



Prayas (Energy Group)

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Initiatives in Health, Energy, Learning and Parenthood

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Ref. no. PEG/2014/114

To,

Date: 22/10/2014

The Secretary,
Tamil Nadu Electricity Regulatory Commission
19-A Rukmini Lakshmi-pathy Salai,
Egmore
Chennai-600008

Subject: Comments and suggestions with respect to suo-moto tariff determination process initiated by TNERC.

**Ref: Public Notice by TNERC dated 23rd September 2014.
Submission by Prayas, Energy Group with reference number PEG/2014/107**

Dear Sir,

This letter is with respect to the matter mentioned above. As mentioned in our previous submission with letter reference number PEG/2014/107 we are making another submission on more substantive issues in the tariff process. We wish to re-iterate that we are not an active stake holder in the Tamil Nadu power sector and the submission is based on study of relevant documents and our experience of working with the regulatory processes in other states.

Given the precarious financial position of TANGEDCO and the challenges it has faced in power procurement, operationalizing open access and mainstreaming renewables, we feel that some of our submissions may be relevant. The submissions are with respect to the true up process, power procurement and capacity addition, tariff design, energy accounting and load shedding. Our endeavour via this submission is to aid this process and share relevant lessons from other states.

Please find, enclosed with this letter our submission on the above mentioned issues. Our previous submission with respect to date gaps is also enclosed as Annexure 1.

We request the commission to take our submission on record and thank the commission for giving us this opportunity. We will be glad to clarify any particular issue or assist in any manner as the commission may so desire in this regard. We would also request the commission to allow us to present our submission during the public hearing in Chennai on the 24th of October 2014 and also to make additional submissions if any.

Thanking you

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BEFORE TAMIL NADU ELECTRICITY
REGULATORY COMMISSION,

Objections/Comments/Suggestions

On

*True up for FY 2011-12, FY 2012-13, Annual
Performance Review for FY 2013-14 and suo-moto
tariff determination for FY 2014-15 for TANGEDCO*

By

Prayas Energy Group
22nd October 2014

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I. Introduction: Crucial Nature of current process

TANGEDCO is facing severe financial stress especially due to sustained non revision of tariffs and procurement of high cost power for a prolonged period. This has resulted in accumulated losses estimated to be more than Rs.39, 614 crores¹. Moreover as TANGEDCO has been borrowing heavily in order to meet operational needs, its short term liabilities had accumulated to an estimated Rs.24422 crores on as 31st March 2012². Given the gravity of the situation, the need to increase tariffs, rationalise power purchase costs and monitor performance, this tariff determination process is extremely crucial.

The initiation of the suo-moto process for tariff determination and true-ups by the commission in this regard is a welcome step. However, for this process to be effective, the following points need to be kept in mind:

1. True-ups have not happened in the past and the current true-up process is crucial to assess financial predicament

Along with revision of tariffs, true-up of past performance is imperative as it evaluates the actual costs incurred by the utility in previous years vis a vis commission approved trajectories. Despite the need to evaluate/regulate the performance of the distribution company, the true-up process has happened only once (in 2013-14) in the past 12 years. Even for that year, data for only 5 months of 2010-11 was evaluated. *Without post-facto evaluation, the actual extent of costs incurred and consequently the loss levels cannot be adequately assessed.* Therefore, there is every chance that the accumulated revenue gaps are higher than assessed by the commission. In this context, especially if the need for a regulatory asset is to be debated, the current true-up for 2011-12, 2012-13 and the annual performance review for 2013-14 must be done via a transparent, public process where audited annual accounts are being used for all years.

2. Informed public participation is vital for such a crucial process to gain legitimacy

As consumers have to bear all the prudent expenses of the TANGEDCO, they have a right to participate in the determination of necessary expenses incurred. Public participation can only be effective if relevant information is provided to the public and the 28 page 'Summary of ARR determination of TANGEDCO for 2014-15' did not provide vital information, about TANGEDCO's performance (based on audited accounts till 2013-14) as well as TNERC's assumptions in their estimations. The data-gaps are described in our first submission to the commission attached as Annexure 1. If transparency or participation in this process is not ensured in its true spirit, it will not only be against the spirit of the Electricity Act 2003 but also significantly erode the credibility of the entire exercise.

3. The existing regulatory asset as well as amortisation plan of the same must be revised with audited accounts data and progress of the FRP

The financial restructuring plan (FRP) of the Central Government had proposed a pathway to deal with short-term liabilities till 31st March 2012 which was accepted by TANGEDCO and the State Government. In the previous tariff order (T.P 1 of 2013), the TNERC approved a regulatory asset of Rs. 25644 crores which is being amortised with the assistance of the State Government over the next

¹ The accumulated losses is estimated at Rs.17207.03 crores till TNEB unbundled in November 2010 (reported in Tariff order dated 30th March 2012) . In Tariff Order dated June 2013, the approved accumulated revenue gap for 5 months of 2010-11 and the period between 2011-14 amounted to Rs.22407 crores.

² Tamil Nadu Government Order G.O. Ms. No 142 Dated: 24.12.2012.

five years. As audited accounts for TANGEDCO till 2013-14 are available and the first phase of the FRP has been rolled out, the estimation of the regulatory asset amounts to be amortised this year and the plans for amortisation in the coming years can be reworked in this tariff order.

4. **Need for assessing controllable and uncontrollable costs borne by the Generation and Distribution operations of TANGEDCO**

As per TNERC MYT Regulations, the true up should assess variations in revenue and cost and variations in cost due to controllable factors must not be passed on to the consumers. As there is a large variation in TANGEDCO's costs especially the generation costs, the reasons for such a variation should be explained and deliberated and if controllable should not be passed onto consumers.

Given these considerations and the proposal for a 17% increase in tariffs, this submission will look at substantive issues in power procurement, capacity addition planning, tariff philosophy and design, energy accounting as well as TANGEDCO's finances. Based on our experiences in other states and our study of relevant documents pertaining to Tamil Nadu, we would also like to submit a few ideas/suggestions for the consideration of the Commission.

II. **Power Procurement and Capacity Addition**

With the energy requirement increasing by 52% in the past 6 years, power procurement, is a vital function and a challenge for TANGEDCO especially as it accounts for more than 70% of the costs. This section has specific submissions for the performance of State Generating Plants, procurement of power from central sector sources, IPPs and market sources.

1. **Performance of State Generating Plants**

The generating plants of TANGEDCO contribute to about 40% of the much needed base load capacity. However, these plants also tend to be very expensive with an average power purchase cost of Rs.4.43/unit estimated by the commission for 2014-15 for the suo-moto process.

Between the ARR for 2014-15 estimated by the commission for this process and the ARR approved for the same year in the previous tariff order (T.P. 1 of 2013), the costs required by the TANGEDCO's generating plants have shown a significant increase, as shown in the Table 2.1 below:

Commissions cost estimates for the year 2014-15 (Rs. Cr)			
Selected components of ARR	As per previous Tariff Order	TNERC consideration for this process	Change in estimation
Expenses in respect of Generation	8851	12687	3836
Power Purchase Cost ³	17949	17946	-3
Gross Aggregate Revenue requirement	35918	39818	3900

Table 2.1: Increase in cost from previous estimates

Therefore 98% of the cost increase in the current estimation from the approved costs accrues to the generating plants of TANGEDCO. As approved SHRs are considered, the high costs can be attributed to rising interest costs and high landed cost of coal. Therefore clarity is needed on:

³ From sources other than TANGEDCO plants

- a. **Possibility of rationalising interest charges for long term loans and working capital:** From 2011-12 to 2014-15 about 60% of the fixed costs approved are due to interest on long term loans and interest on working capital. In the previous tariff petition, TANGEDCO stated loans were not related to a particular capital expenditure scheme and this makes debt and interest rate hard to ascertain. However, for the benefit of the commission, it used a methodology to map loans to specific project and if not at least to the distribution and generation functions. The methodology used to decide interest payments resulted in a sudden spike in the interest rates being paid by each generating station. Even though the commission devised a methodology to account for interest expenses, it led to a sudden increase in the interest expense component of the fixed costs and is not clear about which expenses will be borne by the Government under various schemes and which will not. Therefore, the following clarifications are needed:
- i. Following the implementation of the transfer scheme, some of the debt obligations incurred by the erstwhile TNEB will be borne by State Government. Clarity should be there on which obligations would be borne by the State Government such that interest costs for those loans are not passed onto the consumers. The commission can direct TANGEDCO and advise the State Government to takeover liabilities incurred by the erstwhile TNEB in a time-bound manner as part of the transfer scheme, to reduce the interest burden on consumers. This is applicable for the generation and distribution functions of TANGEDCO.
 - ii. Short term liabilities taken to meet working capital needs are being restructured and a part of it is being taken over by the State Government. If so, does the restructuring effect interest rate on working capital loans taken prior to 2012? As part of the FRP, the utility is also not to incur short term liabilities after 2012. In that case, if the state government is supposed to bear the burden of short term liabilities, interest payments should not be borne by the state government. Therefore clarity is needed on the debt taken over by different schemes and how it has been considered in the estimation of interest payments. This is applicable for the working capital needs of generation and distribution functions of TANGEDCO.
 - iii. As power plants pay for their capital expenditure over their lifetime, it is not clear why there is a sudden rise in interest payments accruing to older plants.
- b. **Possibility of using imported coal:** The variable cost for thermal power plants varies between Rs.2.33/unit to Rs.3.28/unit due to a high average landed cost of coal. This could be because of transport costs. If so and given the parity with imported coal prices and given the proximity of ports to most coal-based power plants, the possibility of using imported coal could be explored.

2. **Need to share information on generating units of TANGEDCO to increase accountability**

Given the challenges faced by the generating units of TANGEDCO, there is a need to communicate issues faced to the consumers to gain their support, especially for issues involving multiple agencies (coal procurement, delays in commissioning etc.) More sustained and frequent practices of information dissemination will help build public discourse by TANGEDCO and TNERC will help channelize all involved agents into action and minimise costs due to avoidable inefficiencies and co-ordination issues in power generation. A simple and inexpensive way of doing this would be for the commission to direct the generating company to publish the following information on monthly basis on its website:

- a. *Unit-wise source wise (i.e. CIL subsidiary, captive mine, e-auction and/or imports) quantity and cost (separating out transportation cost) of coal procured on monthly basis.*
- b. *Unit-wise performance in terms of net and gross generation, auxiliary fuel consumption, heat rate, load factor, availability, etc. along with fixed and variable costs on a monthly basis.*
- c. *Status of plants under construction, reasons for delay if any, IDC accruing to each unit on an annual basis*

- d. Capital works planned, undertaken and completed per unit with amount spent and expected benefit from the scheme on an annual basis. This is applicable to capital expenditure related to the distribution function as well.
- e. Details on loans taken including term of loan, purpose of loan, interest rates, annual interest payments and details of lenders on an annual basis. This is applicable to loans related to the distribution function as well.

3. Need for benchmarking capital costs for new TANGEDCO plants

Capital cost incurred for new capacity may not be based on principles of economy and efficiency. In the light of this, for the state generating plans, we recommend a benchmarking exercise to be undertaken by the commission in the lines of that undertaken by CERC in Order No. L-1/103/CERC/2012. Benchmarking should be done for capital cost and performance parameters with sufficiently high penalties for non-compliance. Such a benchmarking exercise will ensure that projects which are to come online have their capital expenditure proposals evaluated for prudence and all plants have incentives to perform efficiently.

4. Need to re-evaluate status of power procured from IPPs

To mitigate power shortages, the erstwhile TNEB had contracted power from IPPs in Tamil Nadu, most of which were Gas/ Naphtha based. Table 2.2 presents the power procurement details from these IPPs.

PPAs	MW	Fuel	Term of Contract	DATE OF COMMISSIONING
Madurai Power	106	LSHS	15	22.09.2001
Lanco Aban	113.2	Natural Gas	15	11.08.2005
Pioneer Penna	52.8	Natural Gas	15	01.07.2006
ST CMS	250	Lignite	30	15.12.2002
GMR	196	LSHS/HFO	15	31.12.1998
Samalpatti Power	105.66	LSHS	15	01.03.2001
PPN	330.5	Natural Gas/Naphtha	30	26.04.2001

Table 2.2 Power Procurement

As can be seen from the table above, the contract with GMR expired in 2013. As station-wise or seller wise details of power purchase quantum and cost for the 2013-14 are not available it is unclear if TANGEDCO procured power from GMR after the contract period. If so, there seems to be no order from the regulatory commission, allowing extension of the PPA. For the year 2014-15, the commission's estimation shows no power procurement from GMR. However, in the 2016, PPAs with Madurai Power and Samalpatti Power with power purchase cost estimated at Rs.12.32/unit and Rs.13.57/unit will also expire. Given the shortage scenario in the state, in case contracts for these high cost sources need to be renewed, it is suggested that:

- a. Extension of the PPA happens with the approval of the commission after prudent check of costs and the necessity of high cost power given all other sources of power in the power purchase basket.
- b. The extension of PPA should not be for a period longer than a year so that there is no lock in of high cost power, especially when cheaper capacity may come online shortly.
- c. As the capital cost of the plant has been paid for by TANGEDCO over the term of the PPA, it is suggested there be a revision of tariffs as well in case the contracts are renewed.

5. Need to re-evaluate status of power procured via Case 1 Bidding

Given the shortages in the State, TANGEDCO contracted 3330 MW of power from 11 bidders via the Case 1 Bidding at a levelised tariff of Rs. 4.91/kWh for a period of 15 years from 2014 to 2028. However, given the fact that Raichur- Sholapur transmission link has been completed and the fact that all PPA terms begin in 2014, it is not clear why power procurement from these sources is not considered for 2014-15. The commission and the utility should ensure that the tariff adoption order is passed expediently so that this power can be procured by TANGEDCO instead of buying very expensive gas based power from IPPs.

6. Need for regulatory review of capacity addition

7.

Given the shortage of power in the state and the severe burden of load shedding borne by the consumers of TANGEDCO, the state also has ambitious firm capacity addition plans where it plans to add 25,646 MW by 2021-22. This implies an increase in capacity by 3 times the present installed capacity in the next 10 years⁴. Though this plan is extremely ambitious, there is no public debate or scrutiny by the Regulatory Commission about the feasibility of such capacity addition. This proposal must be reported with the fact that the allocated capacity addition by TANGEDCO in the past 10 years (2002-03 to 2012-13), has been to the tune of a mere 2017 MW, as shown in Figure 2.1.

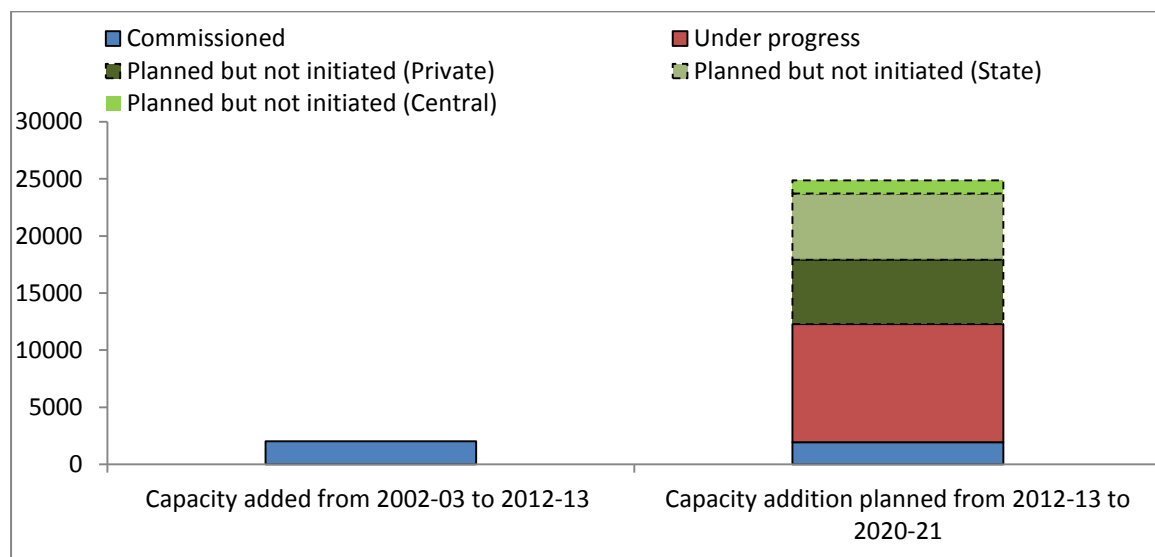


Figure 2.1: Capacity addition in the past and in the future

⁴ This estimation is as per TANGEDCO submitted in M.P 10 of 2012. Some of these projects may not be in the pipeline anymore but without a broader public consultation it is difficult to ascertain.

During the same period, when base load capacity was most needed, increase in wind capacity in the state was significant as shown in Figure 2.2. When base load capacity increase by just 2%, wind capacity almost doubled. This calls for a rational integrated capacity addition plan.

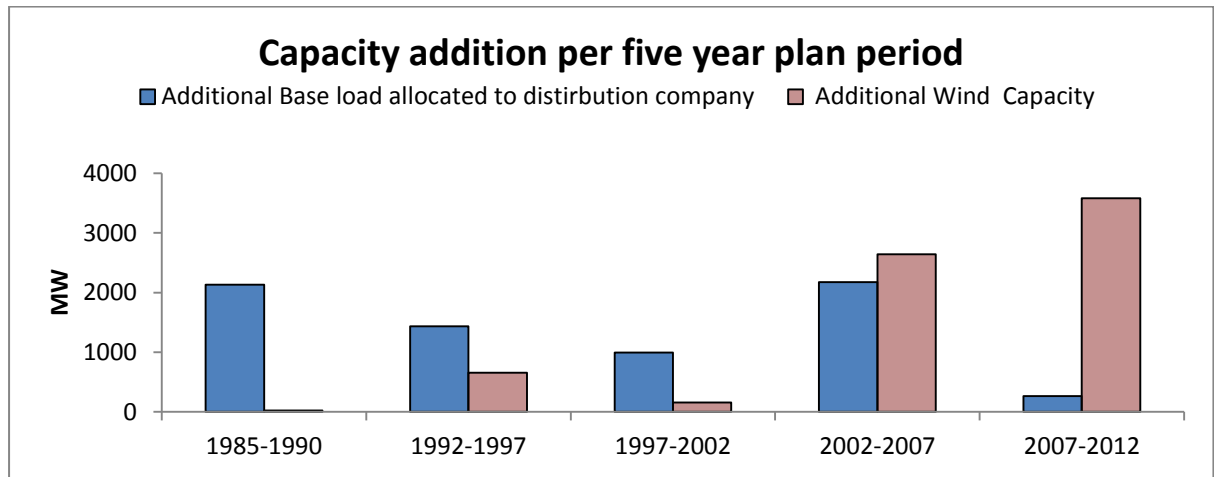


Figure 2.2- Capacity Addition per five year plan period

This is a clear indication that there was no prioritisation given to base load capacity addition in the past, which may continue in the future.

From the reported status of the projects in the pipeline, work has not started for more than 60% of the planned projects. Therefore, without strict scrutiny, especially of the State and Private projects, capacity addition in the coming decade could also be abysmal. Moreover, if these projects are delayed significantly, the future capacity addition could also be extremely expensive and TANGEDCO would be forced to depend on high cost short term sources to meet demand. Therefore, the following actions must be taken:

- a. Regulatory scrutiny of execution of sanctioned projects to evaluate the costs and benefits of planned projects on an annual basis to ensure mitigation on delays.
- b. The regulatory commission should institute a framework to rationalise capacity addition planned. Some of the projects listed seem infeasible due to various reasons and does not provide a realistic estimate of capacity addition in the coming years. Therefore the commission can look at feasibility of projects considered and add capacity to the pipeline only if the project fulfils certain criteria. The criteria could include completion of land procurement, obtaining fuel linkages, obtaining necessary clearances etc. This will help form a realistic estimate for capacity addition in the pipeline with which to compare changes in demand.
- c. Private capacity, bound by PPAs forms bulk of the capacity in pipeline. If contractual commitments are not met, it would negate benefits of competitive bidding and timely capacity addition. Therefore, the regulator, on an annual basis should evaluate performance on power projects based on if the terms and conditions of the contract are being met which include:
 - i. Not adhering to capacity addition timelines and reasons for doing so (failure in securing land, issues with obtaining environmental clearance and water linkage) as well as the imposing penalties involved.

- ii. Supply of power as per availability norms for contracted supply specified in the contract and imposing penalties involved for non-adherence.
- iii. Sharing of revenue from sale of surplus power generated as per PPA terms.

8. Need for a comprehensive demand estimation exercise by the commission and utility and a consequent revision of capacity addition plans

Any capacity addition must be planned or approved contingent to the demand in the state. Given the high cost of power in the state, the operationalising of open access even below 1 MW, the fact that roof-top solar options are at price parity for a large number of high paying consumers, issues in estimation of agricultural demand, demand is uncertain. Given this predicament, there is a need for a more comprehensive planning approach. Any further capacity addition is to be allowed only if a rational exercise is undertaken to assess all possible eventualities and determine its viability. Such an exercise should include:

- a. Proper demand estimation exercise based on macroeconomic indicators, progress of government development programs, environmental/resource factors (e.g.-power required by agricultural sector to access water etc.), historic trends of sales, elasticity of sales to tariffs, historic trends of migration of consumers to open access and renewable options, change in appliances used etc.
- b. Scenario building exercises to assess impact of increase in number of captive plants, open access, advances in renewable technology and its uptake, energy efficiency schemes on future demand.
- c. Estimation of costs to assess impact of costs and power shortage due delay in commissioning of plants in pipeline and deferment due to not getting environmental clearances.
- d. Estimation should be for 15 year, 10 year and 5 year intervals.
- e. Given the comprehensive demand estimation, if the commission finds that capacity addition is more than 20% in excess of projected demand, then the capacity addition plan should be reviewed and revised to be more modest. Such an exercise should be repeated on a regular basis, say every five years.

III. Tariff philosophy and design

In the present process, TNERC has estimated a tariff increase of 17% with certain categories facing a higher increase in tariffs than others as shown in Table 3.1.

HT/LT	Category	Average tariff increase
LT	Domestic	14%
	Agriculture	13%
	Commercial	13%
	Industrial	23%
	Others	17%
HT	Industrial	22%
	Commercial	13%
	Others	36%

Table 3.1: Category wise increase in tariffs

An increase in tariffs for the already high paying industrial and commercial consumers would force such consumers to migrate to other alternatives for power (group captive, rooftop solar, open access etc.). In fact Open Access sales grew from 4878 MU in 2010-11 to 8200 MU in 2012-13 such that almost half the HT power wheeled in the state can be attributed to Open Access. If the Open Access consumers are mostly long term OA consumers, this might be useful for the consumers who stay with TANGEDCO as more power will be freed up for their use. However, if high paying consumers migrate and these consumers continue to pay much lesser than the average cost of supply, the finances of TANGEDCO will continue to deteriorate. In fact revenue loss⁵ due to migration towards Open Access is about 1/5th of the revenue gap in the year 2012-13.

Our estimations indicate that with this increase in tariff, even if an additional 10% of the LT industrial and commercial consumers switch to solar and an additional 10% of the HT industrial and commercial consumers switch to Open Access, TANGEDCO will lose more than 14% of the revenue it would have recovered with the increase in tariffs. This loss is after assuming some power purchase can be forgone due to loss of sales and after accounting for revenue from wheeling and CSS.

With the aggressive power procurement being undertaken by TANGEDCO, if a significant portion of high paying consumers migrate away from TANGEDCO, then the distribution company will also have to bear the costs of the long term power procured which also happen to be much higher than power at market prices.

Therefore in order to protect the interests of obligated consumers of TANGEDCO and TANGEDCO itself, restructuring tariff design such that more consumers pay closer to the average cost of supply is a priority. Therefore it is suggested that:

1. Efforts to reduce cross-subsidy need to be taken

As shown in Table 3.2, the tariff design in Tamil Nadu is skewed and ensures that tariffs of certain category of consumers are low In spite of their consumption.

Consumer	ABR (Rs./kWh)	% cross subsidy	Cross Subsidy (Rs. Cr)
Huts	4.09	32%	105
Domestic	3.97	34%	4695
Industry	7.97	-32%	-1074
Agriculture	2.95	51%	3395
Commercial	8.98	-49%	-1832
Others	6.69	-11%	-245
LT	5.02	17%	5043
HT Industries	9.40	-56%	-3566
HT Commercial	9.98	-65%	-691
HT Railways	8.69	-44%	-213
Others	8.81	-46%	-737
HT	9.37	-55%	-4994

Table 3.2: Cross Subsidy estimated for 2014-15

All HT categories and LT Industrial and LT Commercial are paying tariffs which are much above the estimated average cost of supply of Rs.6.02/unit. If revenue recovery from certain categories falls or if costs increase, even such large increase will not be able to mitigate revenue gaps. Therefore

⁵ Net revenue loss=Revenue loss due to loss of sales–Revenue from cross subsidy surcharge and wheeling charges

given the fact that certain categories of consumers have tariffs which are high enough for alternative sources to be affordable and will therefore not tolerate a further increase in tariff, there is a need to rationalise tariffs.

2. Need for Tariff rationalisation

The proposals for tariff rationalisation are being made keeping in mind the need for TANGEDCO to ensure revenue recovery, the necessity to protect consumer interest, especially those consumers who contribute less to the revenue, consume little but are heavily dependent on electricity. The proposals also take into account that tariff design needs to be simple to understand, easy to implement, should dis-incentivise unnecessary consumption and encourage energy efficiency. The proposals are:

- a. **Restructuring of domestic slabs:** Tamil Nadu follows a unique slab system for domestic tariffs as each slab in the category is subject to telescopic tariffs within the slab. This tariff system might be implemented with the intention of discouraging high levels of consumption but given the fact that the marginal price on the units of consumption is much higher for those consuming more, there might be more of an incentive to tamper with meters and report lesser consumption. If policing cost for such behaviour is more expensive than the marginal return from such differential tariffs it may not be worthwhile for the distribution company to monitor or stop tampering. Moreover, if consumers are insensitive to price changes, then such a tariff structure may not influence their consumption at all.

Consumption Slab	Consumers	Sales	Average Consumption
1 to 100 units	75%	38%	45
101 to 250 units	21%	43%	179
> 250 units	4%	20%	425

Table 3.3 : Slab-wise details for domestic consumers for the year 2012-13

As shown in Table 3.3, 4% of the consumers use more than 250 units per month and despite the high energy charge of Rs.5.75/unit in 2012-13, the average consumption in this category is 425 units. This implies that the tariff design is not effective in curtailing consumption even with high ABRs. Therefore, there is an urgent need to look at consumption patterns, price elasticity and willingness to pay of domestic consumers. At proposed tariffs, the estimated average billing rate for consumers using more than 250 units per month is only 29% higher than consumers using less than 50 units per month. Given the fact that a large number of the state's consumers use less than 100 units, having a tariff design with higher intra-category cross subsidy and a larger number of consumption slabs might help curtail excess consumption and increase revenue recovery from the category. The proposal for domestic tariffs is as follows:

- i. Club all consumers consuming less than 200 units/month into one category as illustrated in Table 3.4. The fixed cost for this category is to be uniform and the increase in energy charge to be higher for every additional 50 units.
- ii. Consumers using above 200 units to be part of a separate category. With consumption higher than 200 units, the household will probably be using appliances such as water heaters and air conditioners whose use should be disincentivised. Therefore consumers in this category start with a higher fixed charge and a higher bracket for energy charges which increases with every additional 100 units by 15-20%

Less than 200 units/month			Greater than 200 units per month		
Slabs Units/month	Fixed Charge Rs./month	Energy Charge Rs./unit	Slabs Units/month	Fixed Charge Rs./month	Energy Charge Rs./unit
0-50	30	3.0	0-300	50	4.6
51-100	30	3.5	301-400	50	5.5
101-150	30	4.0	401-500	100	6.6
151-200	30	4.6	>500	100	7.9

Table 3.4: Proposed restructuring of domestic tariffs

b. **Creation of a general category to protect small consumers-** The proposed tariffs for the commercial category is the highest in the State with LT commercial ABRs being 13% higher than LT Industrial and HT Commercial tariffs being 6% higher than HT Industrial. Given the number of large commercial establishments in the state where electricity costs form an insignificant part of their operating costs, such high tariffs are suitable. However, in the LT category, there are many small consumers, whose consumption might be very less but are very dependent on electricity. LT commercial consumers, on an average use 150 units /month and have a connected load less than 3 kW. It is commendable that the Commission, noting the problems faced by small commercial establishments, decided to create 2 slabs in the LT commercial category. The current tariff design is such that those LT commercial consumers using less than 50 units per month pay about Rs. 4.86/unit in energy charges and consumers who use more than 50 units pay Rs.8.06/unit in energy charges from the first unit of consumption .However, 50 units is not sufficient for to support common appliances used by small commercial establishments such as a refrigerator, mixer/grinder etc. At this tariff, a small consumer with a connected load of 2kw consuming 150 units per month will be paying Rs.1489 per month. Therefore such high tariffs could be unaffordable for businesses whose revenue stream is not large enough for such payments. Recently, in order to promote productive activities MERC in Case 118 of 2012 directed the distribution company to ensure residential tariffs are applicable to commercial consumers who use less than 300 units per month. Such a scheme provided relief to small enterprises within the state as it would reduce the harassment and transaction costs they have to bear to take a separate connection. In order to protect the interest of small consumers, irrespective of category is proposal is :

- i. Consumers of all types (LT Domestic, LT Commercial, LT Industrial) with consumption less than 200 units to be to be grouped into 1 category charged in the same tariff slabs.
- ii. Tariffs increase with increase in consumption such that there is high level of intra-category subsidy.
- iii. TNERC can also ensure certainty in tariff increase to this category by pegging increase in tariff every year to the rate of inflation minus, say, 2%.Any further increase in revenue which might be required can be obtained from other categories of consumers.

3. Need for Operationalization of Open Access

As mentioned earlier, Open Access can be detrimental to the current operations (power procurement, capacity addition, revenue realisation etc.) of TANGEDCO and its operationalization should ensure that the interest of small consumers availing supply from the distribution company must be protected. TNERC Intra-State Open Access regulation were first drafted in 2005 specifying a gradual lowering of the lower limit for contracted demand eligible for open access till

2008. According to the regulations, by December 2008, consumers with a connected load of up to 1 MW shall be eligible for Open Access. In 2009, while the rest of the nation was engaged in a raging debate to decide whether to allow OA for above 1MW consumers, TNEB permitted consumers needing less than 0.25 MW to avail Open Access. Since 2005, Open Access regulations have been amended many times but no specification of a lower limit for contracted demand in case of eligibility for open access post 2008 has been added. In fact, in March 2014 TNERC notified a new set of regulations titled Grid Connectivity and Intra-State Open Access Regulations. These regulations too, do not specify a lower bound for open access eligibility. As the regulations did not specify a lower limit, the consequence is that all consumers, even those below 1 MW are eligible for short term and long term Open Access in Tamil Nadu. Given the power shortage in the state and the encouragement by the Distribution Company, many HT consumers switched to open access.

Besides permitting Open Access for below 1 MW consumers, TNERC also permits short term Open Access. In fact, a significant proportion of consumers avail only short term OA in order to address seasonal, periodic shortages. Therefore, even with the migration of such consumers, power purchase planning of the DISCOM was affected as it still had to contract power to meet the demand of these consumers. Moreover, many of the open access consumers had overdrawn power beyond permissible limits thereby affecting the supply of non-Open Access consumers. In many cases, consumers, especially short term consumers behaved opportunistically, by purchasing only a minimal quantity of power (30 or 50 KVA) during the time they were facing restriction measures imposed by TANGEDCO and then drawing more power than permitted. This resulted in them drawing power meant for non-OA consumers, resulting in unscheduled power cuts for such consumers. Current penalties are not high enough to deter such practices.

Open access in the long term could ensure that load shedding is mitigated by freeing up power for consumers with the utility or help avoid power purchase in case there is no shortages. However, the transitional phase is crucial and given the difficulties TANGEDCO has been facing, and the need to protect the interest of small consumers, the following amendments to the OA regulations are proposed:

- a. Short term open access to be disallowed, unless for contingency purposes, by amending the regulations so as to not permit OA for a period less than 1 year. This will help the TANGEDCO plan power procurement and operations better.
- b. A lower limit for open access should be set (say 1 MW), keeping in mind the constraints of TANGEDCO.
- c. All consumers whose connected load is higher than the lower limit specified by the commission in the regulations (say, 1 MW), must sign a contract with the distribution company if they want to continue avail power from the distribution company. This will ensure certainty of demand and revenue for TANGEDCO.
- d. All Open Access consumers who wish to avail power from the distribution company will be charged at standby charges or temporary supply if and only if it does not curtail the demand of consumers of TANGEDCO.

4. Rationalising Agriculture tariffs and exploring possible

As agriculture which is completely subsidised by the State Government is unmetered, their

consumption is estimated based on certain assumptions. Agricultural energy consumption is estimated based on a benchmark consumption norm of 923 units/ HP. This is based on a 2011-12 study conducted by TANGEDCO where they provided sample meters to agricultural consumers in every area/circle in the state. Having sample meters in every circle ensures that regional variations due to differences in the water table, cropping patterns etc. are captured. As the state government is paying for the power, the average consumption based on these readings will capture and average such variations. Agricultural consumers often face poor quality supply as there is no economic incentive for the TANGEDCO to supply to them. Moreover, the tariff and subsidy design is such that the state government has no incentive to ensure agricultural consumers as metered as this is will result in the subsidy amount increasing by 50%. Our suggestions as follows:

- a. **Gradually increasing effective tariffs of farmers so they pay reasonable tariffs:** Given the energy shortage in the state and the need for efficient use of energy, it is important to send price signals to manage energy and water consumption. Moreover, if agricultural consumers are paying for the power, they can hold the utility more accountable for quality supply of power. The Commission can commission pilots within the states to see if farmers are willing to pay for quality power supply. If farmers are willing to pay, the provision of free power should be gradually phased out and agricultural consumers should be charged reasonable tariffs.
- b. **Regional Benchmarking for agricultural consumption:** Till all consumers are metered, in a scenario where consumers are bearing part of their energy costs, it is essential to have regional benchmarks (say, in each circle) revised every year for agricultural consumption to ensure that their benchmark consumption is reflective of resource, agro-climatic realities and is based on farming practices prevalent in the region.
- c. **Explore the possibility of feeder level solar based pump-sets:** As agricultural consumers are to be subsidised, the feasibility of a one-time capital subsidy to provide power to agriculture as opposed to a recurring revenue subsidy needs to be evaluated. If a one-time capital subsidy for solar power is provided to an individual farmer it is difficult to monitor and evaluate. However, it may be possible in certain areas to have solar plants connected to feeders supplying to predominantly agricultural areas which might help reduce the annual revenue subsidy burden and provide farmers with the limited supply of power they need. Such schemes are underway in AP and Karnataka and the feasibility of such systems can be looked into.

IV. Energy Accounting

The need for demand estimation using a scientific method is necessary for effective power purchase planning and framing an appropriate tariff design. This is especially important when it comes to measuring consumption of unmetered categories and estimating the T&D loss levels. This is especially relevant in a state with acute shortages like Tamil Nadu. This section looks at suggestions for estimating demand for unmetered categories and ensuring proper energy auditing.

1. Need for estimation of demand of unmetered categories and proper energy auditing

As consumption from the Hut and Agriculture is unmetered, energy accounting for the state becomes difficult. Moreover, without a scientific process for energy auditing, T&D loss estimation is next to impossible. Recognising this fact, TNERC issued numerous directives and orders to TANGEDCO to ensure that consumer metering is completed for hut and agricultural categories .In

the interim period sales estimation was directed to be based on feeder level data from all circles. As directives were not complied with, TNERC also issued a suo-moto order based on directions from APTEL which reiterated the need for 100% consumer metering. The order also directed TANGEDCO to conduct a scientific study to arrive at benchmark consumption norms for Hut and Agricultural consumers for loss estimation till consumer metering is complete. The study was to use data from DTs (with AMR meters) on at least one predominantly agricultural feeder and one feeder with a large number of hut consumers in every circle. Line losses and voltage wise T&D losses in this study were to be based on data from metered feeders where all DTs are metered and all consumers are metered. TANGEDCO reported T&D losses for 2012-13 at 18.74%. However, as this loss estimation was not supported by the mandated scientific study, the commission has since then decided to approve loss levels based on previously approved loss reduction trajectory until TANGEDCO submits T&D losses based on a scientific study. Given the lethargy of TANGEDCO in ensuring proper energy accounting and the slow pace of metering consumers our suggestions are as follows:

- a. The commission can direct TANGEDCO to install AMR meters on all feeders in the State which can supply hourly data automatically to the commission.
- b. Based on the feeder level data, the utility can estimate Hut and Agricultural consumptions as well as T&D losses. This is a relatively cost effective⁶ way to obtain energy data on a regular basis.

V. Load Shedding

Load shedding seems likely to continue for some years to come in Tamil Nadu, especially in the summer. Given this predicament it is imperative that the commission devise a methodology such that shortages are shared equitably. Consumers for smaller cities, towns and villages are subject to longer hours of load shedding than others without any principle being following for sharing shortages. While there are many efforts being taken to reduce the demand-supply gap, it is also essential that there is fairness, transparency and predictability in load shedding is present. To ensure this :

1. The commission should prepare a discussion paper on possible load shedding protocol based on which state-wide consultations should be undertaken.
2. The load shedding protocol can divide the state into regions based on levels of AT&C losses and more power can be supplied to regions with lower losses.
3. Based on the inputs, and after public hearings are conducted, TNERC should issue an order ratifying a load shedding protocol.

A similar scheme was operational in Maharashtra and it significantly increased transparency and accountability in load shedding decisions.

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⁶ Installation of AMR meters for all feeders cost about Rs.50, 000 per feeder (Rs. 48 Cr for about 9000 feeders), according to cost estimates of MSEDCL in 2007. This excludes cost of data collection, transfer and analysis. The cost per feeder might be low due to scale economies, considering the number of feeders in Maharashtra. Alternatively, due to technology advancements, the cost per feeder might be lower. This number should be treated only as an indicative estimate.