

October 13, 2023

PEG/2023/63

To

The Secretary

TSERC

Hyderabad, India

Cc to CGM/IPC&RAC/TSNPDCCL, CGM/RAC/TSSPDCL

Dear Sir

**Sub: Load Forecast and Resource Plan petitions and clarifications of TS DISCOMs –
Additional submission by Prayas (Energy Group)**

We thank the Hon'ble Commission for directing the DISCOMs to provide more information of review of 4th control period and on smart meters. We also thank the DISCOMs for providing this information through email and TSERC for making it available on its website.

This additional submission is made after studying the replies given by TSNPDCL and TSSPDCL subsequent to the public hearing held on 01/09/2023 and a brief study of the additional information. Some of the points raised in our earlier submission dated 27/06/2023¹, for which satisfactory replies are not provided, are raised again.

This submission covers four topics – demand/sales forecast, power purchase, network investment and process improvement suggestions.

We request the Honourable Commission to take this on record, permit us to make additional submissions and present these when a public hearing is held.

Thanking you,

Yours truly,

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¹ Prayas submission to TSERC, dated 27/06/2023, is available at TSERC website [here](#).

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Load Forecast and Resource Plan petitions and clarifications of TS DISCOMs – Additional submission by Prayas (Energy Group)

1. Demand forecast

We thank the DISCOMs for providing analysis of historical sales in their replies dated 16/9/2023. We also thank the TSERC for uploading additional information, with SPDCL data on circle -wise, category -wise sales data and network data; and NPDCL data on sales, NCE PPAs, load curves etc. There is indeed a lot of data that is provided, which we have not been able to completely study. But it is still not clear how this data has led to the demand projections given in the resource plan.

LT agriculture: DISCOMs have not given replies to the doubts on the method used to arrive at 5% growth rate, in our submission dated 27/06/2023. The only reference is on page 6/31 of Annexure I that LT agriculture sales has increased in 2022-23, due to 24 x7 supply to agriculture introduced in January 2018²

Our submission had asked for the basis for taking 5% growth rate in 5th and 6th control period. To quote from our submission:

The YoY growth of agriculture consumption reported by DISCOMs has been negative for the past three years. This was also highlighted during the FY24 Retail Tariff process. Section 4.16 of the FY24 Retail Tariff order of TSERC covers this aspect. It mentions that DISCOMs have admitted that "...consumption under LT-V category would not further increase given the fall in use of borewells and a rise in canal-based cultivation ...".

From historical data, it is clear that the average capacity has stabilised at 5 hp and hours of pumping at 2000 hours. DISCOM petitions assume that both the number of consumers and average connected load would increase by around 2.5% YoY, thus resulting in 5% YoY consumption growth, while maintaining hours of operation to around 2000. The basis for these assumptions need to be explained.

We request the DISCOMs to provide the basis for their sales forecast for LT Agriculture.

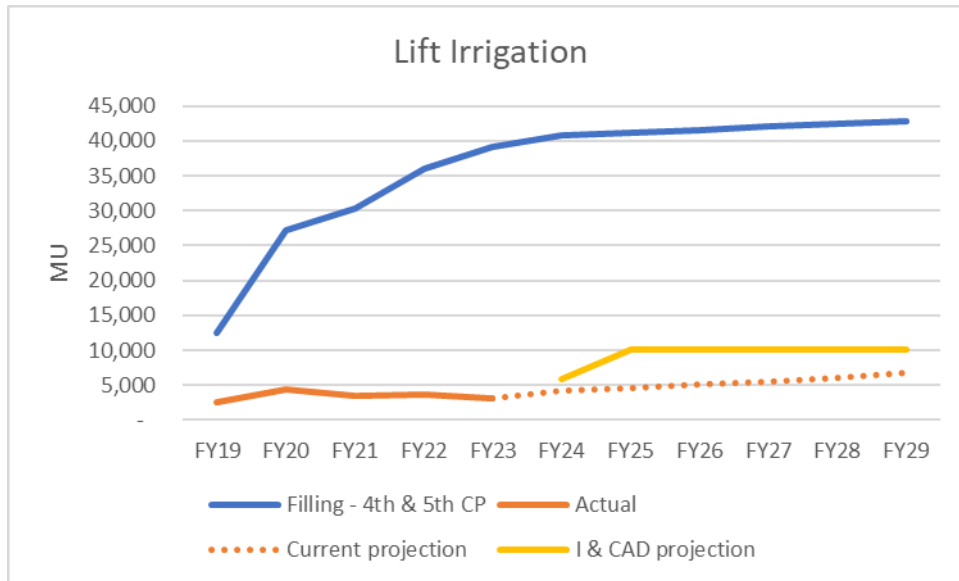
HT – Lift Irrigation: It is good that the DISCOMs have given some details for this in Annexure II of the reply by DISCOMs. But it is unfortunate that the DISCOMs have not been able to provide a realistic sales forecast. Since this category has a crucial contribution to system

² Note below Table 4 in Annexure I: "It is pertinent to mention that the State of Telangana has started supplying 24*7 power to agriculture sector from 01.01.2018. This has increased the power purchase requirement of FY 2022-23."

demand (and hence network & power purchase), realistic demand projection becomes very important. From data given in Annexure I and II, it is clear that this has not happened.

Figure 1 gives different sales figures for this category from different sources – namely the previous resource plan filings for 4th and 5th control periods (FY19-FY29), actuals (FY19-FY23), current projections for 5th control period (FY24-FY29) and I & CAD projections given to DISCOMs as part of the current resource plan preparation (FY24-29).

Figure 1: The many numbers for Lift Irrigation sales



Source: Compiled by Prayas (Energy Group) from Annexure I and II of DISCOM replies dated 16/09/2023

From Figure 1, it can be seen that projections in the previous resource plan was extremely ambitious. As mentioned in Annexure I, this resource plan did not go through regulatory scrutiny and public consultations due to many reasons.³ DISCOMs could clarify if the network expansion and power purchase were planned on such projections. From Figure 1, it can also be seen that actual sales (FY19-FY23) were much lower – 20% of projections in FY19 and 8% in FY23. The dotted line indicates the sales projections in the current petition and the line above it is the projections by the I&CAD department. I&CAD department projections suggest that the whole LI demand is expected from FY25 onwards.

While it is true that the current projection is sober compared to the previous, basis for the projection is not very clear. As stated in Annexure II, the projection is based on 10% growth

³ Annexure I mentions the following reasons: TSERC was not operational after the Chairman retired in January 2019 till October 2019; Election code of conduct from 10/03/2019 to 23/05/2019 due to Lok Sabha elections; Election code of conduct from 23/12/2019 to 25/01/2020 due to Municipal elections.

rate on some base year sales. ⁴ As we had mentioned in our submission dated 27/06/2023, projection of sales to this category should depend on number of pumps operational, completion of reservoirs & canals and hours of pumping. We feel that DISCOMs can improve the forecast of sales for this category. For example, Table 1 gives the data on sales to this category in FY23.

Table 1: Sales to Lift Irrigation, FY23

LI sales FY23	MU	% of Filed
DISCOM Filing	14,962	
RC Approved	7,603	51
Actual	4,421	30

Source: Compiled by Prayas (Energy Group) from Annexure I and II of DISCOM replies dated 16/09/2023

It can be seen from the last column that RC approved figure is 50% of the DISCOM filing and actual is 30%. DISCOM could explain why the TSERC figure is much closer to actual sales and why it could not adapt methods used by TSERC to arrive at more realistic forecast.

We request the DISCOMs to provide the basis for arriving at 10% growth rate and also request TSERC to conduct a closer scrutiny of LI sales projections.

Domestic and HT Industry: DISCOMs have not provided answers to the questions on forecast for these categories, raised in our submission dated 27/06/2023.

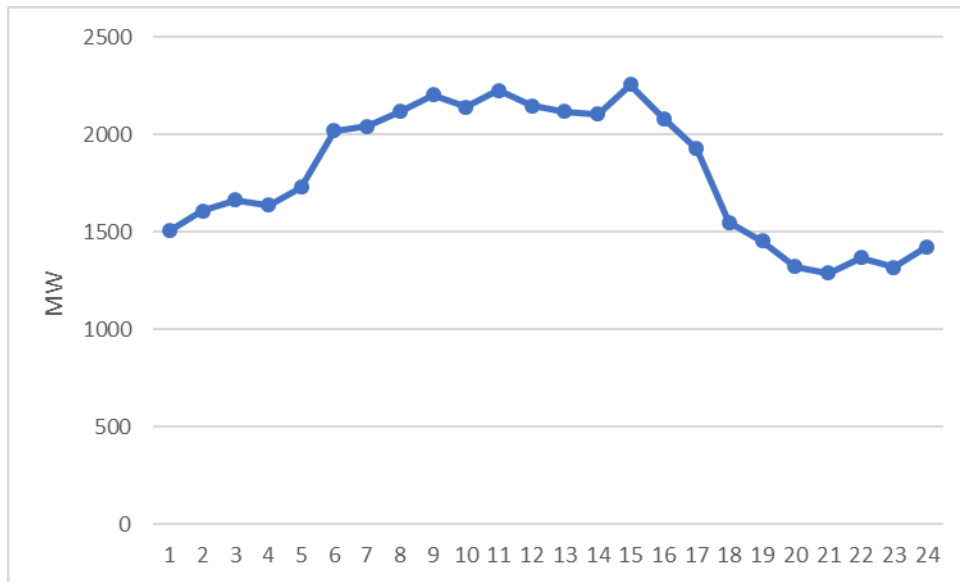
RESCO, Sircilla: Sircilla RESCO is distributing power in its area of operation through a license issued by the Commission though it falls within the area of TSNPDCL's area. RESCO, Sircilla also needs to submit a detailed load forecast for its area of operation. TSNPDCL in its submission has merely stated as follows, *"the consumption pattern of the Resco is in line with TSNPDCL's consumption of all LT consumer categories."* No data is presented in support of this statement. Request the Commission to direct RESCO, Sircilla to file its detailed load forecast for the control periods under examination.

Load curve and load duration curve: We had requested for load curves for the whole state for typical demand days (say maximum, minimum, average demand) and load duration curves. Examining actuals in 4th control period and projections in 5th control period will help to assess required generation – base, and peak. Page 17/31 of Annexure I gives yearly peak load data for DISCOM. But other requested data has not been provided by DISCOMs. Spread sheet files in Additional submissions of DISCOMs (Annexure II in Additional information 3 of

⁴ From page 2/14 of Annexure II: *"In view of the delay in receipt of the information, the Discoms have projected the sales against the lift irrigation schemes considering a growth rate of 10% based on the historical actual sales (TSSPDCL considered the base sales as recorded in FY 2021-22 and TSNPDCL considered the base sales as recorded in FY 2020-21)."*

SPDCL and Annexure 4 – load profiles of NPDCL) provide hourly sales data for all categories. DISCOMs indicate that they have used hourly demand data for 365 days to arrive at the daily load curve. Figure 2 gives the hourly load curve for LT agriculture for the state using data from these Annexures.

Figure 2: Daily demand curve for LT Agriculture for TS



Source: Compiled by Prayas (Energy Group) from data provided in Additional information

If this is indeed representative curve for a day in a year, the area under the curve, 43.27 MU is the average daily agriculture demand, which translates to 15,793 MU for a year (365 days). This is much less than the current and projected agriculture demand. DISCOMs need to explain this anomaly. A proper assessment of consumption pattern requires analysis of hourly data for typical days in a year or category wise load duration curves. Since hourly data is available, DISCOMs should provide load duration curves for past years for the whole state and expected curves for at least next few years in the 5th control period.

2. Power Purchase

Resource plan projects significant surplus in 5th control period and reducing surplus in 6th. As we had pointed out in earlier submission, surplus, as a percentage of energy availability is 30.2% in FY25, reducing to 13.2% by FY29. There is 3.3% surplus in FY30, and shortage of 22.7% by FY34. Table 1 of Annexure II of the replies also gives the details, but there appears to be a typo in its last row – “% of Surplus to Availability”. The figures given are actually % Surplus of requirement.

Annexure II indicates that mismatch in Lift Irrigation sales, delay in commissioning power plants and variation between normative and actual PLF as the three reasons for the energy requirement mismatch. It also indicates that there have been significant market purchases

in FY20, FY21, FY22 and FY23. Market purchase has been between 9 to 13% of total energy available (including markets). It can also be seen that the quantum of market purchase has been 4 to 7 times the TSERC approved value and 2-3 times the DISCOM filed value. It appears that DISCOMs are depending on market to manage demand-supply imbalance.

As of now the proportion of renewable in total energy available is only about 10%. If this proportion increases, the grid balancing challenge would be higher. There would also a need to avoid renewable energy curtailment. This is reason why we had enquired about the plans for storage options like BESS or Pumped storage in TS. In their replies dated 16/9/2023, DISCOMs state: *“TS Discoms shall explore the Battery energy storage systems for utilizing the surplus energy and feeding back to the system during the period of peak hours thereby reducing the dependency on the short-term power purchases to balance the demand and supply.”* This answer may be relevant for pumped storage hydro, since using BESS to manage such high surplus is not yet an economic option. As mentioned in our earlier submission, TS utilities should use modelling tools to plan capacity addition and optimal utilisation, while meeting reliability constraints.

The need for better forecasting of lift irrigation sales has been covered in section 1. It is unfortunate that DISCOMs are not able to access realistic schedules of commissioning of power plants. But DISCOM could explain how the delay in commissioning power plants has led to surplus in 5th control period.

As for PLF, actual PLF of most thermal stations in the country are below normative values due to many reasons. Reasons include the increasing share of cheaper renewable power (especially in few hours in the year), change in demand profile and reduction of shortages. These trends are present for the past few years and is likely to continue. As we had pointed out in our earlier submission, though there are variations in monthly PLF, annual PLF of many TS thermal plants are close to normative value. In any case, we feel that taking the average actual PLF of past three years is a better option rather than the normative PLF. A mid-term review of resource plan can be used for any course corrections, due to wide variations in actual PLF.

The case of reduction in Chhattisgarh power purchase (CSPDCL) was raised in our previous submission. We thank the DISCOMs for making it clear that power purchase from this station has been low, due to ongoing ATE case (filed by TS DISCOMs), non-payment of dues etc. DISCOMs need to make it clear why it filed an appeal against the CSERC order in ATE in 2018, when CSPDCL power appears to be having low total cost and variable cost. As per the Pooled power purchase cost order of TSERC (dated 22/09/2022), the APPC for TS for FY23 is Rs 4.5/Unit (FC of 1.9 + VC of 2.6), whereas CSPDCL total cost is Rs.3.9/Unit (2.7 FC + 1.2 VC).⁵ We request DISCOMs to clarify if the power cost of CSPDCL quoted here is only the

⁵ Order available at TSERC website, [here](#).

cost of generation and if so, give information on any additional charges like transmission charges, cess, fuel cost adjustment, trade margin (which we understand was waived) etc. Were the DISCOMs paying the fixed charges when the power purchase was reduced? Section on FY23 in Annexure I mentions that all dues to CSPDCL has been settled, but still CSPDCL is scheduling zero energy. Can anything be done about this? DISCOM could also explain why it could not take timely steps to avail of this apparently cheaper power supply option. The PPA term, as we understand, ends only in 2027.⁶

Surplus power sale: In their reply, DISCOMs have given three options to handle surplus power – banking arrangement with other states, use of PUSHP platform and power exchange. Arrangement of surplus in such high volumes would be possible only if there are potential buyers when TS has surplus. As can be seen from the generation mix and mentioned in our previous submission, TS has significant thermal power surplus, which is base power available for 24 hours, except when thermal units are under maintenance or there is coal shortage. This implies that surplus power would be available in most of the time blocks in the year. Many states have similar surplus, and for the RE rich states, surplus is during the day time (solar), or during monsoon season (wind). Also, the generation cost of the recent TSGENCO power plants are over Rs 5/Unit, whereas the APPC for TS and AP were close to Rs 4.5/Unit. Who will require such costly base load power? What are the specific plans of DISCOMs to sell the surplus power? Which DISCOMs would be ready to enter into banking (or is it swapping) arrangement?

DISCOM could clarify if any potential buyers have been identified and if so provide the details of the quantum and price.

Announcement of HPDAM to sell high price power (greater than Rs 12/Unit) in the exchange and the surplus power portal was [announced](#) by MoP in March 2023. Replies by DISCOMs state that *“TS Discoms, have already utilized the services of PUSHP platform in order to meet its requirements in the month of May 2023.”*

Term ahead market could be another option to sell surplus power and DISCOM reply mentions the possibility of using market.

We request the DISCOMs to provide details of the power sold through PUSHP in May 2023, and any plans to sell surplus power through swapping/banking or exchange. Will it be possible to claim true-up charges in such arrangements? If not, what is the plan of DISCOMs to claim true-up?

No power purchase cost optimisation: In addition to the 2005 Regulations, the 2006 APERC Guidelines on load forecast, resource plan and power procurement should be used to

⁶ Prayas had raised some of these issues in an article, “Chhattisgarh power for Telangana: The curious case of a power purchase contract” (2020), available [here](#).

prepare this petition. According to Clause 3.1.3 of the Guidelines *“Each Licensee must be able to demonstrate, through a process of integrated resource planning, that it has examined the economic technical, system and environmental aspects of all available reasonable options to satisfy the load and energy service needs of its consumers in its area of supply, and that such examination has been carried out in accordance with these Guidelines.”* According to Clause 3.3.2 of the Guidelines *“The Power Procurement Plan shall be an optimal least-cost portfolio of long-term and short-term plans (...), with the ultimate objective being to make available secure and reliable power supply at economically viable rates to all consumers while satisfying Power Supply Planning and Security Standards.”*

An examination of the submissions shows that there is no attempt at integrated resource planning and optimal least-cost power procurement. This was pointed in our previous submission and DISCOMs, in their reply dated 16/9/2023 have stated that: *“Discoms have noted the objections and shall improve in future submissions”*.

Significant surplus in power availability during the 5th control period is a pointer towards this lack of integrated, optimal and least-cost planning. Hence, without waiting for a future submission, we request the DISCOMs and TSERC to make the best efforts to improve demand forecasts and power purchase planning to optimise costs. As a first step, different scenarios could be envisaged and DISCOMs could calculate the average cost of supply and total cost for these. As the second step, TSERC could revise the 2006 guidelines and ensure that DISCOMs improve the planning process.

Clarifications on network planning and investments

We thank the DISCOMs for providing year-wise data on losses, reliability, DT failure etc. But data related to safety is not provided in the replies. We had also requested DISCOMs to link the network investments to such performance metrics – demand growth, reliability, losses, voltage profile, accidents etc.

We also seek responses from DISCOMs on few other network proposals, as below.

TSNPDCL in its filing (p.78) proposes conversion of single phase agriculture DTRs to 3 phase agriculture DTRs to reduce technical losses. From this filing it is not clear why the DISCOM wants to shift from single phase HVDS DTRs. In the first place, HVDS transformers were introduced to address high technical losses/theft. What prompted the TSNPDCL to take up this conversion is not clear.

TSNPDCL also has the following proposal *“Provision of alternate supply for LT consumers: In the event of a distribution transformer failure, it is necessary to have an alternate LT supply from adjacent DTRs to the existing LT lines. Hence 6,500 KM of LT line is proposed for above purpose, which would incur an amount of Rs. 390 Crores during the current fiscal year and ensuing control periods (5th& 6th).”* (p.81) The Regulations on Standards of Performance

provide the time limit within which problems related to DTRs need to be addressed. Given this the expenditure on alternate LT supply line from adjacent DTR may not be needed. Also, whether the adjacent DTR has the capacity to take additional load of another DTR is an issue.

From TSSPDCL's filing it is not clear whether it has similar proposals.

Suggestions on Process improvement: In our submission dated 27/6/2023, we had made many suggestions on process improvement. DISCOMs have not given any replies and some of the points are under the purview of TSERC.

We had suggested that DISCOMs should optimise power purchase cost under different scenarios and provide average cost of supply and total cost, so that consumers can understand the implications of the plan. As mentioned in previous paragraph, this has not been done, with the DISCOM replying that they would do in the next plan.

DISCOMs have cited non-functioning of TSERC and election code of conduct as reasons for not being able to file resource plan for 4th and 5th control periods. This is indeed unfortunate for the TS power sector and consumers, since power purchase decisions and network expansion were carried out without a plan approved by TSERC, through a transparent participative process. We request the DISCOMs and TSERC to examine the need to suspend the whole regulatory process due to elections. The experience from other states have been mixed, with some states continuing the process, some with- holding final order on crucial and few like TS, not even initiating it.

Information on 4th control period has been provided only after it was raised in the public hearing on 01/09/2023. Review of previous control period should be made mandatory when a new plan is being prepared. A mid-term review of the plan should also be conducted, perhaps in the 2nd or 3rd year, and it could be combined with the retail tariff process.

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