

**REPORT OF**

**HIGH LEVEL PANEL**

**ON**

**FINANCIAL POSITION OF**  
**DISTRIBUTION UTILITIES**

December, 2011

New Delhi



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## INTRODUCTION

With the approval of the Prime Minister the Planning Commission in July 2010 appointed a High Level Panel to look into the financial problems of SEBs and identify corrective steps. The Terms of Reference (ToR) of the Committee are at **Annexure– I**.

The composition of the High Level Panel is as follows :-

(i)	Shri V.K. Shunglu, former CAG	-	Chairman
(ii)	Shri S.K. Tuteja	-	Member
(iii)	CMD/PFC	-	Member
(iv)	CMD/REC	-	Member
(v)	Member (E&C), CEA, representative of CEA-	-	Member
(vi)	Pr. Advisor (Energy), Planning Commission	-	Convener
(vii)	Secretary (P), Govt. of West Bengal	-	Member
(viii)	Managing Director, MSEDCL	-	Member
(ix)	Managing Director, APGENCO	-	Member

It would be recalled that the Electricity Act in its present form was enacted in 2003. An important change envisaged in the Act i.e. separation of three interlinked activities namely generation, transmission and distribution was to take place in all the States. This part has by and large been completed by 10th June 2010 with the exception of Bihar, Jharkhand, Kerala and those States where supply of electricity has not been corporatized. It was expected that considerable gains would result from this separation. It is observed that even though the separation has taken place it is only in the form and not in substance. The ownership, the maintenance, the financial well being and the cash flow in particular are so interlinked that it cannot be said that there is separation in any real sense of the word. This is so across all the States. The inefficiencies of generation and transmission are passed on at cost plus basis to the distribution companies which have no choice but to procure power from State generating units through State transmission lines for the purposes of distribution. Thus a second element of the amendments carried out in 2003, Open Access, in its broadest sense, remains a dead letter. It would not be wrong to say that between 2003 and the present time, very little has changed and therefore problems remain as they were. No doubt certain States have made progress in reducing T&D losses and so on and their financial position as a result is much better as reflected in the balance sheet of the Distribution Utilities. However, these gains are not connected in any meaningful manner to the structural change and in fact what seems to have happened is that the improvements

have taken place in power sector of a particular State which shows up in the result of the Distribution Utilities. Some changes, e.g., emergence of truly autonomous State Load Dispatch Centers are, at best, in infancy.

In this background in order to better understand the ills of electricity sector a number of studies were mounted by the High Level Panel. The performance of generation and transmission sectors has been ignored as being outside the terms of reference. It is generally assumed that ills of generation and transmission are subsumed in the distribution sector and hence it is this sector which has been the focus of the study.

The problems faced by Distribution Utilities are, some times, laid at the door of the Regulator. It is stated that periodic tariff increases to meet ever increasing costs have not taken place and therefore Discoms are unable to cover costs from tariff. Alternatively the cost of generation keeps increasing without there being a concomitant increase in tariffs. In order to better understand issues connected with fixation of tariff and the regulatory regime, which commenced about 15 years back and which is now operational in all the States, was studied. The study connected with issues covered by ToR(c) was led by Mr. Divakar Dev, erstwhile Chairman of Uttarakhand Electricity Regulatory Commission.

It has also been argued that it is not appropriate to expect tariffs to pay for operational inefficiencies and with T&D losses standing at around 30% or more, it is wrong to blame tariff per se for these problems. At present the Central Govt. has two schemes to address this issue. For urban areas Power Finance Corporation Ltd. (PFCL) is the nodal agency to implement the Restructured – Accelerated Power Development and Reform Programme (R-APDRP) scheme which covers 1400 towns with population of over 30,000 (2001 census) accounting for 40% of the energy consumed. Besides rural electrification is being administered by the Rural Electrification Corporation Ltd. (RECL) through Rajiv Gandhi Gramin Vidyutikaran Yojna (RGGVY). The High Level Panel engaged Mr. R.K. Narayan (retired Chairman, Powegrid) who has long years of experience in the electricity sector including transmission and distribution for these issues [ToR (d), (e) and (f)]. The operations of the two schemes have been studied and a number of measures for further improvements recommended.

There are some who suggest that so long as ownership of distribution is in the public sector the kind of improvements required to accomplish break-even / profits cannot take place. In other words efficiency may well be a function of ownership. In order to address this issue, the four models operational at present were studied namely Public Ownership (Jaipur Vidyut Vitran Nigam Ltd., Jaipur); Private ownership (BSES Ltd., Mumbai); Public Private Partnership (NDPL, Delhi); and Franchisee Model (Torrent Power, Bhiwandi). The study report is appended at **Annexure – VI** and its conclusions are discussed in our report.

Having said all this it may be noted that a true and fair picture of the electricity sector is simply not available because accounts have been in arrears, books of accounts have not been maintained, a number of statements made as part of the accounts are inaccurate and it cannot be said that reliable information is provided by the Distribution Utilities as to reflect the true state of affairs based on annual financial statements which they are expected to publish. A diagnostic study was mounted in those States (Uttar Pradesh, Bihar, Chhatisgarh and Jharkhand) where the problems are particularly acute. The results of the diagnostic study are appended in the form of a report at **Annexure – III & IV**. Additionally efforts were mounted by the Panel to facilitate completion of accounts of all Distribution Utilities upto the financial year ending 31st March 2010. Most of the work in relation to Chapter – I was the responsibility of Shri K.N. Khandelwal, Former Dy. CAG and Shri Sachin Jain, Chartered Accountant.

Accounts for all the States have been audited upto that date with the exception of Bihar, Jharkhand and Uttar Pradesh. In other words accounts are available for all States and for most States audited accounts are available. However, the diagnostic studies undertaken by the panel elucidate that the quality of accounts is seriously in-question and that it would be inappropriate to draw firm conclusions on the basis of accounts in particular as to the health of the Distribution Utilities. The Report addresses these problems at the appropriate place. These efforts cover issues encompassed by ToR (a) and (b). It should be noted that the studies were not restrictive, there is some overlap and ToR (g) was the concern of all studies.

The HLP was assisted by a number of individuals and institutions listed in the **Annexure- II**.

### **States visited for assignments related to HLP**

HLP officials visited Uttarakhand, Madhya Pradesh, West Bengal, Gujarat, Maharashtra, Punjab, Haryana, Meghalaya, Assam, Uttar Pradesh, Delhi, Rajasthan, Andhra Pradesh, Tamil Nadu, Karnataka, Bihar, Jharkhand and Chhatisgarh. Discussions were held with the Secretary (Power) of the States and Chairpersons / Managing Directors / officials of the utilities to gauge the problems in the power sector and steps required to be taken for possible solutions.

### **Meetings held for assignments related to HLP**

The Panel held discussions with various stakeholders in power sector for accomplishing the task assigned to HLP. The meetings were held with Ministry of Power, CERC, SERCs, Forum of Regulators, Discoms, Franchisees (SPANCO, Nagpur and Torrent, Bhiwandi & Agra), NDPL, Banks/FIs and Private Equity Funds (to assess the climate of investment viz-a-viz Franchisee Model). The Panel also held discussions with the Planning Commission and exchanged views on the various actions required to be taken for financial viability of the power sector.

We express our sincere thanks to Chairman & Managing Director, Power Finance Corporation Ltd. (PFC) for administrative and functional support provided to the Panel and also to the Board of Directors, PFC for extending financial assistance for accomplishing the tasks assigned to it.

The report is organized in the chronological order as the Terms of Reference.

<b>Terms of Reference</b>	
<b>Chapter - I</b>	(a) Review accounts of SEBs' and State Distribution Companies as on March 31, 2010 or earlier if updated accounts for the year ended March 31, 2010 are not available.
-	(b) Review their Financial Position as on March 31, 2010, and in particular, losses incurred and projected distribution losses over the period April 2010 to March 2017.
<b>Chapter - II</b>	(c) Review Electricity Tariff including the role of (i) State Governments; (ii) State Tariff Regulator; and (iii) SEBs' /State Distribution Companies in periodic tariff revision.



**Terms of Reference**

- |                      |  |
|----------------------|--|
| <b>Chapter – III</b> | (d) Assess system improvement measures accomplished in distribution of power, in particular, in urban areas as well as future needs / plans.<br>(e) Examine geographical and spatial compulsion and determine their operational impact.<br>(f) Review organizational and managerial structure, manpower, employed and future requirements / plans. |
| <b>Chapter-IV</b>    | (g) To recommend plan of action to achieve financial viability in distribution of power by 2017.   |



## CHAPTER-I

**ToR (a):** “Review Accounts of SEBs’ and State Distribution Companies as on March 31, 2010 or earlier if updated accounts for the year ended March 21, 2010 are not available.”

and

**ToR (b)** “Review their Financial Position as on March 31, 2010 and in particular, losses incurred and projected distribution losses over the period April 2010 to March 2017.”

- 1.0** In order to review the accounts of SEBs and Discoms for the year ending March 2010 it was necessary (August – Sept. 2010) to determine the status of completion of accounts for earlier years, audit of such accounts and finally completion and audit of accounts for the F.Y. ended on 31st March 2010. Between August 2010 and March 2011 the accounts of all Discoms / SEBs were progressively completed, statutory audit undertaken and audited accounts were available by April / May 2011. This process could not be completed despite periodic intervention of the HLP in the case of Bihar, Jharkhand and Uttar Pradesh. It may be noted that Bihar and Jharkhand retain the old structure (SEBs) while Uttar Pradesh has separated the three functions and distribution is the responsibility of 5 legally separate entities. Having said that it should also be noted that the separation in Uttar Pradesh is in form only and not in substance because management, finances and control remains a singularity. This is our observation with regard to several Discoms where during the last several years separation has been effected by dividing the functions of the erstwhile Electricity Board between generation, transmission and distribution. Discom is obligated to take all the power generated by State generating company and is also obligated to surrender all receipts to a common pool from where expenses are met. For purposes of accounts balance sheets are drawn up for separate companies.
- 1.1** We have restricted our enquiries to the fortunes of the Distribution utilities because that is not only our Terms of Reference but also in accordance with our understanding that operational consequences of performance of the distribution utilities ends up in subsuming performance of generation and transmission companies. That being so the distribution companies capture the financial health

of electricity sector in the States even though the financial results displayed are those of Discoms alone.

1.2 A number of States (North-Eastern, Goa, etc.) have not corporatized these functions. Generation / procurement of electricity, its transmission and distribution are departmental functions. The financial consequences of these operations are reflected as a part of the State budget, hence, it is very difficult to isolate their performance. Secondly, the aggregate consumption of power of these States accounts for a modest percentage of power. For purposes of our work under ToR (a) and (b); West Bengal, Chattisgarh, Goa & all North Eastern States have been excluded. The states covered are :

- Maharashtra
- Andhra Pradesh
- Tamilnadu
- Uttar Pradesh
- Gujarat
- Karnataka
- Punjab
- Rajasthan
- Haryana
- Madhya Pradesh
- Bihar
- Kerala
- Jharkhand
- Himachal Pradesh
- Uttrakhand

There were certain data problems, hence West Bengal and Chattisgarh are excluded from aggregate data. Our financial analysis and efforts are based on 15 States which account for 91% of power consumed in the country.

1.3 We now proceed to present the results of Discoms / SEBs for the last 5 years ending March 2010 concisely.

1.3.1 Table – I

(Rs. 000 Crs.)

<b>SOURCES</b>	<b>Mar 2010</b>	<b>Mar 2005</b>	<b>Change</b>
<b>Own funds</b>	<b>58</b>	<b>25</b>	<b>33</b>
<b>Loan funds:</b>			
State Govt.	24	15	9
Others	161	56	105
Current liabilities/provisions	153	52	101
<b>Total</b>	<b>396</b>	<b>148</b>	<b>248</b>

<b>UTILISATION</b>	<b>Mar 2010</b>	<b>Mar 2005</b>	<b>Change</b>
Accumulated losses	107	19	88
Fixed assets (net)	128	67	61
Investments	6	1	5
Stocks	7	3	4
Debtors	56	31	25
Other current assets/advances	92	27	65
<b>Total</b>	<b>396</b>	<b>148</b>	<b>248</b>

The above table shows a net change of Rs. 2,48,000 Crores (Source & Uses) during this period. This is represented by increase in accumulated losses by Rs. 88,000 Crores, increase in fixed assets by Rs. 61,000 Crores and increase in current assets by Rs. 94,000 Crores. The last figure is highly opaque and it is not clear as to what are the contents which aggregate to this. This is particularly so for certain SEBs/ Discoms namely U.P., Rajasthan, Andhra Pradesh and to a modest extent Maharashtra and Madhya Pradesh. It appears that part of the losses are displayed as increase in current assets. UP alone accounted for 40% of increase in Current Assets Like wise one-third of the increase in sundry debtors Rs. 8,000 Crores was in case of A.P. Inevitably these represent nothing but losses not displayed as such in the annual accounts. Table II and III analyse these issues from different perspective.

### 1.3.2 Table – II

(Rs. 000 Crs.)

<b>Current assets/advances</b>	<b>Mar 2010</b>	<b>Mar 2005</b>	<b>Change</b>
Cash and bank balances	10	5	5
Stocks	7	3	4
Sundry debtors	56	31	25
Loans and advances	5	1	4
Other current assets	77	21	56
<b>Total</b>	<b>155</b>	<b>61</b>	<b>94</b>

Since the largest unexplained entry from the Sources and Uses table pertains to current assets, that data is presented in greater detail in Table – II and it would be observed from the table that the most dramatic increase is in “other current assets”; in the main Subsidy carried to Profit & Loss Account which remains to be

paid by the State Govt (Andhra Pradesh and Rajasthan). While there is a certain accounting clarity in the case of number of States, it is hard to say what constitutes current assets because inter-alia proper current assets records and registers do not exist in the Distribution utilities. It would also be observed that there is a significant increase in debtors. This information is presented in Table – III.

**1.3.3 Table – III**

**(Rs. 000 Crs.)**

	<b>Mar 2010</b>	<b>Mar 2005</b>
<b>Receivables</b>	<b>56</b>	<b>31</b>
<b>Revenue</b>	<b>150</b>	<b>90</b>
<b>Collection period (range)</b>	<b>36 to 645 days</b>	<b>54 to 933 days</b>
<b>Madhya Pradesh</b>	<b>241 days</b>	<b>198 days</b>
<b>UP</b>	<b>317 days</b>	<b>199 days</b>
<b>Bihar</b>	<b>606 days</b>	<b>1006 days</b>

The collection period is so long that any proper description of current demand is meaningless. The Distribution utilities are able to collect a certain amount of cash which includes arrears and there is a very wide variation from State to State as to the accumulation of arrears as is illustrated in the Table III. It would be proper to say that the longer the period of arrears the worst is the financial health of the Distribution utilities. Some states, at some point have addressed this problem by forming an empowered committee which reviewed and decided what is the recoverable and what is not. While recasting the financial position of distribution utilities, it would be desirable for this exercise to be undertaken. It should be noted that electricity over-dues are recoverable as arrears of Land Revenue. In other words indication of the financial well being of a Distribution utility is certainly the collection period displayed in above table. Unfortunately, both in case of Madhya Pradesh and Uttar Pradesh the collection period has significantly deteriorated between 2005 to 2010. It is also moot whether demand outstanding for nearly 2 years (Bihar) can at all be classified as a good debt.

**1.4** The key financial data as to revenue, subsidies, expenditure, losses etc. are presented in Table – IV.

## 1.4.1 Table – IV

(Rs. 000 Crs.)

Particulars	2010	2009	2008	2007	2006	Total
Revenue	150	134	119	107	90	600
Subsidies	30	25	17	13	12	97
Other income	7	6	6	5	5	29
Total	187	165	142	125	107	726
% subsidy/revenue	20	19	14	12	14	16
Total expenditure	214	191	156	135	112	808
Net loss before subsidies	(57)	(51)	(31)	(23)	(17)	(179)
Net loss after subsidies	(27)	(26)	(14)	(10)	(5)	(82)

**Note :** The accumulated losses of Rs. 82,000 Crore in the above table are the aggregate losses for the period 2006 to 2010 and vary from accumulated losses of Rs. 88,000 Crore (Table – I) which are accumulated losses as per balance sheet.

During the 5 years period losses were Rs. 1,79,000 Crores before subsidy and Rs. 82,000 Crores after subsidy. These losses were primarily because of the gap of about Re. 0.60 / kwh between average cost and average revenue. Having provided this financial explanation we do not propose to discuss the reasons for losses in any greater detail because they are discussed as a part of other Terms of References including those connected with regulatory, operational and management issues. Primarily operational and management issues coupled with Regulatory shortcomings are responsible for the losses. In other words the Re. 0.60/kwh gap could have been bridged by operational and managerial improvement.

- 1.5** Had the Aggregate Technical and Commercial Losses (AT&C) losses been reasonable, even with the present tariff the Discoms would not have been in such financial distress. Unfortunately, what is described as Aggregate Technical and Commercial Losses (AT&C) are high and in fact much higher than commonly acknowledged. For example, according to CEA, losses are taken at 30% but this does not include other operational losses which are not captured by CEA data, e.g. over-statement of agricultural consumption. It is not necessary to pursue this point any further in dealing with the financials since these are exhaustively covered in the Chapter – III relating to (d) Part of ToR.

- 1.6 However, it is necessary to point out that commercial losses are connected with the functions of finance and accounts in as much as billing / bill collection etc. are the function of the finance and accounts deptt. It has been seen that at present, in some states most of the energy billing is outsourced for bill preparations and distribution of bills and that energy consumption data is also allowed to be stored in Service Provider Server. This practice in particular leads to corrupting key data, overstating revenue and is responsible for commercial losses in addition to technical losses. It is not our case that inaccurate billing data is entirely due to external service provider(s) probably the extent of abuse is greater in the latter case. We may refer in passing to a study conducted by IIT, Roorkee, at the behest of the Utrakhnad Regulatory Commission which shows a great deal of light on this issue. (*Investigation of Defective Bills for the period September 2005 to August 2006*).

While on this subject it should be noted that the record of Govt. Deptts. and local bodies in paying electricity bills is deplorable. It is also the case that these entities secure budgetary approval for electricity charges and yet do not pay electricity dues. Distribution Utilities should, as a matter of policy change over the present system to pre-paid meters in case of such consumers.

- 1.7 The critical issues which emerged are largely as to the quality of financial statements. Is it accurate to say that the statements are true and fair? Unfortunately the statements are not entirely true and they are certainly not fair because :
- (a) The receivables outstanding are enormous and there are considerable issues with regard to quality of the receivables. To take just one example, in the state of Maharashtra a certain distribution area (Bhiwandi) was handed over as a Franchise by the Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) about 5 years back. During the last 5 years all parameters of Bhiwandi have improved. Technical losses are down to 15%, there are virtually no commercial losses and from any technical or commercial point of view Bhiwandi has become a role model except for the arrears of electricity charges at the time of taking over which have not been realized even to the extent of one rupee. What were shown as arrears of revenues outstanding for Bhiwandi remain as they were. Customers are willing to pay for all what they are charged now but seem to deny that they have any liability for what may largely have been on the books of MSEDCL.



- (b) There is no enumeration of assets and for that matter there is no fixed asset register. Like wise inter-unit reconciliation between account units does not take place and there is no reconciliation of stocks and stores as well. Thus what is issued to different units, what is consumed, what is available, what is transformed to an asset is all in the realm of estimate.
- (c) At present time given the scale of operations of Discoms / SEBs none of these shortcomings can be addressed without systematic computerization. By systematic computerization is meant integration of operational information with commercial and financial. The software must encompass all three functions to be meaningful. What is the number of units generated should be known not only to the plant in-charge, but also to the billing unit in-charge of the commercial and finally to the finance and accounts units maintaining the accounts. Without this comprehensive computerization, it cannot be said that there is a framework of computerization in place. Our comments take into account the efforts at computerization in certain states in relation to some activities but as stated the computerization system is not integrated. Unfortunately, the computerization proposed under R-APDRP also does not cover finance and accounts.
- (d) It must also be pointed that the computerization undertaken in certain States lacks ownership because so much of the work has been outsourced that within the system people neither understand what is going on nor find it useful to do so. This kind of out-sourcing defeats the very purpose of computerization because it ceases to have any operational relevance. The key functions must remain the responsibility and the operational duty of those who are employed by the Distribution utilities. This is not the place to discuss at length or draw a line between the essential functions and the outsourcing. However that distinction has to be operationally made, should be uniformly defined for all Distribution utilities and must be adhered to by them. Otherwise as had happened in other cases, chances are that the Distribution utilities would lose management control without any gain in operational efficiency.
- (e) What is the way forward in this background? We believe that many processes must now begin in parallel. There has to be a time bound plan for

- (i) Physical verification and preparation of fixed asset register on a commonly accepted definitions of fixed assets under the financial accounting standards.
- (ii) A programme of stocks reconciliation and physical verification
- (iii) Inter-unit reconciliation.

While this process is going on, a very realistic judgment has to be made on the commercial side regarding the receivables so that what is really outstanding is separated from what is shown as outstanding. This exercise is not difficult because it is our understanding that at the operational level there is a great deal of awareness of what is really receivable and what is shown as receivable. Some states, at some point have addressed this problem by forming an empowered committee which reviewed and decided what is the recoverable and what is not.

After arriving at a correct picture of receivables there should be a plan for realization of arrears and annual separation of realization of current demand plus arrears.

- (f) Each State depending on its situation will also have to draw a programme of computerization which is systematic and comprehensive.
- (g) Last year when this Panel was constituted it was felt that in a short period of time International Financial Reporting Standards (IFRS) would become applicable to Discoms and would cast an additional burden on them. International developments suggest that these standards are unlikely to become applicable for some time. It is also hard to judge when agreement on IFRS would be reached because so long as the financial markets are depressed there is little chance of any significant movement towards an agreement. In other words for the next few years, or in practice for the next Plan period, the current accounting standards would continue to be applicable. Their uniform application would remain an issue.

KPMG and Deloitte Touche Tohmatsu India Pvt. Ltd. were contracted by HLP to undertake Diagnostic Studies in the states of Uttar Pradesh and Bihar. Jharkhand was assigned to Ravi Rajan & Co. and Mukund Chitale & Co. reviewed the accounting practices of Chhattisgarh. The diagnostic studies prescribe the measures to be taken vis-à-vis Accounting Practices,

maintenance of accounts etc. by DISCOMs in order to produce accurate and credible financial statements. Reports of Deloitte and KPMG are appended with this report as **Annexure III and IV**.

### **Forecast of projected distribution losses over the period April,2010-March, 2017**

- 1.8** Whatever be the limitations of accounting statements of Discoms / SEBs pointed out by us we were still obligated to forecast their financial position for the period April 2010 to March 2017. It would be recalled that the accounts have been completed for all Distribution utilities and used for the purpose of this chapter for the 15 States which account for 91% of the energy consumed. It should also be noted that the years 2010-11 and 2011-12 belong to the current plan period and the next plan will commence on 1<sup>st</sup> April 2012. However, no forecast was possible without forecasting / estimating the two intervening years i.e. 2010-2011 and 2011-2012.
- 1.8.1** The key basis for the forecast was taken as the number of units consumed. Energy demand forecast has been made by the Central Electricity Authority as a part of the Eighteenth Power Survey. The results of the survey are expected to be made public during this month (December 2011). The statistical information generated by CEA and the forecast were made available by CEA to HLP.
- CEA forecast has been made state-wise and the financial outcome is displayed in Appendix-I State-wise.
- 1.8.2** In making the forecast we have recognized that there are significant commercial losses, we have assumed that States will make concerted efforts to eliminate these losses and that commercial losses may be substantially reduced by the end of the third year of the next plan.
- 1.8.3** We have assumed constant revenue realization. In so far as costs are concerned we have divided total costs by aggregate units available in 2009-10 (actual), thus arriving at average cost per unit. Thus the average unit cost for the consolidated statement comes to Rs.3.65/unit. Using this as the multiplier, total expenditure for the expenditure forecast i.e. 2010-11 through 2016-17 has been made. By this time many States have finalized their accounts for year 2010-11. However, complete information for all the States on the basis of audited accounts is yet to

become available and is likely to take time hence, in this Report the year 2010-11 is a forecast rather than being based on actual results.

It is possible to update the forecast on the basis of the year 2010-11 (actuals) or for that matter 2011-12 as and when such information becomes available.

It is also possible to assume rates of increase in both revenue and expenditure. However, assumptions in this behalf are likely to enhance uncertainty..

**1.8.4** Likewise CEA has forecast different rates for loss reduction in each State depending on the absolute percentage of loss at present. Broadly higher the losses higher the scope for reduction of losses and lower the losses less the scope for reduction. Thus each State depending on its position has been differently treated. Subsidy payable is included in the ARR on the ground that without subsidy the operations of the Distribution utilities are unsustainable. On these assumptions we present in the following table the losses forecast for the 15 States which account for 91% of energy consumed.

**Table – V**

**ALL INDIA STATE ELECTRICITY DISTRIBUTION UTILITIES**

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	157472	189274	208735	229321	251687	276310	303109	334087
Subsidies and grants	29691	32721	36066	39493	43039	46943	51145	55780
<b>TOTAL REVENUE</b>	<b>187163</b>	<b>221994</b>	<b>244802</b>	<b>268815</b>	<b>294726</b>	<b>323252</b>	<b>354254</b>	<b>389867</b>
<b>TOTAL EXPENDITURE</b>	<b>214121</b>	<b>249754</b>	<b>272351</b>	<b>296024</b>	<b>321291</b>	<b>348879</b>	<b>378418</b>	<b>411977</b>
<b>Profit/Loss</b>	<b>-26957</b>	<b>-27760</b>	<b>-27549</b>	<b>-27209</b>	<b>-26565</b>	<b>-25626</b>	<b>-24164</b>	<b>-22110</b>
UNIT CONSUMED	44509	52634	57992	63652	69792	76546	83889	92299
UNIT AVAILABLE	58635	68909	75096	81566	88506	96073	104175	113388
UNITS LOST	14126	16275	17104	17914	18714	19527	20286	21089
% of Units Loss (T&D)	24	24	23	22	21	20	19	19
Cost of Units / Energy	214121	249754	272351	296024	321291	348879	378418	411977
Average cost per unit sold	4.81	4.75	4.70	4.65	4.60	4.56	4.51	4.46
Average Revenue Realisation (ARR)	4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21
Out of which subsidy is	0.51	0.47	0.48	0.48	0.49	0.49	0.49	0.49

Cost / unit for available energy 3.65/kwh

Other Income included in Sale of power

It would be observed that losses of these States decline from roughly Rs. 27,000 Crore in 2009-10 to Rs. 22,000 Crore in 2016-17 due to the improvement in performance built into the forecast. The CEA forecast is based on two assumptions; first that units available would virtually double during the seven years ending March, 2017. Second that aggregate losses decline from 24% to 19% by March, 2017. While, in aggregate, this would appear to be less than a percentage point improvement every year, it would require vast changes in certain States (UP, MP etc.) which consume large quantity of energies and also have high aggregate losses. To what extent this will take place or can take place is discussed in Chapter-III. Needless to say that the current sources of financing these losses will no longer be available; to the States. The banks would not be in a position to finance these losses any longer. The time for immediate radical action is now. Soft options are no longer available.

This report in succeeding chapters delineates a set of measures which together have the potential to turn-around the Distribution utilities in the foreseeable future and certainly within the next plan period provided decision are expeditiously taken, consequent action quickly follows and the comprehensive measures are accepted and acted on as a package. Slippages would have multi-dimensional consequences rendering the whole exercise futile.

## 1.9 Mechanism for outstanding Bank loans

The financial data shows that the aggregate net losses (after subsidy) of Distribution Utilities during the last 5 years have been Rs. 82,000 crores. These losses have been financed as below :-

Table – VI

### Financing of Losses:

		Rs. in Crores
<b>Financial Losses</b>		(-) 82000
<b>i) Current Assets - Current Liabilities)</b>	<b>94700</b>	
	(-) 101700	(+ ) 7000
<b>ii) Long Term Loans + Own Funds</b>	<b>78000</b>	
<b>(-) Creation of Fixed Assets</b>	(-) 61500	(+ ) 16500
<b>Balance outstanding</b>		(-) 58500
<b>iii) Bank's Loan</b>		(+ ) 58500

Over 70% of the loss is financed by Public Sector Banks. The information with regard to loans outstanding, guaranteed or otherwise is as follows :-

Table – VII

(Rs. In Crores)

S.No.	Bank Details	Total loans	Loans backed by SG Guarantee	%age of loan backed by SG guarantee
1.	Public Sector Banks	49131	20740	42
2.	Other commercial banks	2190	917	42
3.	Cooperative banks	530	--	--
	Total	51851	21657	42

**Note :** The variation between Bank outstanding displayed in Table – VI and Appendix vis-à-vis above captioned information is because information regarding loans is not available for UGVCL (Gujarat), CHESCOM (Karnataka), CSPDCL(Chhatisgarh), APDCL (Assam) and UHBVNL(Haryana).

**1.9.1** Neither the Distribution utilities are in a position to pay banks nor the Banks are in a position to realize the dues. There are Govt. guarantees, as is clear from the above table, as a collateral security to the extent of 42%. Thus bank outstandings in Table – VII can be divided into those backed by Govt. guarantee and the rest. State Governments have tried to honour their guarantee even if they have asked for some rescheduling. Further under the State FRBM Act guarantees are now strictly regulated. Ten States have also set up guarantee redemption funds, a requirement of the 12<sup>th</sup> Finance Commission. The amount available in these funds is roughly Rs. 4,000 crore. RBI ought to allow States to draw down guarantee redemption funds in order to meet liabilities incurred to banks and guaranteed by them. Guarantees can also be enforced through due process including Debt Recovery Tribunals and Public Sector Banks possess leverage with the States since they subscribe to State Development Loans. These instruments can be used to reduce bank outstanding but only to limited extent. Clearly distribution utilities are not in a position to repay the balance outstanding which financed deficits between income and expenditure which is a substantial amount. In this background what should be the way forward?

**1.9.2** We believe that having legitimately lent money and secured Government guarantee, it would be quite inappropriate for the Banks to make any substantial sacrifice. Arguably the State Govt. as the owner of Distribution utilities should provide further infusion to meet / finance losses or rather to repay the banks. But it is common ground that the States whose Distribution utilities borrowed to finance losses do not generate any revenue surplus<sup>1</sup>. In other words current income (tax + non tax) is significantly below revenue expenditure. If the States were to assume the responsibility of meeting these losses on behalf of Distribution utilities they would be obligated to generate the extra resource by additional borrowings. There are only two sources for them to borrow i.e. Reserve Bank of India (RBI) and Public Sector Banks. RBI does not lend State Govts. except for ways and means requirements and public sector banks can hardly lend to the State Govts. to enable them to repay themselves. Therefore, the idea that State Govts. can meet their repayment obligations to public sector banks is a non-starter. At a time when even the largest public sector banks are struggling with capital adequacy, additional infusion of share capital etc, it would be idle to speculate that their profits can be used to write-off the loans.

**1.9.3** We still have to address the question of what next? The responsibility for these loans and the present conditions lies on the State Govt.(s), Distribution utilities and the banks. In the first instance before the commencement of a plan of action the commercial banks should jointly renegotiate with the Distribution utilities / State Govts. the outstanding amount and reschedule the repayment of the amount by the Distribution utilities taking into account the several actions the Distribution utilities / State Govt. are obligated to take for reform of the distribution sector referred to in succeeding paras of this chapter. Once the outstanding has been rescheduled it would be for the Distribution utilities to meet its obligation. Nevertheless there may be circumstances where despite the best efforts of the Distribution utilities there is some default in the repayment schedule. How this should be addressed is discussed in the succeeding paragraphs.

**1.9.4** Our proposal is that a Special Purpose Vehicle (SPV) should be set up, as a corporate entity, for this purpose. This vehicle would be entitled to purchase

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<sup>1</sup> HLP is aware that the accounts of certain States show a healthy revenue surplus as well as a large fiscal deficit. Since this report is not the place to discuss accounting policies followed by State Governments, the net effect of any increased support to SEBs/ Discoms will remain the same i.e. increased fiscal deficit through increase in borrowings.

loans of Banks where the public sector banks believe that it needs to redefine its portfolio. Such purchase would be subject to a number of conditions :

- (a) Public sector bank(s) has negotiated with the State Govt. and come to a settlement as to a revised repayment schedule and we discuss this in some detail in succeeding paras.
- (b) That the State Govt. has agreed for regular tariff increase so as to enable the Distribution utilities, with immediate effect, to meet its current expenditure from its current income and the current expenditure includes interest charges on all loans outstanding.
- (c) That the State Govt. has prepared an Operational Plan in consultation with the SPV to meet technical and operational performance parameters and in particular with regard to a policy of planned franchising of distribution function.
- (d) That the State Govt. has taken all measures agreed to the SPV, with regard to regulatory issues including those relating to appointment of Regulator, independence of Regulator and time bound annual fixation of tariff.
- (e) That the State govt. has drawn up a plan for financial up gradation of Distribution utilities on the lines described in the report and encompasses all the issues raised therein.
- (f) With regard to public sector banks outstanding, the concerned Bank and the State Govt. will reach agreement both with regard to the interest rates and the period of repayment and the amount of repayment on each installment. This plan will be based on a forecast of potential revenue to be generated by the State due to the number of measures described above. It is likely that in the first few years the Distribution utilities would be unable to meet the repayment obligation because of the several competing claims on the cash surplus generated after meeting current expenditure. The Distribution utility would be obligated to undertake capital expenditure for technical and operational up gradation as a first priority. This would start yielding additional income / surplus cash after a time gap. The chances are that the earlier repayments obligations would not be discharged by the States, and this will differ from State to State. In cases where the Distribution utility is unable to meet the repayment liability, the SPV will purchase the liability from the bank(s) and



this would become an asset of the SPV. Needless to say this would result in a further rescheduling of instalments taken over by the SPV. RBI would provide a line of credit to the SPV to make the purchase and thus the transaction would balance both on the asset and liability side. On the income side the interest on the repayment liability purchased by the SPV would now flow from the Distribution utility to the SPV and from interest income the SPV should be able to pay the interest charges of RBI. We believe it would be legitimate to provide a considerable spread between the interest rates. The spread should provide a substantial surplus to meet contingencies. We have already stated that the State Govt. must agree as a part of this mechanism to raise the tariff sufficiently for payment of interest charges to be met, therefore, inter-alia the current income of the Distribution utilities should be able to meet the interest charges whether it is able to repay the principal or not. It is not our intention to let the State Govt. off the hook. In due course they would have to pay the SPV. Hence, there would not be any question of writing off anything even though the period of repayment is likely to be elongated.

- 1.9.5** In case taking into account all the circumstances the SPV comes to the conclusion that the default by the Distribution utility from the repayment schedule was for reasons within its control the mechanism of purchase by the SPV will still be available and would enable it to repay the bank. In such cases the SPV will inform the RBI of the default and prior to commencement of the plan the State Govt would provide an undertaking to RBI that the amount defaulted would be debited to the account of the State Govt. with the RBI. Hence intentional default, non-performance, non-adherence to the action plan would all become very expensive choices.
- 1.9.6** The SPV will be in-charge of ensuring that all the conditionalities, the entire plan of action, financial, commercial, operational, technical, regulatory as agreed to between Distribution utility and the SPV is complied with. A precondition of this compliance would be that future Bank lending to Distribution utility would be against verifiable physical assets, and with the concurrence of the SPV. We believe that working capital facility by banks to Distribution utilities in future should be limited to purchase and discounting of bills. Cash credit and hypothecation facilities being impossible to monitor should not be available. Hence every attempt will be made to ensure that the Distribution utilities do not go back to a regime of business as usual.

- 1.9.7** Given the key role of the RBI in extending the line of credit it would be in the fitness of the things if the chairperson (CEO) of the SPV is appointed by the RBI. A small Board including Chairman, CERC; Chairman, PFC; Chairman, REC, two representatives of public sector banks (chief executives) and two independent directors with professional background of the power sector would constitute the Board of the SPV. The experts shall be nominated by the RBI. The share capital of the SPV would be held by RBI 76%, PFC and REC can hold the balance. The headquarter of the SPV given its nomenclature should be at Mumbai. It would need a small core staff which can be more easily found in Mumbai vis-à-vis Delhi.
- 1.10** Functions of the SPV in particular would be periodic sample verification of reports of the compliance sent by Distribution utilities through selected Third Party Independent Agencies (TPIA). In this it would receive full support from PFC which is the nodal agency for R-APDRP meant to reform urban distribution and REC which is implementing the RGGVY.

The detailed financials are presented in the appendix to this chapter. The state-wise information is given in two tables. The first table gives the information relating to past profit / losses of the last five years and the second table of the projected profit / losses for the last two years of this plan and five years of the next plan.

## APPENDIX TO CHAPTER - I

## All India Electricity Distribution Utilities

## BALANCE SHEET (Rs. In Crs.)

PARTICULARS	AS AT	AS AT	AS AT	AS AT
	31-03-2010	31-03-2010	31-03-2005	31-03-2005
<b>SOURCES OF FUNDS</b>				
1. <u>Own Funds:</u> (Including Share Capital, Reserve & Surplus)		58502		25024
2. <u>Loan Funds:</u>				
From: State Government		24079		15199
From: Others		160662		55560
3. <u>Current Liabilities:</u> (including Creditors, Deposits & Provisions)		153356		51624
		396586		147406
<b>APPLICATION OF FUNDS</b>				
1. <u>Fixed Assets:</u>		128350		66877
2. <u>Investments:</u>		6164		1341
3. <u>Current Assets &amp; Loans &amp; Advances:</u>				
Cash & Bank Balances	9622		5172	
Stock	6948		3464	
Sundry Debtors	55837		30209	
Loans & Advances	5325		1448	
Other Current Assets	77413	155146	20166	60459
4. <u>Miscellaneous Expenditures:</u> (including Profit & Loss Account)		106926		18731
		396586		147406

(Amount in Crores)

Sources:		
Increase in Own Funds		33400
Increase in Loan from State Govt		8900
Increase in Loan (Others)		105000
Increase in Current Liabilities		101700
<b>TOTAL</b>		<b>249000</b>
Uses:		
Creation of Capital Assets		61500
Investments		4800
Increase in Current Assets		94700
Losses Including Misc. Exp		88000
		<b>249000</b>

Increase In Own Funds	33400	
<u>Major Contribution by States:</u>		
Uttar Pradesh	12200	36%
Tamil Nadu	3500	11%
Maharashtra	3200	10%
Madhya Pradesh	3600	11%
Karnataka	1700	5%
Andhra Pradesh	2400	7%
<b>TOTAL</b>	<b>26600</b>	<b>80%</b>

Increase In Sundry Debtors	25600	
<u>Major Contribution by States:</u>		
Uttar Pradesh	7900	31%
Maharashtra	7200	28%
Karnataka	2600	10%
Tamil Nadu	1770	7%
Madhya Pradesh	4000	16%
<b>TOTAL</b>	<b>23470</b>	<b>92%</b>

Increase In Other Current Assets	57000	
<u>Major Contribution by States:</u>		
Uttar Pradesh	28500	50%
Rajasthan	13700	24%
Andhra Pradesh	9800	17%
Haryana	4700	8%
<b>TOTAL</b>	<b>56700</b>	<b>99%</b>

**Financing of Losses:****(Amount in Crores)**

<b>Financial Losses</b>		<b>(-) 82000</b>
<b>(i) Current Assets - Current Liabilities</b>	<b>94700</b>	
	<b>(-) 101700</b>	<b>(+) 7000</b>
<b>(ii) Long Term Loans + Own Funds</b>	<b>78000</b>	
<b>(-) Creation of Fixed Assets</b>	<b>(-) 61500</b>	<b>(+16500)</b>
<b>Balance outstanding</b>		<b>(-) 58500</b>
<b>(iii) Bank's Loan</b>		<b>(+) 58500</b>

<b>Loan from Others:</b>	<b>Year</b>		<b>Increased By</b>
	<b>2005</b>	<b>2010</b>	
<b>Banks</b>	<b>8190</b>	<b>72185</b>	<b>63995</b>
<b>Public Bonds</b>	<b>5740</b>	<b>6100</b>	<b>360</b>
<b>R.E.C.</b>	<b>13390</b>	<b>30436</b>	<b>17046</b>
<b>P.F.C.</b>	<b>5686</b>	<b>10325</b>	<b>4639</b>
<b>LIC</b>	<b>2203</b>	<b>2616</b>	<b>413</b>
<b>Consumer Contribution</b>	<b>8479</b>	<b>17412</b>	<b>8933</b>
<b>Govt Grants</b>	<b>3370</b>	<b>7700</b>	<b>4330</b>
<b>APDRP/PMGY</b>	<b>665</b>	<b>1037</b>	<b>372</b>
<b>Other Fls</b>	<b>3855</b>	<b>12839</b>	<b>8984</b>
<b>Total</b>	<b>51578</b>	<b>160650</b>	<b>109072</b>

**(Amount in Crores)**

<b>Long Term Loan includes:</b>	
<b>REC</b>	<b>17046</b>
<b>PFC</b>	<b>4639</b>
<b>LIC</b>	<b>413</b>
<b>Consumer Contribution</b>	<b>8933</b>
<b>Govt. Grant</b>	<b>4330</b>
<b>APDRP/PMGY</b>	<b>372</b>
<b>State Govt Loans</b>	<b>8900</b>
<b>Long Term Loans</b>	<b>44633</b>
<b>Own Funds</b>	<b>33400</b>
<b>Total</b>	<b>78033</b>

## MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD

## PROFIT &amp; LOSS STATEMENT (Rs in Crores)

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	13628	18864	20159	23483	27642	103776
Rev. subsidies and grants	0	0	0	0	400	400
Other Income	623	887	841	1315	1146	4812
<b>TOTAL REVENUE</b>	<b>14251</b>	<b>19751</b>	<b>20999</b>	<b>24798</b>	<b>29188</b>	<b>108988</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>
<b>EXPENDITURE</b>						
Purchase of Power	11950	16277	17006	20606	23842	89682
Repairs & Maintenance	215	416	0	0	0	631
Employees cost	1272	2037	1690	2398	1838	9236
Adm. & General exp.	94	207	775	916	899	2892
Other Expenses	288	343	319	819	1520	3289
Depreciation & other related debits	416	502	540	647	812	2917
Interest & Financial Expenses	319	572	573	788	900	3153
<b>TOTAL EXPENDITURE</b>	<b>14555</b>	<b>20354</b>	<b>20904</b>	<b>26175</b>	<b>29811</b>	<b>111799</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-303</b>	<b>-603</b>	<b>95</b>	<b>-1377</b>	<b>-623</b>	<b>-2811</b>
<b>UNIT CONSUMED</b>						
UNIT AVAILABLE	4055	4915	5571	5817	6394	26752
UNITS LOST	5852	6981	7860	7987	8547	37227
% of Units Lost	1797	2066	2289	2170	2153	10475
Cost of Units / Energy	31	30	29	27	25	28
<b>Average cost per unit sold</b>	<b>14555</b>	<b>20354</b>	<b>20904</b>	<b>26175</b>	<b>29811</b>	<b>111799</b>
<b>Average Revenue Realisation (ARR)</b>	<b>3.59</b>	<b>4.14</b>	<b>3.75</b>	<b>4.50</b>	<b>4.66</b>	<b>4.18</b>
<b>Total Loss for units lost</b>	<b>3.51</b>	<b>4.02</b>	<b>3.77</b>	<b>4.26</b>	<b>4.56</b>	<b>4.07</b>
<b>Total Loss for units lost</b>	<b>6450</b>	<b>8556</b>	<b>8589</b>	<b>9764</b>	<b>10038</b>	<b>43776</b>

**MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD**

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	28788	38424	41744	44971	48478	52295	56461	62355
Subsidies and grants	400	527	604	643	684	728	776	847
<b>TOTAL REVENUE</b>	<b>29188</b>	<b>38952</b>	<b>42349</b>	<b>45614</b>	<b>49161</b>	<b>53024</b>	<b>57237</b>	<b>63202</b>
TOTAL EXPENDITURE	29811	39308	42180	44850	47726	50828	54193	59103
Profit/Loss	-623	-356	169	764	1436	2195	3044	4098
UNIT CONSUMED	6394	8542	9287	10003	10781	11628	12552	13860
UNIT AVAILABLE	8547	11263	12086	12851	13675	14564	15528	16935
UNITS LOST	2153	2721	2799	2848	2894	2936	2976	3075
% of Units Loss (T&D)	25	24	23	22	21	20	19	18
Cost of Units / Energy	29811	39308	42180	44850	47726	50828	54193	59103
Average cost per unit sold	4.66	4.60	4.54	4.48	4.43	4.37	4.32	4.26
Average Revenue Realisation (ARR)	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56
- Out of which subsidy is	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Total Loss for units lost	10038	12521	12713	12769	12811	12834	12849	13113
% Losses as per ATC	25	24	22	21	19	18	17	16
Difference in loss T&D & ATC	0	0	-1	-2	-2	-2	-2	-2
Unrealised Revenue	-50	-54	-482	-749	-1053	-1277	-1268	-1269
Total Financial Losses	-573	-302	651	1513	2489	3473	4312	5367
Surcharge to be levied	-0.01	-0.01	-0.05	-0.07	-0.10	-0.11	-0.10	-0.09

Cost per unit for available energy      3.49  
 Other Income included in Sale of power

**ANDHRA PRADESH DISTRIBUTION UTILITIES  
PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	10030	10935	12909	14021	16553	64448
Rev. subsidies and grants	1533	1958	2866	7980	6709	21046
Other Income	433	729	839	807	951	3759
<b>TOTAL REVENUE</b>	<b>11997</b>	<b>13622</b>	<b>16614</b>	<b>22808</b>	<b>24213</b>	<b>89253</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>15</b>	<b>18</b>	<b>22</b>	<b>57</b>	<b>41</b>	<b>33</b>
<b>EXPENDITURE</b>						
Purchase of Power	9688	11310	13204	19051	20248	73500
Repairs & Maintenance	101	41	47	60	56	304
Employees cost	619	830	1033	1082	1177	4741
Adm. & General exp.	205	296	318	367	418	1605
Other Expenses	121	53	905	554	218	1851
Depreciation & other related debits	535	631	645	780	902	3492
Interest & Financial Expenses	545	551	405	763	1159	3423
<b>TOTAL EXPENDITURE</b>	<b>11813</b>	<b>13712</b>	<b>16557</b>	<b>22656</b>	<b>24178</b>	<b>88917</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>183</b>	<b>-90</b>	<b>57</b>	<b>152</b>	<b>35</b>	<b>337</b>
<b>UNIT CONSUMED</b>	<b>4054</b>	<b>4568</b>	<b>4947</b>	<b>5402</b>	<b>5966</b>	<b>24937</b>
<b>UNIT AVAILABLE</b>	<b>4843</b>	<b>5397</b>	<b>5737</b>	<b>6333</b>	<b>6939</b>	<b>29249</b>
<b>UNITS LOST</b>	<b>789</b>	<b>829</b>	<b>790</b>	<b>931</b>	<b>973</b>	<b>4312</b>
% of Units Lost	16	15	14	15	14	15
Cost of Units / Energy	11813	13712	16557	22656	24178	88917
Average cost per unit sold	2.91	3.00	3.35	4.19	4.05	3.57
Average Revenue Realisation (ARR)	2.96	2.98	3.36	4.22	4.06	3.58
Total Loss for units lost	2299	2488	2644	3905	3943	15375



## ANDHRA PRADESH DISTRIBUTION UTILITIES

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	17504	18382	20311	22159	24174	26376	28778	31406
Subsidies and grants	6709	7484	8280	9002	9788	10643	11574	12588
<b>TOTAL REVENUE</b>	<b>24213</b>	<b>25866</b>	<b>28591</b>	<b>31161</b>	<b>33962</b>	<b>37019</b>	<b>40352</b>	<b>43994</b>
<b>TOTAL EXPENDITURE</b>	<b>24178</b>	<b>26939</b>	<b>29705</b>	<b>32294</b>	<b>35117</b>	<b>38183</b>	<b>41523</b>	<b>45160</b>
Profit/Loss Before Prior Period Adjustment	35	-1072	-1115	-1134	-1155	-1163	-1171	-1166
<b>UNIT CONSUMED</b>	<b>5966</b>	<b>6371</b>	<b>7042</b>	<b>7675</b>	<b>8365</b>	<b>9118</b>	<b>9939</b>	<b>10836</b>
<b>UNIT AVAILABLE</b>	<b>6939</b>	<b>7741</b>	<b>8536</b>	<b>9280</b>	<b>10091</b>	<b>10972</b>	<b>11932</b>	<b>12977</b>
<b>UNITS LOST</b>	<b>973</b>	<b>1370</b>	<b>1494</b>	<b>1605</b>	<b>1726</b>	<b>1854</b>	<b>1993</b>	<b>2141</b>
<b>% of Units Loss (T&amp;D)</b>	<b>14</b>	<b>18</b>	<b>18</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>16</b>
Cost of Units / Energy	24178	26939	29705	32294	35117	38183	41523	45160
Average cost per unit sold	4.05	4.23	4.22	4.21	4.20	4.19	4.18	4.17
Average Revenue Realisation (ARR)	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
- Out of which subsidy is	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Total Loss for units lost	3943	5793	6302	6753	7246	7764	8326	8923
% Losses as per ATC	18	18	18	17	17	16	16	16
Difference in loss T&D & ATC	4	0	0	0	0	0	-1	-1
Unrealised Revenue	1045	78	28	-30	-103	-184	-284	-395
Total Financial Losses	-1011	-1151	-1143	-1104	-1051	-979	-887	-771
Surcharge to be levied	0.18	0.01	0.00	0.00	-0.01	-0.02	-0.03	-0.04

Cost per unit for available energy 3.48

Other Income included in Sale of power

**TAMIL NADU STATE ELECTRICITY BOARD  
PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	12719	14455	15673	15426	16765	75038
Rev. subsidies and grants	1179	1330	1457	1832	1672	7470
Other Income	451	320	379	387	408	1944
<b>TOTAL REVENUE</b>	<b>14349</b>	<b>16105</b>	<b>17508</b>	<b>17644</b>	<b>18846</b>	<b>84452</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>12</b>	<b>10</b>	<b>10</b>
<b>EXPENDITURE</b>						
Purchase / Generation of Power	11092	13362	15873	19186	21025	80539
Repairs & Maintenance	189	240	365	435	371	1599
Employees cost	1708	1967	2156	2689	3079	11599
Adm. & General exp.	176	185	217	192	211	982
Other Expenses	16	502	520	147	165	1350
Depreciation & other related debits	1182	627	676	771	822	4079
Interest & Financial Expenses	952	1047	1395	2010	2750	8154
<b>TOTAL EXPENDITURE</b>	<b>15317</b>	<b>17931</b>	<b>21202</b>	<b>25429</b>	<b>28424</b>	<b>108302</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-968</b>	<b>-1826</b>	<b>-3693</b>	<b>-7785</b>	<b>-9578</b>	<b>-23850</b>
<b>UNIT CONSUMED</b>	<b>4459</b>	<b>5016</b>	<b>5283</b>	<b>5306</b>	<b>5778</b>	<b>25842</b>
<b>UNIT AVAILABLE</b>	<b>5438</b>	<b>6117</b>	<b>6443</b>	<b>6471</b>	<b>7046</b>	<b>31515</b>
<b>UNITS LOST</b>	<b>979</b>	<b>1101</b>	<b>1160</b>	<b>1165</b>	<b>1268</b>	<b>5673</b>
% of Units Loss	18	18	18	18	18	18
Cost of Units / Energy	15317	17931	21202	25429	28424	108302
Average cost per unit sold	3.44	3.57	4.01	4.79	4.92	4.19
Average Revenue Realisation (ARR)	3.22	3.21	3.31	3.33	3.26	3.27
Total Loss for units lost	3363	3936	4655	5583	6238	23775

**TAMIL NADU STATE ELECTRICITY BOARD**  
(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	17173	18636	20003	21569	23260	25071	27039	29168
Subsidies and grants	1672	1821	1976	2128	2292	2467	2657	2862
<b>TOTAL REVENUE</b>	<b>18845</b>	<b>20457</b>	<b>21979</b>	<b>23697</b>	<b>25552</b>	<b>27537</b>	<b>29695</b>	<b>32030</b>
<b>TOTAL EXPENDITURE</b>	<b>28424</b>	<b>30918</b>	<b>33179</b>	<b>35734</b>	<b>38478</b>	<b>41420</b>	<b>44612</b>	<b>48058</b>
Profit/Loss Before Prior Period Adjustment	-9579	-10462	-11200	-12037	-12927	-13883	-14917	-16028
<b>UNIT CONSUMED</b>	<b>5778</b>	<b>6275</b>	<b>6742</b>	<b>7269</b>	<b>7838</b>	<b>8447</b>	<b>9109</b>	<b>9825</b>
<b>UNIT AVAILABLE</b>	<b>7046</b>	<b>7672</b>	<b>8233</b>	<b>8867</b>	<b>9548</b>	<b>10278</b>	<b>11070</b>	<b>11925</b>
<b>UNITS LOST</b>	<b>1268</b>	<b>1397</b>	<b>1491</b>	<b>1598</b>	<b>1710</b>	<b>1831</b>	<b>1961</b>	<b>2100</b>
<b>% of Units Loss (T&amp;D)</b>	<b>18</b>	<b>18</b>	<b>18</b>	<b>18</b>	<b>18</b>	<b>18</b>	<b>18</b>	<b>18</b>
Cost of Units / Energy	28424	30918	33179	35734	38478	41420	44612	48058
Average cost per unit sold	4.92	4.93	4.92	4.92	4.91	4.90	4.90	4.89
Average Revenue Realisation (ARR)	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26
Out of which subsidy is	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Total Loss for units lost	6238	7874	7338	7856	8395	8978	9604	10272
<b>% Losses as per ATC</b>	<b>20</b>	<b>19</b>	<b>18</b>	<b>17</b>	<b>17</b>	<b>16</b>	<b>17</b>	<b>15</b>
Difference in loss T&D & ATC	2	1	0	-1	-1	-2	-1	-3
Unrealised Revenue	406	192	9	-207	-322	-500	-361	-836
Total Financial Losses	-9985	-10654	-11209	-11830	-12605	-13383	-14556	-15192
Surcharge to be levied	0.07	0.03	0.00	-0.03	-0.04	-0.06	-0.04	-0.09
Cost per unit for available energy	4.03							
Other Income included in Sale of power								

**GUJARAT DISTRIBUTION UTILITIES  
PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	8662	10457	11544	15158	16054	61875
Rev. subsidies and grants	1179	1238	1100	1100	1100	5717
Other Income	377	542	1004	433	410	2765
<b>TOTAL REVENUE</b>	<b>10218</b>	<b>12237</b>	<b>13648</b>	<b>16691</b>	<b>17564</b>	<b>70357</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>14</b>	<b>12</b>	<b>10</b>	<b>7</b>	<b>7</b>	<b>9</b>
<b>EXPENDITURE</b>						
Purchase of Power	8872	10363	11840	14745	15206	61026
Repairs & Maintenance	140	182	232	173	179	906
Employees cost	516	725	657	956	1072	3926
Adm. & General exp.	109	98	119	164	180	670
Other Expenses	-2	76	34	-203	188	92
Depreciation & other related debits	249	310	356	408	470	1794
Interest & Financial Expenses	276	393	371	415	175	1630
<b>TOTAL EXPENDITURE</b>	<b>10161</b>	<b>12146</b>	<b>13609</b>	<b>16659</b>	<b>17469</b>	<b>70044</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>58</b>	<b>90</b>	<b>38</b>	<b>32</b>	<b>95</b>	<b>313</b>
<b>UNIT CONSUMED</b>	<b>2915</b>	<b>3257</b>	<b>3493</b>	<b>3706</b>	<b>4044</b>	<b>17415</b>
<b>UNIT AVAILABLE</b>	<b>4261</b>	<b>4409</b>	<b>4746</b>	<b>4972</b>	<b>5532</b>	<b>23920</b>
<b>UNITS LOST</b>	<b>1346</b>	<b>1152</b>	<b>1253</b>	<b>1266</b>	<b>1488</b>	<b>6505</b>
% of Units Lost	32	26	26	25	27	27
Cost of Units / Energy	7152	12146	10104	12380	17469	70044
Average cost per unit sold	2.45	3.73	2.89	3.34	4.32	4.02
Average Revenue Realisation (ARR)	3.51	3.76	3.91	4.50	4.34	4.04
Total Loss for units lost	3303	4296	3625	4229	6428	26164

## GUJARAT DISTRIBUTION UTILITIES

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	16464	22096	23909	26025	28335	30846	33560	36513
Subsidies and grants	1100	1375	1485	1603	1733	1873	2020	2174
<b>TOTAL REVENUE</b>	<b>17564</b>	<b>23471</b>	<b>25393</b>	<b>27628</b>	<b>30068</b>	<b>32719</b>	<b>35579</b>	<b>38687</b>
<b>TOTAL EXPENDITURE</b>	<b>17469</b>	<b>21851</b>	<b>23457</b>	<b>25334</b>	<b>27375</b>	<b>29597</b>	<b>31910</b>	<b>34349</b>
Profit/Loss Before Prior Period Adjustment	95	1619	1937	2295	2692	3123	3670	4338
<b>UNIT CONSUMED</b>	<b>4044</b>	<b>5408</b>	<b>5851</b>	<b>6366</b>	<b>6928</b>	<b>7539</b>	<b>8198</b>	<b>8914</b>
<b>UNIT AVAILABLE</b>	<b>5532</b>	<b>6915</b>	<b>7423</b>	<b>8017</b>	<b>8663</b>	<b>9366</b>	<b>10098</b>	<b>10870</b>
<b>UNITS LOST</b>	<b>1488</b>	<b>1507</b>	<b>1572</b>	<b>1651</b>	<b>1735</b>	<b>1827</b>	<b>1900</b>	<b>1956</b>
<b>% of Units Loss (T&amp;D)</b>	<b>27</b>	<b>22</b>	<b>21</b>	<b>21</b>	<b>20</b>	<b>20</b>	<b>19</b>	<b>18</b>
Cost of Units / Energy	17469	21851	23457	25334	27375	29597	31910	34349
Average cost per unit sold	4.32	4.04	4.01	3.98	3.95	3.93	3.89	3.85
Average Revenue Realisation (ARR)	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34
Out of which subsidy is	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Total Loss for units lost	6428	6089	6302	6570	6856	7172	7396	7537
<b>% Losses as per ATC</b>	<b>27</b>	<b>26</b>	<b>24</b>	<b>23</b>	<b>21</b>	<b>20</b>	<b>18</b>	<b>17</b>
Difference in loss T&D & ATC	0	4	3	2	1	0	-1	-1
Unrealised Revenue	85	947	788	590	346	40	-262	-567
Total Financial Losses	11	672	1149	1705	2346	3082	3931	4904
Surcharge to be levied	0.02	0.18	0.13	0.09	0.05	0.01	-0.03	-0.06

Cost per unit for available energy 3.16

Other Income included in Sale of power

**KARNATAKA DISTRIBUTION UTILITIES  
PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	7554	9867	11139	11617	13322	53499
Rev. subsidies and grants	1225	286	0	0	0	1512
Other Income	98	175	178	229	241	921
<b>TOTAL REVENUE</b>	<b>8877</b>	<b>10328</b>	<b>11318</b>	<b>11846</b>	<b>13563</b>	<b>55932</b>
Percentage of subsidies in terms of Revenue	16	3	0	0	0	3
<b>EXPENDITURE</b>						
Purchase of Power	6731	8398	9025	11285	11110	46550
Repairs & Maintenance	89	96	110	105	108	508
Employees cost	855	725	909	941	1105	4535
Adm. & General exp.	144	158	176	179	200	855
Other Expenses	311	323	284	325	193	1436
Depreciation & other related debits	296	236	160	202	349	1244
Interest & Financial Expenses	254	414	532	526	755	2481
<b>TOTAL EXPENDITURE</b>	<b>8679</b>	<b>10351</b>	<b>11196</b>	<b>13563</b>	<b>13821</b>	<b>57611</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>198</b>	<b>-23</b>	<b>122</b>	<b>-1717</b>	<b>-258</b>	<b>-1679</b>
<b>UNIT CONSUMED</b>	<b>2409</b>	<b>2845</b>	<b>2998</b>	<b>3224</b>	<b>3381</b>	<b>14857</b>
<b>UNIT AVAILABLE</b>	<b>3347</b>	<b>3856</b>	<b>3856</b>	<b>4123</b>	<b>4242</b>	<b>19424</b>
<b>UNITS LOST</b>	<b>893</b>	<b>966</b>	<b>818</b>	<b>858</b>	<b>820</b>	<b>4567</b>
% of Units Lost	27	25	21	21	19	24
Cost of Units / Energy	6182	10351	8426	9987	13821	57611
Average cost per unit sold	2.57	3.64	2.81	3.10	4.09	3.88
Average Revenue Realisation (ARR)	3.68	3.63	3.78	3.67	4.01	3.76
Total Loss for units lost	2292	3515	2299	2658	3352	17709

## KARNATAKA DISTRIBUTION UTILITIES

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	13563	16008	17608	19156	20920	22769	24577	26502
Subsidies and grants	0	0	0	0	0	0	0	0
<b>TOTAL REVENUE</b>	<b>13563</b>	<b>16008</b>	<b>17608</b>	<b>19156</b>	<b>20920</b>	<b>22769</b>	<b>24577</b>	<b>26502</b>
<b>TOTAL EXPENDITURE</b>	<b>13821</b>	<b>15941</b>	<b>17448</b>	<b>18892</b>	<b>20531</b>	<b>22236</b>	<b>23889</b>	<b>25637</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-258</b>	<b>67</b>	<b>160</b>	<b>264</b>	<b>389</b>	<b>532</b>	<b>688</b>	<b>865</b>
UNIT CONSUMED	3381	3992	4391	4777	5217	5678	6129	6609
UNIT AVAILABLE	4242	4890	5352	5795	6298	6821	7328	7864
UNITS LOST	861	898	961	1018	1081	1143	1199	1255
% of Units Loss (T&D)	20	18	18	18	17	17	16	16
Cost of Units / Energy	13821	15941	17448	18892	20531	22236	23889	25637
Average cost per unit sold	4.09	3.99	3.97	3.95	3.94	3.92	3.90	3.88
Average Revenue Realisation (ARR)	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01
Out of which subsidy is	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Loss for units lost	3520	3586	3819	4026	4254	4476	4673	4868
% Losses as per ATC	25	23	21	19	17	17	16	15
Difference in loss T&D & ATC	5	5	3	2	0	0	-1	-1
Unrealised Revenue	684	797	596	340	37	-59	-138	-228
Total Financial Losses	-942	-730	-435	-76	352	591	826	1093
Surcharge to be levied	0.20	0.20	0.14	0.07	0.01	-0.01	-0.02	-0.03

Cost per unit for available energy

3.26

Other Income included in Sale of power

**MADHYA PRADESH DISTRIBUTION UTILITIES  
PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	4908	6257	6591	7130	8346	33233
Rev. subsidies and grants	294	419	569	755	901	2937
Other Income	381	438	463	484	612	2379
<b>TOTAL REVENUE</b>	<b>5583</b>	<b>7114</b>	<b>7623</b>	<b>8369</b>	<b>9859</b>	<b>38548</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>6</b>	<b>7</b>	<b>9</b>	<b>11</b>	<b>11</b>	<b>9</b>
<b>EXPENDITURE</b>						
Purchase of Power	4839	6285	7381	8437	9176	36119
Repairs & Maintenance	43	56	90	106	87	383
Employees cost	644	872	1000	1185	1768	5469
Adm. & General exp.	114	142	177	191	209	834
Other Expenses	338	276	281	357	882	2133
Depreciation & other related debits	231	296	239	269	301	1337
Interest & Financial Expenses	115	165	239	280	443	1242
<b>TOTAL EXPENDITURE</b>	<b>6324</b>	<b>8093</b>	<b>9408</b>	<b>10824</b>	<b>12867</b>	<b>47518</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-741</b>	<b>-979</b>	<b>-1786</b>	<b>-2455</b>	<b>-3008</b>	<b>-8969</b>
<b>UNIT CONSUMED</b>	<b>1551</b>	<b>1968</b>	<b>2088</b>	<b>2094</b>	<b>2257</b>	<b>9958</b>
<b>UNIT AVAILABLE</b>	<b>2749</b>	<b>3256</b>	<b>3523</b>	<b>3460</b>	<b>3578</b>	<b>16567</b>
<b>UNITS LOST</b>	<b>1198</b>	<b>1288</b>	<b>1435</b>	<b>1366</b>	<b>1321</b>	<b>6609</b>
% of Units Lost	44	40	41	39	37	40
Cost of Units / Energy	6324	8093	9408	10824	12867	47518
Average cost per unit sold	4.08	4.11	4.51	5.17	5.70	4.77
Average Revenue Realisation (ARR)	3.60	3.62	3.65	4.00	4.37	3.87
<b>Total Loss for units lost</b>	<b>4885</b>	<b>5299</b>	<b>6466</b>	<b>7061</b>	<b>7531</b>	<b>31535</b>



## MADHYA PRADESH DISTRIBUTION UTILITIES

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	8958	11570	13069	14726	16599	18715	21117	23834
Subsidies and grants	901	1151	1247	1360	1485	1623	1778	1949
<b>TOTAL REVENUE</b>	<b>9859</b>	<b>12721</b>	<b>14316</b>	<b>16086</b>	<b>18083</b>	<b>20338</b>	<b>22894</b>	<b>25783</b>
<b>TOTAL EXPENDITURE</b>	<b>12867</b>	<b>16459</b>	<b>17957</b>	<b>19577</b>	<b>21377</b>	<b>23375</b>	<b>25596</b>	<b>28062</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-3008</b>	<b>-3738</b>	<b>-3641</b>	<b>-3491</b>	<b>-3294</b>	<b>-3037</b>	<b>-2702</b>	<b>-2279</b>
UNIT CONSUMED	2257	2911	3276	3681	4138	4654	5239	5900
UNIT AVAILABLE	3578	4572	4988	5438	5938	6493	7110	7795
UNITS LOST	1321	1661	1712	1757	1800	1839	1871	1895
% of Units Loss (T&D)	37	36	34	32	30	28	26	24
Cost of Units / Energy	12867	16459	17957	19577	21377	23375	25596	28062
Average cost per unit sold	5.70	5.65	5.48	5.32	5.17	5.02	4.89	4.76
Average Revenue Realisation (ARR)	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37
Out of which subsidy is	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total Loss for units lost	7531	9392	9384	9344	9299	9236	9141	9013
% Losses as per ATC	41	38	35	32	29	27	25	23
Difference in loss T&D & ATC	4	2	1	0	-1	-2	-2	-1
Unrealised Revenue	405	216	101	-45	-232	-367	-365	-359
Total Financial Losses	-3413	-3954	-3742	-3446	-3062	-2670	-2336	-1920
Surcharge to be levied	0.18	0.07	0.03	-0.01	-0.06	-0.08	-0.07	-0.06

Cost per unit for available energy 3.60

Other Income included in Sale of power

**PUNJAB STATE ELECTRICITY BOARD**  
**PROFIT & LOSS STATEMENT (Rs in Crores)**

1

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	6701	7031	7913	9010	8695	39350
Rev. subsidies and grants & Compensation	1436	1424	2848	2602	3144	11454
Other Income	199	254	321	303	371	1448
<b>TOTAL REVENUE</b>	<b>8335</b>	<b>8709</b>	<b>11083</b>	<b>11915</b>	<b>12210</b>	<b>52252</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>21</b>	<b>20</b>	<b>36</b>	<b>29</b>	<b>36</b>	<b>29</b>
<b>EXPENDITURE</b>						
Purchase / Generation of Power	4808	6776	8666	8359	8296	36905
Repairs & Maintenance	223	268	274	317	360	1442
Employees cost	1619	1751	2035	2202	2497	10105
Adm. & General exp.	58	59	70	71	75	333
Other Expenses	4	12	10	11	6	43
Depreciation & other related debits	583	604	665	694	797	3343
Interest & Financial Expenses	951	884	864	1195	1330	5223
<b>TOTAL EXPENDITURE</b>	<b>8247</b>	<b>10354</b>	<b>12584</b>	<b>12849</b>	<b>13361</b>	<b>57394</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>89</b>	<b>-1645</b>	<b>-1501</b>	<b>-933</b>	<b>-1151</b>	<b>-5142</b>
<b>UNIT CONSUMED</b>	<b>2546</b>	<b>2790</b>	<b>3212</b>	<b>3263</b>	<b>3270</b>	<b>15081</b>
<b>UNIT AVAILABLE</b>	<b>3365</b>	<b>3626</b>	<b>4092</b>	<b>4004</b>	<b>4074</b>	<b>19161</b>
<b>UNITS LOST</b>	<b>819</b>	<b>836</b>	<b>880</b>	<b>741</b>	<b>804</b>	<b>4080</b>
% of Units Lost	24	23	22	19	20	21
Cost of Units / Energy	8247	10354	12584	12849	13361	57394
Average cost per unit sold	3.24	3.71	3.92	3.94	4.09	3.81
Average Revenue Realisation (ARR)	3.27	3.12	3.45	3.65	3.73	3.46
Total Loss for units lost	2653	3103	3448	2918	3285	15527

**PUNJAB STATE ELECTRICITY BOARD**  
(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	9066	9449	10422	11493	12669	13957	15372	16920
Subsidies and grants & Compensation	3144	3296	3565	3867	4194	4548	4930	5345
<b>TOTAL REVENUE</b>	<b>12210</b>	<b>12745</b>	<b>13988</b>	<b>15360</b>	<b>16863</b>	<b>18505</b>	<b>20302</b>	<b>22264</b>
<b>TOTAL EXPENDITURE</b>	<b>13361</b>	<b>14009</b>	<b>15186</b>	<b>16472</b>	<b>17866</b>	<b>19372</b>	<b>21002</b>	<b>22766</b>
Profit/Loss Before Prior Period Adjustment	-1151	-1263	-1199	-1112	-1003	-867	-699	-502
UNIT CONSUMED	3270	3417	3750	4118	4521	4961	5443	5969
UNIT AVAILABLE	4074	4271	4630	5022	5447	5906	6403	6941
UNITS LOST	804	854	880	904	926	945	960	972
% of Units Loss (T&D)	20	20	19	18	17	16	15	14
Cost of Units / Energy	13361	14009	15186	16472	17866	19372	21002	22766
Average cost per unit sold	4.09	4.10	4.05	4.00	3.95	3.90	3.86	3.81
Average Revenue Realisation (ARR)	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73
Out of which subsidy is	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Total Loss for units lost	3285	3501	3564	3616	3659	3690	3704	3707
% Losses as per ATC	20	20	19	18	17	16	15	14
Difference in loss T&D & ATC	0	0	0	0	0	0	0	0
Unrealised Revenue	-12	1	-1	0	0	0	1	-1
Total Financial Losses	-1140	-1264	-1198	-1112	-1003	-867	-701	-501
Surcharge to be levied	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cost per unit for available energy								3.28
Other Income included in Sale of power								

**UTTAR PRADESH DISTRIBUTION UTILITIES  
PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	7580	7838	8983	10196	12525	47121
Rev. subsidies and grants	1347	1547	1854	1581	1816	8145
Other Income	228	268	335	348	543	1721
<b>TOTAL REVENUE</b>	<b>9154</b>	<b>9653</b>	<b>11172</b>	<b>12126</b>	<b>14883</b>	<b>56988</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>18</b>	<b>20</b>	<b>21</b>	<b>16</b>	<b>15</b>	<b>17</b>
<b>EXPENDITURE</b>						
Purchase of Power	9985	11422	12789	14013	15784	63992
Repairs & Maintenance	245	292	357	467	547	1909
Employees cost	677	645	674	779	1022	3797
Adm. & General exp.	100	102	71	98	131	501
Other Expenses	56	71	97	105	105	434
Depreciation & other related debits	568	526	663	550	485	2792
Interest & Financial Expenses	295	360	727	538	1117	3038
<b>TOTAL EXPENDITURE</b>	<b>11926</b>	<b>13418</b>	<b>15378</b>	<b>16550</b>	<b>19191</b>	<b>76463</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-2772</b>	<b>-3765</b>	<b>-4207</b>	<b>-4424</b>	<b>-4308</b>	<b>-19475</b>
<b>UNIT CONSUMED</b>	<b>2993</b>	<b>3322</b>	<b>3648</b>	<b>3923</b>	<b>4099</b>	<b>17985</b>
<b>UNIT AVAILABLE</b>	<b>4266</b>	<b>4741</b>	<b>5103</b>	<b>5209</b>	<b>5606</b>	<b>24925</b>
<b>UNITS LOST</b>	<b>1273</b>	<b>1419</b>	<b>1455</b>	<b>1286</b>	<b>1507</b>	<b>6940</b>
% of Units Lost	30	30	29	25	27	28
Cost of Units / Energy	8602	13418	11266	11848	19191	76463
Average cost per unit sold	2.87	4.04	3.09	3.02	4.68	4.25
Average Revenue Realisation (ARR)	3.06	2.91	3.06	3.09	3.63	3.17
Total Loss for units lost	3659	5731	4493	3884	7056	29505

**UTTAR PRADESH DISTRIBUTION UTILITIES**  
(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	13068	15212	17557	20148	23115	26520	30422	34899
Subsidies and grants	1816	2281	2527	2826	3162	3540	3965	4443
<b>TOTAL REVENUE</b>	<b>14884</b>	<b>17493</b>	<b>20085</b>	<b>22974</b>	<b>26278</b>	<b>30060</b>	<b>34387</b>	<b>39342</b>
<b>TOTAL EXPENDITURE</b>	<b>19191</b>	<b>24077</b>	<b>27011</b>	<b>30205</b>	<b>33796</b>	<b>37835</b>	<b>42377</b>	<b>47487</b>
Profit/Loss Before Prior Period Adjustment	-4307	-6584	-6926	-7231	-7519	-7775	-7990	-8145
UNIT CONSUMED	4099	4819	5533	6329	7239	8281	9473	10838
UNIT AVAILABLE	5606	7040	7898	8832	9882	11063	12391	13885
UNITS LOST	1507	2221	2365	2503	2643	2782	2918	3047
% of Units Loss (T&D)	27	32	30	28	27	25	24	22
Cost of Units / Energy	19191	24077	27011	30205	33796	37835	42377	47487
Average cost per unit sold	4.68	5.00	4.88	4.77	4.67	4.57	4.47	4.38
Average Revenue Realisation (ARR)	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63
Out of which subsidy is	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Total Loss for units lost	7056	11097	11546	11946	12339	12711	13054	13350
% Loss as per ATC	40	37	33	29	25	21	19	17
Difference in loss T&D & ATC	13	5	3	0	-2	-5	-5	-5
Unrealised Revenue	1900	892	543	71	-551	-1382	-1719	-2122
Total Financial Losses	-6207	-7476	-7470	-7302	-6968	-6394	-6271	-6022
Surcharge to be levied	0.46	0.19	0.10	0.01	-0.08	-0.17	-0.18	-0.20

Cost per unit for available energy 3.42

Other Income included in Sale of power

**RAJASTHAN DISTRIBUTION UTILITIES**  
**PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	6278	6802	7770	8417	9299	38566
Rev. subsidies and grants	1629	1741	2702	5461	8192	19725
Other Income	207	230	378	742	635	2191
<b>TOTAL REVENUE</b>	<b>8113</b>	<b>8772</b>	<b>10850</b>	<b>14620</b>	<b>18126</b>	<b>60483</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>26</b>	<b>26</b>	<b>35</b>	<b>65</b>	<b>88</b>	<b>51</b>
<b>EXPENDITURE</b>						
Purchase of Power	6744	7072	9743	12998	16252	52808
Repairs & Maintenance	76	83	90	152	174	575
Employees cost	379	405	743	1842	2463	5832
Adm. & General exp.	57	70	70	94	114	405
Other Expenses	18	26	248	39	66	396
Depreciation & other related debits	307	411	284	388	480	1871
Interest & Financial Expenses	562	711	947	1490	2612	6321
<b>TOTAL EXPENDITURE</b>	<b>8143</b>	<b>8778</b>	<b>12123</b>	<b>17003</b>	<b>22161</b>	<b>68208</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-30</b>	<b>-5</b>	<b>-1273</b>	<b>-2383</b>	<b>-4034</b>	<b>-7725</b>
<b>UNIT CONSUMED</b>	<b>1792</b>	<b>2003</b>	<b>2366</b>	<b>2638</b>	<b>3064</b>	<b>11863</b>
<b>UNIT AVAILABLE</b>	<b>3179</b>	<b>3246</b>	<b>3668</b>	<b>3855</b>	<b>4436</b>	<b>18384</b>
<b>UNITS LOST</b>	<b>1387</b>	<b>1243</b>	<b>1302</b>	<b>1217</b>	<b>1372</b>	<b>6521</b>
% of Units Lost	44	38	35	32	31	35
Cost of Units / Energy	8143	8778	12123	17003	22161	68208
Average cost per unit sold	4.54	4.38	5.12	6.45	7.23	5.75
Average Revenue Realisation (ARR)	4.53	4.38	4.59	5.54	5.92	5.10
Total Loss for units lost	6303	5447	6671	7844	9923	37493

## RAJASTHAN DISTRIBUTION UTILITIES

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	9934	11474	13177	14818	16426	18213	20209	22439
Subsidies and grants	8192	8281	9224	10188	11096	12097	13198	14413
<b>TOTAL REVENUE</b>	<b>18126</b>	<b>19755</b>	<b>22401</b>	<b>25006</b>	<b>27522</b>	<b>30310</b>	<b>33407</b>	<b>36852</b>
<b>TOTAL EXPENDITURE</b>	<b>22161</b>	<b>22420</b>	<b>24930</b>	<b>27535</b>	<b>29990</b>	<b>32695</b>	<b>35670</b>	<b>38955</b>
Profit/Loss Before Prior Period Adjustment	-4035	-2665	-2529	-2529	-2468	-2385	-2263	-2103
UNIT CONSUMED	3064	3337	3784	4224	4649	5120	5643	6225
UNIT AVAILABLE	4436	4484	4986	5507	5998	6539	7134	7791
UNITS LOST	1372	1147	1202	1283	1349	1419	1491	1566
% of Units Loss (T&D)	31	26	24	23	22	22	21	20
Cost of Units / Energy	22161	22420	24930	27535	29990	32695	35670	38955
Average cost per unit sold	7.23	6.72	6.59	6.52	6.45	6.39	6.32	6.26
Average Revenue Realisation (ARR)	5.92	5.92	5.92	5.92	5.92	5.92	5.92	5.92
Out of which subsidy is	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85
Total Loss for units lost	9923	7706	7919	8363	8702	9061	9425	9800
% Losses as per ATC	31	26	24	23	22	21	20	19
Difference in loss T&D & ATC	0	1	0	0	0	-1	-1	-1
Unrealised Revenue	-7	130	-2	-49	-108	-182	-267	-369
Total Financial Losses	-4028	-2795	-2527	-2480	-2360	-2203	-1996	-1734
Surcharge to be levied	0.00	0.04	0.00	-0.01	-0.02	-0.04	-0.05	-0.06
Cost per unit for available energy			5.00					
Other Income included in Sale of power								

**HARYANA DISTRIBUTION UTILITIES**  
**PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	3794	4274	4784	6304	7819	26975
Rev. subsidies and grants	1289	1545	2276	2637	3289	11036
Other Income	295	235	571	607	835	2542
<b>TOTAL REVENUE</b>	<b>5378</b>	<b>6054</b>	<b>7631</b>	<b>9548</b>	<b>11942</b>	<b>40553</b>
Percentage of subsidies in terms of Revenue	34	36	48	42	42	41
<b>EXPENDITURE</b>						
Purchase of Power	4543	5445	7297	8573	10756	36614
Repairs & Maintenance	68	141	67	69	86	431
Employees cost	470	514	563	1038	1638	4223
Adm. & General exp.	35	52	75	98	124	385
Other Expenses	276	7	77	498	51	909
Depreciation & other related debits	147	149	111	122	173	703
Interest & Financial Expenses	105	148	257	522	776	1809
<b>TOTAL EXPENDITURE</b>	<b>5645</b>	<b>6457</b>	<b>8446</b>	<b>10920</b>	<b>13605</b>	<b>45073</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-266</b>	<b>-403</b>	<b>-815</b>	<b>-1372</b>	<b>-1663</b>	<b>-4520</b>
<b>UNIT CONSUMED</b>	<b>1522</b>	<b>1666</b>	<b>1825</b>	<b>2010</b>	<b>2379</b>	<b>9401</b>
<b>UNIT AVAILABLE</b>	<b>2204</b>	<b>2351</b>	<b>2538</b>	<b>2853</b>	<b>3356</b>	<b>13303</b>
<b>UNITS LOST</b>	<b>683</b>	<b>685</b>	<b>713</b>	<b>843</b>	<b>977</b>	<b>3901</b>
% of Units Lost	31	29	28	30	29	29
Cost of Units / Energy	5645	6457	8446	10920	13605	45073
Average cost per unit sold	3.71	3.88	4.63	5.43	5.72	4.79
Average Revenue Realisation (ARR)	3.53	3.63	4.18	4.75	5.02	4.31
Total Loss for units lost	2533	2656	3300	4580	5587	18703



**HARYANA DISTRIBUTION UTILITIES**  
(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	8654	9221	10275	11579	12787	14140	15653	17352
Subsidies and grants	3289	3244	3585	3968	4306	4680	5095	5555
<b>TOTAL REVENUE</b>	11943	12465	13860	15547	17093	18820	20748	22906
<b>TOTAL EXPENDITURE</b>	13605	13406	14815	16398	17796	19343	21056	22955
Profit/Loss Before Prior Period Adjustment	-1662	-941	-955	-852	-703	-523	-308	-49
<b>UNIT CONSUMED</b>	2379	2483	2761	3097	3405	3749	4133	4563
<b>UNIT AVAILABLE</b>	3356	3310	3658	4049	4394	4776	5199	5668
<b>UNITS LOST</b>	977	827	897	952	989	1027	1066	1105
<b>% of Units Loss (T&amp;D)</b>	29	25	25	24	23	22	21	19
Cost of Units / Energy	13605	13406	14815	16398	17796	19343	21056	22955
Average cost per unit sold	5.72	5.40	5.37	5.29	5.23	5.16	5.09	5.03
Average Revenue Realisation (ARR)	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02
Out of which subsidy is	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Total Loss for units lost	5587	4465	4813	5041	5169	5299	5431	5559
<b>% Losses as per ATC</b>	29	27	25	23	21	19	18	17
<b>Difference in loss T&amp;D &amp; ATC</b>	0	2	0	-1	-2	-3	-3	-3
<b>Unrealised Revenue</b>	-15	250	65	-81	-259	-477	-526	-578
<b>Total Financial Losses</b>	-1648	-1191	-1020	-770	-443	-46	217	529
<b>Surcharge to be levied</b>	-0.01	0.10	0.02	-0.03	-0.08	-0.13	-0.13	-0.13

Cost per unit for available energy 4.05

Other Income included in Sale of power

**BIHAR STATE ELECTRICITY BOARD**  
**PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	1132	1276	1464	1676	1862	7410
Rev. subsidies and grants	844	720	720	720	840	3844
Other Income	721	116	124	90	94	1145
<b>TOTAL REVENUE</b>	<b>2697</b>	<b>2112</b>	<b>2308</b>	<b>2485</b>	<b>2796</b>	<b>12399</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>75</b>	<b>56</b>	<b>49</b>	<b>43</b>	<b>45</b>	<b>52</b>
<b>EXPENDITURE</b>						
Purchase / Generation of Power	1382	1503	1667	1945	2600	9096
Repairs & Maintenance	17	23	28	38	55	161
Employees cost	349	552	554	627	560	2641
Adm. & General exp.	20	22	28	34	34	138
Other Expenses	354	0	0	0	0	355
Depreciation & other related debits	118	58	54	56	60	345
Interest & Financial Expenses	627	809	829	888	983	4136
<b>TOTAL EXPENDITURE</b>	<b>2866</b>	<b>2968</b>	<b>3159</b>	<b>3587</b>	<b>4292</b>	<b>16872</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-169</b>	<b>-856</b>	<b>-851</b>	<b>-1102</b>	<b>-1496</b>	<b>-4473</b>
<b>UNIT CONSUMED</b>	<b>434</b>	<b>454</b>	<b>485</b>	<b>532</b>	<b>607</b>	<b>2512</b>
<b>UNIT AVAILABLE</b>	<b>760</b>	<b>821</b>	<b>825</b>	<b>890</b>	<b>1017</b>	<b>4313</b>
<b>UNITS LOST</b>	<b>326</b>	<b>367</b>	<b>340</b>	<b>358</b>	<b>410</b>	<b>1801</b>
% of Units Lost	43	45	41	40	40	41.76
Cost of Units / Energy	2866	2968	3159	3587	4292	16872
<b>Average cost per unit sold</b>	<b>6.60</b>	<b>6.54</b>	<b>6.51</b>	<b>6.74</b>	<b>7.07</b>	<b>6.72</b>
<b>Average Revenue Realisation (ARR)</b>	<b>6.21</b>	<b>4.65</b>	<b>4.76</b>	<b>4.67</b>	<b>4.61</b>	<b>4.94</b>
<b>Total Loss for units lost</b>	<b>2153</b>	<b>2399</b>	<b>2214</b>	<b>2414</b>	<b>2899</b>	<b>12097</b>

## BIHAR STATE ELECTRICITY BOARD

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	1956	2458	3004	3672	4497	5511	6475	7592
Subsidies and grants	840	1087	1247	1440	1672	1948	2183	2444
<b>TOTAL REVENUE</b>	<b>2796</b>	<b>3545</b>	<b>4250</b>	<b>5112</b>	<b>6168</b>	<b>7459</b>	<b>8658</b>	<b>10036</b>
<b>TOTAL EXPENDITURE</b>	<b>4292</b>	<b>5554</b>	<b>6338</b>	<b>7322</b>	<b>8499</b>	<b>9904</b>	<b>11099</b>	<b>12428</b>
Profit/Loss Before Prior Period Adjustment	-1497	-2008	-2088	-2209	-2331	-2445	-2441	-2392
UNIT CONSUMED	607	769	922	1109	1338	1618	1878	2177
UNIT AVAILABLE	1017	1316	1502	1735	2014	2347	2630	2945
UNITS LOST	410	547	580	626	676	729	752	768
% of Units Loss (T&D)	40	42	39	36	34	31	29	26
Cost of Units / Energy	4292	5554	6338	7322	8499	9904	11099	12428
Average cost per unit sold	7.07	7.22	6.87	6.60	6.35	6.12	5.91	5.71
Average Revenue Realisation (ARR)	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61
Out of which subsidy is	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Total Loss for units lost	2899	3950	3987	4133	4294	4462	4444	4384
% Losses as per ATC	44	41	38	35	33	31	29	28
Difference in loss T&D & ATC	4	-1	-1	-1	-1	0	1	2
Unrealised Revenue	101	-23	-30	-59	-40	-11	63	225
Total Financial Losses	-1597	-1986	-2058	-2150	-2291	-2435	-2504	-2617
Surcharge to be levied	0.17	-0.03	-0.03	-0.05	-0.03	-0.01	0.03	0.10
Cost per unit for available energy			4.22					
Other Income included in Sale of power								

**KERALA STATE ELECTRICITY BOARD**  
**PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	3590	4286	4934	5097	4951	22858
Rev. subsidies and grants	145	142	91	749	1228	2355
Other Income	103	130	202	252	233	920
<b>TOTAL REVENUE</b>	<b>3837</b>	<b>4558</b>	<b>5227</b>	<b>6099</b>	<b>6411</b>	<b>26133</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>15</b>	<b>25</b>	<b>10</b>
<b>EXPENDITURE</b>						
Purchase / Generation of Power	1585	1741	2297	3832	3749	13204
Repairs & Maintenance	94	111	116	139	173	633
Employees cost	822	859	860	1188	1372	5100
Adm. & General exp.	111	131	122	132	161	658
Other Expenses	132	683	932	367	72	2187
Depreciation & other related debits	393	406	419	435	451	2104
Interest & Financial Expenses	517	394	323	317	241	1793
<b>TOTAL EXPENDITURE</b>	<b>3654</b>	<b>4326</b>	<b>5070</b>	<b>6410</b>	<b>6219</b>	<b>25679</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>183</b>	<b>233</b>	<b>157</b>	<b>-311</b>	<b>192</b>	<b>454</b>
<b>UNIT CONSUMED</b>	<b>1091</b>	<b>1238</b>	<b>1340</b>	<b>1288</b>	<b>1405</b>	<b>6362</b>
<b>UNIT AVAILABLE</b>	<b>1425</b>	<b>1584</b>	<b>1672</b>	<b>1607</b>	<b>1739</b>	<b>8027</b>
<b>UNITS LOST</b>	<b>334</b>	<b>346</b>	<b>332</b>	<b>319</b>	<b>334</b>	<b>1665</b>
% of Units Lost	23	22	20	20	19	21
Cost of Units / Energy	3654	4326	5070	6410	6219	25679
Average cost per unit sold	3.35	3.49	3.78	4.98	4.43	4.04
Average Revenue Realisation (ARR)	3.52	3.68	3.90	4.74	4.56	4.11
Total Loss for units lost	1119	1209	1256	1587	1479	6721

**KERALA STATE ELECTRICITY BOARD**  
(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	5184	5547	5981	6373	6813	7284	7793	8332
Subsidies and grants	1228	1311	1411	1489	1578	1672	1774	1887
<b>TOTAL REVENUE</b>	<b>6412</b>	<b>6858</b>	<b>7392</b>	<b>7861</b>	<b>8390</b>	<b>8956</b>	<b>9567</b>	<b>10219</b>
<b>TOTAL EXPENDITURE</b>	<b>6219</b>	<b>6648</b>	<b>7113</b>	<b>7507</b>	<b>7955</b>	<b>8431</b>	<b>8943</b>	<b>9516</b>
Profit/Loss Before Prior Period Adjustment	192	210	278	354	436	525	624	703
UNIT CONSUMED	1405	1504	1621	1724	1840	1964	2098	2241
UNIT AVAILABLE	1739	1857	1987	2097	2222	2355	2498	2658
UNITS LOST	334	353	366	373	382	391	400	417
% of Units Loss	19	19	18	18	17	17	16	16
Cost of Units / Energy	6219	6648	7113	7507	7955	8431	8943	9516
Average cost per unit sold	4.43	4.42	4.39	4.35	4.32	4.29	4.26	4.25
Average Revenue Realisation (ARR)	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56
Out of which subsidy is	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Total Loss for units lost	1479	1560	1606	1624	1651	1678	1705	1771
% Losses as per ATC	18	17	15	15	14	14	13	13
Difference in loss T&D & ATC	-1	-2	-3	-3	-3	-3	-3	-3
<b>Unrealised Revenue</b>	<b>-77</b>	<b>-138</b>	<b>-253</b>	<b>-219</b>	<b>-268</b>	<b>-233</b>	<b>-288</b>	<b>-275</b>
<b>Total Financial Losses</b>	<b>269</b>	<b>348</b>	<b>531</b>	<b>573</b>	<b>703</b>	<b>758</b>	<b>912</b>	<b>978</b>
<b>Surcharge to be levied</b>	<b>-0.06</b>	<b>-0.09</b>	<b>-0.16</b>	<b>-0.13</b>	<b>-0.15</b>	<b>-0.12</b>	<b>-0.14</b>	<b>-0.12</b>
<b>Cost per unit for available energy</b>	<b>3.58</b>							
<b>Other Income included in Sale of power</b>								

**JHARKHAND STATE ELECTRICITY BOARD**  
**PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-10
<b>REVENUE</b>						
Revenue from sale of power	1155	1407	1391	1585	1634	7173
Rev. subsidies and grants	363	200	77	80	400	1121
Other Income	515	457	232	285	301	1791
<b>TOTAL REVENUE</b>	<b>2034</b>	<b>2064</b>	<b>1701</b>	<b>1950</b>	<b>2336</b>	<b>10085</b>
Percentage of subsidies in terms of Revenue	31	14	6	5	24	16
<b>EXPENDITURE</b>						
Purchase / Generation of Power	1455	1628	1745	1923	2068	8818
Repairs & Maintenance	31	36	57	68	68	261
Employees cost	170	169	169	189	208	905
Adm. & General exp.	31	33	34	55	41	194
Other Expenses	249	182	403	210	0	1044
Depreciation & other related debits	32	36	44	48	50	210
Interest & Financial Expenses	315	487	463	457	460	2181
<b>TOTAL EXPENDITURE</b>	<b>2283</b>	<b>2570</b>	<b>2914</b>	<b>2950</b>	<b>2895</b>	<b>13613</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-249</b>	<b>-505</b>	<b>-1214</b>	<b>-1000</b>	<b>-559</b>	<b>-3528</b>
<b>UNIT CONSUMED</b>	<b>345</b>	<b>384</b>	<b>428</b>	<b>466</b>	<b>530</b>	<b>2153</b>
<b>UNIT AVAILABLE</b>	<b>658</b>	<b>694</b>	<b>743</b>	<b>817</b>	<b>863</b>	<b>3775</b>
<b>UNITS LOST</b>	<b>313</b>	<b>310</b>	<b>315</b>	<b>351</b>	<b>333</b>	<b>1622</b>
% of Units Lost	48	45	42	43	39	42.97
Cost of Units / Energy	2283	2570	2914	2950	2895	13613
Average cost per unit sold	6.62	6.69	6.81	6.33	5.46	6.32
Average Revenue Realisation (ARR)	5.90	5.38	3.97	4.18	4.41	4.68
<b>Total Loss for units lost</b>	<b>2072</b>	<b>2074</b>	<b>2145</b>	<b>2222</b>	<b>1819</b>	<b>10255</b>

## JHARKHAND STATE ELECTRICITY BOARD

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	1935	5606	6087	6609	7187	7785	8405	9077
Subsidies and grants	400	863	916	980	1051	1123	1196	1274
<b>TOTAL REVENUE</b>	<b>2335</b>	<b>6469</b>	<b>7003</b>	<b>7590</b>	<b>8238</b>	<b>8908</b>	<b>9601</b>	<b>10350</b>
<b>TOTAL EXPENDITURE</b>	<b>2895</b>	<b>6238</b>	<b>6670</b>	<b>7139</b>	<b>7651</b>	<b>8177</b>	<b>8707</b>	<b>9276</b>
Profit/Loss Before Prior Period Adjustment	-560	232	333	451	586	731	894	1074
UNIT CONSUMED	530	1467	1588	1721	1868	2020	2177	2347
UNIT AVAILABLE	863	1862	1991	2131	2284	2441	2599	2769
UNITS LOST	333	395	403	410	416	421	422	422
% of Units Loss	39	21	20	19	18	17	16	15
Cost of Units / Energy	2895	6238	6670	7139	7651	8177	8707	9276
<b>Average cost per unit sold</b>	<b>5.46</b>	<b>4.25</b>	<b>4.20</b>	<b>4.15</b>	<b>4.10</b>	<b>4.05</b>	<b>4.00</b>	<b>3.95</b>
<b>Average Revenue Realisation (ARR)</b>	<b>4.41</b>	<b>4.41</b>	<b>4.41</b>	<b>4.41</b>	<b>4.41</b>	<b>4.41</b>	<b>4.41</b>	<b>4.41</b>
<b>Out of which subsidy is</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>
Total Loss for units lost	1819	1680	1693	1701	1704	1704	1688	1668
% Losses as per ATC	22	21	20	19	18	17	16	15
Difference in loss T&D & ATC	-17	0	0	0	0	0	0	0
Unrealised Revenue	-387	-14	-17	-18	-18	-22	-23	-25
Total Financial Losses	-172	246	350	469	604	753	917	1099
Surcharge to be levied	-0.73	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01

**Cost per unit for available energy 3.35**

**Other Income included in Sale of power**

**HIMACHAL PRADESH STATE ELECTRICITY BOARD**  
**PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	1647	1918	2308	2915	2978	11766
Rev. subsidies and grants	77	96	0	0	0	173
Other Income	47	44	45	51	70	257
<b>TOTAL REVENUE</b>	<b>1771</b>	<b>2058</b>	<b>2352</b>	<b>2966</b>	<b>3049</b>	<b>12196</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>EXPENDITURE</b>						
Purchase of Power	1082	1255	1529	1954	2172	7992
Repairs & Maintenance	18	27	26	28	30	130
Employees cost	413	472	548	613	730	2775
Adm. & General exp.	25	28	31	49	48	182
Other Expenses	1	3	1	2	-4	3
Depreciation & other related debits	54	57	88	97	106	401
Interest & Financial Expenses	122	138	177	172	176	786
<b>TOTAL EXPENDITURE</b>	<b>1715</b>	<b>1980</b>	<b>2401</b>	<b>2915</b>	<b>3258</b>	<b>12268</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>56</b>	<b>79</b>	<b>-48</b>	<b>52</b>	<b>-209</b>	<b>-71</b>
<b>UNIT CONSUMED</b>	<b>529</b>	<b>556</b>	<b>622</b>	<b>696</b>	<b>710</b>	<b>3113</b>
<b>UNIT AVAILABLE</b>	<b>624</b>	<b>644</b>	<b>719</b>	<b>801</b>	<b>832</b>	<b>3620</b>
<b>UNITS LOST</b>	<b>95</b>	<b>88</b>	<b>97</b>	<b>105</b>	<b>122</b>	<b>507</b>
% of Units Lost	15	14	13	13	15	14
Cost of Units / Energy	1715	1980	2401	2915	3258	12268
<b>Average cost per unit sold</b>	<b>3.24</b>	<b>3.56</b>	<b>3.86</b>	<b>4.19</b>	<b>4.59</b>	<b>4</b>
<b>Average Revenue Realisation (ARR)</b>	<b>3.35</b>	<b>3.70</b>	<b>3.78</b>	<b>4.26</b>	<b>4.29</b>	<b>4</b>
<b>Total Loss for units lost</b>	<b>308</b>	<b>313</b>	<b>374</b>	<b>440</b>	<b>560</b>	<b>1998</b>



## HIMACHAL PRADESH STATE ELECTRICITY BOARD

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	3048	2806	2977	3162	3355	3561	3779	4011
Subsidies and grants	0	0	0	0	0	0	0	0
<b>TOTAL REVENUE</b>	<b>3048</b>	<b>2806</b>	<b>2977</b>	<b>3162</b>	<b>3355</b>	<b>3561</b>	<b>3779</b>	<b>4011</b>
<b>TOTAL EXPENDITURE</b>	<b>3258</b>	<b>3191</b>	<b>3348</b>	<b>3512</b>	<b>3689</b>	<b>3877</b>	<b>4069</b>	<b>4273</b>
Profit/Loss Before Prior Period Adjustment	-209	-385	-370	-351	-334	-316	-289	-262
<b>UNIT CONSUMED</b>	<b>710</b>	<b>654</b>	<b>694</b>	<b>737</b>	<b>782</b>	<b>830</b>	<b>881</b>	<b>935</b>
<b>UNIT AVAILABLE</b>	<b>832</b>	<b>814</b>	<b>854</b>	<b>896</b>	<b>941</b>	<b>989</b>	<b>1038</b>	<b>1090</b>
<b>UNITS LOST</b>	<b>122</b>	<b>160</b>	<b>160</b>	<b>159</b>	<b>159</b>	<b>159</b>	<b>157</b>	<b>155</b>
% of Units Loss	15	20	19	18	17	16	15	14
Cost of Units / Energy	3258	3191	3348	3512	3689	3877	4069	4273
Average cost per unit sold	4.59	4.88	4.82	4.77	4.72	4.67	4.62	4.57
Average Revenue Realisation (ARR)	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29
Out of which subsidy is	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Loss for units lost	560	781	772	758	750	743	725	708
% Losses as per ATC	18	17	16	15	15	14	14	14
Difference in loss T&D & ATC	3	-3	-3	-3	-2	-2	-1	0
Unrealised Revenue	102	-75	-81	-87	-64	-74	-43	-9
Total Financial Losses	-311	-311	-289	-264	-270	-242	-247	-253
Surcharge to be levied	0.14	-0.11	-0.12	-0.12	-0.08	-0.09	-0.05	-0.01
Cost per unit for available energy	3.92							
Other Income included in Sale of power								

**UTTRAKHAND POWER CORPORATION LIMITED**  
**PROFIT & LOSS STATEMENT (Rs in Crores)**

	2005-06	2006-07	2007-08	2008-09	2009-10	2005-2010
<b>REVENUE</b>						
Revenue from sale of power	835	932	1183	1673	2086	6708
Rev. subsidies and grants	0	0	0	0	0	0
Other Income	41	23	175	41	92	372
<b>TOTAL REVENUE</b>	<b>876</b>	<b>955</b>	<b>1358</b>	<b>1714</b>	<b>2177</b>	<b>7080</b>
<b>Percentage of subsidies in terms of Revenue</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>EXPENDITURE</b>						
Purchase of Power	688	825	1214	1675	2063	6466
Repairs & Maintenance	0	25	53	39	49	166
Employees cost	90	94	111	106	168	569
Adm. & General exp.	39	15	17	16	17	104
Other Expenses	42	50	65	76	100	332
Depreciation & other related debits	94	101	60	86	93	434
Interest & Financial Expenses	138	53	59	71	77	399
<b>TOTAL EXPENDITURE</b>	<b>1091</b>	<b>1164</b>	<b>1578</b>	<b>2069</b>	<b>2568</b>	<b>8470</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-215</b>	<b>-209</b>	<b>-220</b>	<b>-355</b>	<b>-391</b>	<b>-1390</b>
<b>UNIT CONSUMED</b>	<b>359</b>	<b>389</b>	<b>474</b>	<b>565</b>	<b>625</b>	<b>2412</b>
<b>UNIT AVAILABLE</b>	<b>517</b>	<b>582</b>	<b>699</b>	<b>799</b>	<b>828</b>	<b>3425</b>
<b>UNITS LOST</b>	<b>158</b>	<b>193</b>	<b>225</b>	<b>234</b>	<b>203</b>	<b>1013</b>
% of Units Lost	31	33	32	29	25	30
Cost of Units / Energy	1091	1164	1578	2069	2568	8470
Average cost per unit sold	3.04	2.99	3.33	3.66	4.11	3.51
Average Revenue Realisation (ARR)	2.44	2.45	2.86	3.03	3.48	2.94
Total Loss for units lost	480	578	749	857	834	3557

## UTTRAKHAND POWER CORPORATION LIMITED

(Rs in Crores)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Revenue from sale of power	2178	2384	2610	2861	3073	3268	3470	3689
Subsidies and grants	0	0	0	0	0	0	0	0
<b>TOTAL REVENUE</b>	<b>2178</b>	<b>2384</b>	<b>2610</b>	<b>2861</b>	<b>3073</b>	<b>3268</b>	<b>3470</b>	<b>3689</b>
<b>TOTAL EXPENDITURE</b>	<b>2568</b>	<b>2796</b>	<b>3013</b>	<b>3252</b>	<b>3444</b>	<b>3605</b>	<b>3773</b>	<b>3953</b>
<b>Profit/Loss Before Prior Period Adjustment</b>	<b>-390</b>	<b>-412</b>	<b>-403</b>	<b>-391</b>	<b>-371</b>	<b>-338</b>	<b>-303</b>	<b>-264</b>
UNIT CONSUMED	625	685	750	822	883	939	997	1060
UNIT AVAILABLE	828	902	972	1049	1111	1163	1217	1275
UNITS LOST	203	217	222	227	228	224	220	215
% of Units Loss	25	24	23	22	21	19	18	17
Cost of Units / Energy	2568	2796	3013	3252	3444	3605	3773	3953
<b>Average cost per unit sold</b>	<b>4.11</b>	<b>4.08</b>	<b>4.02</b>	<b>3.96</b>	<b>3.90</b>	<b>3.84</b>	<b>3.78</b>	<b>3.73</b>
<b>Average Revenue Realisation (ARR)</b>	<b>3.48</b>	<b>3.48</b>	<b>3.48</b>	<b>3.48</b>	<b>3.48</b>	<b>3.48</b>	<b>3.48</b>	<b>3.48</b>
<b>Out of which subsidy is</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Total Loss for units lost	834	886	892	898	889	860	832	802
% Losses as per ATC	34	31	28	25	23	19	18	17
<b>Difference in loss T&amp;D &amp; ATC</b>	<b>9</b>	<b>7</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Unrealised Revenue</b>	<b>207</b>	<b>165</b>	<b>135</b>	<b>96</b>	<b>76</b>	<b>-9</b>	<b>-3</b>	<b>5</b>
<b>Total Financial Losses</b>	<b>-597</b>	<b>-578</b>	<b>-538</b>	<b>-487</b>	<b>-447</b>	<b>-329</b>	<b>-300</b>	<b>-269</b>
<b>Surcharge to be levied</b>	<b>0.33</b>	<b>0.24</b>	<b>0.18</b>	<b>0.12</b>	<b>0.09</b>	<b>-0.01</b>	<b>0.00</b>	<b>0.00</b>

Cost per unit for available energy 3.10

Other Income included in Sale of power



## CHAPTER - II

**Tor (c): Review Electricity Tariff including the role of (i) State Governments; (ii) State Tariff Regulator; and (iii) SEBs' / State Distribution Companies in periodic tariff revision.**

### **2.0 Background**

In this chapter we address TOR (c) i.e. "Review Electricity Tariff including the role of (i) State Government (ii) State Tariff Regulator and (iii) SEBs/ State Distribution Companies in periodic tariff revision".

Historically electricity tariffs were fixed by SEBs / State Governments. Constrained by political and administrative compulsions, over the years this resulted in acute distortion of tariffs on a large scale. Thus arose the need for removing this (and other) responsibilities from SEBs/State Governments and vesting them in independent regulatory bodies.

Independent regulatory mechanism for the Power sector is somewhat new to our country but it has been working successfully in many developed countries. In India, the institution of independent electricity regulators was introduced for the first time in Orissa under World Bank assistance. Thereafter, this became an important item in the reform agenda for the Power sector and was ultimately included in the Electricity Act, 2003. Given the background for its introduction and the legal position, the regulatory mechanism for the Power sector is there to stay and cannot be wished away.

The focus of this study is not to confute the regulatory mechanism, but on identifying infirmities and suggest possible corrective actions to ensure proper functioning of the Regulatory Institutions.

### **2.1 Outline of the approach and data sources applied**

As required by law, all regulators have issued Regulations which spell out the methodology to be adopted and principles to be followed by the Regulators for fixing tariffs for the utilities. These regulations amongst other things require the regulator to so fix the tariffs that all validated expenses of the utility get recovered

along with reasonable return on the investment made by the utility. The reality is that notwithstanding the above requirement, most of the distribution utilities have been incurring losses which have now assumed disturbing proportions. Obviously the regulatory arrangement is not working as expected to and legally required to.

**2.1.1** A study was undertaken by Shri Divakar Dev, assisted by S/Shri Vivek Sharma, Pankaj Prakash and Deepak Pandey. The shortcomings thrown up by this examination can be grouped into following broad areas:

- a) Infrequent Revision of tariffs.
- b) Variations in the actual and estimated values of major expenditure items like, Power purchase cost, O&M cost and Capital Expenditure, their reasons and treatment.
- c) Variations in the estimated and actual revenue, their reasons and treatment.
- d) Gap between the total validated expenditure and total estimated revenue, if any, its reasons and its treatment
- e) Effect of prescribed and achieved milestones for loss reduction and collection improvement.

**2.1.2** For the above analysis, all tariff order passed by the regulators in 8 States have been studied. In all total of 70 Tariff orders have been examined. The reference period considered for the analysis is from 1st tariff order to FY 2009-10. A template for capturing the dataset was prepared, and best attempts were made to collect this data from these Tariff orders and tariff petitions. (State wise results of this analysis is given in **Annexure - V.**)

## **2.2 Deficiencies in functioning of the Regulatory Mechanism**

The present regulatory regime has been setup as a conscious and deliberate action for reforming the Power sector. This has been done after considerable deliberations both inside and outside the Parliament. Such mechanisms are working successfully in other countries. Creation of independent regulatory bodies understandably constituted a crucial element in the reform agenda for the Power sector. This is clearly stated in the Statements and Reasons in the Electricity Act, 2003. Relevant portions of the same are reproduced below:

*“.....Over a period of time, however, the performance of SEBs has deteriorated substantially on account of various factors. For instance, though power to fix tariffs*

*vests with the State Electricity Boards, they have generally been unable to take decisions on tariffs in a professional and independent manner and tariff determination in practice has been done by the State Governments, Cross-subsidies have reached unsustainable levels. To address this issue and to provide for distancing of government from determination of tariffs, the Electricity Regulatory Commissions Act, was enacted in 1998. It created the Central Electricity Commission and has an enabling provision through which the State Governments can create a State Electricity Regulatory Commission. 16 States have so far notified/created State Electricity Regulatory Commissions either under the Central Act or under their own Reform Acts.....”*

**2.2.1** From the study and analysis of the tariff orders, it is observed that inadequacies and distortions in tariffs have been caused by actions and inactions of Regulators, Utilities and indeed the State Governments. This however should not lead to the conclusion that this arrangement should or can be done away with. On the contrary, the shortcomings in their functioning need to be identified and addressed with a view to streamlining and fine tuning their working. This is being attempted hereafter.

### **2.3 Regulator’s functioning**

The approach adopted by most of the Regulators during Tariff determination relating to updated accounts of utilities’, truing of past costs particularly relating to power purchase and establishment, reduction in T&D losses may be theoretically correct, but it has often resulted in non recovery of valid expenses of the distribution utilities. Failure to revise and fix tariffs with due frequency has only aggravated the problem.

**2.3.1** Importance of the utilities regularly updating their accounts and getting them audited in time cannot be overemphasized. Most of the utilities being registered companies, this is indeed their statutory responsibility. However, the reality is that by and large distribution utilities’ accounts are rarely up to date. With delays in finalization of accounts annual audit of accounts has also been delayed. Insistence only on audited accounts for truing up and tariff determination exercise has therefore often delayed the exercise itself. As a result these companies often continue to charge outdated tariffs and are also not able to recover revenue short falls of the previous years in absence of validation of their past expenses. They are

thus forced to borrow money from financial institutions/ banks for meeting their revenue gap. Loans for such purposes are no longer small and have reached disturbing amounts and in turn cause serious damage not only to these companies but also to the concerned financial institutions / banks.

**2.3.2** The common explanation that is offered for failure to determine tariffs regularly is that the distribution utilities either do not file their ARRs or tariff proposals in time or even if they are filed the same are not backed with audited accounts. The larger issue here is whether the regulator should be allowed to become a hostage to distribution utilities' failures or manipulations, or can he assert himself and discharge his functions with the best available, though not perfect, information/data. Tariff determination is a statutory responsibility placed on the regulator and he cannot shy away from the same or remain a mute spectator because of his own licensees' failures.

**2.3.3** Instead of indefinitely waiting for audited accounts, the Regulators should undertake the truing up and tariff fixation exercise timely, based on the best available data as required by law. Some suggestions in this regard are :

- (a) The total cost of power purchased by the distribution company can be accurately calculated pending audit and the Regulator should be able to work on the basis of this unaudited figure if certified by the utility's Board of Directors. Same is true of the staff cost if the staff strength has not increased and after due scrutiny even if the strength has gone up.
- (b) While fixing the tariff, projections are made for the total power to be purchased by the distribution utility. These projections inevitably undergo change for various reasons. Purchases made by the utility in the spot market at relatively high prices are again often faulted by the Regulator if there are variations from the initial projections. Regulators should not be unduly rigid and disallow variations in this cost. The event having already taken place, a realistic approach can prevent revenue loss to the distribution utility arising out of power purchase cost already incurred but not recognized during truing up. The choice before the distribution licensee was to purchase and distribute relatively expensive power as per requirements of the situation or to impose power cuts. The distribution licensee's judgment on this issue should normally not be questioned and the power purchase cost actually incurred should be recognized and allowed during truing up.



- (c) Projections for total sales and their category wise distribution can again be worked out from the previous year's figures based on the historical CAGR. This in turn can be used for estimating the power requirement. Major part of the power purchased by the distribution utilities comes from long term PPAs, therefore cost of power to be purchased from such generators can also be estimated based on the latest available tariffs of such suppliers.
- (d) Generation tariffs usually have an in-built formula to take care of changes in the fuel costs of the generation company. Accordingly the bills raised by the Generation companies are based on such updated tariffs. No such mechanism exists in the retail tariffs fixed for distribution companies. This often results in short recoveries for the distribution companies which go on accumulating till the Regulator finally completes the truing up exercise. This can be eliminated or at least minimized by incorporating a similar provision in the retail tariffs also or by the Regulator carrying out this correction on ongoing basis. This has been successfully done by some states and there is no reason why similar formulae cannot be incorporated in the Retail Tariffs by other regulators.
- (e) In absence of audited figures O&M expenses can be estimated based on those allowed by the Regulator himself in the previous year and linking them to the consumer price index.
- (f) Even in absence of audited accounts or tariff proposals of the distribution utilities, Regulators can thus make fairly reliable estimates of major input costs for the coming year. Such being the case distribution utility's failure to file its proposals, or to back them up with audited accounts should not hold back or delay the tariff determination exercise. In such situations the Regulator should unhesitatingly determine tariffs suo-moto based on the previously allowed figures, corrected/updated as enumerated above. Failure to do so amounts to the Regulator failing to discharge its crucial statutory responsibility and the same should in turn invite adverse action.

**2.4** These issues were considered and validated by Appellate Tribunal for Electricity vide its order dated 11<sup>th</sup> November 2011. Appellate Tribunal issued the following directions<sup>2</sup> :

- (i) Every State Commission must ensure that Annual Revenue Requirement (ARR) and tariff determination takes place annually.

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<sup>2</sup> Excerpts of order dated 11/11/2011 of Appellate Tribunal for Electricity – Power of Regulator vis-à-vis suo-moto tariff revision.

- (ii) Tariff should be decided well before 1<sup>st</sup> April and should be applicable for the year so that Licensees remain vigilant to follow the time schedule for filing application for tariff determination.
- (iii) In the event of delay in filing such application beyond one month, the State Commission must initiate suo-moto proceedings.
- (iv) Truing-up should be an annual exercise.
- (v) Fuel and power purchase cost being major expenses should be allowed as monthly adjustments.

**2.5** Reduction in T&D losses is an important element of the reform agenda. The Regulators have understandably been laying down targets and road maps for this purpose. Failure to achieve these targets often results in the Regulator calculating the Tariff based on the targeted loss figures and in turn under recovery of revenue for the distribution utility. The importance of the need for checking thefts and reduction in losses arising from the same is quite obvious. At the same time it is also true that no distribution utility, and certainly not a government owned one, can meaningfully tackle this problem without full and sustained support and help from the government. The reality is that Government support in checking power theft is lukewarm. It is therefore not surprising that many of the distribution utilities are either unable to meet the targeted figures or try other creative solutions. In such a situation, Regulators adhering to the targeted loss reduction levels for calculating the tariff, deprive the distribution utility of revenue for inaction which can at least partly be attributed to the State Government. It is therefore suggested that without releasing the pressure for effective action in this area, for calculating tariffs, the Regulator should refrain from ignoring the actual loss figures. Doing so will eliminate short realization of costs on this account. For achieving loss reduction objective the Regulator can use other tools available to him under law.

**2.5.1** T&D losses are not uniform all over a state. In some areas losses are very high and in some areas they are modest mainly due to substantial variation in commercial losses. For Tariff calculation, presently most of the Regulators pool all losses together. If large number of consumers are less than transparent in one area there is no reason why their burden be placed on relatively honest consumers of another area as is the outcome of current practice. A glaring example of this is Uttrakhand where losses in far flung rural remote areas like Pithoragarh or Uttrakashi are below 20% while in high density areas i.e. Dehradun, Haridwar, Roorkee are around 40%. Pooling these for tariff purposes results in poorer

consumers of remote and far flung areas paying for pilferage of electricity by consumers in better off areas having sizable consumer population and favourable consumer mix. Comparatively inferior quality of supply and service in such remote areas only adds insult to injury.

**2.5.2** To address this obvious inequity It is suggested that the basic tariff may continue to be fixed by the Regulator taking into account the targeted loss levels. Over and above this basic tariff, a loss surcharge should be levied and the same should be worked out based on the actual losses of a particular area and imposed area wise. It may be mentioned that meters have been installed at nearly all distribution transformers (33 KV in some States and 11 KV in other States) it is thus possible to know accurately the power supplied at the distribution transformers. The energy sold to all the consumers of that area can be aggregated and juxtaposed with the energy supplied to arrive at losses in specified areas and for calculating the applicable loss surcharge for a given area serviced by a distribution transformer. This loss surcharge should be shown separately from the approved tariff in the bills both for transparency as well as consumer education. Such loss surcharge is likely to vary from area to area and, consumers would know clearly what they have to pay for dishonesty or inefficiency of other consumers of their area and indeed of local functionaries of the distribution utility and the State Government. This would understandably be resented by straightforward and honest consumers of high loss areas. Given the level of consumer awareness and over active media, such resentment is likely to bring pressure on concerned authorities and delinquent consumers to take meaningful action for curbing pilferage and bringing down prevailing losses to acceptable levels. Bringing into open the area wise disparity in losses will enable the Regulator and management of the DISCOM to fix responsibility for the same on concerned functionaries and take appropriate remedial and penal action against them. Under the present arrangement, the Regulator is merely penalizing the licensee company for failure to reduce losses. Under the proposed arrangement, the officers and staff responsible for such failure will become accountable and can be penalized without depriving the distribution company of revenue and damaging its fragile financial health.

**2.6** Regulators rightly scrutinize and validate the projections for costs and revenue elements that go into tariff determination. This is usually referred to as prudence check. Having done so the Regulator should then not fail to ensure full recovery of the validated costs. In many cases the Regulatory orders have been found wanting

in this regard. Many Regulators have left uncovered gaps to avoid “Tariff Shock”. It is Regulators duty that entire validated costs of the distribution company get recovered and the Tariffs should be determined to ensure this. Regulators have often failed to do so and have resorted to measures like converting the uncovered gap into regulatory assets to be converted into cash in due course again by the Regulator. This accounting jugglery results in serious liquidity problems for the distribution companies, particularly when such measures are resorted to repeatedly. This practice has assumed alarming proportions and in some states the total value of the regulatory assets has gone up to totally unacceptable levels. For example, in the States of Tamil Nadu, West Bengal, and Haryana the Regulators have created regulatory assets of Rs. 7905 Crore (2010-11), Rs. 1569 Crore (2010-11) and Rs. 724 Crore (2009-10) respectively. Such practices resorted to in the name of avoiding tariff shocks need to be stopped forthwith. Such shocks, if any, should be the state government’s concern and not of the Regulator who has the statutory duty to enable the distribution utility to recover its full costs as validated by the Regulator after its prudence checks.

**2.7** Some of the actions and inactions of the Regulatory Commissions discussed earlier in this report can be easily attributed to the uncalled for influence exerted by the state government over the Commission. It is being increasingly felt that many State level Regulators have failed to show independence in the discharge of their duties expected of them. Regulators are often more concerned with State Governments’ agenda thereby compromising their statutory functions. Irregular determination of Tariffs, leaving uncovered revenue gaps, camouflaging the same through measures like creation of regulatory assets and laying down unrealistic efficiency improvement targets instead of revising tariffs etc are nothing but examples of Regulatory failure to discharge statutory responsibilities. Such dilution in Regulatory performance can be linked to more and more state governments increasingly placing in these positions individuals willing to follow government’s wishes.

**2.7.1** The procedure for selection of the chairman and members of the regulatory commissions is given in the Electricity Act, 2003. For the central electricity regulatory commission the selection committee consist of six members and is headed by Member of Planning Commission in charge of Energy. Some important members of the committee are Chairperson of the Public Enterprises Selection

Board, Secretaries to Government of India in the Ministry/Department of Legal Affairs and Power. The other two members are nominated by the Central Government from amongst heads of Public Financial Institutions and research, technical or management institutions. Against this, the committee for selection of the state regulators, consists of only three members as shown below:

- |  |              |
|--|--------------|
| a) A person who has been a Judge of the High Court                               | -Chairperson |
| b) The Chief Secretary of the concerned State                                    | -Member      |
| c) The Chairperson of the Authority or the Chairperson of the Central Commission | -Member      |

**2.7.2** To reinstate Regulatory autonomy it is suggested that the selection committee for the State Regulators should be broad based so as to make the selection process fair, objective and independent. To this end it is suggested that the Committee for selecting Chairman and Members of the State Regulatory Commissions should be constituted as given below :-

- |  |   |             |
|--|---|-------------|
| (a) A sitting Judge of the High Court of that State nominated by the Chief Justice | - | Chairperson |
| (b) Chairperson of the Central Electricity Regulatory Commission                   | - | Member      |
| (c) Chairperson of Public Service Commission of another State                      | - | Member      |
| (d) Chief Secretary of concerned State   | - | Member      |

**2.7.3** The present practice of individuals working with the state government or in Power companies being appointed as a member or chairman of the State Regulatory Commission is not conducive to independent functioning of these bodies. Appointment as Chairman / Member of the State Regulatory commission should not seem to be reward for services rendered. The present practice of appointing superannuating bureaucrats or technocrats as Chairman / Member of the Regulatory Commission hampers their independence which is essential to their successful functioning as Regulators as it is often in conflict with their earlier actions. Section 85(5) of the Electricity Act 2003 prohibiting such appointments is ignored even when there is obvious conflict of interest in such appointments. This provision is reproduced below:

*"Before recommending any person for appointment as the Chairperson or other Member of the State Commission, the Selection Committee shall satisfy itself that*

*such person does not have any financial or other interest which is likely to affect prejudicially his functions as such Chairperson or Member, as the case may be."*

It is therefore suggested that a person who has worked during the preceding five years with the state government or any of its undertakings/organizations, should be ineligible for appointment as a member or chairman of the Commission in the same state.

- 2.7.4 Similarly in order to retain, in the true sense, independence in functioning of the state Regulators, any individual who has functioned as a chairman / member of the State Regulatory Commission should be prohibited for a period of 5 years from taking up any employment with any department, undertaking or organization owned or controlled by the state government or a private entity having direct or indirect stake in the power sector.
- 2.7.5 At the present time regulators do not enjoy financial autonomy and there are instances of regulators being influenced by the State Govts. due to lack of financial independence. In order to overcome this problem a system to secure financial autonomy for the regulators has been devised. This is expected to secure financial autonomy for the regulators.
- 2.8 We visualize that the Regulators would meet their annual expenses from the fees and charges leviable by Regulators. At **Annexure - VII** a system for preparation of budget, maintenance of accounts and audit for Regulators is appended with this report. The annexure provides a basis for securing financial autonomy for the Regulator while ensuring full accountability.
- 2.9. In order to be effective in discharge of their functions Regulators have understandably to be independent of other stakeholders. However independence should not be confused with absence of accountability. The Regulatory regime as created by the Electricity Act, 2003 does not seem to secure accountability. Regulator's errors can no doubt be rectified by the appellate tribunal/higher courts through judicial intervention. However if a Regulator fails to discharge its duties or does not discharge them in objective and impartial manner, he cannot be questioned for such lapses. This has resulted in the Regulators being vested with enormous powers without corresponding accountability. Such an arrangement has tempted individuals to exercise powers in a less than fair manner. It is therefore

suggested that there should be an arrangement for periodically evaluating functioning of the State Regulatory Commissions. For this periodic reports may be required to be sent by the regulators on a prescribed proforma. These reports can be useful inputs for carrying out periodic evaluation. If as a result of such evaluations it is found that a particular Regulator has consistently failed to discharge his statutory responsibilities, such failure should also be made a ground for his removal in addition to those listed in Section 90 (2) of the Electricity Act, 2003. However, to maintain Regulator's independence, the central and state governments should not be directly or indirectly involved in any such exercise. In this context the arrangement made for determining accountability of various Central Government departments as per the Results Framework Documents (RFD) could be considered as a possible option. Under this arrangement task force comprising of independent experts of the subject will be constituted and will scrutinize functioning of Regulatory Commissions to determine whether the Commission has been sincere and effective in discharging its functions as laid down in the Act, Rules, Policies and Regulations framed under various provisions of the Act. To make this work independent of the Central / State Government, the same can be organized and undertaken in the Planning Commission. It is suggested that a Committee headed by Member (Energy), Planning Commission and comprising of Chairman, CERC and one non-government functionary (with a suitable background) may discharge the oversight function. If the outcome of such Performance Audit calls for action against any Regulator, suitable reference will be made to the Chairperson of the Electricity Appellate Tribunal who will take further action in accordance with provisions of the Electricity Act, 2003.

**2.9.1** The Electricity Act, 2003 already lays down a procedure for removal of the member/ chairman of the State Regulatory Commission. Without changing the procedure, failure or improper discharge of a statutory function should be made an additional ground for removing a delinquent member / chairman. Performance Audit of the Regulator done in accordance with provisions of the preceding para would be the basis for such removal.

## **2.10. Distribution Companies shortcomings**

**2.10.1** Apart from the Regulators the distribution utilities must share major responsibility for their current financial mess. Most of them do not give due importance or seriousness to the regulatory issues. This results in non or delayed submission of

tariff proposals, submission of incomplete proposals without proper supporting data and similar other lapses. Instead of logically explaining and convincing the Regulator the rationale or legitimacy of their claims, many distribution utilities tend to be non serious about the Tariff exercise and then rush to state Governments/Courts resulting in further delays in resolving the disputed issues and avoidable waste of time and money. This tendency is more pronounced in government owned utilities and is detrimental to their own long term interests.

**2.10.2** To avoid this, Regulatory issues, particularly the requirements and directions spelt out by the Regulator, need to be appreciated given serious consideration by companies' top management instead of knee jerk reactions and regulator bashing which is easiest to do as it needs no major effort or sacrifices from the licensee. Company's lapses in this regard result in direct revenue loss to it, yet their boards rarely oversee or deliberate upon them. It is suggested that the Board of Directors of distribution utilities whether owned by Government or privately should invariably monitor compliance of directions issued by the Regulator as failure in this regard is detrimental to the utility's own interests.

**2.10.3** The distribution utilities need to realize that the regulatory mechanism has been created under law and is there to stay and simply cannot be wished away. Irresponsible or flippant approach to regulatory issues is self defeating and can in the long run cause serious damage to the utility itself. Distribution utilities' managements need to reorient their present attitudes and create requisite environment for this. They also need to create mechanisms to present their claims before the Regulator in manner and form which are convincing.

## **2.11 State Governments' Role**

**2.11.1** The agenda for reform of the electricity sector envisages a pivotal role for the state governments. The prevailing situation in most of the states suggests that many of the state governments have actually thwarted functioning of the regulatory mechanism which in turn has contributed substantially to the present mess. Some such actions/inactions on part of state governments are listed below:

**2.11.2** One primary reason for the distribution utilities not submitting their tariff proposals in time or in acceptable form is the state governments' political sensitivity to any proposed increase in tariffs. Since most of the distribution utilities are owned and



controlled by State Governments, they are unable to overlook state governments concerns. Such delays result in the retail tariffs remaining unrevised for years together resulting in heavy revenue shortfalls for the distribution utilities.

- 2.11.3** Some state governments have issued directions to the Regulator under section 108 of the Electricity Act requiring that the retail tariffs for all distribution licensees functioning in the state should be uniform. The Regulator's option is to fix tariffs for all such utilities based on either the most efficient one or the least efficient one. If the regulator chooses to adopt the most efficient utility's standards, other utilities face the risk of not recovering their validated expenses. If the Regulator goes by the standards of the least efficient utility, excess revenue accrues to the better run utilities but at the cost of their consumers.
- 2.11.4** Some state governments have used their powers under section 108 to direct the Regulator to reserve the cheapest available power for specified category of consumers while fixing tariffs. This too distorts the tariff determination exercise and results in increasing the incidence of cross subsidy instead of reducing it.
- 2.11.5** One State Government recently prevented the regulator from issuing the tariff order by giving directions U/S 108 of the Act. The State Government's actions in this regard have dragged the whole issue to courts and in turn tariff revision was delayed resulting in avoidable confusion and problems.
- 2.11.6** Using their somewhat loosely defined powers under section 108 of the Electricity Act, 2003, the state governments driven by their own agenda, have in various ways curbed or negated functioning of the Regulatory bodies that they have themselves established. This tendency is dealt with some details by two recent orders passed by the Appellate Tribunal/ High Court. Highlights of these orders are at **Annexures VIII & IX**. Based on such interpretation and the orders passed by various High Courts and Appellate Tribunal, Government of India may draw up and Issue detailed guidelines for use of this particular Section.
- 2.11.7** While paying lip service to the importance and need for preventing power thefts and reducing T&D losses, most of the state governments have not taken any effective steps in this direction. As stated earlier for any effective action in this area the distribution utility needs full and sustained support of the state governments and the local administration. Providing such support has a political cost, which the state governments shy away from.

**2.11.8** The Planning Commission can usefully monitor whether the State Government as well as government owned / controlled utilities have been making adequate and sincere efforts for reforming the power sector or have they just been paying lip services to these issues only to become eligible for grant of funds. For this the annual plan discussion can be a useful forum. Power sector reforms in general and functioning and effectiveness of the State Regulatory Commissions in particular should be assigned adequate attention.

## CHAPTER- III

### 3.0 ToR (d): “Assess system improvement measures accomplished in distribution of power, in particular, in urban areas as well as future needs / plans”.

For the financial year ending 2011 the power sector, all sources, generated about 800 billion units of electricity. The category wise sale of energy was as follows :-

**Table – I** (MUs)

Domestic	131383
Commercial	44432
Agriculture	123724
Industry	181168
Railway	10064
Inter-state	12697
Others	43733
<b>Total</b>	<b>547202</b>
<b>Ex-Bus (Generation Plant)</b>	<b>788355</b>
Not Sold	241153
T&D Losses	30.59%

3.1 Of this system losses were 30% and the balance was available for billing etc. Since 12% of the power is distributed by the private sector we may deduce the pattern as described below.

**Table – II** In (%)

(a)	Total distribution	100
(b)	Of which by private sector	12
(c)	Estimated consumption by the agriculture sector	20
(d)	Estimated consumption in about 1400 towns covered by the R-APDRP scheme	40
(e)	Non-agriculture consumption outside the Municipal limits of R-APDRP towns, and villages etc.	28

**3.2** A few comments would be in order. First, energy and peak deficit during 2010-11 was as follows :

- Sale of energy 547 BUs against ex-bus availability of 788 BUs.
- Energy shortage of more than 73 Bus @ 8.5%.
- Peak shortage of 9.8%, gap of 12,000 MW.
- Country wide high T & D Losses of 31%.
- Peaking shortage may drive to build the capacities which would warrant backing down in non peaking slots.
- Efficient grid management would contribute in controlling T & D Losses and peak shortage.

**3.2.1** Second, it may be pointed out that after 2003 electricity board functions were mandated to be separated between generation, transmission and distribution. This process is complete except in the case of Bihar, Jharkhand and Kerala. However, the separation is in form and not in substance. The management of all three separated companies is virtually the same. The revenue collection and financing are common except accounts which are legally presented separately, it cannot be said that the management of the three are un-connected. In fact they are connected to the extent that all the efficiencies / inefficiencies of generation and transmission are eventually subsumed in the performance of the distribution company. If for example, coal is purchased at an expensive rate or an obsolete plant is operated because the generation company is oblivious of the fortune's of the distribution company the latter can do very little about it. So long as common ownership continues this will be the case. However, in ensuring the viability of the Discoms we would in fact be ensuring that of the entire sector.

**3.2.2** Third, it is our estimate that a substantial part of the consumption under (e) of the Table - II is in the peripheral areas of R-APDRP towns but outside the Municipal limits and therefore technically not covered by the manner in which R-APDRP is defined at present. We deal with this issue more extensively while reviewing the R-APDRP scheme.

**3.2.3** Fourth, agriculture consumption is an estimate and the extent of consumption depends on the authority who is making the estimates. Our enquiry shows that it is considerably over-stated and we deal with the extent of over-statement as well as remedial action in reviewing the Rajiv Gandhi Gramin Vidyutikaran Yojna

(RGGVY) because electricity consumption in the rural areas has to be addressed comprehensively, agriculture and domestic including non-agriculture.

### **3.3 Restructured –Accelerated Power Development and Reform Programme (R-APDRP ) Scheme**

**3.3.1** As a part of our response to the Terms of Reference the R-APDRP Scheme was reviewed by a team of experts led by Shri R.K. Narayan, Ex-CMD, PGCIL and UPPCL and was supported by S/Shri A Velayutham, Ex-Member, MERC, A.K. Pradhan, Ex-Director, PVVNL (U.P.) and M.K. Gupta, Ex-Member, DVB. The report prepared by them is appended with this report as **Annexure - X**. Some of the major features of the report are discussed in the succeeding paragraphs.

**3.3.2** The report was prepared on the basis of visits to all the States which account for 91% of power consumption. In addition, Meghalaya, Assam etc. were also visited to understand issues unique to the North-East. It would be recalled that the R-APDRP Scheme was reformulated for the present plan period with the specific objective of reducing distribution losses covering 1400 towns and including all towns with a population of more than 30,000 (census 2001). The limitations of the earlier scheme were sought to be addressed. The purpose of the study undertaken by Shri R.K. Narayan and his team was to evaluate the extent to which the R-APDRP has succeeded in addressing its objectives and further what is the way forward for the next plan period commencing 1<sup>st</sup> April 2012. It is this last objective which was most significant for deliberations of the High Level Panel and for Shri Narayan and his team. Our attempt is in no way to confute either the scheme or the efforts made by PFC as the implementation agency rather to describe the way forward.

**3.3.3** As mentioned above areas peripheral to 1400 towns covered under the R-APDRP account for a substantial part of electricity consumption presently classified under (e) in Table - II at the commencement this chapter. In our view the technical definition of R-APDRP should be relaxed and all areas peripheral to R-APDRP towns, part of contiguous urban habitation etc. ought to be covered under the R-APDRP scheme. In essence except agriculture consumption all consumers should be covered under the R-APDRP scheme irrespective of the Municipal limits which presently define R-APDRP areas. This is unlikely to have any substantial financial

implication because the systems being devised for the R-APDRP areas can be conveniently extended to contiguous areas.

**3.3.4** An important issue which has emerged in reviewing the scheme is of sequencing. While the R-APDRP Scheme is comprehensive and addresses all the issues which ought to be addressed the time taken in addressing the preliminary issues is so long that very little capital expenditure, the key basis for reducing losses, has taken place. Our review of PFC data shows a disbursement of just Rs. 3500 Crore for period ending March 2010. Most of this has been expended on Part (A) of the R-APDRP Scheme. This part has the following components :

- Establishment of IT enabled system for achieving reliable and verifiable base line data system in all towns with population greater than 30,000 as per 2001 census (10,000 for special category states).
- Installation of SCADA / DMS for towns with population greater than 4 lacs and annual input energy greater than 350 MUs.

**3.3.5** The progress under these heads has been at best modest. Computerization which is a key issue has not seriously commenced in particular with the object of integrating operational, commercial and financial data in a single system. While on the subject of computerization, it need also to be noted that there is no logical delineation between what is regarded as the key functions to be performed by the Distribution Utilities and what can be outsourced. In the cases reviewed by us outsourcing had led to virtual abdication of authority by the Distribution Utilities and there seems to be loss of control over vital operational and commercial data. A problem which ought to be addressed is what functions can be outsourced and by that token all the remaining functions belong to the Distribution Utilities, must be performed by them. In case trained man power is not available those requirements ought to be immediately met.

**3.3.6** Not surprisingly while installation of meters at 33 KV sub-station and 11 KV feeders emanating from these sub-stations has taken place as it was part of the earlier APDRP scheme, reading of such meters which can lead to an accurate assessment of losses in that area is not being done on a systematic basis. The reliance continues to be on manual skills with a very high scope for human error. Consequently, while there is an aggregate estimate, dis-aggregation of feeder-wise losses is not attempted. Some States, without waiting for a more

sophisticated systems envisaged under Part (A) are beginning to use the data and not surprisingly they show lower technical losses as well as improvement in commercial losses.

**3.3.7** Under the R-APDRP system it is envisaged that there would be a distinct number for the 33 KV sub-station. Further for each feeder emanating from sub-station a new number would be given. Thereafter for each distribution transformer, 11/4 KV (DT) a number will be assigned. Finally the consumer will also be assigned a distinct number which will capture all the numerical information from 33 KV sub-station to distribution transformer. Thus a numbering code at four levels is required to be implemented. At present at three levels the work has taken place i.e. the sub-station, the feeder and the consumer. What is delayed is the metering and numbering of DT. The assessment of the technical group is that to assess losses it is not necessary to wait for the metering of DT transformers. Energy accounting, auditing and accountability should immediately commence on the basis of the sub-station, the feeder and unique consumer number. Since this part of the APDRP / R-APDRP is virtually complete in all states the next step described above should immediately commence. The basis for preparation of bills leaves much to be desired and it is the case that the billing information is substantially in variance with ground realities. This discussion is an example of how the issue of sequencing is holding up the progress towards the main objective of reduction in distribution losses by non-introduction of energy accounting and audit. No doubt some states have done well but the aggregate figure for loss reduction is a modest number below 1% for the financial year ending 2009-10. With this kind of progress the aggregate reduction during the plan period would be meaningless from the point of view of the objective set for the plan period. In other words, for the current plan which will end in a few months there will be a very serious under-performance in relation to loss reduction in the distribution sector. Not surprisingly the losses continue to mount, subsidies have increased and there are significant commercial losses in a number of States besides technical losses. In dealing with the financial statements the commercial losses have been estimated and it is assumed that these losses will disappear from the fourth year of the next plan. However, even to achieve this would require a number of measures.

**3.3.8** It is moot whether given the current situation Distribution Utilities would be able to accomplish the objective. Loss reduction requires managerial efficiency, substantial capital expenditure and expeditious actions on both these fronts. It

would defy credibility if we were to suggest that this is possible with certain changes in the R-APDRP scheme in particular in sequencing. The execution of the scheme by public sector Distribution Utilities will not lead to the kind of loss reduction which must be made in order that the distribution sector becomes viable at least by the end of next plan period. To accomplish that it is essential that private sector is systematically asked to play a part. The study of the technical group has found that the in-put based Franchisee system is the right method, if we may say so the only method, for expeditious loss reduction in the distribution sector. This system is discussed in the succeeding paragraphs.

### **3.4 In-put based Franchise Model**

**3.4.1** It would be recalled that the ToR explicitly required the HLP to consider measures for reduction of losses. An issue before the HLP was the relationship between ownership and losses. In other words does the nature of ownership influence losses?

**3.4.2** In order to address this question HLP commissioned CRISIL Infrastructure Advisory (CRIS) to undertake a study of different models of ownership including Govt., Public Private, Private and Franchisee. The study is appended with this Report as **Annexure - VI**. The study looked at the following companies/undertakings:

- Jaipur Vidyut Vitran Nigam Ltd. - Public Ownership
- BSES Ltd., Mumbai - Private ownership
- NDPL, Delhi - Public Private Partnership (PPP)
- MSEDCL - Bhiwandi Franchise Model (Torrent Power)

The Committee also examined the Orissa Model of privatization, with the help of Shri D.K. Roy, former Chairman, OERC. Orissa was the first State to go for privatization of the existing SEB after unbundling and disaggregating it into four distribution companies. This exercise was done with technical assistance from the World Bank and other experts. Notwithstanding the same, the Orissa experiment has had problems right from the beginning. Of the four distribution companies privatized, one was subsequently abandoned and the Regulator has had to appoint an administrator for its functioning. The other three companies are



also having serious problems and the Regulator has given them notices for cancellation of their licenses.

There could be a number of factors contributing to the present state of affairs. However, our study reveals some fundamental weaknesses in the approach adopted in this model. These are :

- Unreliable and infirm financial and other information available with the erstwhile SEB resulted in presenting to interested investors a picture which was far removed from reality. This in turn resulted in the private licenses going seriously wrong in their projections and calculations.
- In absence of reliable information on assets, they were transferred neither on the basis of their book value nor on their market value. Instead the assets were given a value equal to the SEBs liabilities to the State Govt. who in turn vested the same primarily by way of equity in the new companies.

Non-remunerative nature of the rural distribution and supply business was overlooked without any clear arrangement for future capex in the rural distribution network. This issue was precipitated when soon after privatization the State was hit by a major cyclone resulting in severe damage to the distribution network. For the private license capex in restoration of non-remunerative rural distribution network was not a priority. This in turn caused considerable inconvenience and suffering to rural consumers.

**3.4.3** We now discuss results of CRISIL study based on performance for the last 5 years. The study found that private ownership was superior both to public ownership and to public private ownership. Within private ownership there were two models namely Privatization and second Franchise. Alongwith the study HLP also benefited from a presentation made to it by NDPL which has been operational in Delhi for about 9 years. As a result of our discussions and the study the following factors emerged :

- (a) In terms of reduction of system losses the performance of both PPP (Delhi Model) and Franchisee (Bhiwandi) the results were dramatic and comparable. These were obtained not only by better management practices; better surveillance etc. but also by providing superior services to customers.

The Maharashtra experience besides information captured in the study is summarized in the following table :

S.No.	Franchisee	Gains
1.	Bhiwandi (date of handover 26 <sup>th</sup> Jan., 2007)	<ul style="list-style-type: none"> <li>• Reduction in AT&amp;C losses from 58% to 18%.</li> <li>• Improvement in collection efficiency from 68% to 100%.</li> <li>• Reduction in Distribution Transformer failure rate from 40% to 2.25%.</li> <li>• Financial gains to Discom during first three years of operation Rs. 419 Crores besides saving of Rs. 30 Crores per year on human resource and O&amp;M costs.</li> </ul>
2.	Nagpur (Date of handover 1 <sup>st</sup> May 2011)	<ul style="list-style-type: none"> <li>• Discom to receive contracted minimum amount of Rs. 5350 Crores for 15 years period against bench mark of Rs. 4675 Crores fixed by it.</li> <li>• The bench mark rate fixed by Discom assumes a very aggressive loss reduction trajectory.</li> <li>• Gain of Rs. 675 Crores of NPV over the amount expected by Discom.</li> <li>• Discom would save approx. Rs. 1920 Crores towards HR and O&amp;M costs.</li> </ul>
3.	Aurangabad	<ul style="list-style-type: none"> <li>• Bench mark tender rates fixed very aggressively at Rs. 6946 Crores at NPV over 15 years.</li> <li>• Highest bidder quoted Rs. 7246 Crores to Discom.</li> <li>• Gain of Rs. 300 Crores of NPV over the amount expected by Discom.</li> <li>• Discom would also save Rs. 1458 Crores on HR and O&amp;M costs.</li> </ul>
4.	Jalgaon	<ul style="list-style-type: none"> <li>• Bench mark tender rates fixed very aggressively at Rs. 2614 Crores at NPV over 15 years.</li> <li>• Highest bidder quoted Rs. 2902 Crores to Discom.</li> <li>• Gain of Rs. 288 Crores of NPV over the amount expected by Discom.</li> <li>• Discom would also save Rs. 364 Crores on HR and O&amp;M costs.</li> </ul>

(Source : Information provided by MSEDCL).

- (b) The theory seems to be that a satisfied customer is a paying customer. Customer satisfaction depended on quality of power supplied, regularity of power supplied and redressal of customer grievances. These could be accomplished by undertaking large capital expenditure. NDPL has achieved success in a difficult area greatly by substantial capital expenditure. In the case of Bhiwandi there was provision for licensee for minimum capital expenditure plan of around Rs. 12 Crores. per annum for first five years for franchise area. However, Torrent Power, the Franchisee has invested approximately Rs. 500 Crores in a period of 5 years and according to the Company capex has been the key factor in loss reduction besides better management and operational practices. In fact capex and operational and management practices are so interconnected that it is not possible to think of one without the other. By itself capex is not useful and without capex operational efficiency cannot be improved. It would be noticed that even with a modest contractual obligation the franchisee premised his strategy on undertaking very large capital investment.
- (c) There are several advantages which a franchisee model enjoys over other ownership model. Firstly, the competitive process in a PPP model is not as rigorous as ought to be. There are a limited number of parties with the necessary financial muscle to meet the pre-qualification criteria and with limited competition, the rigors of competitive bidding are also limited. On the other hand the franchise model is based on competitive bidding, open to not only to those who have worked in the power sector but also others who have experience of infrastructure and service industry and therefore, far more transparent. It is our understanding, the companies that have successfully introduced the technological inputs for the power sector would have the advantage in such a bidding process.
- (d) In the private ownership and PPP model the Licensee is required to enumerate the distribution assets in the relevant area, to value the assets and for the new owner to pay for these assets. Hence for commencing operations an elaborate exercise is undertaken which is at best an estimation because Discoms have very little idea of their fixed assets. Our discussion in dealing with finance and accounts emphasizes the dismal state of accounts and information about assets available with Discoms. The situation in Delhi was no better and NDPL mentioned to us that they are still discovering assets owned in the area of

operation which were neither enumerated nor paid for at the time of transfer of ownership. Hence a big handicap in private ownership model is the enumeration of distribution assets in the relevant area. Further, Discoms assets particularly Sub-Station, Land and Building are located in prime area of Town / Cities and their valuation is not only very high but is also extremely difficult to quantify. This could lead to subjectivity in valuation. A connected issue is the fact that the new owner has to put down a substantial sum of money for assets of extremely doubtful quality without having earned a rupee. Rather in transfer of ownership it is only companies with deep pockets who can come forward to bid. It would be recalled that in case of Delhi the three companies who happened be in the distribution sector came forward i.e. Reliance, Tatas and CESC. It is relevant to point out that Delhi Govt. provided financial support of over Rs. 3,400 Crore in the first five years since it was only after that period that the Discom was expected to achieve financial viability. Delhi Govt. was in a position to infuse this large amount of cash which no other State Govt. is in a position to do. Thus in case of public private ownership or privatization the financial liability of the Govt. continues for a considerable period of time while in case of the franchisee model Govt.'s financial liability becomes zero from day one of the agreement.

- (e) In the franchise model the Franchisee is not expected to pay anything upfront because the model envisages that he works as an agent of the Licensee. The franchisee being an agent of the Licensee gets to use all the assets and nothing more. What the agreement does provide for is that every financial year the capex undertaken by him would be jointly verified by the Licensee and the franchisee under regulatory supervision and approval. On the basis of verification a proper financial statement of capex undertaken would be drawn up and audited. Hence for every year of the franchise agreement there would be a objective record of improvement made to the distribution system by the franchisee at his cost. This capital expenditure would also be subject to approval of the Regulator. At the end of the franchise period the licensee would take over the assets created by the franchisee at the written down value. This kind of provision is quite standard in all property transactions i.e. the improvements made by a lessee on property leased to him become his entitlement on the return of property to the lessor.

- (f) The other important point of difference between private ownership plus PPP and franchisee is that the former depend on periodic increase in tariff, in particular to be able to recover his capital expenditure. Like any other supplier he approaches the tariff regulator for fixation of tariff and after costs have been tried they become the basis of fixation of tariff. The model wherein every private operator independently approaches the Regulator for tariff fixation will lead to multiple tariff in the states. This situation of multiple power tariffs would make governance difficult for the state government. Our discussion on the Regulator shows that this is always a complicated exercise, not always timely and leads to huge tensions in the supply area as is self evident from the experience of Delhi. On the other hand the franchisee model is not based on periodic revision of tariff. Franchisee is not expected to amortize his capex through a higher charge on the customers. The gains of increase in tariff belong, in the main, to the licensee. Therefore for a long period of 15 years the entire issue of tariff becomes largely academic in the franchisee area. It bears repetition that during this time tariff does increase but the gain of increase in tariff belongs mostly to the (75%) licensee. Alternatively if the licensee is able to contain his average costs of supply within that number it is a net gainer besides gaining from increase in paying customers.

**3.4.4** In case of Agra, not part of the study and recently franchised (April 2010) it was found that on a base of 2.73 lakh customers 15,000 customers were non-existent. After removing non-existent customers on a base of 2.58 lakh customers the addition in the first year was 24,000 customers or 10%. In a four years period in Bhiwandi the number of paying customers have gone by 1.25 lakh after excluding 39,000 non-paying customers at the commencement of the four years period. The Bhiwandi has seen an increase in customer base of over 12% and increase in units consumed by over 6%. It should be added that collection is 100% in Bhiwandi and there are no arrears of amount billed. The increase in no. of paying customers while being crucial to the franchisee is also substantially beneficial to the licensee.

**3.4.5** Our conclusion thus is that the franchisee model enjoys some significant advantages over the private ownership model. In subsequent paragraphs we have also discussed the advantages of franchise model over the PPP model. At this stage we may only note that even in the PPP model success would be predicated on periodic and adequate increase in tariff and substantial capex to reduce losses.

Considering the constraint resource position of Govt. where this money would be found remains in contention.

(a) One of the issues to be addressed while recommending this model is whether this arrangement can continue in perpetuity or is it an interim arrangement.

- It must be emphasized that during the period of franchise (say 15 years) tariff increases for the State, including for the franchised area will take place. However, the franchise model assigns modest additional income to the franchisee. His gains are almost entirely from reduction of T&D losses, addition to number of paying customers, etc.
- In this context let us take a hypothetical example, the main features of which for the franchisee area are given below :
  - (a) Weighted average tariff - Rs. 4 / unit
  - (b) Average realization - Rs. 3 / unit
  - (c) Average payment to the licensee -Rs. 3.20 / unit
- The one Rupee gap between the average tariff and average realization is on account of both controllable and non-controllable factors. The Franchise is expected to cover this gap to the maximum possible extent through better managerial practices and improvement and up gradation of the network. Up gradation of the network is also required for improving the quality of service to consumers.
- This requires substantial capex to be done particularly in the initial years. The cost of such capital investments devolves on the Franchisee by way of interest and depreciation. Assuming for simplicity their rates to be 10% each, capex of Rs. 500 Crore results in annual cost of Rs. 100 Crore to the Franchise, which is not insignificant.
- In the franchise model the successful bidder is expected to progressively narrow the gap between Rs. 4/- (average tariff) and the present average realisation to licensee. The difference between what he is able to realize and what he pays to the licensee is his income. This would be clear from the following illustration :-

(All values in Rs/kwh)

Year	Tariff	Realisation by Franchisee	Payment to Licensee	Franchisee's Revenue
1st	4	3.00	3.00	0.00
2nd	4	3.10	3.05	0.05
3rd	4	3.20	3.10	0.10
4th	4	3.40	3.20	0.20
5th	4	3.60	3.30	0.30

(b) During the initial period of the franchise the assumption is that the additional revenue for covering of costs in particular the capex will be realized through efficiency gains and on that assumption the successful bidder has bid for the franchise. Tariff increases during the period of the franchise would benefit the Licensee and not the Franchisee because as a part of the franchise agreement around 75% of the increase in tariff is to the account of the Licensee and only a portion of the remaining 25% becomes available to the Franchisee. This would be clear from the following illustration :

(Rs. / Kwh)

Year	Payment to Licensee as per agreement	Revised Avg. tariff	Payment to the Licensee considering revised tariff	% of increase in tariff passed on to Licensee
1st	3.00	4.00	3.00	75
2 <sup>nd</sup>	3.00	4.50	3.375	75
3 <sup>rd</sup>	3.00	5.00	3.75	75
4 <sup>th</sup>	3.00	5.50	4.125	75
5 <sup>th</sup>	3.00	6.00	4.50	75

(On a different set of numbers the percentage of gain may change, but will remain modest.)

In other words, the Franchisee cannot and does not rely on periodic tariff increases to service the additional revenue requirements for the large capex which he is obligated to make in order to succeed. These calculations are made for the period of the franchise hence it would be legitimate to assume that towards the end of the franchise period it may not be possible for the Franchisee to meet any additional requirements from gains in efficiency commercial / technical. A

consequence of this would be that towards the end of the franchise period say from 12th or 13th year onwards the Franchisee would be reluctant to make any capital investments even though in the distribution sector such investments are regularly and periodically required. This discussion would suggest that for the Franchisee Model to become widely popular there would need to be a sense of continuity even after the period of the franchise so that technical improvements through capex, proper maintenance of assets, etc. can take place seamlessly up to the end of the franchise period and beyond. Our view is that this can be accomplished by providing in the initial bid document an option for the Franchisee to obtain towards the end of the franchise period a second license for supply of electricity to consumers in the erstwhile franchise area. Once he becomes a holder of the license his capex would count for increase in tariff as in the same manner as capex undertaken by the Distribution Utility and in future he would legitimately be able to service cost of capex by increased revenue collection through increase in tariff.

- (c) Grant of a license to the Franchisee within the area of operation of the existing Licensee is permissible under different provisions of Electricity Act 2003 discussed below :
- (i) Sixth proviso of section 14 envisages grant of a License to more than 1 Licensee over the same area for sale of electricity but through their own distribution systems. Since the existing network of the Licensee would stand substantially upgraded / totally replaced or scrapped by the end of the Franchisee period, *de-jure* transfer of its ownership from the existing Licensee to the Franchisee at the end of the Franchisee period could enable the Franchisee to obtain a license. There could however be a theoretical obstacle as this area will also continue to be part of the original licensee's area with corresponding obligations to supply electricity to any consumer in the Franchisee area demanding the original Licensee to do so.
  - (ii) Section 18 of the Act envisages amendments in the license given to the original Licensee. Under this provision the area of operation of the Franchisee could be taken out of the original Licensee's area and license for the same can be given to the Franchisee. Such amendment can be done on request of the Licensee or otherwise. If such an arrangement is stipulated in the original agreement between the Licensee and the Franchisee and Regulatory approval obtained, there should be no legal or operational difficulty in implementing this arrangement.



A Franchisee morphing into a Licensee for its area at the end of the Franchise period has the advantage of introducing continuity in its status and empowering it to approach the Regulator for recovery of all its costs including the capital expenditure cost. Award of initial franchisee with option of securing a license prior to end of franchise period would encourage serious long term entrepreneurs to participate in the franchise process.

(d) Continuity of tenure can also be achieved by stipulating automatic renewal of the franchise subject to the licensee having met fully its financial commitments. However the issue of non recovery of its costs will still remain and could slowdown investments in the distribution network.

**3.4.6** It should be noted that for the franchisee model to succeed, for that matter for any alternative to succeed, the complete support of the local administration plus the local bodies in the relevant area would be crucial and this should be an assurance to be provided jointly by the State Government, Licensee and the local bodies.

**3.4.7** We also had benefit of report of Sub-Group on Public Private Partnership (PPP) in the distribution of electricity prepared in October 2011. The Report (para 2.3) states "neither privatization (Delhi model) nor Franchisee model would deliver the desired outcomes, but a well formulated PPP model could be the way forward". The Report goes on to state (para 2.9) "It was felt that the PPP framework would be in consonance with the Electricity Act and would also obviate the shortcomings of the Franchise model" and finally (para 3.1), "After detailed deliberations the Sub-Group felt that Public Private Partnership in the distribution of the electricity was clearly the way forward."

**3.4.8** It may be pointed out that Delhi, described as a privatization model is in fact a PPP model in as much as the GNCTD continues to hold 49% shares in the Discoms and CRIS study has considered it as a PPP Model. The CRIS report is annexed with this Report as **Annexure – VI**. There is sufficient experience of the success of the Franchise Model and its legality has been tested in the Courts of Law. It is also not correct to state that the Franchisee is not accountable to the Regulator since the Franchisee is an agent of the Licensee who continues to be accountable to the Regulator. The experience of capital outlays has been extremely positive and the current awards contain specific commitments by the Franchisee as to

capital expenditure. The operational experience in Bhiwandi confirms improvements in quality and availability of power. The selection of the Franchisee is by transparent competition and none of these models are competent to address the larger issue of Open Access. In addition the following factors are significant :

- (a) In the PPP model the operator will seek and secure separate periodic tariff increases and these are likely to become contentious; witness the ongoing debate in Delhi. On the other hand the franchise model as operating in Maharashtra, the Franchisee is not entitled to seek tariff increase and when tariff increase takes place for the entire State the resulting additions to him is not more than 25%. In other words, for a period of 15 years the service provider is not in a position to raise any issue about tariff. The other disadvantage of PPP model is that it would bring in different tariffs for different areas of the state. Multiple tariff structure in one state is not desirable and would lead to huge administrative and political problems for the state government.
- (b) In Franchise Model the tariff is not the way forward for Franchisee as gains must come and have come from technical and operational improvements through regular and substantial capex hence, in this system technical efficiency is in-built and no contractual provision is required.
- (c) The supply of bulk power continues as before in Franchise Model while in the PPP model a completely new arrangement is envisaged.
- (d) It is our understanding that the investors from the Private Equity are likely to be attracted by the Franchisee Model in view of its operational freedom and virtually no initial capital outlay.

**3.4.8** The franchise model has also dealt successfully with State utility's employees. A significant percentage are engaged by the Franchisee and the others are accommodated by Distribution Utilities and thus on the account of employees there is no problem even in difficult circumstances e.g. Agra.

**3.4.9** For all these reasons we believe that the Franchise system, tried in Maharashtra and accepted by some other States, capable of being implemented on small scale is the way forward.

**3.4.10** It would not be out of place to mention that the Forum of Regulators (FoR) under the aegis of Act considered the input based Franchisee model, recognized as

legally permissible and has prepared a model set of documents for implementing this model. This work was undertaken with the participation of all the stake-holder including the private sector, State Regulators, State Discoms, etc.

**3.4.11** The technical group has estimated that 255 towns (**Annexure -XI**) from amongst the towns covered under R-APDRP account for about 22% of the 40% energy consumption attributable to the 1400 towns. If a proportionate addition is made from the 28% power consumed mentioned in (e) of Table – II at the commencement of this chapter this figure may be as high as 35 to 40%. In other words energy consumption of 40% recognized as part of the R-APDRP towns and 28% others have to be taken together and then apportioned between 255 cities identified by the technical group and the rest. On that basis our estimate is that consumption in these cities would be approximately 40%. And it would be possible, given the experience in Bhiwandi, Maharashtra in the Franchise areas to bring down losses in a short period of three to four years from the present levels to around 18%. This strategy is crucial to radical loss reduction essential for solvency of power sector atleast by the end of the next Plan.

**3.4.12** The Franchisee Model envisages carving out urban areas with a demand of atleast about 400 MW and a consumer base of over 1,00,000 consumers with energy consumption of atleast 2,000 MUs per annum. Uttar Pradesh has franchised the distribution of power in Agra effective, April 2010 and the results have been very positive. The operational issues of adjacent rural areas can be separately addressed and conceivably through the same methodology as soon as more systematic information is provided through the progress of the R-APDRP scheme.

### **3.5 Public Sector Discoms**

**3.5.1** Certain public sector Discoms have periodically performed well. Unfortunately their continued well being has been intimately connected with the political will. With political changes their fortune have taken wild swings. As mentioned earlier, a number of changes including emphasis has to be adhered to in implementation of the R-APDRP programme. Some of the key issues are described in the succeeding paragraphs.

- (a) We have mentioned the adverse effects of outsourcing and this is particularly true where storage of energy consumption data as well as energy billing has been outsourced. Energy consumption data should at all times be generated

and retained by the Distribution Utilities. What can be outsourced is Revenue Collection Management (RCM) system. The details of this can be seen in the report of the technical group appended as **Annexure – X**.

- (b) The technical group has also emphasized the whole system of replacement of existing electro-mechanical meters with electronic meters. The positive outcome in places where this has been done is dramatic. As per the Electricity Act all consumers including consumers whose connections are for agriculture pump sets have to be metered. This aspect is separately discussed under RGGVY.
- (c) We have already discussed the energy accounting envisaged in the 33 KV sub-station and we do not need to re-emphasize that point which is discussed in considerable detail in the report appended as **Annexure – X**.

### 3.6 Rajiv Gandhi Gramin Vidyuthikaran Yojna (RGGVY)

#### 3.6.1 Agriculture consumption

Since agriculture consumption accounts for most of the energy consumed in truly rural areas, we deal with it first. Agriculture consumption is an estimate furnished by the State Govts. to the Central Electricity Authority. On that basis on an All India level CEA estimates agriculture consumption to be 20% displayed at Item (c) Table – II at the commencement of this chapter. However, there are a number of variations. The First variation is on account of the differing geological conditions, geographical conditions and other differences between the States. Unfortunately data of agriculture consumption between the States is asymmetric. Those states where the water tables was at a much lower depth, where the water tables have fallen and where the cropping intensity is high display much lower per pump consumption of energy than other States. The most glaring comparison is between the Jammu & Kashmir which claims to consume nearly 28,000 units per pump set and Tamil Nadu where the comparable figure is approx. 5,300 units per pump set. It also relevant that in J&K, AT&C losses are 69% versus about 15% in Tamil Nadu. Likewise Rajasthan consumes nearly 11,000 units per pump set as against Madhya Pradesh where the consumption 4,600 units. The table at **Annexure – XII** displays the relevant information. It would be apparent that agriculture consumption estimates are over-stated and that some of the losses otherwise attributable to AT&C are classified as agriculture consumption.

- 3.6.2** It is also the case that since agriculture consumption is virtually free there is hardly any incentive for the pump set owner/ operator to install either any energy efficient pump or to maintain the pump properly in order to conserve energy/ water. It is estimated that efficient pump sets can save atleast 15-25% of current cost. Proper suction pipes and foot valves can save another 5 to 15% and like wise more efficient irrigation methods saves another 15 to 25 %. The total savings on this account can be between 35 to 65%. This data is based on pilot studies conducted by USAID in Karnataka and Maharashtra. It is essential that outcome of the study should be carried forward and a incentive scheme for implementation of these savings devised and states which show high agriculture consumption for instance Gujarat should be encouraged to undertake the efforts taken under the pilot project in Karnataka and Maharashtra. Details of what was achieved are available in technical report annexed as **Annexure – X** with this report.
- 3.6.3** In order to get a grip on agriculture consumption, it is important that new pump sets should be metered. Readings preferably by remote meter reading technology of pump set consumption should be taken. Every agriculture pump-set must be issued a bill at a rate of atleast Re. 0.50 per unit. This would enable physical verification of no. of pump sets. It would also enable verification of consumption per pump sets because bill would have to be issued, payment taken from the consumer for the amount billed. It is not the case that this modest amount would meet the cost of supply but rather this methodology would enable the Distribution Utility as well as the Govt. to accurately arrive at consumption in the agriculture sector. In Maharashtra, where a systematic effort has been made to issue bills on this basis, the per pump set consumption is lower than other States as would be clear from **Annexure – XII**.
- 3.6.4** The State Governments would be enabled by this method to accurately calculate the subsidy payable as the difference between what is billed and collected and what is the cost of the supply. In the system of estimated consumption, as followed at the present time, the State Govts. seem to be subsidizing Distribution Utilities for operational inefficiencies and probably thefts. The revised system would be in the interest of the State Govt. and would force the Distribution Utilities to recognize non-agriculture system losses, the reasons for the same and corrective actions required.

- 3.6.5** In addition to metering which should eventually cover all pump sets, it is also necessary that a separate line designated as the agriculture feeder should be developed in the relevant area. This line would be high voltage, would be energized for no more than 8 hours a day and its operation will be controlled at the more senior level than is presently the case. The non-agriculture rural consumption recommendations are a complimentary feature of this separation which is discussed later in this chapter.
- 3.6.6** We expect that in due course agriculture feeder lines will be separated, all pump sets will be metered and a strong and economical arrangement would be available from the service providers for remote reading of meters installed on all pump sets. It is recommended that the expense of feeder separation should be eligible for financing from REC and the terms of financing should be decided to make it positively attractive for the State Govts. / Distribution Utilities to do so. A pattern of financing is also suggested in the technical report.
- 3.6.7** There are a number of other recommendations connected with technical issues for operational efficiency which are not being described in detail and this report should be seen as a part of the larger work undertaken in this behalf in the technical report appended with this as **Annexure - X**

### **3.7 Villages**

- 3.7.1** At the present time the fortune of domestic consumption in rural areas are intimately connected with supply for pump sets. The result is that supply is both erratic and not of proper quality. We estimate that in time to come the average consumption even in rural households may increase to 300 KWH meaning a load of atleast 1 KW per consumer. The lines etc. under are RGGVY should be laid taking into account this demand. Supply should be for 24X7, even though in our estimate the average consumer may use the connection for no more than 10 hours a day. Those who are not within the BPL category should be treated no differently to urban consumers, their desire for consumer electronics and electrical appliances should be respected and they should by the same token be obligated to pay like any other consumer. The policy change made in 2008 of restructuring rural supply to 8 hours seems to be too intimately connected with what is being attempted for rural pump sets. If the lines are separated as suggested there is no reason why the supply to the domestic sector should be any different.

**3.7.2** There is another important reason for our recommendation. This is not the first time that rural electrification is being attempted; earlier attempts have been successful but has also led to the de-electrification of villages because of lack of ownership and irregular supply. The Distribution Utilities would have little interest to supply electricity 24 x 7 unless they get paid for it. And hence our recommendation that the rural consumer, minus the BPL category, should pay for electricity just the same as any other consumer. Regularity of supply would lead to transfer of assets created under RGGVY largely financed by Gol to the Distribution Utility who for reasons of revenue would have sufficient incentive to maintain the assets. The advantages of regular supply of electricity in rural areas can hardly over-emphasized and the availability of this kind of facility would serve as a dampener to migration. If large sections of the population have to live in rural India the conditions of living must be comparable to what is available in urban areas.

### **3.8 Open Access**

Provision of non discriminatory open access for use in transmission and distribution system is a very significant feature of Electricity Act 2003.

**3.8.1** National Electricity Policy and tariff Policy also lay emphasis on proper implementation of this competitive framework which has the potential of (i) desired market signal (ii) inducing improved service from existing utilities (iii) enabling consumers to get power from any source of their choice (iv) enable / permit captive generation and cogeneration units to freely sell surplus energy available to meet power shortage which most of the state distribution utilities are facing and finally (v) reviewing the marginal cost of generation from high cost generating units/stations.

**3.8.2** CERC had notified open access in inter- state transmission system since 2004. There had been large numbers of transactions involving the generating companies, traders and distribution companies. Most of the State Electricity Regulatory Commissions have also framed regulations for introducing open access above 100 KW in a phased manner in intra state transmission and distribution system. Transmission charges, wheeling charges and surcharge have also been determined by SERCs. However, implementation of open access has

not been encouraging so far. Keeping in view of importance of open access, Forum of Regulators (FOR) constituted a working group for detailed examination of the operational constraint in implementation of open access. The Working Group Report was submitted to the Forum in 2008.

**3.8.3** Government of India and CERC have been laying emphasis not only on introduction of Open Access but also its seamless functioning. Most of the State Regulators have framed regulations governing Open Access for bigger consumers. However, the experience has been that either Open Access has remained only theoretical and has not taken off or has come into operation in a manner prejudicial to legitimate commercial interest of the distribution licensee. This is on account of non or faulty addressal of some related issues like :

- (i) Determination of wheeling and cross subsidy surcharge.
- (ii) Licensee's continued obligation to supply power to a consumer opting for Open Access and recovery of its related costs through levy of additional surcharge.
- (iii) Availability of capacity in the supply network by SLDC.

All the above charges are added on to the basic price at which a consumer wishes to procure power from a third party source. If these charges are unreasonably high the advantage of lower cost, if any, gets lost defeating the very purpose of giving the consumer this choice. At the same time these are real costs incurred by the licensee directly or indirectly and the same need to be recovered by it. These problems have been further compounded by few SERCs like Punjab and Uttrakhand permitting Open Access during off-peak hours when Licensee's own availability is surplus to the requirement and it is forced to scale down its procurement further on account of this Open Access.

**3.8.4** As stated above, Open Access to consumers is an important provision of the Act and indeed a crucial element of the power sector reforms. It is not getting operationalised for a number of reasons referred to above and needs to be put back on rail. It is, therefore, recommended that :

- (i) The most of the SLDCs today are independent only in name and seem to be looking for instructions to the State Utilities or the State Govt. This defeats the very purpose of creating separate SLDCs and creates problems not only in operationlising the schemes like Open Access and also in proper management



of the grid. Technical upgradation of SLDCs has been undertaken by some States but it needs to be done in all States. Further their upgradation has to be done in a manner which would enable these SLDCs to discharge their functions with full compatibility with National Load Dispatch Centre (NLDC) and the concerned regional load dispatch centre (RLDC). Equally important is establishment of utility level LDCs, which is getting lost sight of presently, the focus being limited to installation of SCADA in large cities.

- (ii) The role of SLDCs is such that for them to function effectively they have to be completely autonomous and free of influence of utilities and the State Govts, which is not the case presently. It is suggested that to make SLDCs truly independent they should work under the concerned State Regulator.
- (iii) When a consumer opts to procure power from an Open Access source, the distribution licensee's obligation to supply remains and the consumer has a freedom to take power from the licensee whenever he faces problems from the Open Access source. For this the licensee has to be in readiness both in technical as well commercial terms, which has a substantial cost. It is suggested that this cost should be recoverable by the licensee, that such consumers having to pay the marginal cost of supply instead of average cost. This would enable the Regulator to rationalize the additional surcharge.
- (iv) While permitting Open Access the Regulators should not lose sight of its implications on the Licensee's legitimate interest. Allowing Open Access only during off peak hours is a typical example of hurting the licensee without commensurate benefit to the consumer. The same objective can be achieved by the Regulator introducing and rationalizing the time of the day tariff for the distribution licensee itself.

MoP has recently issued a circular (No. 23/1/2008-R&R(Vol.-IV) dt. 30<sup>th</sup> Nov. 2011) on Open Access. It would be appropriate to watch developments taking into account the recommendations made by us to keep the issue of Open Access under active review. Copy of the Circular of MoP is annexed as Annexure –XIII.

The issue relating to exercise of powers by the State Govts under section 11 of the Electricity Act 2003 with significant consequences for open access is under consideration of the Supreme Court, we are therefore refraining from commenting on this issue.

**3.9. ToR(e) “Examine geographical and spatial compulsions and determine their operational impact.”**

- 3.9.1** In responding to this ToR we begin by outlining our observations on energy conservation, which are as important as energy audit, financial solvency and regularity of supply. By energy conservation we mean obtaining the same service with the expenditure of lesser no. of energy units. Thus the very obvious example is use of CFL bulbs in place of incandescent bulbs. Before proceeding we must recognize that the Bureau of Energy Efficiency formed under Energy Conservation Act 2001 has done excellent work towards energy conservation. It is a result of their efforts that Bachat Lamp Yojna has been conceived, a scheme for replacing incandescent bulbs with CFL bulbs.
- 3.9.2** More importantly Distribution Utilities should play a more proactive role in the energy audit of consumers. The consumers may not have the capability to do so but there is no shortage of service providers who have the capability to conduct energy audit. This is particularly important in small and medium enterprises where the growth rates are the highest while not ignoring energy intensive units such as continuous process plants, electrolytic chemical etc.
- 3.9.3** As far as geographical and spatial considerations are concerned it is necessary to review the current decisions under RGGVY. That scheme enables electrification of all revenue villages and Majras/ Talukas with atleast 100 households. However, supplying electricity at the end point of distribution net work would be more efficient to provide electricity through other means such as non-conventional and renewable energy sources. Considerable progress has been made in technology both for generation of energy by these means as well as storage of energy for use when required. For example, wind energy or solar energy may be available at particular times of the day but it is possible to store that energy appropriately and to supply it when needed for example after 7:00 PM. It may well be that even that this option may not be available at some remote end points, in such cases even energy generated by means of kerosene fuel generator and supplied locally is likely to be less expensive than extending a distribution line all the way to the remote location.

**3.10 ToR (f) “Review organizational and managerial structure, manpower employed and future requirements/ plans”.**

**3.10.1** This review was carried out by the technical team and the management plus manpower practices were noted. As has been pointed out at the commencement of **chapter - III ToR (d)** the changes in the Electricity Act 2003 did not substantively change the management structure of the electricity undertakings. No doubt unbundling has been accomplished in all the States except Bihar, Jharkhand and Kerala but there are important differences between the States. In Maharashtra there are three separate companies with separate CEOs. In Punjab and Haryana while there are separate companies for each of the functions, the management of generation and transmission are under one CEO while Discom / Distribution company(s) has separate CEO. In Madhya Pradesh and Chhatisgarh the CEO is the same for all three companies. The financial pool is the same and the accounts are separated at the end of the year for purposes of display.

**3.10.2** In order to introduce competitiveness it is important that the distribution company should enjoy much more autonomy than it does at present time. Since many States are burdened with energy and peaking shortages they are obligated to purchase energy from a variety of sources. The kind of autonomy which a distribution company ought to enjoy in making these purchases seems to be lacking in a number of States.

**3.10.3** There is also the practice in certain States of a part time Chairman of all companies who happens to be an extremely busy official of the State Government. He neither has the time nor the inclination to address the micro issues of the power sector so essential for the technical and financial well being of the undertakings. In one State the chief Secretary is the chairman of the Generation Co., the Transmission co. and all the Distribution Companies for years together. In certain other States the Energy Secretary is the Chairman of all the entities. These managerial practices are not conducive to efficiency and are contrary to good corporate governance. Like wise in certain cases retired officials are designated as Chairperson of electricity undertaking. The HLP is of the view that these practices must cease, that Chief Executives should be appointed who should also be the Chairperson of the undertaking to ensure complete autonomy and further these appointments, based on professional competence, should be for a fixed term of atleast three years. In fact a longer term of five years would be more conducive

for efficiency, enabling good management practices such as planning, accountability and review of outcome. HLP recommends that the States may be asked to undertake these changes immediately. In cases where IAS officers hold the position of chief executive there should be an undertaking that irrespective of the exigencies of service their tenure in the electricity undertakings shall not be shortened from what has been recommended above. It may be a good idea to excise these positions from the State cadre and to select the Chief Executive plus whole time Members / Directors on the basis of merit and open selection. The report of the technical group makes detailed recommendations with regard to composition of the selection committee, the process of selection, the constitution of the Board of Directors and its autonomy / independence. If it becomes necessary to make a change in the Chief Executive or the whole time Member / Director of the Distribution Utility, the decision to do so should be based on the recommendation of the same Committee which recommended the appointment.

**3.10.4** The Board of Directors of the Distribution Utility should include two independent Directors with relevant experience of the power sector and could also be from the private sector.

**3.10.5** There is also a great dearth of senior middle management talent in the electricity undertakings and in particular in respect of certain disciplines. The present systems in the electricity sector cannot run in the absence of sophisticated IT management system. While we have commented on the progress made with regard to this aspect under the R-APDRP scheme we must also point that the absence of in-house professionals has led to a situation where the easy option of excessive and inappropriate outsourcing is being employed. There has to be far greater ownership of this programme from the top management downward. Without the support of the Chief executive introduction of IT technology will not succeed. Amongst the many key issues in our report this is one of them. In fact it is serious enough for separate consideration as to the implementation in the right forum.

**3.10.6** The majority of the ground staff in nearly all Electricity utilities have common problems. Firstly, and specially on the distribution side their functions have been sub-contracted and hence fresh recruitment was not made on the premise that since the function was being sub-contracted there was no need for fresh recruitment. While this explanation may well be a half-truth the fact remains that

from about 1980 onwards there has been practically no recruitment at the operational level in what are now designated as Distribution Utilities. The result is that most of the staff at the operational level is above 50 years of age. In certain States staffs employed on specific works have been obligatorily absorbed in the Distribution Utility as a matter of Government policy. Hence today the situation is that while in terms of numbers the Distribution Utilities have large operational staff this is neither trained nor possessing skills required at present and their functions are by and large being performed through outsourcing. In the few cases wherein recent years privatization / franchise have led to this issue being faced squarely it has resulted in not more than 20% of the staff being picked up by the private / franchise owner. This is indicative of paucity of professional manpower in Discoms. As a part of the attempt to restore financial viability it seems that a large voluntary retirement effort should be undertaken so that the Distribution Utilities are able to recruit by this attrition professional staff which they so lack at present.

**3.10.7** There is also the need for introduction of training programmes for middle management and other operational staff. At present insufficient attention is being paid to HR and Finance functions. There is no doubt, a provision exists under the R-APDRP programme for States to be assisted in this behalf but it is also the case that this facility has been used to a limited extent by Distribution Utilities<sup>3</sup>. We have observed, while examining the finance and accounts of Distribution Utilities that part of the problem in these functions is the lack of professional in areas of finance and accounts. Professional accounts personnel plus professional HR personnel need also to be recruited. These matters have been dealt with in considerable detail in the report of the technical group Appended as **Annexure – X**.

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<sup>3</sup> It is understood that the total staff is estimated to be 9 lacs and no study of training needs has been conducted. Hence, number of personnel trained to date (16,000) appears to be prima-facie inadequate.



## CHAPTER - IV

### **4.0 ToR (g) :To recommend plan of action to achieve financial viability in distribution of power by 2017.**

**4.1** Over the last three decades of the previous millennium the fortunes of State Electricity Boards (SEBs) went from bad to worse. It was government's expectation that the changed regime introduced in 2003 would address the many problems faced by the sector. While emphasis had been laid on significant increase in generation and radical changes in the transmission network, insufficient attention was paid to the distribution sector. This was in part because that sector was entirely the responsibility of State Governments who were expected to keep pace with developments in the generation and transmission system.

**4.1.1** By 2003 it was believed that a comprehensive plan to address the problems of the distribution sector had been put in place. The main elements of the plan were

- (a) Unbundling of State Electricity Boards and division of their activities into generation, transmissions and distribution.
- (b) Constitution of a Regulatory regime to determine tariff.
- (c) Upgradation and reform of the urban distribution network through the introduction of APDRP.
- (d) Introduction of the RGGVY plus a number of measures to address the needs of the rural sector.
- (e) Comprehensive financing through PFC, REC to meet the requirements of (a), (c) and (d) above.
- (f) A further strengthening of the APDRP scheme by the introduction of R-APDRP during the current Plan period.

**4.1.2** Our review shows that the unbundling of SEBs while complete in nearly all the States, with regional variations, is more in form and not sufficiently in substance. The kind of autonomy which a true unbundling ought to have engendered has not taken place.

**4.1.3** The Regulatory regime has been introduced in all States, but the expectation of rational and timely determination of tariff has been belied. Even though tariffs are

no means modest several Distribution Utilities believe that their problems are attributable to infrequent fixation of tariff and inadequate coverage of cost increases.

**4.1.4** Our study shows that while this may well be the case insufficiency of tariff is not the only significant reason for mounting losses. The increase in distribution losses, accepted and / or camouflaged by distribution utilities is an equally important reason for the financial misfortunes of distribution utilities.

**4.1.5** It is not possible to accurately apportion losses between these two factors given the less than average quality of financial information put forth by Distribution Utilities. Unless the quality of financial information is significantly improved it would be difficult to capture a true and fair picture of the operational consequences of Distribution Utilities.

**4.1.6** Efforts to reduce losses through implementation of the R-APDRP scheme have been modest since Part – B of the scheme remains to be implemented.

**4.1.7** The progress under RGGVY has been better but there are a number of unanswered issues including intra-rural issues between domestic consumption and agriculture in villages.

**4.1.8** Our recommendations spread over our response to the terms of reference (a) to (f) attempts to address these concerns and are briefly presented below as the way forward for the next plan period. This chapter captures summary of recommendations which need to be read alongwith the relevant chapter.

## **4.2 ToR**

- (a) Review accounts of SEBs' and State Distribution Companies as on March 31, 2010 or earlier if updated accounts for the year ended March 31, 2010 are not available.**
- (b) Review their Financial Position as on March 31, 2010, and in particular, losses incurred and projected distribution losses over the period April 2010 to March 2017.**

### **4.2.1 Key issues / road blocks in completion of accounts**

- Non-reconciliation of stores



- Non-reconciliation of inter-unit transactions
- Non-reconciliation of receivables

**4.2.2** This requires administrative action at the highest level of the management to clear the backlog.

- CEO should issue clear instruction to the units to submit their pending returns within a given time period.
- It would require strong administrative action at the top management level to ensure adherence to the various time lines by all as instructed / defined for preparation of accounts.
- In order to facilitate one time clearance of arrears, a monitoring cell may be set up at the zonal and Head Office level.
- If required, the utility can take the help of external / internal auditors/ service providers at division level for one time backlog clearance.
- For future the utility should re-look at the current accounting practices and evaluate the option of changing final head to expenditure based on the stores issued instead of waiting for the concerned unit to render the accounts.
- For future utilities should look at computerization of accounting system which will enable automatic inter-unit reconciliation.
- Preparation of detailed schedule of receivables including customer name, connection and area reference, category, over due amount, surcharge on late payment, outstanding amount with age analysis. Action plan with schedule time for recovery be drawn up, analyzing the reasons for non-recovery and pending legal cases.
- Assign responsibility for actual recovery of arrears, close monitoring on weekly basis, penal action and discontinuation of power supply for defaulters.

### **4.2.3 SPV**

Ordinarily State Govt as the owner of DISCOMs should provide further funds to meet the losses and to repay the Bank's Loan. It is observed that the states whose Distribution Utilities borrowed to finance losses do not generate any revenue surplus. Part of the guaranteed loans can be redeemed by RBI permitting State

Governments to draw down guarantee redemption fund set-up by certain States as required by the 12<sup>th</sup> Finance Commission. For the balance HLP recommends, a Special Purpose Vehicle (SPV) be set up as a Corporate entity consisting of a Chairperson (CEO) appointed by RBI. The board will consist of Chairman (CERC), Chairman (PFC), Chairman (REC), two chief executives of banks and two independent directors with background of power sector. It will be entitled to purchase loan of banks subject to following conditions:

- a) Banks have negotiated with the State Government / Utility, a revised repayment schedule.
- b) State Govt has agreed for regular tariff increase.
- c) The State Govt has agreed on an operational plan to meet certain technical and operational performance parameters including a policy of franchising of distribution function.
- d) The state government has taken all the measures agreed with the SPV within a time span regarding regulatory issues and annual fixation of tariff along with technical and operational parameters settled in the operational plan.
- e) The DISCOMs should be obligated to undertake capital expenditure as a first priority which will start yielding additional income with the least time gap.

RBI would provide a line of credit to the SPV to purchase the loan of the banks. In cases of non-compliance of the terms set by SPV, the State Govts undertaking should be available to RBI that the amount defaulted would be debited to the State Govts Account with RBI.

The detailed mechanism for operationalization of SPV is given in Chapter – I.

#### **4.2.4 Process of commencement / completion of audit**

- Utilities may take the matter with the branch auditors to commence the audit based on monthly trial balance sent by the divisions without waiting for consolidation at zonal level. This can help in earlier commencement of branch audit.

#### **4.2.5 Fixed Assets Register/ Tracking of capital work in progress**

- Classify assets that can be identified based on the available records
- Rest of the assets for which it is not feasible to trace records
  - Formation of a team
    - HO to form a separate team at various levels to monitor physical verification exercise and compilation of data
  - External support
    - HO to engage external support to supervise the exercise
    - Fixation of accountability with each team at Head Office Level, Circle Level and Division and Sub-Division Level
- Physical verification exercise:
  - Identification of standard categories of assets
  - Format for physical verification and data capturing
  - Physical survey and recording of existing assets in a serially controlled format
  - Confirmation by respective Divisional Heads / Technical Heads
  - Supervision by Finance Team
  - Supervision by external agencies
- Compilation of data
- Allocation of values to assets in existence, based on appropriate method (e.g. replacement value method)
- Tracking of capital work in progress and to identify:
  - Assets already being used and to be capitalised
  - Assets ready to use
  - Reconciliation of ICT to identify additional items for capitalization.

**4.2.6** Some issues require administrative actions which would facilitate the completion of accounts in time especially the computerization of accounts, upgradation of skills of accounting staff, quality of accounts rendered for audit, timely adoption of final accounts by the Board and convening of the AGM for approval of the accounts.

**4.3 ToR(c):Review Electricity Tariff including the role of (i) State Governments; (ii) State Tariff Regulator; and (iii) SEBs' /State Distribution Companies in periodic tariff revision.**

#### **4.3.1 Regulatory Functioning**

**(a) Delay in tariff fixation/ Truing up exercise**

Regular and timely review and determination of retail tariffs is crucial to proper revenue realization and in turn the financial health of Distribution Utilities and is an important responsibility placed on the Regulators in the statute. Non-finalisation of Distribution Utilities' accounts or their inability / unwillingness to file tariff proposals before the Regulators should not be allowed to derail this arrangement and stop the Regulator from discharging his crucial statutory responsibility. It is therefore suggested that if required, the Regulator should undertake this exercise suo-moto based on the best available data/ estimates. If need be, further refinement of this exercise can be done as and when more reliable data becomes available. Increase in power purchase cost due to increased fuel surcharge of the generating company needs to be automatic for which suitable formula can be prescribed by the Regulator while fixing the tariff itself. Similarly while truing up the previous year power purchase cost the cost actually incurred should be recognized due to its inevitability. Detailed recommendations in this regard have been made in the report annexed as **Annexure – V**.

**(b) T&D Losses**

All efforts to push the Distribution Utilities to bring down their T&D losses to acceptable levels are important and most of the Regulators have laid down trajectories for this purpose. However, fixing retail tariffs based on normative T&D losses ignoring the actual losses results in denial of revenue to Distribution Utilities and further rocks their fragile financial health. Distribution Utilities' efforts in this area to be effective need to be backed and supported by the State Government and the local administration, which does not always happen. It is, therefore, recommended that the Regulators should continue to fix the retail tariff taking into account the normative T&D losses and in areas where the actual losses are higher, a loss surcharge based on the actual prevailing losses of the particular area should be levied. This will ensure full recovery of revenue by Distribution Utilities and bring out and convey to all concerned the prevailing loss situation transparently. Advantage of doing this will be that pressure from consumers of such areas could force the Distribution Utilities and other players to take effective steps and bring down such losses.

**(c) Regulatory Assets**

Having scrutinized and validated the projected costs the Regulators are duty bound to ensure their full recovery through tariffs. Leaving a gap between the projected revenue and expenditure or deferring revenue realization through creation of regulatory assets and similar other actions is unacceptable and amounts to the Regulator failing to discharge its statutory responsibility. The Regulators need to recognize this and so fix the tariff that full recovery of validated costs takes place and in doing so should not be swayed by other considerations.

#### **(d) Independence of Regulators**

The committee for selection of State Regulators is proposed to be further strengthened as listed out in the Report. It is also recommended that an individual having worked in any capacity with the State Government during immediately preceding five years should not be eligible for appointment as a Regulator in that State. Similarly the Regulator should not take up further employment with the concerned State Government on relinquishing office. Ensuring financial autonomy of the State Regulatory Commissions is crucial to their independent functioning and for this their dependence on budgetary support needs to be minimized/eliminated. Detailed recommendations in this regard have been made in the Report annexed as **Annexure – VII**.

#### **(e) Evaluation of functioning of SERCs**

It is recommended that functioning of each SERC should be subject to independent and objective evaluation on regular basis. Such evaluation is proposed to be done by independent task force of experts created especially for this purpose. It is recommended that this work should be overseen by a Standing Committee headed by Member (Energy), Planning Commission on which Chairman, CERC should also be a Member.

#### **4.3.2 Actions by Distribution Utilities**

The Board of Directors of Distribution Utilities need to look into the regulatory issues with greater seriousness as inadequate compliance of regulatory directions or Distribution Utilities' inability / failure to furnish proper information has a direct bearing on tariffs and in turn on its revenue.

#### **4.3.3 State Government's Role**

It is recommended that misuse of powers under Section 108 of the Electricity Act to influence or pressurize regulatory functions should be effectively stopped. Courts

having examined the scope of this Section and interpreted the same more than once, there is no scope for any ambiguity in this area and the law should be respected and followed by all including the State Governments. Similarly the State Governments should give greater importance to the need for reduction of T&D losses and for this purpose provide full political and administrative support to Distribution Utilities efforts in this area. The Planning Commission can usefully monitor whether the State Government as well as government owned / controlled utilities have been making adequate and sincere efforts for reforming the power sector or have they just been paying lip services to these issues only to become eligible for grant of funds. For this the annual plan discussion can be a useful forum. Power sector reforms in general and functioning and effectiveness of the State Regulatory Commissions in particular should be assigned adequate attention.

**4.4 ToR(d): Assess system improvement measures accomplished in distribution of power, in particular, in urban areas as well as future needs / plans.**

**4.4.1 Restructured- Accelerated Power Development Reform Programme (R-APDRP)** is a key step taken by the Central Govt. to reduce distribution losses. It is recommended that :

- (i) R-APDRP scheme should be extended to the next plan period taking into account the recommendations in this Report.
- (ii) The scheme should apply to all towns above 30,000 populations based on census 2011. This information is likely to become available before the commencement of the plan.
- (iii) R-APDRP should be extended to all peripheral areas of R-APDRP cities / towns because that can be accomplished with very little effort and on the basis of the IT backbone already being built under the R-APDRP. Even towns, not covered under R-APDRP which can be conveniently covered through extension of system created under R-APDRP should become eligible for coverage.
- (iv) Without awaiting the detailed planning required through the introduction of GPS based consumer mapping Distribution Utilities should activate energy accounting on the basis of meters installed at 33 KV sub-stations and 11 KV feeders based on the existing consumer data base.

- (v) While electronic meters are now being introduced for all new consumers it is equally important to replace existing non-electronic meters with electronic meters in a time bound manner.
- (vi) The testing and validation of meters should cease to be the responsibility of the Discoms/ SEBs. There are sufficient facilities for third party validation of calibration of meters supplied to Discoms / SEBs and these ought to be used in place of in-house testing of calibration. This would also provide greater confidence to consumers.
- (vii) Pre-paid meters ought to be introduced progressively.
- (viii) Time of the Day (TOD) meter need to be introduced for HT and high value consumers.
- (ix) Consumer meter boards ought to be installed outside the premises of the consumers as far as possible.
- (x) Meter reading ought to be taken by automatic hand held meter reading instrument based on a common protocol specified by CEA.
- (xi) The billing process should be computerized on the basis of in-house IT expertise and essential data should be archived on the Distribution utility's system in place of the current practices of outsourcing.

#### **4.4.2 Rajiv Gandhi Gramin Vidhyutikaran Yojna (RGGVY)**

- (i) For domestic purposes energy supplied should be available in non-urban areas 24x 7.
- (ii) All consumers, including BPL consumers, should be metered thereby facilitating instant consumer enumeration and energy audit.
- (iii) A suitable tariff and proper collection would ensure that the assets created under this scheme are maintained and preserved by the Distribution utility. Lack of ownership, in particular in the absence of any revenue, may lead to de-electrification of villages experienced during past rural electrification efforts.
- (iv) The planning for domestic supply in rural areas should be based on a minimum load of a 1 KW per house hold and power infrastructure financed by REC should be built on that basis.

#### **4.4.3 Agriculture supply**

- (i) Energy to agriculture sector should be supplied through a separate feeder constructed on the basis of the details outlined in this report.

- (ii) Agriculture should be assured 8 hours of minimum supply.
- (iii) The terms on which financing is available for separation of feeders should be softer than at present.
- (iv) All agricultural consumers should be billed monthly like any other consumer in the following manner :
  - On the basis of meters installed on new pump sets average consumption under different geo-climatic conditions should be established.
  - Based on these statistical norms each agriculture consumer should be expected to pay atleast 50 Ps. / unit to the Discom / SEB directly. This would enable an accurate enumeration of agricultural connections and a proper estimate of power used in agricultural consumption. It would also enable the State Govt. to correctly asses the subsidy as the difference between the average cost of power and bills paid by the consumers.
- (v) HLP believes that after this system becomes stabilized the agriculture consumers should be obligated to pay the full cost of supply to DISCOM/ SEB. In case the State Govt. wishes to continue subsidize such customers that would be a matter between the customer and the State Govt.

**4.4.4** Given the magnitude of losses, the several far reaching measures required to reduce them and the high capex required to do so, it is unlikely that the measures outlined above would succeed in radically reducing the losses during the next plan period. In recognition of this unfortunate conclusion HLP recommends :

- (i) The introduction of the Franchise model detailed in the report on an urgent basis
- (ii) This should be extended by the States during the next few years to atleast 255 towns (including peripheral areas) listed state wise which seem to account for over 40% of the consumption.
- (iii) A model agreement for doing so has been prepared by the Forum of Regulators. HLP has examined the legal aspects and has been assured that this is permissible under the relevant statutes.
- (iv) In making available financial assistance through the special purpose vehicle to State Govts. / Distribution utilities suggested in the report adherence to



action for franchising the towns would be regarded as an essential precondition.

**4.4.5** A number of other detailed recommendations with regard to system improvement, energy conservation, use of renewal energy are contained in the Chapter – III and not being reproduced at this point.

**4.4.6** A series of anti-theft measures have been recommended, relevant for both urban and rural areas. These are described in detail in the report at **Annexure – X** and not being reproduced here.

**4.5 ToR(e): Examine geographical and spatial compulsion and determine their operational impact.**

**4.5.1** In villages and areas far away from Grid, electrification by Solar PV need be encouraged. Even use of biomass, bio-fuel and wind energy will be beneficial. Wind energy is a good source for supplying power to grid connected as well as to non-grid connected locations. As discussed in the report power generation using a DG set with bio-fuel or kerosene may be cheaper when considered with the subsidy given by GOI on providing kerosene in the villages for lighting.

**4.5.2** Areas such as Sunderban in West Bengal, Kutch in Gujarat, Thar Desert in Rajasthan need be treated at par with Special category states like North East and Hilly states for electrification and be given 90% grant for electrification and building distribution back bone.

**4.5.3** Solar power can be a good option for agriculture pumps as well as for telecom towers in rural India. Studies have revealed that in near future solar power shall have parity with grid energy as cost of electricity generation.

**4.5.4** The pumps should be maintained properly and energy efficient pumps installed in order to conserve energy / water. In this behalf our detailed statement at paragraph 3.6.2, Chapter – III needs to be considered as a recommendation in its entirety.

**4.6 ToR (f): Review organizational and managerial structure, manpower, employed and future requirements / plans.**

- 4.6.1** There is a need to have in-house core team of IT experts in the organization who can work with IT consultants appointed under R-APDRP. A multi-functional team of engineers, finance, HRD, etc. should be part of this core team who will gain experience in the IT and understand both hardware as well as software aspects of IT.
- 4.6.2** There is need of proper HRD department with persons having professional experience in dealing with Changed Management and new working culture and training needs. Similar is the need in Finance Department of professionals having MBA, ICWA, C.A. qualifications.
- 4.6.3** It is necessary that organization structure as well as Human resources required to handle the requirement of new system be modified keeping in view R-APDRP Project as well as future vision of organization needs arising out of market competition.
- 4.6.4** The new structure needs to be lean with lesser tiers needed in decision making in view of multiple layers of information necessary for R-APDRP Project.
- 4.6.5** The present staff needs a proper development orientation course to become familiar with new system and get fully conversant in its operations. New recruitments should be done keeping in view these needs.
- 4.6.7** As the States are facing difficulties in meeting the liabilities related to pension, It is suggested that the distribution utilities may change service condition of new employees on the lines of Contributory Pension Scheme.
- 4.6.8** There is need to have transparent and all India based selection of Chief Executive of the Utility. Following selection committee is recommended for the selection :-
- Chief Secretary of the state -- Chairman
  - Chairman CEA/Member CEA -- Member
  - Director of an IIT for technical posts/ Director IIM for finance and accounts post/ P&A posts -- Member
  - One representative from Public Enterprises Selection Board, GOI -- Member

For the Board Members of the Utility, instead of the Chief Secretary, Principal Secretary Energy may chair the Selection Committee with CEO as one of the members. The other members shall remain the same.

- 4.6.9** Utility should have a full time CEO appointed for a period of five years competent to take and implement all executive decisions. Govt. officials who are interested / selected in joining the utility have to agree to serve full term of five year service, so that persons selected can be made responsible and answerable for the results. Termination or removal from the service of such executive(s) shall also need to be cleared by the above committee.
- 4.6.10** There is a need for at least 2 non executive independent directors on the Board of Discoms from amongst the persons who have served in the power sector at Central level or in any other states.