with the sub-contractor that the Company was well aware of the identity of the

contractor for the awarded work. Moreover, no recovery had been effected so far (January 2016) as assured by the Company.

Avoidable expenditure due to delayed payment

2.1.28 In Solapur town, the scope of the work included construction of 33/11KV sub-station. There was a pending proposal made (March 2010) by the Company before the Collector, Solapur for allotment of land at Solapur for the sub-station and thus it was evident at the time of award of work, that the Company had no assurance of availability of land. The Collector allotted (September 2012) the land to the Company after two and half years and ordered to deposit an amount of ₹ 57.69 lakh towards cost of the land. The Company deposited ₹ 57.69 lakh (January 2013) after a lapse of four months. Since payment was made in the next calendar year, the Collector raised additional demand (August 2013) of ₹ 69.96 lakh as per Ready Reckoner for the year 2013 which was paid by Company (December 2013) *i.e.* after five months. However, no land was allotted by the Collector before the end of the year (2013) and Deputy Collector again raised (March 2014) demand of ₹ 31.91 lakh which was deposited by Company (November 2014). Finally the possession of land was handed over by the Collector in November 2014 after four years from the date of demand. Thus, the Company made total payment of ₹ 1.60 crore as against original cost of ₹ 57.69 lakh for the land. Due to the delay in handing over of the land, the contractor also expressed inability to execute the work of construction of sub-station unless assurance was given of price variation. (October 2015).

The Company stated that the delay in payment for the land was procedural and there was delay from the Collector, Solapur also to hand over the land.

Though there was delay in handing over the land by the collector, delay in effecting payment lacked justification as the Company had sufficient funds under R-APDRP Scheme whereby the initial demand of the Collector could have been met in time. Besides, there was no active follow-up from the management of the Company with the Collector, Solapur after the first proposal. The Company should also pursue the recovery of ₹ 31.91 lakh, which was an unjustified demand, from the Collector along with the interest as additional funds to the extent of ₹ 1.02 crore of the schemes were utilised for allotment of land.

Release of retention money in violation of payment procedure and consequential loss of interest

2.1.29 As per contract conditions, 10 *per cent* retention money had to be released only on completion of entire works and certification of the same by competent authority. In Greater Mumbai town work, the Company released (December 2014) 90 *per cent* of such retention money to the contractor while the work was in progress, which resulted in consequential loss of interest ₹ 1.07 crore to Company.

The Company stated that the retention money was released since work of an amount more than original contract value had been completed and additional

work was in progress. The reply was not acceptable as the retention money should have been paid only on completion of the entire work.

Non commencement of works resulted in blocking of funds and consequential loss of interest

2.1.30 The Company gave advance of ₹ 1.03 crore to the contractor under Part B towards material for work of conversion of overhead LT line to LT U/G cable in 2012-13. However, the work was not started by the contractor even after a period of two years. Hence the amount of advance could not be recovered from the contractor resulting in blocking of funds and consequential loss of interest of ₹ 28.73 lakh due to absence of monitoring mechanism of the works by the Company.

The Company stated that the work could not be carried out due to local objections for digging the road being narrow and in a market area. It was also stated that as per tender conditions, penalty would be recovered from the contractor along with material advance from the bills. The fact, however, remained that the work was yet to be carried out and recovery of advance was pending (December 2015).

Implementation of SCADA (Part A and Part B) project

2.1.31 The SCADA/DMS system was intended to provide Real time monitoring and control, loss minimisation, load balancing and improvement in voltage/VAR profiles.

The project was being implemented in eight towns - Amravati, Greater Mumbai, Sangli, Solapur, Malegaon, Nashik, Pune and Kolhapur. The works under SCADA were bifurcated by Company into SCADA Part A and SCADA Part B *i.e.* enabling works.

A review of the progress of SCADA projects as on November 2015 for both Part A and Part B in five towns indicated that;

- ▶ Work of SCADA Control Centre was completed in all five⁶ towns;
- ▶ Work of providing links showed a progress in the range of 26 to 79 *per cent*;
- ▶ Work of Remote Terminal Units (RTU) was completed in the range of 56 to 100 *per cent*, while work of Feeder Remote Terminal Unit (FRTU) was completed in the range of 35 to 96 *per cent*;
- ▶ Work of Numerical relays was completed in the range of 47 to 90 *per cent*;
- ▶ Work of Winding Temperature Indicator (WTI)/Oil Temperature Indicator (OTI) and Automatic Voltage Regulator was in the range of 40 to 100 *per cent*;
- ▶ Work of Ring Main Units (RMUs) was completed in the range of 96 to 100 *per cent*.

⁶ Greater Mumbai, Malegaon, Sangli, Solapur and Amravati

The deficiencies noticed in implementation of SCADA projects are discussed below;

Poor performance of contractor in SCADA enabling works leading to delay in implementation of SCADA

2.1.32 In case of five towns - Amravati, Malegaon, Sangli, Solapur and Greater Mumbai, the SCADA enabling works were supposed to be completed within one year from the date of award *i.e.* by May 2014. The contractor M/s LPTE was required to submit the detailed Milestone Charts before execution of the Contract documents. The agency, however, neither submitted detailed milestone charts nor was the same insisted upon by Company. Consequently all the activities were delayed.

Two extensions were granted upto December 2014 and May 2015 respectively by the Company to M/s LPTE. LD and interim penalty were applicable during the first extension but no LD/interim penalty was levied by Company. The second extension was granted without applicability of LD/IP citing reasons such as concept of SCADA was not clear to field staff, non-availability of timely shut-downs, stoppage of work at Sangli and Amravati towns and issue of LT power supply to RMUs where no nearby supply available.

The delay in SCADA enabling works caused corresponding delay in SCADA Part A works as the FRTUs even though installed by the contractor could not be commissioned in the absence of enabling works such as LT power supply.

The contention of the Company for non-applicability of LD/IP was not convincing as it was the responsibility of Company to adequately train its officials before implementing the scheme on such a large scale. Moreover, issues like availability of shutdowns and provision of LT power supply were entirely within the control of the Company. Thus, the absence of proper planning and co-ordination within the Company resulted in delays in overall implementation of the SCADA project.

Replacement of relays

2.1.33 The work of replacement of relays was part of the scope of work of contractor in SCADA enabling works in Sangli town awarded (May 2013) for ₹ 110.62 crore (composite for five towns *i.e.* Amravati, Greater Mumbai, Sangli, Solapur and Malegaon) to M/s LPTE. It was, however, observed that, in Sangli town, replacement of relays in EHV sub-stations where distribution feeder directly emanated from the EHV sub-station could not be done because the required permission from MSETCL was not obtained by the Company. As a result, there was delay of more than two years in the replacement works resulting in delay in overall implementation of the SCADA enabling works for these towns. The permission was obtained in the co-ordination meeting held with MSETCL in January 2015.

The Company stated that as the existing battery sets in EHV sub-station could not cater the additional load of new equipments and, therefore, it was decided

to erect new battery panel at the sub-station due to which there was delay in execution.

Road digging permission from Local authority

2.1.34 The contractor started carrying out road excavation and cable laying works without obtaining prior permission from the local municipal authority of Sangli town. As a result, the municipal authority stopped (October 2014) the work and decided to levy penal charges. The required permission was obtained subsequently (January 2015) and work resumed. This showed that there was improper monitoring of the contractor's work, resulting in delay as the work was held up midway.

Delay in completion of the works under SCADA Part-A due to discrepancies in works carried out under Part B

2.1.35 In Greater Mumbai town, the Ring Main Units (RMUs) installed by the Part B contractor had only one Fault Phase Indicator (FPI) per RMU instead of one FPI per isolator, which was required as per technical specifications. The contractor refused to carry out the compatibility works as the works carried out by him were as per approved drawings and due to this dispute, the SCADA Part A contractor could not integrate the FRTUs with the RMUs. Due to this omission, the SCADA Part A works were also delayed.

The Company accepted the audit observation and stated that now the concerned agencies were ready to carry out the work with no additional financial burden.

Impact of the scheme on AT&C losses

2.1.36 The Aggregate Technical and Commercial (AT&C) losses of the Company in the year 2008-09 was 24.60 *per cent*. One of the main objectives of the R-APDRP was restoring the commercial viability of the distribution sector by substantially reducing the AT&C losses. Loan under the scheme against projects would be convertible into grant if the Distribution Utility achieves the target of 15 *per cent* AT&C loss on a sustained basis in the project area. If the utility fails to achieve or sustain the 15 *per cent* AT&C loss target in a particular year, that year's tranche of conversion of loan to grant will be reduced in proportion to the shortfall in achieving 15 *per cent* AT&C loss target from the starting base-line assessed figure. Thus, for the loan and interest which remained to be converted into grant, the utility would have to bear the balance burden of loan and interest repayment.

The AT&C losses of the Company had come down from 24.60 *per cent* in 2008-09 to 18.71 *per cent* during 2014-15. In the 128 towns where R-APDRP was implemented, the position of the AT&C loss as on August 2015 is given in the table below:

| AT&C Losses | No. of Towns | Names of Towns |
|--------------------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Less than 15 <i>per cent</i> | 47 | Ahmednagar, Amalner, Arvi, Astha, Balapur, Ballarpur, Baramati, Bhandara, Brahmapuri, Chalisgaon, Chikhali, Chiplun, Deolali, Digra, Gadchiroli, Ichalkaranji, Jaisinghpur, Karad, Katol, Khopoli, Kolhapur, Lonavala, Murtizapur, Nagpur, Nashik, Navi Mumbai, Ozar, Palghar, Panvel, Parli, Phaltan, Pulgaon, Ratnagiri, Sangli, Satara, Shegaon, Solapur, Talegaon, Tasgaon, Tumsar, Udgir, Umred, Uren-Islampur, Vita, Wadhgaon, Wai, Wardha |
| Greater than 15 but less than 30 <i>per cent</i> | 44 | Akkalkot, Akola, Amravati, Barshi, Bhadravati, Buldhana, Chandrapur, Chopda, Daund, Dharangaon, Dhule, Gondiya, Greater Mumbai, Hinganghat, Igatpuri, Kamti, Khamgaon, Kopargaon, Latur, Malkapur, Manmad, Morshi, Nalasopara, Nandura, Osmanabad, Pachora, Pandarpur, Pen, Pune City, Pusad, Sangamner, Satana, Shirpur, Sinnar, Umarga, Umerkhed, Vasai, Virar, Wani, Warora, Warud, Yavatmal, Yawal, Yeola |
| Greater than 30 but less than 45 <i>per cent</i> | 16 | Achalpur, Ahmadpur, Akot, Ambejogai, AUSA, Bhusawal, Dahanu, Daryapur, Deglur, Dondaicha, Erandol, Karanja, Mehkar, Nanded, Nandurbar, Parola |
| Greater than 45 but less than 60 <i>per cent</i> | 18 | Anjangaon, Basmat, Beed, Gangakhed, Hingoli, Jalna, Kannad, Majalgaon, Malegaon, Nilanga, Paithan, Parbhani, Sailu, Shahada, Sillod, Tuljapur, Vijapur, Washim |
| Greater than 60 <i>per cent</i> | 3 | Jintur, Pathri, Purna |
| Total | 128 | |

(Source: Information furnished by R-APDRP section of the Company)

It was seen that implementation being poor in the Marathwada region of the State covering 27 towns, the AT&C losses were very high (more than 45 *per cent*) in 17 towns.

The comparison of the AT&C losses as on August 2015 *vis-a-vis* baseline figures is given in the table below:

Comparison of AT&C losses as of August 2015 *vis-a-vis* baseline figure (2012-13)

| AT&C Losses | No. of Towns | Names of Towns |
|-----------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Decrease less than 15 <i>per cent</i> over the baseline figures | 78 | Achalpur, Akkalkot, Akot, Amalner, Ambejogai, Anjangaon, Arvi, Astha, Ballarpur, Baramati, Barshi, Basmat, Bhadravati, Bhusawal, Buldhana, Chandrapur, Chiplun, Chopda, Daryapur, Deglur, Deolali, Dharangaon, Dhule, Erandol, Gondia, Hinganghat, Ichalkaranji, Jaisinghpur, Jalna, Kannad, Karad, Katol, Khamgaon, Kolhapur, Kopargaon, Latur, Lonavala, Malkapur, Mehkar, Morshi, Murtizapur, Nagpur, Nalasopara, Nanded, Nashik, Navi Mumbai, Osmanabad, Ozar, Pachora, Palghar, Pandharpur, Panvel, Parbhani, Parola, Pen, Pulgaon, Ratnagiri, Sangamner, Satana, Shahada, Shegaon, Sirpur, Sillod, Sinner, Solapur, Tasgaon, Tumsar, Udgir, Umerkhed, Uran-Islampur, Vasai, Virar, Wai, Wardha, Warud, Yawatmal, Yawal, Yeola |
| Decrease more than 15 <i>per cent</i> over the baseline figures | 26 | Ahmadpur, Ahmednagar, Balapur, Bhandara, Brahmapuri, Chalisgaon, Chikhli, Daund, Digra, Gadchiroli, Igatpuri, Kamptee, Khopoli, Manmad, Parli, Phaltan, Pusad, Sangli, Satara, Talegaon, Umarga, Umred, Vita, Wadgaon, Wani, Warora |
| Increase less than 15 <i>per cent</i> over the baseline figures | 22 | Akola, Amravati, AUSA, Beed, Dhanu, Dondaicha, Gangakhed, Greater Mumbai, Hingoli, Jintur, Karanja, Majalgaon, Malegaon, Nandura, Nandurbar, Nilanga, Paithan, Pathri, Pune City, Sailu, Vijapur, Washim |
| Increase more than 15 <i>per cent</i> over the baseline figures | 2 | Purna, Tuljapur |
| Total | 128 | |

(Source: Information furnished by R-APDRP section)

The Company stated that the Part B works were under implementation and after the completion of all these works, the losses were expected to show reducing trend at the end of 2016-17 and thereafter. The Company further attributed the increase in AT&C losses in this region to less collection efficiency on account of successive two years drought. It also stated that remedial action would be taken to reduce the losses of all towns below 15 *per cent* for year 2016-17. Though, the reply of the Company had indicated the factual position of AT&C losses, it was noticed that in 24 towns losses had increased over the base line figures (worked out at the beginning of the project) of which, in two towns, loss had increased by 21 *per cent* over the base line figures.

Monitoring

2.1.37 The observations bringing out the weak monitoring during implementation of the projects are discussed below:

Non-compliance of discrepancies pointed out by Third Party Inspection agency

2.1.38 The Company appointed (May 2013) M/s REC Power Distribution Company Limited (RECPDCL) at ₹ 146.26 lakh for third party inspection of quality of work executed under the various turnkey contracts under Part B of the Scheme. After receipt of inspection report from the agency, the same was forwarded to the contractors for compliance.

We noticed that in four towns - Greater Mumbai, Talegaon, Lonavala and Basmath, in the compliance/rectification report submitted by the respective Part B contractors, certain items⁷ were left un-attended or not complied with. However, there was no follow-up of the same by Company to ensure that the discrepancies had been set right. Further, during joint inspection (September 2015) in Basmath town, it was noticed that 27 out of 51 discrepancies were not actually complied with by the contractor though the same had been stated to be attended to/complied with as stated in the compliance report (May 2015) submitted by the contractor. The non-compliance of the discrepancies was likely to compromise with safety and quality of the construction.

Thus, due to non pursuance/follow up of the discrepancies and non-verification of actual compliance, the purpose of appointment of third party inspection agency was not fulfilled.

The Company stated that instructions had been issued to all concerned field offices to the effect that all pending discrepancies should be got rectified and compliance report be countersigned by the concerned Engineers before releasing payment to the concerned contractors.

⁷ Guarding of canal and road crossing, nut bolt for GI earthing connection, barbed wire on poles, danger board on pole and DTCs, provision of cable glands to metering box *etc.*

Good practices in Company

2.1.39 The good practices noticed while implementing the projects are mentioned below:

- ▶ The preparation, approval and forwarding of DPRs were done in a time bound manner.
- ▶ After approval of DPRs, the initial tendering procedure was initiated and completed in time.
- ▶ No projects were abandoned/transferred under the scheme.
- ▶ All Part A projects had been declared Go-Live by October 2014.
- ▶ The Company had a well - established system for metering, billing and collection.
- ▶ Grievance redressal forum were established and found to be functioning.

Conclusions and Recommendations

Part A projects

Due to relatively high percentage of non-working modems installed on feeders and DTCs, the data regarding energy input on the feeders and DTCs could not be completely generated in the Data Centre. There was diversion of R-APDRP meters to other schemes which was not permitted as per Scheme Guidelines.

The Company may resolve connectivity issues relating to Broadbands/ Modems without further delay in order to reap the benefits of completed Part A works. The scheme material should be used as specified in the guidelines.

Part B projects

The progress of work in 40 out of 120 towns (33.30 per cent) was below 75 per cent indicating poor implementation of the scheme in these towns. Delay in acquisition of land for sub-stations, inordinate delays in carrying out allied works, re-tendering of works and absence of co-ordination with related agencies resulted in delay in overall implementation of the Part B works. The Company did not recover Liquidated Damages of ₹ 3.83 crore from contractors and refunded retention money in violation of terms and conditions of contract.

The Company may ensure timely completion of projects by proper planning and monitoring of activities, especially those relating to land acquisition for substations and other works.

The Company should award re-tendered works promptly, ensure effective co-ordination with related agencies to prevent further delays in execution and penalise contractors for delays as per contract conditions.

SCADA projects

Revisions in the scope of work after awarding contracts and non inclusion of essential items of work in the DPRs resulted in Company incurring expenditure for SCADA related works from its own sources. Co-ordination issues with external agencies as well as related works under Part B of the Scheme resulted in delay in implementation of SCADA works.

The Company may prepare DPRs covering the entire required work so as to avoid subsequent revision after award of work. Synchronisation of related works may also be ensured.

Impact on AT&C losses

The AT&C losses of the Company had come down from 24.60 *per cent* in 2008-09 to 18.71 *per cent* during 2014-15.

AT&C losses in only 47 out of 128 towns were below 15 *per cent*. However, in 24 towns losses had increased over the base line figures. It was seen that implementation was poor in the Marathwada region of the State covering 27 towns, where the AT&C losses were very high (more than 45 *per cent*) in 17 towns.

The Company may prioritise projects having higher AT&C losses for implementation and for those towns where AT&C losses are beyond 15 per cent. Corrective measures for reduction of losses may also be taken to avail the benefit of conversion of loans into grants.

2.2 Renewable Energy Sector in Maharashtra

Executive Summary

Promotion of Renewable Energy (RE) is one of the major objectives of National Action Plan on Climate Change (NAPCC) and Electricity Act, 2003. Under the GoM's policy of 2008, target for power generation from non-conventional energy sources was fixed for commissioning of 2,000 MW capacity of wind power projects, 400 MW of Biomass and 100 MW of Small Hydro Power (SHP) Projects as against which the achievements were 4,442 MW of wind power, 1,615 MW of Biomass, 329 MW of solar and 284 MW from SHP Projects.

(Paragraph 2.2.1)

During the year 2007-08 the total energy generated in the State was 99,600.68 Million Units (MUs) which increased to 1,42,724.18 MUs during 2014-15. During 2007-08 the contribution of RE to the total energy generated in the State was 2,555.04 MUs (2.57 per cent) and the same has increased to 11,836 MUs (8.62 per cent) during 2014-15.

(Paragraph 2.2.1)

The GoM had not declared any policy for development of solar energy till June 2015. In the absence of a policy, nominal target of 275 MW was fixed based on the achievement of solar power projects commissioned in the previous years. As against the target of 275 MW fixed by Maharashtra Energy Development Agency (MEDA), the achievement was 329.25 MW upto March 2015. Due to non-framing of policy by GoM, the solar sector had long been ignored and the capacity addition in this sector was insignificant despite a potential of 64,320 MW assessed by Ministry of New and Renewable Energy (MNRE), Government of India.

(Paragraph 2.2.8)

50 wind energy projects were commissioned between April 2014 and March 2015. Though, these wind energy generators had generated 68.42 MUs (April to May 2015) and energy generated was fed in MSEDCL grid, the MSEDCL did not execute Energy Purchase Agreements with these 50 generators (January 2016) mainly due to high tariff.

(Paragraph 2.2.11.3)

MSEDCL paid higher tariff rate in respect of 100.41 crore units of wind energy purchased during April 2010 to March 2015 though the required certificates were neither produced by the generators nor demanded by MSEDCL. This has resulted in excess payment of ₹ 85.06 crore.

(Paragraph 2.2.15.3)

Due to shortfall of 2,004 MUs in purchase of solar and non-solar energy from RE operators which worked out to 7.14 per cent of the target, the MSEDCL may be required to deposit ₹ 260.33 crore in the Renewable Purchase Obligation Regulatory Fund, as per directives of Maharashtra Electricity Regulatory Commission.

(Paragraph 2.2.15.5)

Out of ₹ 2,315 crore of the proceeds collected by GoM by way of tax on sale of electricity required to be transferred to MEDA between 2007-08 and 2014-15, only ₹ 112.79 crore was transferred to them and the balance ₹ 2,202.21 crore was neither transferred to MEDA nor utilised for promotion of the RE Sector. This resulted in diversion of the fund in violation of the statutory provisions.

(Paragraph 2.2.15.7)

Introduction

2.2.1 Maharashtra is one of the most urbanised States growing rapidly. In order to sustain the growth rate, Maharashtra would need to increase its energy supply to meet its growing demand. Fossil fuels, though cost effective and efficient, are depleting, polluting the environment and contribute to the greenhouse effect and global warming.

Renewable Energy (RE) has a potential to satisfy both the challenges of inclusive growth to meet the increasing needs of rural areas and low carbon emission. The State had a estimated potential of 13,427 MW of Renewable Energy sources, as of March 2015.

Promotion of RE is one of the major objectives of National Action Plan on Climate Change (NAPCC) and Electricity Act, 2003. In line with Government of India (GoI), Government of Maharashtra (GoM) has adopted the policy of achieving the target of renewable purchase obligation upto nine *per cent* of consumption and accordingly encouraging policies were formulated for development of the RE sources since 1996. The State stood second in the country in terms of Wind Power Capacity creation as of 31 March 2015.

Under the GoM's policy of 2008, a target for power generation from non-conventional energy sources was fixed for commissioning of 2,000 MW capacity of wind power project, 1,000 MW of cogeneration projects based on Bagasse, 400 MW of Biomass based projects and 100 MW of Small Hydro Power Projects.

Total installed power generation capacity

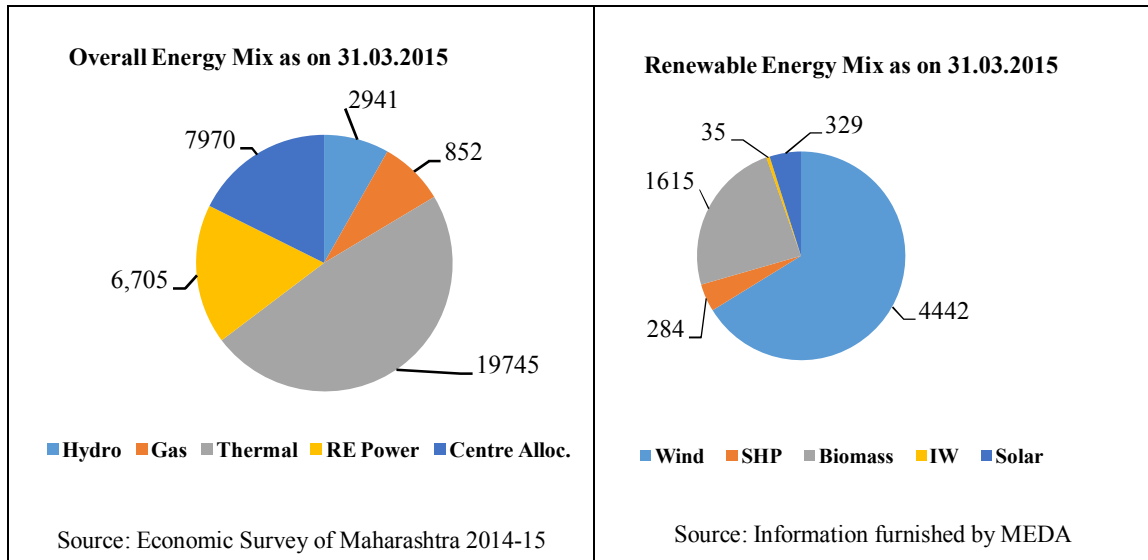
The Energy Sector comprises of Non-Renewable (conventional) and Renewable (non-conventional) sources. Maharashtra had an installed power generation capacity of 38,213 Mega Watt (MW) as on March 2015 which consists of 19,745 MW (51.67 *per cent*) from thermal, 2,941 MW (7.70 *per cent*) from hydro, 852 MW (2.23 *per cent*) from Gas, 7,970 MW Centre Allocation (20.86 *per cent*) and 6,705 MW from Renewable Energy (17.54 *per cent*).

RE based power generation potential and installed capacity (MW)

| Year | Wind | | Small Hydro | | Biomass | | Solar | Industrial and Urban Waste | | Total RE | |
|--------------|-----------|-----------------------------|-------------|-----------------------------|-----------|-----------------------------|------------------|----------------------------|-----------------------------|-----------|-----------------------------|
| | Potential | Capacity created (per cent) | Potential | Capacity created (per cent) | Potential | Capacity created (per cent) | Capacity created | Potential | Capacity created (per cent) | Potential | Capacity created (per cent) |
| Upto 2006-07 | | 1,485.63 | | 206.82 | | 177.50 | 0.00 | 0.00 | 6.13 | 0.00 | 1,876.08 |
| 2007-08 | 4,584 | 268.15 (5.85) | 600 | 6.50 (1.08) | 2,668 | 99.30 (3.72) | 0.00 | 637 | 0.00 | 8,489 | 373.95 (4.41) |
| 2008-09 | 4,584 | 178.08 (3.88) | 600 | 0.00 (0) | 2,668 | 141.00 (5.28) | 0.00 | 637 | 0.00 | 8,489 | 319.08 (3.76) |
| 2009-10 | 4,584 | 138.85 (3.03) | 600 | 16.00 (2.67) | 2,668 | 69.00 (2.59) | 0.00 | 637 | 5.16 (0.81) | 8,489 | 229.01 (2.70) |
| 2010-11 | 5,439 | 239.05 (4.40) | 732 | 16.90 (2.31) | 2,668 | 287.50 (10.78) | 1.00 | 637 | 4.72 (0.74) | 9,476 | 549.17 (5.80) |
| 2011-12 | 5,961 | 407.35 (6.83) | 732 | 18.50 (2.53) | 2,668 | 272.90 (10.23) | 19.00 | 637 | 4.00 (0.63) | 9,998 | 721.75 (7.22) |
| 2012-13 | 5,961 | 288.55 (4.84) | 732 | 6.00 (0.82) | 2,668 | 210.50 (7.88) | 30.15 | 637 | 4.00 (0.63) | 9,998 | 539.20 (5.39) |
| 2013-14 | 5,961 | 1,074.00 (18.02) | 732 | 0.00 (0) | 2,918 | 287.05 (9.84) | 180.10 | 637 | 5.00 (0.75) | 10,248 | 1,546.15 (15.09) |
| 2014-15 | 9,400 | 362.05 (3.85) | 732 | 13.30 (1.82) | 2,658 | 70.00 (2.63) | 99.00 | 637 | 6.14 (0.96) | 13,427 | 550.49 (4.10) |
| Total | | 4,441.71 | | 284.02 | | 1,614.75 | 329.25 | | 35.15 | | 6,704.88 |

(Source: Information furnished by MEDA)

As of March 2007, the installed capacity of the RE based power generation in the State was 1,876 MW (8.66 *per cent*) which increased to 6,705 MW (17.54 *per cent*) as of March 2015 as against the total installed capacity of 21,654 MW and 38,213 MW for the respective years.



Total Energy generated in the State vis-a-vis Renewable Energy

During the year 2007-08 the total energy generated in the State was 99,600.68 MUs which increased to 1,37,245 MUs during 2014-15. During 2007-08 the contribution of Renewable Energy to the total energy generated in the State was 2,555.04 MUs (2.57 per cent) and the same has increased to 11,836 MUs (8.62 per cent) during 2014-15.

Renewable Energy Programme

2.2.2 The RE programme included deployment of RE based projects in the following main categories: (i) grid-connected renewable power (ii) off-grid renewable power.

Grid connected Renewable power

2.2.2.1 This category comprised power generation mainly from - (i) Solar (ii) Wind (iii) Biomass/Bagasse¹ Cogeneration² and (iv) Small Hydro resources. The capacity in terms of installed capacity upto March 2015 is as given in the table below.

| RE Sector | Estimated Potential (MW) | Achievement (MW) |
|----------------------------|--------------------------|------------------|
| Wind power | 9,400 | 4,441.71 |
| SHP | 732 | 284.02 |
| Biomass power | 2,658 | 1,614.75 |
| Solar power | Not Assessed | 329.25 |
| Industrial and Urban Waste | 637 | 35.15 |
| Total | 13,427 | 6,704.88 |

(Information furnished by MEDA)

Off-Grid Renewable power

2.2.2.2 In Maharashtra, this category comprised power generation mainly from (i) Solar Home Lighting Systems (SHL) (ii) Solar Lanterns (SL) (iii) Solar Street Lighting (SSL) (iv) Solar PV Power Plants (SPP) (v) Solar Water Heating Systems (SWH) (vi) Remote Village Electrification (RVE) and (vii) Bio-Gas Programmes for deployment of off-grid/distributed renewable power and decentralised energy systems for rural applications upto 31 March 2015 is given in table below.

| Decentralised Energy Systems | Achievement (in numbers or area as applicable) |
|------------------------------|------------------------------------------------|
| SHLS | 18,603 |
| SL | 60,000 |
| SSL | 1,173 |
| SPP | 13 Nos. (260 kWp) |
| SWH | 12.24 lakh Sq.metre |
| RVE | 376 Villages, 545 Hamlets |
| Bio-Gas | 35 (489.50 kW) |

(Information furnished by MEDA)

¹ Bagasse is sugarcane fibre waste left after juice extraction

² Cogeneration is the simultaneous generation of both electricity and heat from the same fuel, for useful purposes

Agencies involved in promotion of Renewable Energy

2.2.3 The GoM established (July 1985) an autonomous agency *i.e.* Maharashtra Energy Development Agency³ (MEDA), which is working as the State Nodal Agency (SNA) in the RE sector. The main functions of MEDA are to assist GoM to promote and develop renewable sources of energy and technologies.

The Maharashtra State Electricity Distribution Company Limited (MSEDCL) and Maharashtra State Electricity Transmission Company Limited (MSETCL) which are the State Companies in the power Sector are responsible for the purchase and evacuation of the energy generated by the RE operators. In order to fulfill the Renewable Purchase Obligation (RPO) of MSEDCL, Maharashtra State Power Generation Company Limited (MSPGCL) has planned to set up solar power projects in Maharashtra.

Scope of audit and objectives

2.2.4 The Performance Audit (PA) on RE Sector covering the period 2007-08 to 2014-15 was conducted between April and July 2015 for reviewing the implementation of various programmes undertaken by the Renewable Energy Department, Director General (MEDA), Water Resources Department (Small Hydro), Ground Water Surveys and Development Agency and Rural Development Department. The records relating to generation, transmission, distribution and regulation of tariff maintained by MSPGCL, MSETCL, MSEDCL, State Load Dispatch Center (SLDC), Maharashtra Electricity Regulatory Commission (MERC) and nine⁴ Zilla Parishads (ZP) along with two villages of each ZP were selected for audit.

2.2.5 The objectives of the PA on the RE Sector were to examine whether:

- GoM and the State Nodal Agency (SNA) were able to increase the contribution of RE sources in the State energy mix;
- The Renewable Energy schemes/projects were implemented by the State agencies in tune with the policy directives, economically, effectively and efficiently;
- The tariff and other terms and conditions relating to purchase and sale of RE were conducive to development of RE and were adhered to by the agencies; and
- The monitoring by GoM/MEDA was adequate for effective promotion of RE in the State.

³ MEDA is registered as a society under Societies Registration Act, 1860 (in 1985) and Bombay Public Trusts Act, 1950 and started functioning with effect from July 1986

⁴ Ahmednagar, Amravati, Buldhana, Kolhapur, Pune, Sangli, Satara, Sindhudurg and Yavatmal

Audit criteria and methodology

2.2.6 The audit criteria adopted for achieving the stated audit objectives were derived from the following documents:

- Policies and Guidelines of Ministry of New and Renewable Energy, GoI (MNRE), GoM, MEDA;
- Plans and Schemes of MNRE, GoM, MEDA;
- Guidelines of Central Electricity Regulatory Commission (CERC) and orders of the Maharashtra Electricity Regulatory Commission (MERC);
- Policies of MSPGCL, MSETCL and MSEDCL with respect to RE and Board decisions in this regard; and
- Grid discipline norms.

The methodology adopted for attaining the audit objectives involved explaining the audit objectives and criteria adopted for the Performance Audit (PA) to the Management and Principal Secretary, Energy Department, in an entry conference held on 8 June 2015, analysis of data/records with reference to audit criteria, issue of audit enquiries and draft Performance Audit Report to the Management/Government for their comments. The draft PA Report was issued to the GoM and other implementing agencies on 13 November 2015 and the audit findings were discussed with them in an Exit Conference held on 27 and 29 January 2016 and based on the minutes of discussions the Report has been finalised. The replies of MSETCL/MEDA (January/February 2016) wherever received have been included. The replies of the Government/MSEDCL and MSPGCL were awaited (January 2016).

Acknowledgement

2.2.7 We acknowledge the co-operation and assistance extended by Energy Department (GoM), MEDA, MERC, MSPGCL, MSETCL, MSEDCL and all other constituents in the power sector in conducting of the Performance Audit.

Grid connected Renewable Power

Solar Power

Potential, target and achievement

2.2.8 Maharashtra has a huge potential for power generation from solar energy source. There are 250-300 days of clear sun with an available average radiation of 4 to 6 kWh/sq.metre over a day. There is a capacity to generate 1.5 million units/MW/year through solar photovoltaic systems and upto 2.5 million units/MW/year through solar thermal systems.

Despite huge potential of 64,320 MW assessed by MNRE, the GoM had not declared any policy for development of solar energy till June 2015. The solar sector has long been ignored and the capacity addition in this sector was not commendable. In the absence of a policy, a nominal target of 275 MW was

fixed by MEDA based on the achievement of solar power projects commissioned in the previous years, against which the achievement was 329.25 MW upto March 2015.

MEDA stated that in absence of solar policy for the period 2007-15, the target of 275 MW was fixed on the basis of interest taken by private investors and projects in the State under Jawaharlal Nehru National Solar Mission. The comprehensive RE policy which included Solar, was framed by the GoM only in July 2015.

Wind Power

Assessment of wind potential

2.2.9 Wind Power project potential of our country is 1,02,788 MW out of that the State potential had been assessed at 9,400 MW. As of March 2015, 4,441.71 MW of Wind Power Projects are installed.

Wind Resource Assessment Stations (WRAS) are established by MEDA to identify suitable windy sites in the State under Wind Resource Assessment Programme with the technical assistance of National Institute of Wind Energy⁵ (NIWE), an authority under MNRE. The year-wise details of studies conducted and windy sites identified are shown in table below.

| Year | No. of sites studies conducted | No. of sites identified | Expenditure incurred (₹ in crore) |
|--------------|--------------------------------|--------------------------------------------|-----------------------------------|
| Upto 2006-07 | 170 | 42 | NA |
| 2007-08 | 50 | 04 | 1.49 |
| 2008-09 | 100 | 02 | 3.17 |
| 2009-10 | 12 | 00 | 0.45 |
| 2010-11 | 37 | 02 | 1.67 |
| 2011-12 | 20 | 00 | 2.58 |
| 2012-13 | 05 | 00 | 1.01 |
| 2013-14 | 05 | Site declaration awaited from NIWE (C-WET) | 1.01 |
| 2014-15 | 07 | | 1.15 |
| Total | 406 | 50 | 12.53 |

(Source: Information furnished by MEDA)

As of March 2015, 406 sites were explored and 50 sites were identified by MEDA. During 2007-08, the Centre for Wind Energy Technology (C-WET) under the MNRE declared 59 sites not feasible as they did not satisfy the stipulated criteria of 200 Watts/m² at 50 m hub height. As MNRE scrapped the restrictions of applying the stipulated criteria of 200 Watts/m² at 50 m hub height subsequently in August 2011, these 59 sites also could have been gainfully exploited.

⁵ Formerly Centre for Wind Energy Technology (C-WET)

MEDA stated (December 2015) that out of 59 locations, wind power projects have been developed in vicinity of 11 locations and initiatives were on to find new windy locations for exploration.

Potential, target and achievements

2.2.10 Among the medium potential States, Maharashtra had the highest exploitation potential of wind energy at 47.25 *per cent*. The year-wise breakup of targets fixed against the estimated potential and the achievement of wind power projects upto March 2015 are given in the table below:

| Year | Estimated Potential (MW) | Target Fixed (MW) | Achievement (MW) | Percentage of installed capacity of Estimated Potential |
|--------------|--------------------------|-------------------|------------------|---------------------------------------------------------|
| Upto 2006-07 | NA | NA | 1,485.63 | NA |
| 2007-08 | 4,584 | 300 | 268.15 | 5.85 |
| 2008-09 | 4,584 | 300 | 178.08 | 3.88 |
| 2009-10 | 4,584 | 300 | 138.85 | 3.03 |
| 2010-11 | 5,439 | 300 | 239.05 | 4.40 |
| 2011-12 | 5,961 | 300 | 407.35 | 6.83 |
| 2012-13 | 5,961 | 300 | 288.55 | 4.84 |
| 2013-14 | 5,961 | 300 | 1,074.00 | 18.02 |
| 2014-15 | 9,400 | 300 | 362.05 | 3.85 |
| Total | 9,400 | 2,400 | 4,441.71 | 47.25 |

(Source: Information furnished by MEDA)

It can be seen that in 2013-14 there was enormous achievement of 1,074 MW. It was seen that 474 projects were approved and 153 Power Purchase Agreements were executed during the year.

The increase in the number of projects/investors was stated to be due to the encouraging policies of the GoM and saturation of sites in neighbouring States. Further, the tariff of State for the wind energy was favourable and was on increasing trend from ₹ 3.35/4.10 to ₹ 5.70 per unit in 2013-14. In subsequent paras, the outcome of the actual generation of the wind power in terms of its evacuation and benefits to the developers is discussed in detail.

The GoM did not prescribe a new policy, as specified in policy of 2008, for wind power projects immediately after achievement of target of 2,000 MW in May 2013. The new policy was framed only in July 2015, after delay of two years.

2.2.11 As per the RE Policy of GoM (October 2008, July 2010 and December 2010), the RE project developers had to be registered with MEDA and obtain grid connectivity recommendation from MEDA, who would issue Infrastructure Clearance Certificate (ICC) to install the project within a specified period. Subsequently, a Project Commissioning Clearance Certificate (PCCC) would be issued by MEDA after a joint inspection by MSEDCL/MSETCL and MEDA, based on which the project would be commissioned.

Commissioning of power projects without approval of MEDA

2.2.11.1 Prior to 2014-15 the wind power projects were commissioned in the State by following the methodology prescribed by GoM in July 2010. However, out of 98 wind power projects of 362.05 MW capacity which were commissioned during 2014-15, 61 projects of 255.20 MW capacity were commissioned without obtaining ICC and PCCC from MEDA which clearly indicated deviation from prescribed methodology. These 61 projects of 255.20 MW capacity were commissioned based on the MSEDCL policy (June and September 2014), wherein it was mentioned that the recommendation of MEDA was not necessary for grid connectivity and no ICC and PCCC would be required from MEDA for commissioning the projects. As the wind power project developers did not approach the MEDA, MEDA did not give the ICC to the wind power projects.

During exit conference, the MEDA stated that since the State had achieved the target of 2,000 MW in the year 2012-13 they had stopped issuing ICC and PCCC. MSEDCL stated that they have aligned the procedure now as per the methodology prescribed by GoM.

Non-reimbursement of evacuation expenditure to RE Developers

2.2.11.2 The GoM, RE policy (October 2008-July 2010) stipulated that the RE developers were eligible for refund to the extent of actual expenditure on evacuation infrastructure or the sanctioned estimates approved by MSEDCL/MSETCL or the amount as specified in the policy, whichever was lower after one year from the date of commissioning of project in five equal annual installments. The expenditure was to be shared equally by MEDA and MSEDCL/MSETCL (50:50). The GoM vide above policy had fixed target of 2,000 MW and estimated reimbursement of evacuation expenditure of ₹ 700 crore.

It was observed that though MSEDCL approved the estimates for evacuation infrastructure for projects during the period 2007-15, no claims were received for reimbursement of expenditure. MSEDCL stated that there were formalities to be complied by the generators for submission of claims. Further, in a generation scenario where the pooling of energy by generators, the evacuation expenditure was not significant for making the claim.

Non-execution of EPAs by MSEDCL with Wind energy generators

2.2.11.3 In 2014-15 MSEDCL received proposals from 50⁶ wind energy generators for execution of Energy Purchase Agreement (EPA) with the option of 100 *per cent* sale to MSEDCL. These wind energy projects were commissioned between April 2014 and March 2015. However, MSEDCL had not executed EPA with these 50 generators so far (January 2016).

It was observed that these wind energy generators had generated 68.42 MUs (April to May 2015) from the date of commissioning and fed the same into MSEDCL grid. The offer of the Company to purchase energy at Average

⁶ This includes eight proposals received in circle office but not forwarded to MSEDCL HO

Power Purchase Cost (APPC) of MSEDCL (around ₹ 3.00 per unit) was not accepted by the Generators.

MSEDCL stated (December 2015) that wind power tariff was continuously increasing and was becoming unaffordable. Hence, it had opposed hike in wind tariff in financial year 2013-14 and demanded competitive bidding for wind power. Therefore, MSEDCL did not guarantee purchase of power from the projects commissioned. Principal Secretary (Energy) and Managing Director/MSEDCL also confirmed that EPAs were not executed with the developers because apart from tariff issues, the EPAs did not have clauses requiring wind operators to maintain grid discipline.

We observed that the MERC had rejected the proposal for competitive bidding as there were no CERC guidelines for the same as required under Section 63 of the Electricity Act. Thus, the Commission proceeded with fixing wind tariff at generic rate of ₹ 5.81 per unit for 2013-14 and ₹ 5.70 per unit for 2014-15.

The policy decision of the Company in not abiding by the Regulator's approved tariff rates for purchase of wind energy was not only a contravention of the MERC orders but also a violation of the GoM's 2008 policy direction resulting in denial of legitimate dues to the power developers. Further, given the fact that there was a huge shortfall in terms of purchase of RE, non-execution of the EPAs would not only constrain MSEDCL from fulfilling their RPO obligation but also deprive the Developer of the RE benefits. As regards poor grid discipline on part of the developers, GoM and MSEDCL should have taken up the matter of amendment of relevant EPA clauses, with the MERC (regulator) in time and executed EPAs with those developers who were willing to abide by grid discipline norms.

Incomplete maintenance works of approach roads constructed out of cess funds

2.2.11.4 As per GoM policy (July 2010) in respect of Wind Power Projects (WPP), the expenditure on construction of approach roads to the premises of the new projects would be reimbursed from the Green Cess Fund by MEDA. An amount of ₹ two lakh per MW of installed capacity was to be collected by MEDA from the investor/developer for maintenance of rural and other district roads in the WPP areas, being damaged due to transportation of heavy machineries.

It was observed that MEDA had collected ₹ 56.71 crore from the developers for maintenance of rural and other district roads upto March 2015 and transferred (between January 2014 to March 2015) ₹ 61.94 crore to Public Works Department (PWD) for carrying out the repairs and maintenance work of these roads. The works, however, remained incomplete (January 2016).

MEDA stated (December 2015) that the PWD Divisions were the executing authority and MEDA would obtain the details of the work completion reports and utilisation certificates from PWD. However, MEDA did not explain why the same was not monitored by them.

Delays by MSEDCL in payment of energy bills to developers

2.2.11.5 As per Clause 20 of MERC (Terms and Conditions for Determination of RE Tariff) Regulations 2010, in case the payment of any bill for charges payable under these Regulations was delayed beyond a period of sixty days from the date of billing, a late payment surcharge at the rate of 1.25 *per cent* per month was payable by MSEDCL to the generating Company.

In MSEDCL, we observed that in Satara, Sangli, Pune, Ahmednagar and Nandurbar circles there were delays ranging over 30 days to 74 days in case of 225 bills amounting to ₹ 213.51 crore pertaining to the period 2013-15.

The MSEDCL accepted the delay and attributed the same to financial constraints.

Undue financial burden on account of levy of operating charges to RE generators by MSEDCL

2.2.11.6 MERC had approved (August 2012) that Distribution Licensees could recover processing and operating charges from Open Access Consumers (OAC) to meet the operational cost incurred while providing services to OAC *i.e.* other than those selling 100 *per cent* energy to MSEDCL.

During the period 2012-15, we observed that in Satara and Nasik (R) Circles, operating charges amounting to ₹ 1.48 crore were recovered by MSEDCL from 10 Wind Energy generators selling 100 *per cent* wind energy to MSEDCL, instead of OAC, in contravention of the MERC order. This resulted in undue financial burden on these RE Generators.

The MSEDCL stated that the generators should also share the expenditure and that they would approach MERC for approval of the recovery.

Tariff comparison of Maharashtra RE Tariff with other States

2.2.11.7 MERC notified (June 2010) the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010. The Regulation applies to all new RE projects commissioned in the State after its publication in the Official Gazette. In case of existing RE projects, applicable tariff and other terms and conditions shall be governed by respective RE Tariff Orders and amendments thereof as issued from time to time by MERC. We compared tariff for wind energy as determined by MERC with those that determined by CERC and other State Electricity Regulatory Commissions.

- From the year 2012-13, CERC introduced one more wind power zone upto 200 Wind Power Density (W/M²) with Capacity Utilisation Factor (CUF) of 20 *per cent*⁷ and for other zones CERC increased CUF limit by two *per cent* as compared to the tariff for earlier year. In the State, MERC retained the maximum generic tariff for WPD up to 250 W/M² with CUF of

⁷ The amendment was made (2012) by CERC due to MNRE withdrawing (August 2011) the qualifying criteria of minimum wind power density of 200 W/M² at 50m above ground level for establishment of wind power project at any site in India

20 *per cent* up to 2013-14 and 22 *per cent* from 2014-15 onwards. The delay on the part of MERC to notify CUF increase by two *per cent* up to 22 *per cent* resulted in fixation of higher per unit tariff for wind power generators in Maharashtra by ₹ 0.52 and ₹ 0.53 for the projects commissioned during the years 2012-13 and 2013-14 respectively. Consequently, this resulted in to passing of higher tariff to consumers through MSEDCL in respect of test checked seven wind power projects for the period from 2012-13 to 2014-15. Further, this higher tariff would be applicable for the balance years out of the contractual 13 years tariff period.

- The Wind Tariff in Tamil Nadu, Gujarat, Karnataka, Andhra Pradesh and Rajasthan States ranged between ₹ 3.59 and ₹ 4.70 per unit against the generic tariff of ₹ 3.35/4.10 to ₹ 5.70 per unit in Maharashtra during the period 2007-15.

It can be seen from the above, that the wind tariff of Maharashtra State was higher as compared to other States. The high tariff though an encouragement to the industry was opposed by the GoM's own agencies.

In this context, the MSEDCL had made a petition to MERC to introduce competitive bidding amongst developers for determination of tariff for wind energy purchase. However, the Commission had not approved the MSEDCL's petition and determined the generic tariff for wind for FY 2013-14 rejecting their plea for competitive bidding stating that unless CERC directed such bidding, they would not be able to enforce it.

Small hydro power

2.2.12 Small Hydro Power (SHP) projects can play a critical role in improving the overall energy scenario of the country and in particular for remote and inaccessible areas. Small hydro is the classification used for hydro power projects below 25 MW capacity, their distinguishing attribute being that these are mostly run-of-the-river type and do not require the construction of dams. Thus, apart from the fact that electricity is generated from a renewable source, small hydro projects have far lesser environmental impact as well.

GoM has laid maximum emphasis on the full development of its Small hydro potential being a clean and renewable source of energy. As of March 2015, the potential for generating electricity through SHP projects has been identified at 732 MW in Maharashtra.

Potential, target and achievements

2.2.13 Though, Maharashtra is not having huge SHP potential, it stood out with the highest contribution both in terms of capacity creation and potential exploited. The State had achieved a potential of SHP energy of 38.80 *per cent* as of March 2015.

The year-wise breakup of targets fixed against the estimated potential and the achievement of small hydro power projects up to March 2015 are given in the table below.

| Year | Estimated potential (MW) | Target fixed (MW) | Achievement (MW) | Percentage installed of estimated potential |
|--------------|--------------------------|-------------------|------------------|---------------------------------------------|
| Upto 2006-07 | 600 | NA | 206.82 | 34.47 |
| 2007-08 | 600 | 20 | 6.50 | 1.08 |
| 2008-09 | 600 | 20 | 0.00 | 0.00 |
| 2009-10 | 600 | 20 | 16.00 | 2.67 |
| 2010-11 | 732 | 20 | 16.90 | 2.31 |
| 2011-12 | 732 | 20 | 18.50 | 2.53 |
| 2012-13 | 732 | 10 | 6.00 | 0.82 |
| 2013-14 | 732 | 10 | 0.00 | 0.00 |
| 2014-15 | 732 | 10 | 13.30 | 1.82 |
| Total | 732 | 130 | 284.02 | 38.80 |

(Source: Information furnished by MEDA)

Scrutiny revealed that the achievement in respect of SHP projects was more than double as against the target set. However, the targets had been routinely set by MEDA without proper planning and analysis, in comparison to the estimated potential and appeared to be much lower than the potential.

Non-development of identified Small Hydro Projects sites

2.2.13.1 Water Resources Department (WRD), GoM issued (September 2005) detailed policies regarding implementation of the SHPs upto 25 MW in the State and identified the sites for implementation of SHPs. GoM provided (December 2005) that SHPs upto five MW could be installed through MEDA in coordination with WRD.

Scrutiny of records revealed that though MEDA had identified 60 potential SHP sites with generation capacity of 52.77 MW and forwarded (December 2010) the list to WRD for development of SHPs these sites were not yet developed (March 2015).

MEDA stated that the development of SHP was the responsibility of WRD whereas WRD stated that the financial feasibility study was required to take up the project. Principal Secretary (Energy) instructed MEDA to conduct the feasibility study for taking up the projects at the sites identified.

Non-recovery of liquidated damages for delay in commissioning of projects

2.2.13.2 As per GoM policy (July 2010), the developer has to complete the project within two years from the date of issue of ICC by MEDA. The SHP projects were to be commissioned in co-ordination with WRD. As per the Hydro Power Development Agreement (HPDA) entered into (May 2008) between WRD and Generating Company, the progress of the project was required to be monitored as per the milestones. In the event of delay in the commissioning of the project, Liquidated Damages (LD) would be recovered

as per the provisions of the agreement at the rate of 0.5 *per cent* of performance Security Deposit (SD) per day of delay from the scheduled date of commissioning limited to full amount of SD.

We observed that the projects were not monitored and there were delays ranging from 196 to 1,194 days in commissioning of the projects as indicated in the table below. Further, the LD of ₹ 3.59 crore for delays was not levied.

| Sl. No. | Name of the Project | Scheduled date of commissioning | Actual date of commissioning | Delay (days) | Amount of SD (₹ in lakh) |
|--------------|--------------------------------------------------------|---------------------------------|------------------------------|--------------|--------------------------|
| 1 | Veer Nira Left Bank Canal SHP (2 x 2.4 MW) | 10.03.2010 | 20.05.2012 | 800 | 14.50 |
| 2 | Sonawade HEP (2 x 2 MW) | 28.02.2010 | 14.09.2010 | 196 | 5.48 |
| 3 | Kolhapur Kumbhi SHP LakmaPur, Gaganbawda | 06.06.2008 | 18.04.2011 | 1,042 | 64.75 |
| 4 | Chitri HEP, Rajewadi, Ajra, Kolhapur | 06.06.2008 | 24.01.2011 | 960 | 56.90 |
| 5 | Gadre Marine Export HEP, Ghonsari | 06.06.2008 | 03.07.2010 | 755 | 57.75 |
| 6 | Kasari HEP Galewadi, Shahuwadi, Kolhapur | 06.06.2008 | 14.04.2011 | 1,040 | 56.15 |
| 7 | Dhom Balkawadi HEP, M/s Vishwaj Energy Private Limited | 06.06.2008 | 15.09.2011 | 1,194 | 103.60 |
| Total | | | | | 359.13 |

(Source: Information compiled from the records produced by MEDA)

In reply GoM, Energy Department stated (June 2015) that the developers executed HPDA with the WRD and the timely commissioning was to be ensured by WRD. Hence the matter was referred (September 2015) to WRD; their reply was awaited (January 2016).

Execution of EPAs

2.2.13.3 MSEDCL had executed 19 EPAs of 67.375 MW capacity during the period 2010-11 to 2014-15 and had approved reimbursement of evacuation expenditure to five SHP developers amounting to ₹ 220.58 lakh.

In MSETCL the Company had approved refund of evacuation expenditure amounting to ₹ 55 lakh to one small hydro project developer, while only one application for refund was pending with the Company.

Biomass power

2.2.14 The national potential for having grid quality power from surplus biomass material is assessed to be approx. 16,000 MW, while potential for Maharashtra is 2,658 MW (as per the Gokhale Institute for non-bagasse-458 MW and Vasant Rao Dada Sugar Institute for bagasse-2,200 MW). Against this available potential, project of 1,614.75 MW had been commissioned in the State.

Potential, target and achievements

2.2.15 Maharashtra had the highest exploitation of biomass potential. Maharashtra had achieved potential of biomass power 60.75 *per cent* of the estimated potential as of March 2015. The year-wise breakup of targets fixed against the estimated potential and achievement of biomass power projects upto March 2015 are given in the table below.

| Year | Estimated potential (MW) | Target fixed (MW) | Achievement (MW) | Percentage installed of estimated potential |
|--------------|--------------------------|-------------------|------------------|---------------------------------------------|
| Upto 2006-07 | 2,668 | NA | 177.50 | 6.65 |
| 2007-08 | 2,668 | 280 | 99.30 | 3.72 |
| 2008-09 | 2,668 | 280 | 141.00 | 5.28 |
| 2009-10 | 2,668 | 280 | 69.00 | 2.59 |
| 2010-11 | 2,668 | 280 | 287.50 | 10.76 |
| 2011-12 | 2,668 | 280 | 272.90 | 10.23 |
| 2012-13 | 2,668 | 105 | 210.50 | 7.89 |
| 2013-14 | 2,918 | 100 | 287.05 | 9.84 |
| 2014-15 | 2,658 | 175 | 70.00 | 2.63 |
| Total | 24,252 | 1,780 | 1,614.75 | 60.75 |

(Source: Information furnished by MEDA)

It was seen that from 2006-07 till 2009-10, there was lower achievement of targets while during 2010-11 there was marginal overachievement of target set. The targets were scaled down since 2012-13 and against the lowered targets, higher achievement emerged. The targets set had no correlation with the estimated potential of the sector.

Other issues

Commissioning of projects before obtaining ICC from MEDA

2.2.15.1 As per GoM policy (July 2010) in respect of Bio-mas (Bagasse) Projects, the project developer had to submit the requisite documents to MEDA for getting ICC. Based on the ICC, the project developer had to install the project within two years in respect of biomass from the date of issue of ICC by MEDA. In contravention to above policy, we observed that out of the 16 biomass (bagasse) projects, nine⁸ projects were commissioned even before obtaining the ICC from MEDA. Out of these nine projects, MEDA released RE benefits of ₹ six crore (reimbursement of power evacuation expenditure of ₹ two crore and capital subsidy of ₹ one crore each) to two projects⁹.

MEDA stated (December 2015) as per GoM policy of 2010, the PPA was supposed to be executed by MSEDCL after receipt of ICC from MEDA.

⁸ Gangakhed Sugar and Energy Limited, Jawahar Shetkari SSKL, Kranti SSKL, Lokmangal Mauli Industries Limited, Mula SSKL, Sonhira SSKL, Baramati Agro Private Limited, Shri Pandurang SSKL and Kisan Veer SSKL

⁹ Gangakhed Sugar and Energy Limited and Baramati Agro Private Limited

However, MSEDCL executed the PPAs with the developers despite the wanting ICC. The fact, however, remained that due to the agencies working at cross purposes not only resulted in violation of the GoM's policy directives but that developers were released the RE benefits without full compliance of the requisites laid down.

Non-reimbursement of evacuation expenditure by MSEDCL/MSETCL to RE Bio-mass/Bagasse power project Developers

2.2.15.2 The GoM, RE policy (October 2008) stipulated that the RE developers were eligible for refund to the extent of actual expenditure on evacuation infrastructure or the sanctioned estimates approved by MSEDCL/MSETCL or the amount as specified in the policy, whichever was lower after one year from the date of commissioning of project in five equal yearly instalments. The expenditure was to be shared equally by State Nodal Agency (SNA) *i.e.* MEDA and MSEDCL/MSETCL.

We observed that in MSETCL, 20 eligible applications for ₹ 55.09 crore were pending as on July 2015 for reimbursement being 50 *per cent* of the estimated capital expenditure (₹ 110.18 crore) even after one year of commissioning of the project.

In MSEDCL, the Company had approved reimbursement of evacuation expenditure to six out of eight applications received from the bagasse power project developers amounting to ₹ 384.46 lakh.

The MSETCL stated (January 2016) that the generators submitted the reimbursement proposals without proper compliances, whereas MSEDCL stated (January 2016) that the evacuation assets were not handed over to it after compliance of all requirements and therefore reimbursement was not made. The facts remained that the generators were deprived of the benefit of assistance provided in the GoM policy.

Non-receipt of Accelerated Depreciation Certificates from Wind generators resulting in excess payment

2.2.15.3 The generic tariff (July 2010) of MERC for wind generation sources prescribed two different rates *viz* higher tariff without considering Accelerated Depreciation (AD) (gross) and lower tariff for considering accelerated depreciation (net). As per the EPA executed by MSEDCL with the generators for purchase of energy, in order to avail the higher tariff generators were to submit a certificate from Chartered Accountant (CA)/Income Tax Department (IT) within two years from the date of Commercial Operation (COD) that the AD has not been claimed. If such certificate is not submitted within two years from the COD, then the tariff would be payable as if the AD had been availed and excess amount paid would be recovered.

We observed that MSEDCL paid higher tariff rate in respect of 100.41 crore units purchased during April 2010 to March 2015 though the required certificates were neither produced by the generators nor demanded by MSEDCL. These certificates were not on record at the time of audit scrutiny.

This resulted in excess payment of ₹ 85.06 crore in three circles alone (Pune, Satara and Nandurbar) test checked by audit.

The Principal Secretary advised MSEDCL in the Exit Conference (January 2016) that the payments should be restricted to the lower tariff till submission of the certificates. He further stated that the claims/certificates would be subjected to internal audit scrutiny also.

Non-recovery of commitment charges

2.2.15.4 As per GoM policy of 2010, in respect of bio-mass project, the developer/investor was to deposit commitment charges at the rate of ₹ five lakh per MW with MEDA so as to ensure that the project is installed within two years, failing which the project would be cancelled and commitment charges forfeited.

We observed that contrary to the above provision, MEDA did not recover commitment charges of ₹ 9.54 crore (at the rate of ₹ five lakh per MW) from 13 out of 103 bio-mass which were commissioned after obtaining ICC from MEDA. Out of the two non-bagasse projects, in case of GMT Mining and Power Private Limited, the project was delayed by 19 months and accordingly, the commitment charges should have been forfeited by MEDA. Similarly, in respect of 11 bio-mass bagasse power projects, where the MEDA had issued the ICC between July 2012 and November 2013, though these projects were not commissioned till March 2015, the commitment charges were not levied/recovered from the developers.

MEDA stated (December 2015) that developers were finding it difficult to remit the commitment charges due to huge working capital getting blocked, bankers were not willing to fund biomass projects since availability of biomass being seasonal and possibility of not getting regular payment from MSEDCL.

The reply is not acceptable as the policy had provided for recovery of commitment charges from the project developers after issue of ICC by MEDA. This was also necessary to attract serious developers in the interest of overall energy mix from RE developers.

Non fulfillment of Renewable purchase obligation target fixed by MERC

2.2.15.5 The existing legal framework under Electricity Act 2003 puts the responsibility for promotion of RE on the State Electricity Regulatory Commission (SERC). Renewable Purchase Obligation (RPO) is the obligation mandated by the SERC under the Act, to purchase minimum level of renewable energy out of the total consumption by the Obligated Entity.

MSEDCL being an obligated entity under the MERC RPO, its compliance and Implementation of Renewable Energy Certificate (REC) framework Regulations, 2010, was obligated to procure RE to the extent of six, seven and eight *per cent* of its Gross Energy Consumption (GEC) for the years 2010-11,

2011-12, 2012-13 respectively and nine *per cent* for the year 2013-14 and 2014-15.

The MSEDCL has to achieve the aforesaid target by way of own generation or procurement of power from RE developer or by way of purchase from other licensee or by way of REC or way of combination of any of the option. In the event of MSEDCL is unable to fulfill the RPO/REC obligation, MERC may direct the MSEDCL to deposit into a separate fund, to be created and maintained by MSEDCL, such amount as the commission may determine on the basis of the shortfall in units of RPO, provided that RPO Regulatory charges shall be equivalent to the highest applicable preferential tariff during the year or any other rate stipulated by the Commission. MERC allowed MSEDCL to carry forward and fulfil its non-solar¹⁰ RPO cumulative shortfall and solar RPO cumulative shortfall from 2010-11, by the year 2013-14 and 2015-16 respectively. The trading in Solar RECs commenced in May 2012 whereas trading in non-Solar RECs commenced in March 2011.

The RPO achievement *vis-a-vis* target in respect of MSEDCL during the period 2010-14 is given in the table below.

(Figures in MUs)

| Particulars/Year | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Cumulative |
|----------------------------------------------|---------------|-----------------|---------------|-----------------|-----------------|
| Gross Energy Consumption (GEC) | 85,357.35 | 94,967.36 | 93,264.55 | 98,549.36 | 3,72,138.62 |
| Solar RPO (in <i>per cent</i>) | 0.25 | 0.25 | 0.25 | 0.50 | -- |
| Target (in MUs) | 213.39 | 237.42 | 233.16 | 492.75 | 1,176.72 |
| Achievement (in MUs) | 1.13 | 10.89 | 27.74 | 211.00 | 250.76 |
| Shortfall (in MUs) | 212.26 | 226.53 | 205.42 | 281.75 | 925.96 |
| Non solar – RPO Target (in <i>per cent</i>) | 5.75 | 6.75 | 7.75 | 8.50 | -- |
| Target (in MUs) | 4,908.05 | 6,410.30 | 7,228.00 | 8,359.94 | 26,906.29 |
| Achievement | 4,926.42 | 6,778.45 | 6,543.11 | 7,580.18 | 25,828.16 |
| Shortfall (Excess) | (18.37) | (368.15) | 684.89 | 779.76 | 1,078.13 |
| Total shortfall (in MUs) | 193.89 | (141.62) | 890.31 | 1,061.51 | 2,004.09 |
| Total shortfall (in <i>per cent</i>) | 3.78 | (2.13) | 11.93 | 11.99 | 7.14 |

(Source: MERC order case no 190 of 2014, dated 4 August 2015)

We observed that:

- The MSEDCL purchased 250.76 MUs RE from Solar against targeted 1,176.72 MUs during the cumulative period from 2010-11 to 2013-14. Out of 250.76 MUs the substantial part *i.e.* 211 MUs were achieved during the year 2013-14. There was a shortfall in achievement of Solar RPO obligation which worked out to 925.96 MUs (78.69 *per cent*) till 2013-14.

¹⁰Excluding mini/micro hydro RPO cumulative obligation to be fulfilled by 2015-16. The shortfall was 4.42 MUs, 5.80 MUs and 6.38 MUs during 2010-11, 2011-12 and 2012-13. Separate figures for 2013-14 not furnished by MSEDCL

- Though, MERC (March 2014) has allowed MSEDCL to cumulatively fulfill its Solar RPO targets by the financial year 2015-16, the commission did not condone the shortfall against the Solar RPO target in FY 2013-14, while not accepting the contention of MSEDCL that sufficient Solar power was not available, such power was available but not procured as per the RPO requirements. MSEDCL could also have purchased Solar RECs instead, but chose not to do so even though sufficient Solar RECs were available at the Exchanges, the closing balances of Solar RECs at the end of March 2014 was 3,46,872 *i.e.* equivalent to 346.872 MUs.
- As regards Non-Solar Energy targets, MSEDCL purchased 25,828.16 MUs RE from Non-Solar sources against targeted 26,906.29 MUs during the cumulative period from 2010-11 to 2013-14 an achievement of 96 *per cent*. However in 2014-15, it did not procure any REC against the shortfall of 749 MUs.

The clause 12 of the RPO/REC regulations 2010 provided that if the Obligated Entity (MSEDCL) fails to comply with the RPO target as provided in these regulations during any year and fails to purchase the required quantum of RECs, the State Commission may direct the Obligated Entity to deposit into a separate fund, to be created and maintained by such Obligated Entity, such amount as the Commission may determine on the basis of the shortfall in units of RPO, RPO Regulatory Charges and the Forbearance Price decided by the Central Commission; separately in respect of solar and non solar RPO.

As MSEDCL has failed to meet the RPO/REC target for solar energy, the MERC during verification of RPO compliance by MSEDCL for the year 2013-14 ordered (August 2015) MSEDCL to constitute a separate 'RPO Regulatory Charges Fund' to fully meet the shortfall against RPO targets by the end of March 2016 within a month of the order. The Commission also clarified that, the expenditure on purchase of RECs and/or actual power procurement from the Fund shall not be passed through to consumers to the extent of the shortfall was not met by MSEDCL by the end of FY 2015-16.

Considering the REC floor prices a minimum of ₹ 260.33 crore (₹ 161.72 crore for Non-Solar + ₹ 98.61 crore for Solar) may have to be deposited by MSEDCL into the Fund. We observed that had the MSEDCL fulfilled the RPO target or purchased RECs through Power Exchange within stipulated time it could have recovered the cost of renewable energy or cost of RECs purchased through tariff.

The MSEDCL stated (January 2016) that the shortfall of four *per cent* was not significant and they had started purchasing RECs.

Non-implementation / compliance of MERC Orders / Government policy regarding Banked Surplus Units

2.2.15.6 MERC allowed (November 2003) banking of energy delivered to the grid for self-use and/or sale to third-party at any time of the day and night on monthly basis subject to the condition that surplus energy (delivered into the grid but not consumed) at the end of the financial year shall not be carried

over to the next year. Annual surplus limited to 10 *per cent* of the net energy delivered during the year shall be purchased by the Utility at the lowest Time of Day slab rate for High Tension energy tariff applicable on the 31st March of the financial year in which the power was generated.

Instead of following the MERC directives, MSEDCL issued (January 2012) a separate circular for banking of power generated by renewable sources and sold under open access whereby they declared that excess/surplus energy would be paid for only under a separate agreement with the supplier at applicable tariff of a 'Temporary Power connection'.

The aggrieved parties challenged MSEDCL circular before MERC. MERC set aside (January 2013) the circular of MSEDCL (January 2012).

MSEDCL challenged the MERC orders of January 2013 before the Appellate Tribunal for Electricity (APTEL). The APTEL upheld (August 2014) the principles of banking and dismissed the appeal of MSEDCL.

We observed that, as a result of this dispute, 103.21 lakh banked surplus units pertaining to 23 generators were not purchased by MSEDCL during the period 2010-14, the cost of which worked out to ₹ 3.82 crore. Further, during the year 2014-15, 15 out of 23 generators; "No Objection Certificate (NOC)" was not issued, thereby depriving the RE generators an option to sell energy for self-use or third party.

MSEDCL stated that the surplus energy as stated above would be purchased by them. Further, it was stated that the banking of surplus energy had been stopped after 2014. The non-compliance of MERC/APTEL directives was thus not in the interest of promoting renewable energy in the State.

Green Cess Fund – Non utilisation of funds

2.2.15.7 As per the Maharashtra Tax on Sale of Electricity Act, 1963, the tax levied by the State Government on sale of electricity to industrial and commercial consumers shall be first credited to the Consolidated Fund of the State. Thereafter an amount worked out at the rate of four paise per unit was to be transferred to MEDA through Appropriation for implementation of various schemes/projects of renewable and non-conventional energy like reimbursement of evacuation expenditure approach road, opening of letter of credit, capital subsidy *etc.* The rate was further increased to eight paise per unit from May 2008. The fund was popularly known as Green Cess Fund.

Accordingly, ₹ 2,315 crore out of the proceeds collected by GoM on tax on sale of electricity was required to be transferred to MEDA between 2007-08 and 2014-15 (worked out on the basis four/eight paise per unit), whereas only ₹ 112.79 crore was transferred to them and the balance ₹ 2,202.21 crore was neither transferred to MEDA nor utilised for promotion of the RE Sector. This resulted in diversion of the Fund in violation of the statutory provisions.

The Principal Secretary stated (January 2016) that the un-spent balance in the fund was available with GoM and would be utilised for the purpose. The reply

was not in consonance with the facts that the amount collected was credited to Consolidated Fund of the State without creating a Reserve Fund for the purpose. As a result, the availability of the fund for the intended purpose was not feasible now.

Urja Ankur Nidhi

2.2.15.8 GoM constituted (January 2006) “Urja Ankur Nidhi” (fund) under the Indian Trust Act, 1882 with total fund of ₹ 418 crore through Public Private Participation (PPP). Of the ₹ 418 crore, GoM was to contribute ₹ 218 crore over a period of three¹¹ years from 2005-06-to 2007-08 from GCF¹² and Private Fund Manager (PFM) had to mobilise ₹ 200 crore from the capital market within two years.

The primary objective of formation of this fund was to provide speedy financial assistance to bagasse co-generation RE projects in the form of equity participation upto 20 *per cent* to have a planned development of this sector. Of the balance 80 *per cent*, PFM had to mobilise ₹ 980 crore in first year and ₹ 1,820 crore in second year from capital market and commission bagasse co-generation RE projects of 1,000 MW in ensuing three years *i.e.* from 2008-11.

We observed that though the GoM was to contribute ₹ 218 crore from the GCF during 2005-08, actual amount contributed was only ₹ 55.90¹³ crore, which was financed for setting up of two bagasse co-generation projects of¹⁴ 80 MW against the envisaged capacity creation of 1,000 MW planned for.

GoM stated (June 2015) that the Urja Ankur Nidhi was established by the GoM for speedy financial assistance to RE projects and planned development of this sector. The projects under this category were to be developed under PPP model. This model permitted the private developer to run the co-generation project. Two co-generation projects have come up under this model. Meanwhile, the Co-operation Department of the GoM declared a policy (February 2008) which allowed sugar factories to develop their own cogeneration projects with minimal equity contribution of 5-10 *per cent*. The co-operative factory owners preferred this policy, which meant less investment on their part and better control over the project. It is felt that since the developers are not coming forward to avail the benefit of the Urja Ankur Nidhi, the GoM may consider abolishing the Urja Ankur Nidhi or take steps which would ensure utilisation of the fund. The GoM agreed to review the requirement for such fund.

¹¹ 2005-06: ₹ 100 crore; 2006-07: ₹ 100 crore and 2007-08: ₹18 crore

¹² GoM in Industry, Energy and Labour Department modified (March 2006) “Maharashtra Tax on Sale of Electricity Rules, 1963” to create a fund commonly known as “Green Cess Fund” for the development of non-conventional energy sources in the State.

¹³ ₹ 50 crore in March 2006 and ₹ 5.90 crore in March 2012

¹⁴ Urjaankur Shree Datta Power Company Limited, Shirol Kolhapur-₹ 23.20 crore and Urjankur Shree Tatyasaheb Kore Warna Power Company Limited, Warnanagar Kolhapur ₹ 28.10 crore

Non-submission of monthly power generation reports duly certified by SLDC to MEDA

2.2.15.9 GoM stipulated (July 2010) that it was mandatory for the Wind, Bio-mass and Small Hydro Power Projects investors/developers to submit details of monthly power generation to MEDA duly certified by SLDC and the license holders. If the project developer wanted to avail the RE benefits it was mandatory to the RE project developers to sell 100 *per cent* power generated from RE projects to any licensee or consumer to consume it in the State only. For that, the project developer had to submit the PPA entered into with the licensee to the MEDA. Similarly, the project developer had to obtain a certificate from the SLDC stating that the power generated by RE projects had been distributed in the State only and submit the same to MEDA every year. If the power generated by the RE projects had not been distributed in the State then the RE benefits availed by the project developers was to be recovered as per procedure prescribed by the GoM.

Scrutiny of records related to 135 RE power projects¹⁵ revealed that developers had not submitted details of monthly generation from the date of commission till March 2015 to MEDA duly certified by SLDC. This indicated that effective monitoring was not in place.

MEDA stated (December 2015) that though they had directed wind developers couple of times to submit monthly generation regularly, the developers were not submitting the same. GoM stated that efforts would be taken to obtain the data confirmed by MSEDCL and possibility of obtaining the same online from SLDC would also be explored.

Off-grid SPV programmes

2.2.16 Since 2005-06 MNRE had been providing Central Financial Assistance (CFA) to the implementing organisations for deployment of off-grid Solar Photovoltaic (SPV) systems such as Solar Home Lighting Systems (SHLSs), Solar Street Lighting Systems (SSLs), standalone Solar Power Plants (SPPs), Solar Lanterns (SLs), Solar Water Heating Systems (SWHSs) and Solar Water Pumps (SWPs) *etc.*

Various off-grid SPV systems upto a maximum capacity of 100 kW per site and decentralised solar thermal applications, were also eligible for CFA. Mini-grids for rural electrification up to a maximum capacity of 250 kW per site were also supported.

The main objectives were to promote the use of SPV systems, reduce the consumption of kerosene for lighting purposes, improve the quality of life in rural areas and provide an alternate for meeting rural lighting/energy requirements.

¹⁵ Wind power projects-105, Small Hydro Power Projects-10 and Biomass Power Projects-20

GoI launched (January 2010) the Jawaharlal Nehru National Solar Mission (JNNSM) which aimed at 2,000 MW by 2022 and merged all the previous schemes into the mission.

The solar off-grid policy of MNRE was demand driven and open to each implementing organisation. The selection of locations was the prerogative of the SNA/Channel Partners. The projects were to be approved by MNRE.

Target and achievement

2.2.17 The details of targets and achievements upto March 2015 are given in table below.

| Category | Target fixed (Number) | Achievement (Number) |
|-----------------------------|-----------------------|----------------------|
| Solar Home Lighting Systems | 18,603 | 18,603 |
| Solar Lanterns | 60,000 | 60,000 |
| Solar Street Lighting | 1,173 | 1,173 |
| Solar PV Power Plants | 13 Nos. (260 kwp) | 13 Nos. (260 kwp) |
| Solar Water Heating Systems | 12.24 lakh Sq. metre | 12.24 lakh Sq. metre |

(Source: Information furnished by MEDA)

The sector had a total budget allocation of ₹ 54.89 crore including CFA of ₹ 17.97 crore against which an expenditure of ₹ 50.56 crore was incurred.

Distribution of solar home lights

2.2.17.1 As per rate contract (September 2006) of MEDA, cost of the SHL was ₹ 13,531 per unit of which ₹ 8,731 per unit was to be borne by the beneficiary and ₹ 4,800 per unit would be provided as subsidy by the GoI. The following observations were made during the joint physical verification¹⁶ of the 20 households test checked in three¹⁷ Gram Panchayats (GP) in Sangli Zilla Parishad (ZP):

- Of the 20 SHLs stated to have been distributed Agriculture Development Officer (ADO), Agriculture Department, ZP Sangli, five SHLs were not found in the premises of the beneficiaries which was confirmed by the beneficiaries during the joint physical verification.

The ADO, Sangli stated (September 2014) that SHLs were installed and the installation reports were also available on record. The reply was contradictory to the beneficiaries confirmation of not being provided with SHLs.

- The benefit of subsidy component was not given to 15 out of 20 beneficiaries by the ZP and the supplier recovered excess amount ranging from ₹ 4,269 to ₹ 13,619 from the beneficiaries. Further, in respect of 15 beneficiaries, training for use and care of SHLs and Annual

¹⁶ Conducted in the presence of Gram Sevak/representative of the GP and Gram Sarpanch

¹⁷ Haripur, Maalgaon and Takali villages in Sangli district

Maintenance Contract (AMC) was not provided during October 2006 to 2011 though it was mandatory as per the rate contract.

MEDA stated (December 2015) that the role of MEDA in this scheme was restricted to disbursement of CFA to concern ZPs and project was actually implemented by ZPs. However, the ZP, Sangli had been informed to look into the matter at the earliest. The reply was not acceptable since the project was expected to be monitored by MEDA.

Installation of SPV Power Plants at District Collector Offices

2.2.17.2 As per the work order placed by MEDA four SPV Power Plants were installed at four¹⁸ District Collector offices through Autonic Energy Systems Private Limited at a cost of ₹ 41.96 lakh.

We observed that (June 2015) the MEDA had not obtained the quarterly/ yearly performance reports duly certified by the District Collector in respect of above four districts from the date of commissioning (July 2013) of the systems from the contractor as required as per the terms and conditions of contract. In the absence of above performance reports, it could not be ascertained in audit whether the systems were satisfactorily working or not.

MEDA stated (December 2015) that some of the Collector Offices and contractors were submitting the generation reports periodically. The reply indicates that the projects are not monitored by the MEDA.

Solar Water Heating Systems

2.2.17.3 The GoI, MNRE sanctioned (August 2008) a programme on Accelerated Development and Deployment of Solar Water Heating Systems (SWHS) in domestic, industrial and commercial sectors during 2008-09 and 2009-10.

The main objective of the programme was to promote widespread use of solar water heaters in the country through a combination of financial and promotional incentives. Capital subsidy from MNRE was also payable to the beneficiaries at the rate prescribed and modified by MNRE from time to time. The capital subsidy was to be paid to the beneficiaries through MEDA only after commissioning of the SWHS and verification carried out by MEDA. The MEDA was also required to submit audited statement including total expenditure incurred on each system.

We observed that although 3,100 SWHSs were installed in the State by the beneficiaries during the period from 2012-14, the MNRE did not sanction the proposals and released the CFA. This resulted in deprival of RE benefit 3,100 beneficiaries to the extent of ₹ 7.17 crore.

MEDA stated (December 2015) that as against the demand of ₹ 35.04 crore, they had received the CFA of ₹ 17.97 crore till May 2014 and ₹ 11.93 crore

¹⁸ Jalna, Nagpur, Nashik and Yavatmal

was received from MNRE in November 2015 and the subsidy disbursement was in progress. However, the balance CFA of ₹ 5.14 crore was yet to be released by MNRE.

Remote Village Electrification Programme

2.2.18 The Remote Village Electrification (RVE) Programme was designed to provide financial support for electrification of those remote unelectrified villages and unelectrified hamlets of electrified villages where grid-extension was either not feasible or not cost effective; and were not covered under Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY).

Such villages were to be provided basic facilities for electricity/lighting in distributed power generation mode, through various Renewable Energy (RE) sources like Small Hydro Power (SHP), biomass gasification based electricity generation systems, Solar Power Plants (SPP), *etc.* depending upon local availability.

A quarterly Operation and Maintenance report was required to be submitted by the supplier to MEDA till the completion of Comprehensive Maintenance Contract (CMC) period and the GP were required to certify and confirm the status of electrification of the village as on 31 March each year.

Non monitoring of Schemes/Programme

2.2.19 Scrutiny of records of 55 selected villages under RVE programme revealed the following:

- In 31 villages, quarterly reports in respect of the functioning of the solar equipments were submitted for periods ranging from two to three years only as against the full duration of five years. Quarterly reports for the entire period were not available with MEDA in respect of the remaining four villages¹⁹.

MEDA stated (December 2015) that they had received the CMC reports from the manufacturers for the balance CMC period from some of the GPs. However, the collection of CMC reports from some GPs was in progress.

- As per GR (September 2007) of GoM, the Gram Sevaks were required to visit the installed projects every six months and submit the reports on the functioning of the equipments to MEDA.
- In respect of 13 villages out of 55 villages selected, the Gram Sevaks had not submitted the six monthly performance reports to MEDA from the date of installation of solar equipments. In reply GoM stated (June 2015) that the manufacturer and GPs had been instructed to submit the reports of functioning of the solar systems.

¹⁹ Bhatpur, Gongwada and Rameshgudam in Gadchiroli and Charmali in Jalgaon district

Biogas based power generation programme

2.2.20 Biogas technology provides an alternative source of energy mainly from organic wastes. The gas can be effectively utilised for generation of power from biogas based power generation system after dewatering and cleaning of the gas.

As per guidelines issued²⁰ by MNRE, GoI (Bio-energy technology development group), each proposal will be examined and concurred by the Integrated Finance Division of the Ministry on case to case basis. The CFA would be released after successful commissioning of the biogas based power plant. The MNRE requested all the States Nodal Agencies/Departments to initiate action for implementation of biogas power (off-grid) programme as per the scheme and submit the project proposals to MNRE for approval and sanction of CFA to the beneficiaries.

Delays in approval/sanction of Biogas projects

2.2.21 MEDA submitted (between September 2011 and January 2014) the proposals of following seven biogas renewable energy projects having capacity of 2,550 m³/day (306 KW of engine capacity) to GoM for initial scrutiny and approval as shown in table below.

| Sl. No. | Name of Institution/beneficiary (address of the site) | Biogas Plant capacity (m ³ /day and KW) | Date of submission of proposal to GoM | Date of approval of GoM | Time taken for approval by GoM (months) |
|--------------|----------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------|-------------------------|-----------------------------------------|
| 1. | Nanai Dairy Farm, Sudhanagar, A/p Poyanje, Tal. Panvel, District Raigad | 600 m ³ /day (72 KW) | 12-09-2011 | 26-04-2013 | 19 |
| 2. | M/s Sahyadri Agro & Dairy Limited, Village Katphal, Tal. Baramati, District Pune | 1000 m ³ /day (120 KW) | 26-11-2012 | 11-09-2014 | 22 |
| 3. | Shri. Amey B. Patil, Village-Handugari, Tal. Bhum, District Osmanabad | 300 m ³ /day (36 KW) | 26-03-2014 | 11-09-2014 | 6 |
| 4. | Shri. Surendra S. Girmé, Village-Nangaon, Tal. Daund, District Pune | 200 m ³ /day (24 KW) | 26-03-2014 | 11-09-2014 | 6 |
| 5. | M/s Kamshet Dairy Farm, Village - Govitri, Tal. Maval, District Pune | 275 m ³ /day (33 KW) | 26-03-2014 | 11-09-2014 | 6 |
| 6. | Shri. Limbaraj T. Tikale, Village-Khed, Tal. & Dististrict Osmanabad | 75 m ³ /day (9 KW) | 26-03-2014 | 11-09-2014 | 6 |
| 7. | Shri. Sant Lahanuji Maharaj Sansthan, A/p Takarkheda, Tal. Arvi, District Wardha | 100 m ³ /day (12 KW) | 25-06-2014 | 11-09-2014 | 2 |
| Total | | 2,550 m³/day (306 KW) | | | |

(Source: Information compiled from the records produced by MEDA)

It could be seen that the GoM took two to 22 months to accord the initial approval to these seven projects which were forwarded during May 2013 to March 2015 to MNRE for approval. MNRE raised queries on six proposals out of the seven projects forwarded to them for approval which were yet to be

²⁰ June 2009, November 2010, October 2011 and January 2014

complied (January 2016). Hence, there was delay in commissioning of 306 KW capacity biogas projects.

MEDA stated (December 2015) that the queries raised by MNRE with reference to six projects have complied by MEDA in July 2015, however, sanction to these projects was still awaited from MNRE. The reply was silent on the reasons for delay by GoM in approving the proposal.

In respect of another seven projects with total capacity of 60 KW which were completed between June 2011 and August 2012 at a cost of ₹ 97.68 lakh, MEDA inspected the same only after a period of eight to 22 months. Thereafter, the inspection reports were submitted to MNRE in July 2014 for release of CFA of ₹ 26.40 lakh, which was yet to be released (January 2016). Thus, the delay in inspection by MEDA resulted in delay in granting the CFA benefits of ₹ 26.40 lakh to the beneficiaries.

MEDA stated (December 2015) that the MNRE directed the Biogas Development & Training Centre (BTDC), Indore to inspect these projects in July 2014. BTDC had inspected these projects in September 2014 and submitted the report to MNRE in March 2015. MNRE directed the BTDC to re-inspect the projects and to re-submit the report. However, sanction to these projects was still awaited from MNRE. The reply was silent on steps proposed to speed up proposals with MNRE/GoM for approvals.

Information, publicity and awareness programme

2.2.22 The MEDA is implementing programme on Information, Publicity and Public Awareness using Electronic media, Exhibition and outdoor media like Hoardings/Kiosks/Bus back panels and seminars to create mass awareness of the non-conventional energy products and devices, design features products *etc.* and also to disseminate information on technological development and promotional activities taking place in the area of the non-conventional energy.

As per MNRE Guidelines (October 2010) the periodical progress reports, utilisation certificates and audited statements of expenditure were required to be submitted to MNRE. Further, the Rajiv Gandhi Akshaya Urja Divas was also to be celebrated by MEDA every year by organising Runs, Debates, Seminars, Quiz, Drawing Model making, Posters, Essay and Slogan writing competitions amongst others for school children in different talukas/blocks and villages *etc.* and submitting the achievement reports to MNRE.

2.2.23 During the period from 2007-15 the expenditure to the extent of ₹ 12.89 crore was incurred by MEDA on Information, Publicity and Public awareness. The activities *viz.* organising Runs, Debates, Seminars, Quiz, Drawing Model making, Posters, Essay and Slogan writing competitions amongst others for school children in different talukas/blocks and villages have not been conducted.

Conclusion and Recommendations

- In spite of huge potential of solar power in the State, the solar sector was not tapped due to absence of suitable policy framework of the GoM.
- ***Vigorous efforts are required by the GoM, MEDA and MSPGCL to make up the backlog in the solar power sector.***
- The potential of wind energy in the State was 9,400 MW and as against a target of 2,400 MW fixed the achievement was 4,441 MW as on March 2015. In Small Hydro Power the potential was 732 MW and as against the target of 130 MW the achievement was 284 MW. The potential of Biomass was 2,658 MW and as against target of 1,780 MW the achievement was 1,615 MW.
- As of March 2015, 59 potential wind sites and 60 small hydro sites identified in 2007-08 and 2010-11 respectively remained undeveloped despite substantial expenditure on identification of these sites.
- ***GoM, MEDA and WRD may ensure the development of identified 59 wind and 60 small hydro sites respectively after conducting feasibility studies.***
- MSEDCL's policy of commissioning RE projects without obtaining Infrastructure Clearance Certificate and Project Commissioning Clearance Certificate from the MEDA was not consistent with the GoM policy directives.
- Though wind energy projects were set up and energy injected to the Grid, the MSEDCL did not enter into EPAs with 50 wind energy developers complaining of high tariff and absence of grid discipline norms.
- ***Since tariff is a major challenge to the growth of the RE Sector, the MSEDCL/MSETCL may continue their efforts with MERC for introduction of competitive bidding for determination of tariff for the wind energy sector.***
- In five circles test checked, the MSEDCL had delayed payment of bills of Wind Energy Developers over 30 to 74 days involving ₹ 213.51 crore.
- The MSETCL did not reimburse the evacuation expenditure to 20 biomass projects (₹ 55.08 crore).
- ***The MSETCL, MSEDCL may evolve a system to ensure timely reimbursement of expenditure incurred by the Developers on evacuation infrastructure.***

- The MSEDCL paid higher tariff to wind generators without obtaining certificate regarding non-availment of accelerated depreciation.
- ***Necessary certificates regarding non-availment accelerated depreciation from the developers and internal audit of the same may be ensured so as to avoid excess payment on account of higher tariffs.***
- The MEDA did not recover the prescribed commitment charges of ₹ 9.54 crore from 13 biomass projects.
- Due to shortfall of 2,004 Million Units in purchase of solar and non-solar energy from RE generators which worked out to 7.14 *per cent* of the target the MSEDCL may be required to deposit ₹ 260.33 crore in the RPO Regulatory Fund, as per directives of Maharashtra Electricity Regulatory Commission.
- The GoM transferred only ₹ 112.79 crore as against ₹ 2,315 crore due for transfer to MEDA for undertaking promotional activities in RE Sector as specified in the tax on sale of Electricity Act, 1963 resulting in diversion of the balance funds of ₹ 2,202.21 crore.
- ***The transfer of funds (under Green Cess Fund) to MEDA specified in the tax on sale of Electricity Act, 1963 may be ensured to undertake promotional activities in RE Sector.***
- Seven biogas projects having capacity of 306 KW were awaiting approval from MNRE, Government of India whereas in seven projects of 60 KW which were belatedly inspected by MEDA, benefits of ₹ 26.40 lakh were not released to the developers.
- ***GoM may by effective monitoring ensure that all the stake holders and the State agencies follow/implement their policy directives.***

The matter was reported to the Government (November 2015); their reply was awaited (January 2016).