

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
Total	547202
Ex-Bus (Generation Plant)	788355
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 1st 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 th Jan., 2007)	<ul style="list-style-type: none"> • Reduction in AT&C losses from 58% to 18%. • Improvement in collection efficiency from 68% to 100%. • Reduction in Distribution Transformer failure rate from 40% to 2.25%. • 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&M costs.
2.	Nagpur (Date of handover 1 st May 2011)	<ul style="list-style-type: none"> • Discom to receive contracted minimum amount of Rs. 5350 Crores for 15 years period against bench mark of Rs. 4675 Crores fixed by it. • The bench mark rate fixed by Discom assumes a very aggressive loss reduction trajectory. • Gain of Rs. 675 Crores of NPV over the amount expected by Discom. • Discom would save approx. Rs. 1920 Crores towards HR and O&M costs.
3.	Aurangabad	<ul style="list-style-type: none"> • Bench mark tender rates fixed very aggressively at Rs. 6946 Crores at NPV over 15 years. • Highest bidder quoted Rs. 7246 Crores to Discom. • Gain of Rs. 300 Crores of NPV over the amount expected by Discom. • Discom would also save Rs. 1458 Crores on HR and O&M costs.
4.	Jalgaon	<ul style="list-style-type: none"> • Bench mark tender rates fixed very aggressively at Rs. 2614 Crores at NPV over 15 years. • Highest bidder quoted Rs. 2902 Crores to Discom. • Gain of Rs. 288 Crores of NPV over the amount expected by Discom. • Discom would also save Rs. 364 Crores on HR and O&M costs.

(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 nd	3.00	4.50	3.375	75
3 rd	3.00	5.00	3.75	75
4 th	3.00	5.50	4.125	75
5 th	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 operationising 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. 30th 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 Utilities³. 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**.

³ 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.

