CHAPTER-V

RECOMMENDATIONS

Public utilities such as TNEB provide basic essential services to daily life and as such the state has a vital stake in its financial performance including pricing and distribution. Pricing policies of TNEB should be devised after a thorough examination. Although a lot of progress has been made by TNEB in the field of generation, transmission and distribution of electricity but a lot has to be done still. The electric utility industry in India is largely under the control of the SEBs each of which has its own set of tariffs. Further no attempt was made to review the financial performance including electricity tariffs in India so far, however this study was made to review the financial performance including electricity pricing in Tamil Nadu. The main objective of this study is to stress certain common features of financial performance including the tariff structure/rates in TNEB. The observations/suggestions made in this study therefore apply not only TNEB but also broadly to all other SEBs though there may be some minor exceptions in certain cases. Finally, to overcome the various problems faced by TNEB/SEBs and to provide better services at a cheaper rate to the consumers it is necessary to review financial performance, the following recommendations/suggestions have been advocated by the researcher.

For the sake of convenience, the recommendations have been grouped under the following.
1. Recommendations to improve the Operating performance of TNEB.

2. Recommendations to improve the Financial performance of TNEB.

3. Recommendations through new initiatives to improve TNEB/SEBs performance.

4. Other recommendations.

**Recommendations to improve the Operating performance**

**a. Higher level of thermal plant capacity utilization.**

Performance of thermal stations by optimum utilization of plant capacity should be done, so that increased earnings would enable the Board to procure adequate Spare parts resulting in better performance of machinery and equipment. This would lead to further improvement in Plant load factors.

**b. Reduction of system losses.**

TNEB is facing still high transmission and distribution losses. The main reasons for the high transmission and distribution losses have been identified as long as sub-transmission and distribution lines in many areas, low power factor loads comprising irrigation tube well motors inadequate distribution systems in urban areas and improper load management. The above factors should be taken into account for reducing transmission and distribution losses.

**c. Improvements in fuel management.**

Higher fuel consumption is mainly due to inferior quality of coal supplied to TNEB fuel, oil consumption is also high on account of bad quality of coal. TNEB
should be able to get better quality of coal and this would result in savings in operating expenditures.

d. Peak-hour tariff

Reasonable provisions should be made to attract the consumers for optimum utilization of available electricity during peak hours or during off-peak hours by levying suitable surcharge or concessions.

Recommendations to Improve the Financial performance

Even after more than 30 years of functioning of TNEB instead of being at least breakeven, has reported a deficit of Rs.9642 Crores as on 31.03.2007. In addition there are continuous power shortages in the state. This is a situation that needs immediate remedy.

At this juncture, it is necessary to have massive drive for capacity addition and to frame tariff policy of TNEB in such a way that financial performance of the Board can be improved. At the same time, it should also not be harsh on certain class of consumers. Financial performance of TNEB can be improved if the following guidelines are strictly followed.

Change of bi monthly assessment into monthly assessment

At present in TNEB assessment of revenue is, once in two months or bimonthly assessment have been made it means the customer paying the current consumption charges only after 2 months Therefore, two months credit have been allowed after consumption. It can be reduced to a month, by which collection also gets increased; due to that interest on power purchase cost will
gets reduced. Hence, the credit policy of two months credit may be critically reviewed and limited to a month.

**Swapping of High cost loans**

Presently, prevailing market rate of interest is low, when compared to the earlier years or before world economic financial crisis. Therefore, the loans borrowed before the financial melt down, the rate of interest charged on the borrowings might be high. Those loans in which the interest rates are high, can be set off or paid (the existing high cost loans), by fresh borrowings at low cost can be made, which will bring savings to TNEB. So, as to avoid unnecessary financial burden to TNEB.

**Foreign loan assistance by means of grant, subsidy etc.,**

To improve the infrastructure, projects involving infrastructure areas, the multi national agencies, like, Asian Development Bank, world bank Etc, have already financed in the states of Maharashtra, Gujarat, Madhya Pradesh, etc, like wise, TNEB projects also involves infrastructure improvements, it can go for or opt loans from bilateral or multilateral financial institutions, at the cheaper rate of interest.

**Tariff Revision**

Right from 16-03-03 to till date, there was no tariff revision was made in the Electricity tariffs in Tamil Nadu. Every year, the coal cost and fuel cost and other input costs of energy have been rapidly increased. The resultant increase
will have to ultimately reflect in the tariff rates, of various categories of consumers, this is not happened for the past 7 years

In addition to the above, as per the Govt’s. Socio economic policy certain categories of consumers have been supplied energy at below the cost of supply. Agriculture and HUT services have been supplied, energy at free of cost. This also affected very much, the financial viability of TNEB. Under this circumstances tariff revision for every year is inevitable to TNEB.

**Central assistance due to Restructuring**

The central government is granting assistance to the states through APDRP and RGGY and other infrastructure related schemes. Moreover out of the total amount of assistance on the above schemes 90% will be grant only 10% of assistance will have to be payable by TNEB. To avail the above benefit unbundling of TNEB have to be done, since this process have already been started, assistance from APRDRP schemes RGGY schemes may be availed to improve the financial performance of TNEB.

**Pricing Policy**

First and foremost suggestion is that the prices payable by the consumers should reflect the true economic cost of supplying power to the various categories of consumers so that supply and demand can be matched efficiently. Costs should be allocated to the various consumers according to the burden they impose on the electric system.
**Capacity.**

The paying capacity of the consumer should be taken into account. The rates of electricity will depend upon the principle of what the traffic can bear of consumer’s provided the consumer who may not be able to afford full cost. Flat rate tariff should be introduced for Hut services in Tamil Nadu.

**Revenue**

The power price should raise sufficient revenues to meet the financial requirements of the Board. Pricing policy should also take care of cash flow by way of imposing Belated payment surcharge, testing fees, Disconnection and reconnection charges, Annual minimum, levy of penalty for malpractices and illegal extraction of energy.

Pricing policy should also consider Social obligation aspect of socioeconomic cost benefits to the public by imposing reasonable tariff for utilization of electricity used for public lighting water supply and sewerage etc. Two part tariff is Introduced in TNEB. Scientifically metered tariffs for all low tension services, the fixed charges in rupees to cover all capacity related charges and paisa per unit consumed to recover all energy related charges. Power supply to agricultural category should not be below the half average cost of making it available to consumers.

While reviewing the tariff structure, the above guidelines should be strictly followed even if it is not possible to follow the entire guidelines at least the following two principles must be ensured. The total annual revenue at least
should cover the total cost of generation, transmission and distribution. As far as possible each class of consumers must meet the total cost or a fraction of total cost in case of agricultural services for supplying power to those particular classes of consumers the conversion of any part of the state government loan into equity capital would enable the board to project a better financial performance. It will not fundamentally alter inner operation or return on investment needed.

**Subsidies.**

The financial performance of TNEB will considerably improve if full subsidy is granted by the Government for its welfare policies or populist measures. Non-compliance of power committee Recommendations The recommendations of Rajadhakshya committee were not implemented so far. If power committee recommendations are carried out, it will be possible for the TNEB/SEBs to frame and modify their policies towards more realistic tariffs in such a way that it is beneficial to all concerned and at the same time does not cause financial burden on the TNEB beyond its control.

**National or uniform Tariff**

It would be ideal to have a uniform tariff at the national or atleast regional level to begin with. So that there will not be any dispute or discriminatory approach in any part of the Country / Region.
**Massive drive for capacity addition in power is essential**

To meet out increasing power consumption year by year and to improve the financial performance of TNEB it is of vital necessity to implement aggressive massive capacity addition of power in TNEB.

In TNEB, based on the power ministers conference held in New Delhi on 15-11-09, the targeted capacity addition of 5055MW was fixed for 11th five year plan. Out of which during the first two years Tamilnadu have added only 147 MW and the remaining 4908 MW have yet to be added within the period of remaining three years. The same trend is prevailing not only in Tamilnadu but also the country as a whole. Therefore capacity addition in power is very much essential in India.

Accordingly, The annual Economic Outlook, prepared by the Prime Minister’s Economic Advisory Council (EAC), in the Month of October 2009 has rightly highlighted the problem of shortage of electricity. At least for the last ten years, the shortage during peak hours has been well above ten per cent. The energy shortage which was hovering around ten per cent two years ago exceeded 11 per cent last year. In the first half (April-September) of the year (2009), the peak shortage was 12.4 per cent.

In its report, the EAC, headed by Dr. C. Rangarajan, has underscored how the problem ultimately affected competitiveness of the industry. Though the industry relies on captive power in the light of perennial shortage problem, this
option pushes up the capital cost of factories and, for that matter, even of commercial building spaces.

It is against this backdrop that a massive drive for capacity addition becomes essential. But, the country’s track record has been below par. Even during the XI Plan (2007-12), the achievement can hardly be described as satisfactory. Against the targets of 12,039 MW and 7,530 MW for 2007-08 and 2008-09, the country added 9,263 MW and 3,453 MW respectively. While the target for the current year is 14,507 MW, the achievement was 4,673 MW (as on September 30, 2009).

**Considerable slippage**

Going by the performance in the early phase of the current Plan period, experts have come to the conclusion that the target of 78,700 MW will not be met. In fact, even in March this year, the then Union Planning Commission member Kirit S. Parikh went on record, saying that “40,000 MW is certainly achievable; 60,000 MW is a possible target but 78,000 MW looks a bit difficult.” More or less, the same opinion has been expressed by the Council, which has noted that “there has been considerable slippage and it is expected that even under optimistic conditions, perhaps 70,000 MW would actually be completed during the Plan period.”

Experts cite a host of reasons for the delay in execution. Delay in placement of orders, mainly civil works and BOP (balance of plant) work, and non-sequential supply of material for main plant and BOPs are among the reasons. Shortage of
fuel for atomic stations and gas-based plants, inadequate strength of skilled manpower for erection and commissioning, contractual disputes, inadequate deployment of construction machinery, delay in land acquisition and creation of infrastructure also contribute to the delay.

**Centre’s intervention**

The EAC has gone further, saying that “we cannot afford slippages to persist in future years. Given the centrality of electricity and the lead time needed for both plant execution and finalizing fuel linkages and production, we must have a longer time horizon of 15 years. In other words, we must have an ‘active’ as opposed to an ‘indicative’ plan for creating power capacity over the next 15 years.”

Urging the government, both at the Centre and in the States, for greater intervention in capacity creation and other supportive components of the power sector, the Council has made it amply clear that without the government intervention, necessary improvements in the sector will not be possible and that they are crucial to the economy.

Having diagnosed and analyzed the problem, the Council has given advice to the authorities in two areas — give further encouragement to the private sector in electricity business and diversify fuel sources.

Calling for more private investment in power generation, the EAC has mentioned that most of the private sector projects are being or due to be
completed in or before time and the sector’s contribution to capacity addition in
the XI Plan period is likely to be in excess of what had been planned.

According to the documents of the Union Power Ministry and Central Electricity
Authority (CEA), private sector’s contribution to capacity addition [in terms of
commissioning of units] was 750 MW (target: 750 MW) in 2007-08 and 882.5
MW (2761 MW) last year.

Till the end of September 2009, the private sector added 2,899 MW against the
target of 6,164 MW for the whole of 2009-10. All its contribution was through
thermal power projects. In the Plan period, the private sector is supposed to
achieve capacity addition of 15,043 MW, around 19 per cent of the total target
figure.

Another aspect touched by the Council is the fuel source diversification.
Conscious of the fact that thermal accounts for nearly three-fourths of the total
capacity addition target for the current Plan period, the EAC has emphasized
the need for increasing the share of liquefied natural gas (LNG)-based
generation capacity and atomic energy. Calling for an aggregative approach in
nuclear power capacity creation, the Council has recommended that necessary
legislative changes will have to be made to allow the entry of private companies
in atomic energy. An ambitious programme has to be drawn up for generating
1,50,000 MW over the next 15 years through the nuclear power sector.
Recommendations through new initiatives to improve TNEB / SEBs performance.

**Ultra Mega Power Projects: (UMPP)**

Ultra mega power projects (UMPPs) are expected to contribute about 17 per cent to the total coal-fired capacity addition slated for the eleventh and twelfth plan periods. Each of these 4,000 MW projects is designed to perpetuate the strategy to add capacity quickly and cost effectively. So far, four of these tariff based, competitively bid national-level projects have been awarded. The first of these ambitious projects is expected to come online in 2012. The Tilaiya project, the latest to be awarded, is likely to be commissioned by 2015.

So far, 10 UMPPS have been identified. These are to be located at Akaltara (Chhattisgarh), Kudgi(Karnataka), Munge(Maharashtra), Cheyyur(Tamil Nadu), Bedabaha(Orissa), two additional UMPPs in Orissa and an additional UMPP in each Andhra pradesh, Tamil Nadu and Gujarat.

Till now, 11 special purpose vehicles (SPV) have been incorporated – nine by the power finance corporation (PFC) and two by PFC consulting limited, a wholly owned subsidiary of PFC – to facilitate the bidding process for these projects. The ministry of power is the facilitator for the development of the UMPPs, while the central electricity authority (CEA) is the technical partner.

Given the size of these projects and the concessions awarded by the government to UMPPs. It is not surprising that they have invited closer scrutiny...
and become the subject of controversies and issues. A case in point is the Sasan Project, which was initially awarded to a consortium of Lanco Infratech and Globeleq Singapore Pte (a subsidiary of Houston-based globeleq). The project ran into several controversies after which reliance power limited (RPL). The second lowest bidder, was awarded the project. The power ministry, on the advice of the Central Vigilance commission to look into complaints regarding the potential irregularities in the bidding process leading to the project awarded to Lanco Infratech. Under scrutiny the roles of Ernst & Young, the power consultant for the project, and PFC, the nodal agency responsible for executing UMPPs.

**Project Report:**

The Sasan UMPP, developed by Reliance Power Limited (RPL), has recently achieved financial closure, with a debt-equity ratio of 75:25, the debt portion of the Rs. 194 billion project is being financed by a Rs. 21 billion loan from the overseas subsidiary of India infrastructure finance company limited (IIFCL) and Rs. 4 billion from IIFCL. Further, RPL raised Rs. 125 billion through a syndicated loan by consortium of lenders led by the State Bank of India. Others that contributed to the syndicated loan include PFC, the rural Electrification corporation and the Housing and urban development corporation. The first phase of the Sasan UMPP comprising two units of 660 MW each is scheduled for commissioning during the Eleventh plan period. The entire project is to be commissioned by 2013. In November, 2008, power grid
corporation of India limited approved Rs. 70.31 billion for creating as associated transmission system for the project.

The other UMPP being developed by RPL, at Krishnapatnam, is expected to achieve financial closure by June 2009, RPL emerged as the lowest bidder for the Tilaiya UMPP by quoting a levelised tariff of Rs. 1.77 per unit. RPL’s bid was described as aggressive, considering the next lowest bid, that of NTPC limited, quoted a tariff of Rs. 2.34 per unit. RPL has been awarded the letter of intent for the project by the board of Jharkhand integrated power limited, the SPV for the project. With a debt-equity of 70:30, the project is expected to be commissioned by 2015.

PFC received the requests for qualification (RFQ) in April 2007 and by January 2008, had short listed 11 bidders for the final bidding round. The qualified bidders that did not bid in the final round included Torrent power, Essar power, Tata Power Company (TPC) etc.,

First, due to delays in coal linkages and then, as a result of the financial market meltdown, PFC had to defer the requests for proposal (RFPs) four times before finally inviting bids for Tilaiya in December 2008. However, despite apprehensions of a week response, five of the 11 qualified bidders participated in the final bidding process. The four, in addition to the winning bidder, RPL, that participated were Lano infratech, NTPC limited, Jindal steel and power Sterlite Energy.
The Mundra UMPPs is on track for commissioning of its first two units by early 2012. This project, being developed by TPC, was the first UMPP to achieve financial closure, in April 2008, with a debt-equity ratio of 75:25, the total debt component for the Mundra project is Rs. 127.5 billion, Of this, Rs.55.5 billion will be loan and the rest through external commercial borrowings.

Coal for the Tilaiya UMPP is expected to be sourced from the Kirandhari B and C coal blocks of the North Karanpura coalfields located at a distance of about 70km from the project site. The Krishnapatnam project will be based on imported coal sourced from Indonesian coal mines, which RPL acquired last year. For the Sasan project, RPL has already been allotted coal blocks at Moher, Moher-Amlohri Extension and Chattrasal at the Singrauli coalfields. RPL has also submitted a plan to the coal ministry for the development of the Chattrasal Pithead mines, in a strategic partnership with the North American Coal Corporation.

The Sassan UMPP remains mired in controversy, this time for grant of permission to RPL by the government to divert the surplus coal from blocks allocated for this project for use in other RPL projects. TPC recently moved the Supreme Court challenging the government decision allowing such a diversion. In response, the apex court refused to issue any interim order to TPC. The matter has been adjourned till July 2009. Earlier, in April 2009, the Delhi High Court, had dismissed TPC’s petition challenging the government’s decision.
Next in line

The other UMPPs identified for implementation include Kudgi in Karnataka, Cheyyur in Tamil Nadu, Bedabahal in Sundergarh (Orissa), Akltara in Chhattisgarh and Munge in Maharashtra.

In November 2008, the power ministry approved the Karnataka government’s proposal to set up the Kudgi project in Bijapur district. The project is being given UMPP status on the condition that at least 1000MW of the total capacity be shared with other states. After the proposed UMPP in Kirye Maharashtra was abandoned, the ministry asked the CEA to explore alternative sites in the state, including sites near Deege port and Dhopave.

For the proposed Bedabahal UMPP to be set up in Sundergarh district in Orissa, PFC has formed an SPV, orissa integrated power limited, for the project. The SPV has been allotted coal blocks in Meenakshi, Meenakshi-B and dispide Meenakshi for the project. The project entails an investment of Rs. 160 billion. The state is likely to be allocated about 1,300 MW from the project, which is expected to be commissioned by 2013.

PFC is expected to invite RFQ for the Cheyyur UMPP in Tamil Nadu by End May 2009 and price bids by October 2009. This project will be based on imported coal. The project site for the UMPP has been finalized. Land acquisition is under way.
The power sector seems to have so far remained largely unaffected by the current downturn in market conditions, The financial closure of the Sasan UMPP and the successful conclusion of the Tilaiya bid process are reasons for continued optimism. With four UMPPs off the block and with so much at stake, industry watchers will be keenly tracking these projects implementation and commissioning.

**Merchant Power plants**

A merchant power plant does not have long term PPA for sale of its power and is generally developed on the balance sheet of developers. Government of India has reserved coal block with reserves of 3.2 billion tons of coal for allotment by screening committee of Ministry of Coal for merchant and captive power plants. About 10,000 – 12,000MW capacity is expected to be developed through this initiative. This capacity has not been taken into account while working out the capacity required in the 9.5% growth in generation scenario. Capacity addition through this route would further contribute to better economic growth, better reliability of power, more spinning reserve and above all would promote creation of competition in the Electricity Market.

**Coal Bed Methane**

The Directorate General of Hydrocarbons has estimated the country’s resource base is of Coal Bed Methane (CBM). To give impetus to exploration and production, the government has formulated the CBM policy. Based on two rounds of bidding under the policy, contracts have been signed with
PSUs/Private companies for the exploration and production of CBM in 13 blocks. An additional three blocks have been taken up for development on the basis of nomination. The estimated investment in these blocks is about Rs. 560 Crores. ONGC maintains that commercial production of CBM from some of these blocks will start in 2007. Thus at the very low current rate of production, the proven gas and CBM reserves, together, can last for some 50 years.

**Coal Gasification**

Coal gasification can significantly increase the extractable energy from India’s vast in-place coal reserves. This is so because coal gasification can tap energy from coal reserves that cannot be extracted economically based on available open cast/underground extraction technologies. However, gasification has not yet been deployed commercially anywhere in the world. ONGC is engaged in trials to establish the feasibility and economics of this technology for Indian coal and lignite in collaboration with Russia. Naively Lignite corporation has tied up with an Australian group to pursue gasification of Lignite. Gasification has many environmental advantages. The problems of overburden removal and ash disposal faced by conventional coal mining and use are eliminated. Gasification is the first step towards a clean coal technology since carbon can be captured from the gas produced and sequestered in the mine or pumped back in oil or gas fields to enhance oil or gas recovery. Coal gasification, with or without carbon sequestration could be eligible for carbon credits. Finally, using this process at abandoned coalmines might provide an economically
attractive option for full extraction of energy from in-place reserves. Clearly, the potential for domestic energy supply based on coal gasification can be large but it has not yet been assessed.

**Captive Power Plants (CPPS)**

Large number of captive plants including co-generation power plants of varied type and sizes exist in the country which are either utilized in process industry or used for in-house power consumption. A number of industries have set up their own captive plants so as to get reliable and quality power. Some, captive plants are also installed as stand-by units for operation only during emergencies when the grid supply is not available. The installed capacity of CPPS has increased from 588 MW in 1950 to 15,103 MW in March 2005. Captive plants including co-generation power plants could, therefore, play a supplementary role in meeting the country’s power demand.

After the enactment of Electricity Act 2003, there is a renewed interest in captive generation. Surplus power, if any, from captive power plants could be fed into the grid as the Electricity Act 2003 provided for open access, in non-discriminatory way.
Other Recommendations

Other suggestions for improving the performance of TNEB are discussed briefly here. Reducing excessive subsidies being given for some weaker sections, agricultural services and new industries. Controlling or adequately billing all lavish and variety illuminations tapped from subsidized or un-metered services. State and Central Governments are assisting Board to collect fully all revenue arrears in turn Reducing the interest rates on States Government loans. Boards may reserve a portion of Available materials and funds for systems improvement work to reduce line losses. Plugging thefts or pilferages of power by activating surprise raid squads on the line of what Tamil Nadu has done. Insisting on energy efficient installations for pump sets an industries before connecting them up newly.

Improving Distribution Segment

It is well known that making distribution segment efficient and financially viable is the key to the power sector reforms. This would not only improve the consumer services including the power tariffs but also be critical for mobilization of investment in generation and transmission segment.

It has been deliberated in depth on various possible measures for reducing distribution losses and improving quality of supply to the consumers. For reducing AT&C losses, larger investments would be required for up-gradation of distribution networks and special drive would be necessary for identifying high
loss areas and controlling commercial losses in such areas. Following is recommended in this regard.

i. High loss making feeders need to be franchised by the distribution companies. Towns having ATC losses higher than 35% need to be franchised on input energy basis immediately whereas towns having losses between 25-30% should be observed for improvement for six months and if there is no improvement then these towns should also be franchised.

ii. Through appropriate metering and energy audit, feeders incurring high level of losses (may be more than 20% for urban feeders and more than 35% for rural feeders, this would depend on the stage in which distribution reforms are in a particular state) should be identified. Performance of the staff should then be assessed on the basis of key performance indicators (KPI) which would be primarily loss reduction. AT&C loss reduction of 3% every year in next five years should be targeted.

iii. The tariff policy emphasizes on the need for putting in place local area based incentive/disincentive scheme for the staff linked to distribution losses. This should be immediately implemented by the State Electricity Regulatory Commissions.

iv. To realize the objective of Tariff Policy of supplying uninterruptible electricity to those consumers who are ready to pay efficient cost,
distribution tariff should move to distribution margin model which is also provided in the tariff policy. Such distribution margin could be based on loss reduction in a Multi Year Tariff (MYT) framework and the actual power purchase costs should be paid by the consumers over and above the distribution margin. Consumers of a particular area should be given option to collectively choose either uninterruptible supply or otherwise and the tariff could be determined accordingly.

v. It is also recommended that setting up of peaking power stations should be encouraged to overcome peaking shortages as the additional power cost of supply from such a station could then be passed on the consumers who opt for uninterruptible supply.

vi. Correct metering and billing is crucial to reducing distribution losses and also for ensuring that consumers pay according to their consumption. Central Electricity Authority has notified metering regulations which mandate that all new consumers meter would be of static type (Electronic). These meters measure the consumption correctly over a long period of time. The use of electronic meters and spot billing needs to be expanded rapidly and the state should be emphasized to do so. Also, with the objective of promoting more efficient use of electricity and also to provide another payment option to consumers, use of pre-paid meters needs to be promoted.
vii. The Electricity Act gives discretion to the licenses to undertake supply for a specified area within his area of supply through a franchisee. It is recommended that the forum of regulators should develop a model agreement for distribution of electricity by distribution licensee through a franchisee in urban areas outlining the responsibilities and duties of various parties clearly.

**Rural Electricity supply**

The central government is already implementing the ambitious nationwide programme of RGGVY for providing access to electricity to all the households. Need is felt to take up programmes to ensure supply of quality power at reasonable cost to the rural areas. The Rural Electrification policy notified by the Government under the Electricity ACT provided for a facilitative framework for encouraging local resources based decentralized distributed generation systems. Most of the states have already notified rural areas for the purpose of section 14 of the Act. Now there is a need to promote such decentralized distributed generation system.

**Planning at State level**

Prior to reorganization of SEBs, the planning for electricity sector at state level was used to be done by the SEBs. Therefore it is recommended that, there is a need to institutionalize a framework for indicative planning at state level post restructuring of SEBs so that steps could be taken in time for necessary planning and execution of projects. This becomes all the
more important as generation projects, are now to be developed through competitive route for inviting power sector investments and therefore initiative is to be taken at the state government level. Similarly, advance planning is required for augmenting the state level transmission network for catering to new generation capacity and also for enabling open access. Therefore, It is recommended that state government should setup a dedicated planning cell for developing electricity plan at the state level including specific projects which could be posed for investments to the power sector. Such a plan could be on the lines of national Electricity Plan.

**Capacity Building**

The National Electricity Policy aims at overcoming energy peaking shortage. The tariff policy stipulates that all future requirement of power is to be procured competitively by distribution licensees except the expansion projects and public sector projects for which five years window has been envisaged after all the generation and transmission projects would be developed through competitive route. In accordance with the provisions of sections 63 of the ACT, the Central Government had already issued the competitive bidding guidelines for:

- Procurement of power by distribution licensees and
- Procuring transmission services.

To facilitate competitive procurement of power, the central government has already issued standard bidding documents for development of power projects
at a specific given site and based on a particular fuel (Case-II of the bidding guidelines). The competitive bidding guidelines also envisage procurement of power without specifying any specific location or fuel (Case-I Procurement). It is of the view that situation is not yet ripe for procurement through case-I route because fuel, both coal and gas, are not yet freely available in the market. Therefore, all efforts should be made to develop new capacity through developing new power projects under case-II procurement. This route is fully feasible and successful as has been demonstrated by tariff based competitive bidding in Uttar Pradesh. The central government has also taken up major initiative for developing Ultra Mega Power Projects through case-II procurement. Few coastal power stations based on imported coal can be set up based on the option of competitive bids for net heat rate.

Experience in the past had shown that projects got delayed considerably because of difficulties in tying-up various inputs like land, fuel, water and clearances particularly environmental and forest clearances. Since we are envisaging private sector participation in a large scale, It is recommended that special purpose vehicle (SPV) route would be necessary to develop new generation capacities quickly. The SPV is responsible for arranging necessary inputs such as land, fuel and water and also tying-up initial clearances and offering the project for tariff based competitive bidding. Important areas for further improvement on environmental/forest clearance and geological report for coal blocks. In the area of environmental clearance, the experience has
been that the procedures takes long time. Therefore, there is a need to streamline and standardize the procedures to shorten the time cycle for obtaining environmental/forest clearance with greater emphasis on compliance with laid down standards and conditions imposed while granting environmental clearance. Regarding the geological report of the coal blocks, it is being felt that the blocks being made available for power project development are not adequately explored that leads to longer project preparation cycle and uncertainties.

It is also recommended that, the possibility of making available power projects sites quickly by scrapping those small sized old power generation units that are operating at significantly higher heat rates. An appropriate cut-off gross station heat rate, say 3000 kilo calorie per unit, can be considered for identifying inefficient old power plants of more than 25 years age and these sites could be released for setting-up power plants of more efficient and large sized units depending upon the scope of expansion available and with due cost benefit analysis. Coal linkages of the old power plants should also be transferred to the new generating units.

Regarding the promotion of non-conventional energy sources, the tariff policy provided that minimum percentage for procurement of energy from such sources by a licensee should be made applicable immediately for the tariff to be determined by the SERCs. The policy further states that procurement of future requirement of power from non-conventional energy sources shall be done as
far as possible through competitive bidding process u/s 63 of the Act among the suppliers offering energy from same type of non-conventional sources. The policy provides that in the long-run, these technologies would need to compete with other sources in terms of fuel costs. In view of these provisions in the Tariff Policy, it is recommended that.

In the interest of larger competition aimed at consumer benefits, the procurement from non-conventional energy sources should not be restricted to only within that state but suppliers from outside state should also be allowed to compete.

Procurement from non-conventional sources should invariably, unless there are compelling reasons, be done through the competitive bidding process as this would add to transparency and lower procurement costs.

After assessing the stage of development of various non-conventional energy technologies, a definite timeframe should be laid down after which preferential tariff for power generated from such sources would not be available. Such an arrangement is already in place in Germany.

For encouraging captive generators to supply surplus power to grid, the implementation of recommendations of forum of regulators for rationalizing various charges such as parallel operation charge, minimum demand charge, start-up power charges etc., on captive power generators could be a made a condition which may be linked to central assistance to the state power sector.
With a view to encourage renovation & Modernisation (R&M) of old power plants additional benefits after R&M are clearly identified and shared with consumers who will bear the burden of servicing additional capital expenditure. It is required to be seen that depreciation is allowed to the power producer and normal maintenance and replacement should be funded from such depreciation amount. CERC could set up benchmarks for capital expenditure on R&M.

**Dispelling darkness in the next century**

The use of renewable source of energy for the supply of power to remote inaccessible villages. Avoidance of direct subsidy (to prevent subsidy syndrome) to inject a sense of energy conservation consciousness. TNEB/SEB should be permitted to charge at least the cost of production in the case of areas where financial subsidy is provided for non-engineering considerations. Financial assistance to TNEB/SEB to bring a healthy debt equity ratio to reduce or avoid the interest burden. A law should be enacted to prevent the manufacture of electrical appliances like motor, pump sets, etc., which does not comply with I.S.I specified quality and efficiency. The above mentioned suggestions will facilitate to avoid darkness in next century in Tamil Nadu/India to avoid darkness in the next century.

If the above mentioned Recommendations are implemented, it is expected that the TNEB will be able to come out of the present financial crisis and will have the consumers satisfaction as on additional bonus.
In addition to the above, the following recommendations are also made to benefit TNEB viz.,

- Tariff Policy advises states to rationalize taxes and duties on captive power consumption. This may be reviewed periodically with States and made a condition for central assistance to State power sector.

- Central Electricity Regulatory Commission could set up benchmarks for capital expenditure to facilitate accelerated R&M of old power plants.

- Exemption of import duties available to generation projects under Mega policy should be available to all important transmission projects where imported components form large part of the project cost.

- To bring in appropriate accountability of the regulatory process, proposed regulations of the Regulatory Commissions should be examined indepth at draft stage itself. Further, there is a need for scrutinizing the regulations for ensuring consistency with the letter and spirit of the law before they are laid in the parliament/State Assembly. This is important since regulations, once published in the gazette, become sub – ordinate legislation.

- The robust legal framework contained in the Act for control of theft is being further strengthened. Annual conference of power utilities should be organized at national level for highlighting success stories and achievement made in difference States in controlling theft.
• There have been some experimental efforts, with good success, for outpouring distribution of electricity for an identified feeder by the licensee to a private entrepreneur selected.

• Schemes for separation of agricultural feeders in rural areas need to be promoted. Agricultural consumers could be supplied electricity as per seasonal demand for agricultural purpose and the tariff could be fixed taking into view off-peak pricing and uninterruptible supply.

• Schemes for transferring subsidies directly to consumers may be encouraged.

• State Government should set up a dedicated planning cell for developing electricity plan at the State level including specific projects which could be posed for investment to the power sector. Such a plan could be on the lines of National Electricity Plan.

• With the objective of promoting more efficient use of electricity and also to provide another payment option to the consumers use of pre-paid meters needs to be promoted.

• The thrust of the recommendations is for upgrading the generation technology to larger number of super-critical systems, bringing about competitive tariff structure in generation through promotion of Ultra Mea power Projects and Merchant Power. Plants. Improved capacity utilization
through better operation and maintenance practices and through renovation & modernization, wherever required.

- Since coal is going to be the most dominant fuel, all efforts are required to be made to use cost – effective clean coal technologies.

- Lessons learnt from preparations of Tenth plan have been fully taken into account. Therefore, an important feature of Eleventh plan preparation is that only such projects are being taken into consideration as have almost 100% of certainty for getting commissioned after allowing for necessary time in the cycle of project management for sanctions, clearances, tenders, commencement of work and reasonable construction schedule.

- On distribution side, thrust is to continue on a bigger scale, the accelerated power development and Reforms programme (APDRP) for towns wherever these projects were completed to the extent of more than 75% in most cases, there have been positive results, and therefore, this scheme needs to be pursued, but with modification that may be considered.

- RGGVY needs to be continued. But the major concern of revenue sustainability will have to be addressed for which the Franchise programmes must be put in place well in time before any village is electrified.

- To make available adequate power for open access consumers, there is need for enabling policy framework for merchant power plants (MPPs). Size of MPPs could be up to 1000 MW which may be appropriate considering
greater possibility of financial closure without long term PPAs for comparatively smaller sized projects and also of making available transmission corridors for such MPPs.

- Availability of adequately trained human resources is going to be very critical. Training and development not only for utilities on generation transmission and distribution should occupy the centre state, but also for new initiatives like franchisees and empowerment of rural panchayats and cooperatives would require considerable attention. Training infrastructure by way of training institutes, course material etc, would need to properly organized.

- Excise duty/CVD(Counter veiling duty) on power generation, transmission & Distribution equipment which is currently at 16% should be abolished for projects with 1,000 MW dispatch on the lines of concession provided to the Mega Power Project.

- Existing income tax exemption for power sector projects under section 801A expiring in March 2010 to be extended till March 2017.

- Additional depreciation of 20% (WDV) under IT act available for investments in plant and machinery in industries other than power to be made available to power industry also.
• IPO by Power companies.; profit making central/state utilities in generation, transmission & distribution to be encouraged for supply of PSUs stock in the market by way of IPOs / FPOs (Follow on public offer)/ offer for sale,

• Equity support by State Governments through Budget allocation; state Government should allocate funds through its budget for providing equity support to Ste Utilities in Power sector.

• Public Private Participative models; PPP on the lines of UMPP where Govt. undertake to get the various, clearances before the bidding facilitates quicker financial closure.

• Relaxation in Companies (issue of Share capital with differential voting Rights) Rules, 2001 for issuing Equity shares with differential voting Rights; waiver requirement of having distributable profit for three financial years.

• Specialized debt funds for infrastructure financing

• Development of a venture capital/PE fund to invest in equity of power projects

**Potential areas for further Research**

The performance of TNEB /SEBs in India are the study of subjects in the recent interest. SEBs are increasingly and rightly becoming a major area of study in Indian Economic development but such studies are curiously are never extended to the Electricity Economics. Electricity Economics is the study of Generation, transmission and distribution of electricity Rural Electrification,
Demand forecasting a wide gap between demand and supply, promotion of development of non conventional energy, Load shedding or imposition of power cuts on various categories of consumers under H.T services etc., for Research Scholars in Economics / Commerce/ Management/Science, SEB is a paradise. Research study will definitely yield bonanza. Economists should also recommend a chapter on “Power Development and problems in India or performance of SEBs in Indian Economic Development. Economic Development without study of SEBs is not full pledged study. UGC also can encourage research studies in the following areas. Research studies in the following areas will give a desired results.

**H.T.Services**

Research scholars can suggest some of the latest practices which are being followed in many advanced countries in case of tariff revision to the State Electricity Boards. Otherwise, the research scholars can recommend some additional features for proposed tariff revision. The interesting areas for research study are as under.

1. **Time use of charges:**

Most of the advanced countries have already introduced the time of use charges to restrict the demand during peak hours. Reasonable provision should be made in prices of the electricity to attract the consumer for optimum utilization of available electricity either during peak hours or during off-peak hours by levying suitable surcharge or concession. The peak hours are from 7
a.m. to 11 a.m. and 5 p.m. to 9 p.m. in India, Research can be conducted to restrict demand during peak hour for H.T consumers and suggest an additional charge say 5 paise or 10 paise as the case may be, so as to induce the H.T consumers to shift the load to the off-peak period of the day as far as possible. So far the above area was untouched by research scholars in Indian universities.

2. Seasonal Tariff.

It has been ascertained that the agricultural load mainly reflects on the system during peak season of November to April. Since the main crop of wheat etc., is cultivated after the monsoon, the sudden rise of agricultural operations put much strain on the system and therefore during this peak season, the H.T. consumers, whose demand has also to be met in addition to the above agricultural load, have to be compensated by paying slightly higher charges. It may be studied the feasibility of introducing additional charge per KVA per month whose contract demand exceeds 500 KVa and 1.0 paise per unit for the energy consumed during the above period. Seasonal tariff is also another area for research study.

3. Urban charges:

High tension consumers in Urban areas are having better infra structures facilities for supply of electricity as compared to consumers located in rural areas. Then H.T. consumers in the urban areas are generally fed by separate
feeders from nearby 66 KV / 132 / KV sub-station and the system disturbances are also least. On account of the additional capital spent in meeting with these demand in urban areas, it may be examined levy of additional charges per KVA per month for the demand charges in the tariff revision.

4. **Night tariff**

To give suitable incentive to the H.T consumers for shifting their load to the off-peak hours at night from 10 p.m. to 6 p.m. incentives in the form of a concessional tariff which is in excess of 25% of the total consumption may be proposed.

5. **Agricultural tariff**:

One of the controversial sector in electricity tariffs in India is agricultural sector. The study has revealed that the un remunerative tariff structure for supplying farm sector is responsible for poor financial performance of the TNEB and the SEBs. Now the question arises as to whether it is worthwhile to continue free supply to small farmers or not. If TNEB and the SEBs are to get out of the present situation, the correct tariff policy should be devised for agricultural categories. This is also another interesting area for future, Research study. But none of the research paper was published on free supply to agricultural sector, even though the above scheme was in force for more than 10 years.

6. **Cottage Industries**.

It has been observed from the above study, most of the SEBs do not have a
separate tariff / category for cottage industries. In Tamil Nadu, the domestic rate is being charged for cottage industries. But the slabs are very low for cottage industries. A research study can be conducted whether it is worthwhile to have a separate tariff for cottage industries or merged with domestic services under low tension services.

7. Uniform Tariff

Finally, a research study can be undertaken to adopt a uniform tariff structure for India. All SEBs should strictly follow the above uniform tariff structure applicable to all SEBs in India framed by the Central Electricity Authority. Because of the energy crisis the scope is very wide for the research scholars in India. Electricity is a fast expanding source of energy in India and there are more than Twenty State Electricity Boards who are major provider of power. The concern of public, research institutions, the press, the state Govts. and in particular planning commission over the efficient management of the State electricity Boards are well known. Although, research studies on power made every year by various university on the working of many of electricity boards there has been no proper focus on the areas which need more adequate attention and corrective action. This study, it is hoped, will be of practical use to all those who have a responsibility for the generation, Transmission and distribution of power with cost consciousness. It will also serve as policy formulation and informative research study and others who may be interested in a scientific study of the working of electricity Boards in the country. This
study spans a vast range of topics like operational and financial performances at various stages of TNEB.

The above study has concluded that TNEB’s financial performance including tariff is an important area and if not formulated with Board technical and commercial judgment might result in financial difficulties to Tamil Nadu Electricity Board, Even though efficiently and economically administered in other respects. Great care and attention should therefore be paid for financial performance including the framing of new tariff structures or revising tariff rates from time to time.