Prayas (Energy Group)

Prayas

Initiatives in Health, Energy, Learning and Parenthood

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June 27,2023

To

The Secretary
TSERC
Hyderabad, India

Dear Sir

Sub: Comments by Prayas (Energy Group) on the Load forecast and Resource plans for 5th (FY25-FY29) and 6th (FY30 to FY34) control periods by Telangana DISCOMs, TRANSCO and GENCO

We welcome the efforts of the Telangana power utilities in submitting the load forecast and resource petitions for the next two control periods to the TSERC for public comments. Reducing power shortages, commitment on 24 x 7 reliable supply, increased penetration of renewable sources, better integration of the national grid and growing electricity markets call for rigorous forecasting and resource planning at the State level. This petition is a first step in that direction.

Our submission highlights limitations and brings out areas in which the petition can be strengthened, particularly with regard to load forecast and generation capacity planning. Some data gaps are also highlighted, with the hope that the utilities would provide the necessary information.

We request the Hon'ble TSERC to take our submission on record and provide us an opportunity to present it during the proposed public hearing.

Thanking you,

Yours truly,

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Comments by Prayas (Energy Group) on the Load forecast and Resource plans for 5th (FY25-FY29) and 6th (FY30 to FY34) control periods by Telangana DISCOMs, TRANSCO and GENCO

1. Comments and clarifications on the DISCOM petitions

1.1. Presentation of key demand forecast data can be better

The petitions present historical and forecast demand data in pdf tables, in some cases in scan format (example: Annexures). SPDCL petition does not give historical data, while NPDCL has it from FY17. It is mentioned that the forecast has been prepared based on circle-wise analysis (Section 2.3), but data is not made available.

It is important that crucial historical and future data related to category-wise number of consumers, connected load and energy sales are provided in spreadsheet format. This could be done immediately. In future, TSERC could prepare suitable formats, which should be uniformly followed by both the DISCOMs. Similar presentation is important for data related to generation, distribution network and transmission network.

1.2. Essential to cover the many data gaps

Petition provides only annual energy, load factor, coincident peak demand and non-coincident peak demand. Using only energy and peak demand data for resource planning may be suitable decades ago, characterised by high base load capacity, and acute power shortage. Today, when the proportion of renewable capacity is on the rise and power shortages do not exist, it is essential to employ better resource planning methods.

A few suggestions in this regard: It is necessary to provide daily load curves for at least typical days in each season for all the years being analysed. It is also necessary to provide load duration curves for all the years. These could be prepared for different scenarios – based on demand growth, penetration of renewable and growth of market. Such an analysis would help to identify the required base load capacity and peak load/energy requirements, which could be met through market purchase or storage options. It is also important to plan for energy efficiency and demand side management. The impact of such measures on energy and peak demand should be considered. It is not possible to manage intermittency and variability of renewable power without storage options. Battery based storage or pumped storage options are surprisingly not elaborated in the petitions.

1.3. Rigorous analysis of historical data and better forecasting methods needed

A mix of trend and end use methods has been used to prepare the forecast. But the basis for underlying assumptions are not sufficiently explained. Considerations like end use efficiency, potential for shifting demand and impact of a roll out of Time of the Day (ToD) tariff are not covered. A few points regarding four major consumer categories are given in the next paragraphs.

Table 1: Proportion of demand of major consumer categories

Category proportion/Year	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY34
LT Domestic	21	20	21	22	22	22	21	21	21	21	21	20
LT Agriculture	36	36	31	34	31	28	29	29	29	28	28	26
HT Industry	21	22	21	20	23	25	24	24	24	24	24	25
HT Lift Irrigation	4	4	8	6	6	4	6	6	7	7	7	10
Total LT	67	65	61	65	62	59	59	59	59	58	58	55
Total HT	33	35	39	35	38	41	41	41	41	42	42	45
Total demand MU	50,562	57,538	58,522	57,049	61,160	65,002	73,972	78,249	82,746	87,708	92,916	1,25,184

Source: Compiled by Prayas (Energy Group), from Resource plan petitions and FY24 Tariff filings of DISCOMs

Table 1 gives the proportion of demand by four consumer categories from FY19 to FY24 (FY23 and FY24 data are estimates) and forecast from FY25-FY29 and for FY34. From Table 1, it can be seen that these four consumer categories, namely LT Domestic, LT agriculture, HT Industry and HT Lift Irrigation are the major categories driving demand growth. They together account for about 80% of the total demand. The petitions provide a forecast and note that the energy and demand forecast are close to the projections in the 20th EPS of CEA. Notwithstanding the issues with EPS projections, it can be seen that there are differences in category-wise forecasts of EPS and DISCOMs for the same period (FY25-29), for the Telangana state. For domestic category, YoY growth rate as per EPS is about 6.5%, whereas DISCOM project 5.4%. For HT industry, EPS projects 9.5% YoY growth rate, whereas it is 6.2% as per DISCOMs. EPS combines LT and HT irrigation and projects a YoY growth rate of 4.5%, whereas DISCOMs projects 5% YoY growth rate for LT irrigation and 10% for HT. 20th EPS was released in November 2022, and it is not clear how such major changes in growth trends have occurred. Detailed analysis of the historic trends of these categories is essential to prepare a robust forecast. [1]

For domestic, the DISCOMs have used trend analysis, suggesting that historic Year on Year (YoY) growth for some of the years (it varies from 4 to 8%) or the 5-year CAGR (which is about 5.5%) would be used. The YoY growth rates used by both DISCOMs appear higher than the growth rates in the past few years. For the TS state, also a YoY growth rate and CAGR of 5.4% is used for the forecasts.

A similar approach is followed for LT and HT commercial categories, which together account for 10-11% of the demand. Their forecast has also been done based on trend method, but the YoY growth rate assumed for the state is 6.5%, much lower than the 14-18% YoY growth rates based on figures for the post Covid years.

It is surprising that the potential for energy efficiency, which is quite high in domestic and commercial, involving appliances such as air conditioner, refrigerator and fan have not been considered at all. With the reducing growth rate in in population (and households), increasing

[1] LT and HT commercial categories are not energy intensive, and as per the data provided, the proportion of their demand remains around 11% during the whole period from FY19 to FY34.

saturation of appliance penetration and use of efficient appliances, the electricity consumption growth rate is expected to reduce in the years to come. Migration to roof top solar is also likely to be high, in high consumption slabs. Section 5.2.7.1 of NP petition 6.1.7.1 of SP petition mention that roof top solar has been considered during forecast, but no details are provided.[2]

In case of LT agriculture, the forecast is not easy to prepare, firstly because there are many challenges in current consumption estimation method based on a few sample DTs. Better measurement would hopefully be available when the TSERC directive of 100% DT metering is implemented, by the specified deadline of March 2024. [3] But even with better measurements, future agriculture consumption depends on many factors such as, released connections, hours of supply, cropping pattern, spread of lift irrigation, rainfall, temperature and efficiency measures (in electricity and water use).

The logic behind the forecast provided in the petition needs to be explained. DISCOM petitions (Section 2.3.5) indicate that the YoY growth is low or negative, and summarily states that: *"… the licensee expects the growth rate of 5% in agricultural category keeping in view the irrigation lands still to be cultivated which needs pumping water."* 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 …".* TSERC approved agriculture consumption higher than what was proposed by the DISCOMs, using connected load data and 10/12 hours (10 for NPDCL, 12 for SPDCL) of operation for 180 days in a year.[4] Thus, it is not clear how the DISCOMs have assumed a uniform 5% growth in agriculture consumption for the next two control periods.

Table 2 gives the number of consumers, consumption, average capacity, hours of pumping and units/hp/year for the past few years and the next control period. 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.

[2] From 6.1.7.1 of SP petition: "The licensee has factored in the above as part of the sales forecast. However detailed modelling on the revenue impact, category-wise would be carried out by the licensee at the time of ARR and Tariff filing."

[3] Directive 18 in Appendix B of the FY23 Retail Tariff order of TSERC mentions: *"The Commission directs the DISCOMs to achieve 100% Agricultural DTR metering within a period of 2 years and to furnish the quarterly progress on the status of implementation in this regard."*

[4] The basis for 180 days and 10/12 hours/day assumptions of TSERC is also not clear. Moreover, as per a Times of India news report of 8/6/2023, the TSERC chairperson has observed that there are 10 lakh illegal connections, in addition to the existing 27.5 lakh connections. If this is true, the consumption estimates would have to be drastically changed. Only DT metering or agriculture pumpset census can clear the air on this.

Table 2: Analysis of Agriculture consumption

Detail/Year	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29
No. of consumers (lakhs)	22.4	23.1	23.9	25.1	26.4	26.2	27.4	27.5	28.1	28.8	29.5
Consumption (BU)	20.8	17.9	19.6	19.1	18.3	20.5	21.6	22.7	23.8	25.0	26.2
Average capacity (hp)	5.0	5.0	5.0	5.0	5.0	5.2	5.3	5.4	5.5	5.7	5.8
Hours of pumping/year	2,481	2,081	2,195	2,036	1,856	2,001	2,004	2,049	2,052	2,055	2,057
Units/hp/year	1,851	1,552	1,638	1,519	1,384	1,492	1,495	1,529	1,531	1,533	1,535

Source: Compiled by Prayas (Energy Group), from Resource plan petitions and FY24 Tariff filings of DISCOMs

In case of Lift Irrigation and HT Industry, since the consumers are few and granular data is available through electronic meters, one would expect consumer-vide detailed analysis of historical data and detailed explanation for load forecast. This is not provided in the petitions, as detailed below.

For HT industry, DISCOMs have taken annual growth rate (around 6% YOY for the state) and some specific considerations. But the details of arriving at the YoY growth rates by DISCOMs is not provided. Section 2.4.10 of NPDCL petition mentions that growth rates have been low and 2 or 5% growth rates are assumed for circles. But Table 20, gives YoY growth rates of 6 – 8% for FY25-29. This is not clear, even after considering the reduction of sales due to SCCL captive and increase due to Kakatiya textile park, mentioned in the next paragraph. Section 2.3.10 of the SPDCL petition does not explain the method of arriving at the 6.3- 6.5% YoY growth rates given in the table.

Specific considerations include HMR Hyderabad for SPDCL and Warangal Kakatiya mega textile park for NPDCL increasing demand, SCCL captive power in NPDCL reducing demand. It will be good if TSERC independently checked the status of these projects or any other such project which have major impact on HT industry demand. The basis for forecast of open access and captive given in the petitions (Section 5.2.2 and 5.2.4 for NPDCL and Sections 6.1.2 and 6.1.4 for SPDCL) is not given. Considering the national trend, open access sale of 2% of HT sale and captive capacity of 10% peak demand looks low. It may be noted that, as per 20th EPS projections for Telangana, captive power is expected have a YoY growth rate of 20% and Roof Top Solar a growth rate of 30%.

HT Lift irrigation, especially at 132 kV was expected to be a major contributor to energy and peak demand in the MYT petitions for the 4th Control Period (FY19-24), filed by TSTRANSCO in 2020. As per these petitions, in FY24, Lift Irrigation was expected to account for 25% of the total energy demand and 37% of the peak power demand. The total connected load of Lift irrigation projects was expected to be close to 10,000 MW. But as per the current petitions, the progress of lift irrigation projects seems to be slower than expected.

Table 3: 132 kV Lift Irrigation Projects

Detail/Year	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY34
No. of consumers	40	48	49	49	49	49	49	49
Consumption (MU)	3,787	2,753	4,184	4,401	4,842	5,326	5,858	10,853
Connected load MW/MVA	3,042	4,000	4,000	3,966	3,966	3,966	3,966	3,966
Hours of operation/year	1,245	688	1,046	1,110	1,221	1,343	1,477	2,737

Source: Compiled by Prayas (Energy Group), from Resource plan petitions and FY24 Tariff filings of DISCOMs

It can be seen that the number of consumers and connected load is same from FY23 till FY34. Historical data does not indicate any definite trend in consumption, but as per the petition, the consumption is projected to increase by 10% every year. As per the initial plans, LI projects were to be operated for upto 16 hours for 120 days in a year, amounting to 1920 hours in a year. As seen in the last row in Table 3, the number of hours of operation in the past few years has been erratic and projects increase a steady increase till FY34. No explanation is given on the increase hours of operation or how 10% YoY growth rate was calculated. DISCOMs should provide project wise metering data on Lift irrigation projects, so that the actual trends in operation can be understood.

2. Comments and clarifications on the TRANSCO petition

The TRANSCO petition is an aggregation of the DISCOM petitions, but does not provide d typical load curves for peak, off peak days, and load duration curves, for past and future years. Load curves and load duration curves under different scenarios are extremely important to check if the generation capacity can cater to the demand at all times.

As per the petition, there is significant surplus in the 5th control period, followed by deficit in the 6th control period. Surplus, as a percentage of energy availability is 30.2% in FY25, reducing to 13.2% by FY29. There is 3.1% shortage in FY31, and shortage increases to 22.7% by FY34.

Considering that there are no significant power shortages in the country, it is not clear how the utilities plan to manage the surplus. Better planning of power capacity addition in a phased manner should be considered, which avoids high surplus in the 5th control period and deficit in the 6th.

As the State Transmission Utility, TS TRANSCO should strive to optimise power purchase costs, while meeting the demand and ensuring reliable supply. This ideally requires a modelling exercise considering block-wise demand, generation, cost parameters and related constraints. Considering the high penetration of renewable sources, adequate balancing power also has to be planned. Options such as battery storage, pumped storage operation, increasing flexibility of coal plants, market purchase for seasonal loads and introduction of demand management measures have to be considered. The petition does not provide any such details.

3. Comments and clarifications on the GENCO petition

It is good to note that a generation plan that includes all available and possible generation sources over two control periods has been submitted for Telangana. Projections over the long time period can help provide regulatory clarity and guidelines for sector growth. However, given a transitioning power sector, increasing penetration of renewables (RE) and national and state targets, further consideration is needed, as elaborated.

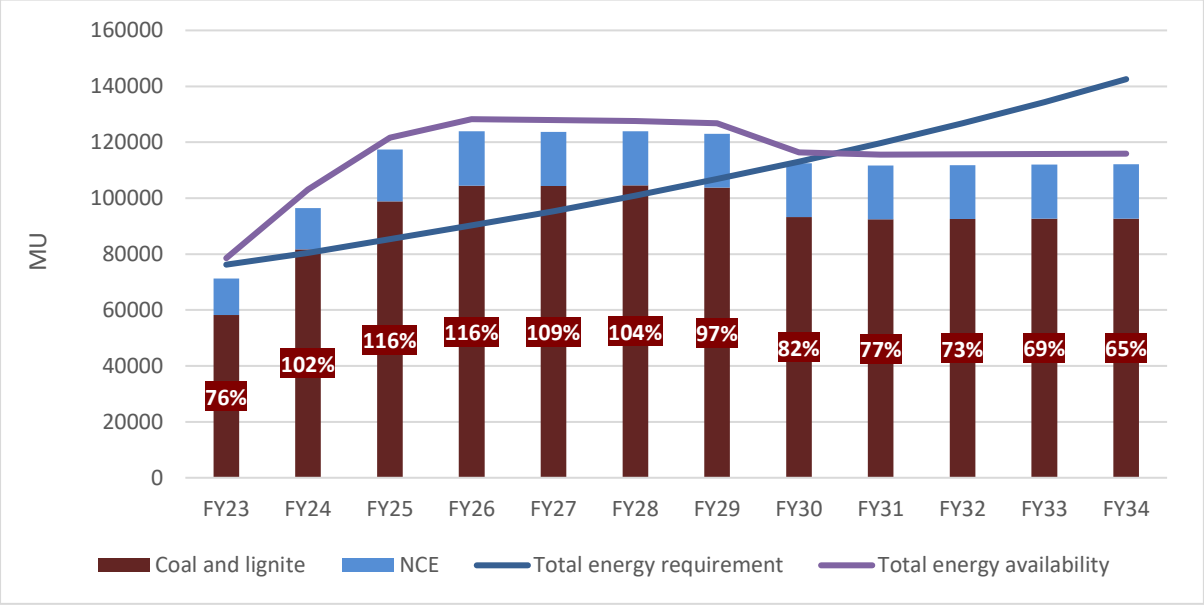
3.1. Generation from thermal baseload capacity:

The generation plan considers, among other sources, generation from 14717 MW of coal and lignite capacity (8042 MW state owned, 3635 MW central, 3040 other) and 3548 MW of non-conventional energy sources. On average, these 2 sources account for over 95% of the energy availability projected till FY34.

With regard to meeting the projected energy requirement, the base load coal/lignite capacity alone is in excess of the total requirement in FY25 at 116%, as seen in figure 1. This surplus tapers down to 97% at the end of the 5th control period, and falls further to 65% of the total requirement at the end of the 6th control period. As a major component of energy available, the drop in coal/lignite base load generation results in a shortage in the 6th control period.

It is interesting to note that for both base load thermal and NCE sources, the generation plan assumes staggering year on year growth till FY25 and some growth in FY26[5]. However, thereafter, it considers little variation in expected generation from FY27 to FY34.

Figure 1. Projected coal/lignite and NCE generation as a proportion of projected energy requirement and availability



Source: Prayas (Energy Group) compilation based on TSTRANSCO Resource Plan petition 2023
Note: The % values indicate the share of coal and lignite based generation in the total energy requirement.

Over 50% of the base load thermal generation considered comes from state owned capacity. The generation plan assumes most of this capacity to operate at normative annual PLFs through the considered control periods. While past generation from state owned capacity has operated at annual PLFs comparable to the normative PLFs, consideration at only the annual level does not account for increasing seasonal variations in the required operations of the TPPs, as illustrated in figure 2.

[5] Availability from coal and lignite based generation increases by 40% from FY23 to FY24, and then by 21% and 6% by FY25 and FY26 respectively. NCE increases by 13% and 26% by FY24 and FY25, and by 5% in FY26.

As seen, while annual PLFs may reflect the norm in some cases, there are months in the year when the plant operates at much lower PLFs. For instance, while Kothagudem TPS (New) generated at annual PLF of 82% in FY23, in the month of July it generated at 63% PLF.

Consideration of such seasonal variations across scenarios would enable more optimal generation planning and better manage surplus and deficits.

PLFs and optimality of generation is also affected by the surplus generation projected in the 5th control period. Given that there is no persistent shortage in the country, there will only be few avenues to offload some of the surplus generation. The thermal power plants (TPPs) would then be required to operate at lower PLFs, affecting optimality of generation and cost recovery of the project. The cost implications are even more pronounced for the new Bhadradri TPP (BTPS) and the upcoming Yadadri TPP (YTPS), which have total costs in the ball park of Rs. 5/unit (Form 1.4, RSF SPDCL FY24).

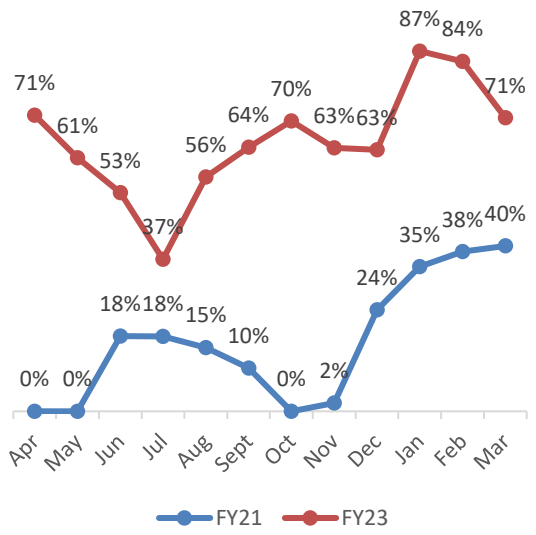
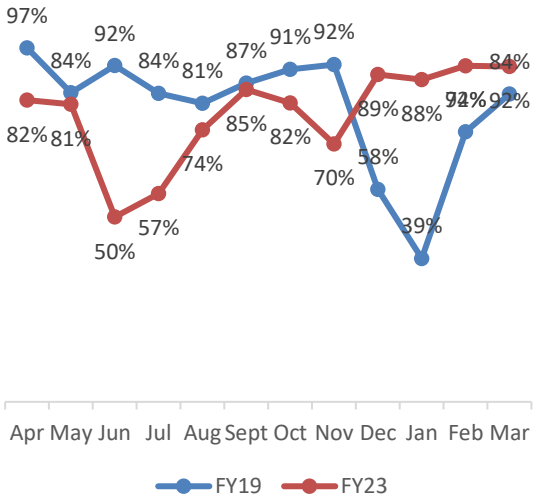
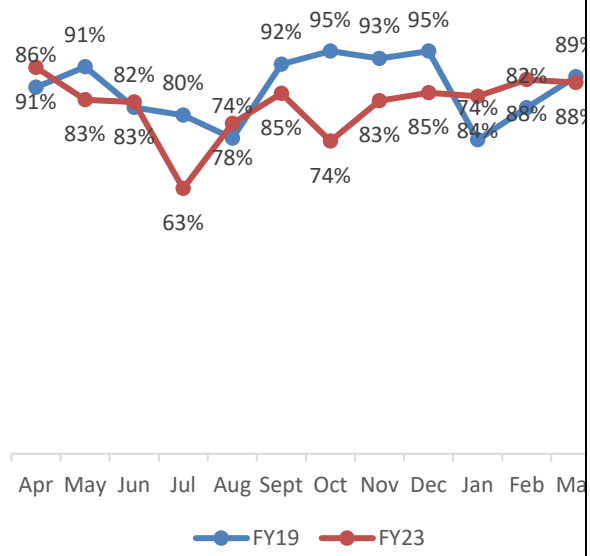
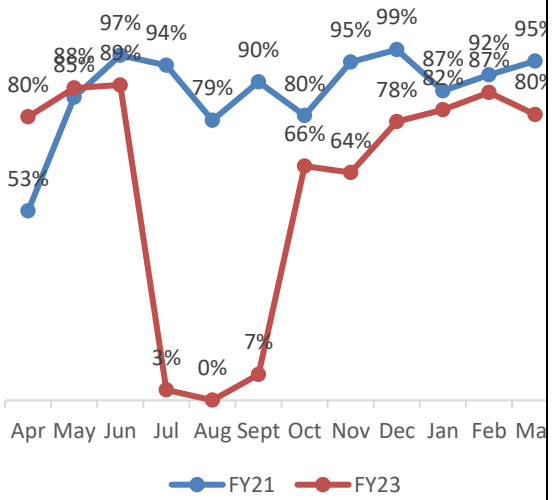
The addition of BTPS and YTPS have already come after significant delays. In addition to impact on costs, these delays and slippages are also a hinderance to planning, as generation from these TPPs are not available as planned and utilities have to procure the required generation from alternate sources.

But the need of bringing on such capacity at the given timelines itself should have been subject to scrutiny. While timely commissioning is important, the need for these plants and their contribution to the state's generation mix has not been in reviewed since they were included in the pipeline, as part of Telangana's Power for All document. If such scrutiny were applied in a timely manner, staggering the addition of some of this capacity could have helped normalise the surplus and deficit seen across the upcoming 5th and 6th control periods.

Further, the generation plan also details that of the 14717 MW of baseload coal/lignite capacity, 10676 MW is tied up with Telangana till 2040 or beyond. Coal based capacity will continue to have an important role to play as the transition unfolds, but the tying up of such long term capacities when there are dynamic and cost competitive alternatives emerging could prove detrimental to the business and operations of the state generating company.

Scrutiny in bringing on baseload capacity, prudence in scheduling their commission and generation, and foresight with regard to the role the state generator would play in a power sector with increasing RE should take on a more central consideration in the formulation of such a generation resource plan over the long time period considered.

Figure 2. Annual versus Monthly PLF for select state owned coal based capacity

Bhadradri TPP	Kakatiya TPP
FY21 Annual PLF: 18% FY23 Annual PLF: 65%	FY19 Annual PLF: 80% FY23 Annual PLF: 79%
	
Kothagudem TPS (New)	**Kothagudem TPS (Stage-7)**
FY19 Annual PLF: 86% FY23 Annual PLF: 82%	FY21 Annual PLF: 87% FY23 Annual PLF: 60%
	

Source: Prayas (Energy Group) compilation based on CEA monthly generation reports

Note: The % values in the graphs indicate the monthly PLFs.

3.2. Consideration of central guidelines and mandates:

As a sector in transition, integration of growing renewables and flexibilization of existing conventional generation are increasingly being recognised as sector priorities by central institutions. CEA's draft guidelines for a resource adequacy planning framework is aimed at ensuring adequacy in generation capacity contracting through Integrated Resource Planning so that demand can be met reliably, with the increasing variable and intermittent RE. Forum of Regulators (FOR) is also reportedly preparing a guideline for resource adequacy planning.[6]

Similarly, CEA's report on flexibilization of coal fired power plants for achieving 40% technical minimum load is aimed at managing the inconsistency and intermittency of RE generation and stabilising the grid. As per the draft phasing plan TSGENCO's BTPS falls in the 1st phase which is required to be compliant by 2026.

Since compliance to such larger sectoral mandates and guidelines will require cost and operational investments, they must be accounted for well in advance to pre-empt challenges and ensure visibility for better planning.

3.3. RPPO targets and consideration of storage:

Telangana mostly meets its RPPO targets, which are at 13% of total energy consumption. While it is not presently mandatory for the state DISCOMs to align with the MoP notified RPPO trajectory, compliance and penalties in the absence of such compliance may be introduced in accordance to the proposed amendment of section 142 of the Electricity Act 2003. This may give rise to the possibility of the DISCOMs having to increase RPPO targets. Given this, and economic drivers and national targets, the role of renewables is likely to grow. In line with section 2.2, with variable RE poised to grow, its effective integration into the grid becomes crucial to the robust and reliable operation of the sector.

Storage options such as Battery Energy Storage Systems (BESS) and Pumped Storage Plants (PSP) will have a role to play in improving the availability of variable RE generation. This is validated by MoP guidelines for RPO and SPO until 2030, which stipulates purchase obligations for storage options as well. Given the likely costs and time required to effectively bring on storage options, such avenues must be explored and discussed as part of the resource planning process so as to ensure a smooth transition into increasing RE whilst maintaining quality of supply. While it is difficult to set targets and projections on these projects given their nascency, their role and related costs could be considered as part of scenarios.

It is important to note that the MoP guidelines for RPO and SPO also discuss wind RPOs. Given that Telangana does not have as much wind potential, it may need to procure the same from other states. Such procurement requires planning and should be included in the

[6] FOR had set up a Working Group on resource adequacy in its 72nd meeting held in August 2020, as reported in the Minutes of the Meeting.

resource plan considerations. The guidelines also mention Hydro purchase obligations, which may impact Telangana's power procurement, but that too has not been explored as part of the resource plan and merits further discussion.

3.4. Compliance to environmental norms:

In September 2022, the MoEFCC introduced an amendment to the Environment (Protection) Rules, 1986. In accordance to the amendment, all TSGENCO TPPs fall into category C and have the laxest timelines for compliance[7]. The amendment also includes a penalty for noncompliance, ranging from Rs. 0.20/unit to Rs. 0.40/unit of generation, based on duration of delay in compliance. It has been understood that RTS-B TPP will be operational till 2029 without implementation of any FGD, since it is claimed that the plant adheres to the emission standards set by the norms. Given the low levels of generation from the small TPP, this may be true, but it is difficult to validate the same in the absence of actual emissions data. In the instance that this is not the case, the noncompliant generation post the retiring unit's 2027 adherence deadline till its retirement in 2030 would accrue a penalty of over Rs. 35 Crore. Noncompliance from the larger TPPs with more generation would have a much higher financial impact, as indicated in table 4, assuming Kakatiya TPPs continued non-compliance till the end of the 6th control period as an example.

Table 4. Indicative cost implication of noncompliant generation from Kakatiya TPP

TPP:	Kakatiya TPP (1100 MW)							Category C TPP		
Non-SOx deadline	31st December 2024									
SOx deadline	31st December 2026									
	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
Projected generation (MU)	7723.8	7726.8	7718.4	7748.64	7723.8	7720.32	7723.8	7748.64	7718.4	7726.8
Penalty if applied from Non-SOx deadline (Rs. Crore)	193.1	309.1	308.7	309.9	309.0	308.8	309.0	309.9	308.7	309.1
Penalty if applied from SOx deadline (Rs. Crore)	0.0	0.0	193.0	309.9	309.0	308.8	309.0	309.9	308.7	309.1

Source: Prayas (Energy Group) compilation based on Resource plan petition and MoEFCC 2022 Amendment
Note: The penalty for 0-180 days of delay is Rs. 0.20/unit, the same for 181-365 days of delay is Rs. 0.30/unit , and for delays over 366 days the penalty is Rs. 0.40/unit. For the first year of non-compliance, generation is assumed to be equally split between the two halves of the year.

The deadlines fall within the considered control periods, and there is an environmental compensation applicable for non-adherence. This makes milestone wise reporting of

[7] 31st December 2024 (non-SOx) and 31st December 2026 (SOx) for non-retiring units and 31st December 2025 (non-SOx) and 31st December 2027 (SOx) for retiring units.

progress and costs across the timeline a much needed part of the resource plan, toward ensuring transparency and accountability of process.

3.5. Plans for decommissioning:

Over the previous control period, TSGENCO decommissioned 420 MW of coal based Kothagudem TPP. RTS-B TPP is scheduled to be retired in the upcoming control period. However, there is no mention of the costs and operations involved in the decommissioning and repurposing process.

As the transition progresses, decommissioning is going to take on a more central role. Like capacity additions, capacity decommissioning also has far-reaching impacts on the sector and requires appropriate scrutiny and transparency. While RTS-B is a small capacity TPP, it is critical from a process standpoint to have guidelines and protocols in place to ensure a smooth and just decommissioning[8]. Such decommissioning guidelines should take into account the repurposing and rehabilitation needed on the socio-environmental and economic fronts, and is good practise as opposed to ad hoc addressing of TPP closures.

4. Transmission & Distribution plan

We have not been able to do a detailed study of the transmission and distribution network plans in the petitions. These plans appear to have been prepared based on projected growth in demand and generation, loss reduction trajectories and initiatives by central or state governments. Since demand projection is a key driver, the comment on increased rigour in demand forecast gains significance. In addition to expected loss reduction, the expected improvements in reliability (reduction in outage time and restoration time), safety (reduction of accidents), revenue collection (due to metering and billing systems) should also be quantified in the petitions, so that they can be tracked.

5. Urgent need to improve the load forecast and resource planning process

Load forecast and resource plan preparation is a critical utility for the state, since capacity addition, as well as the planning of transmission and distribution infrastructure is based on such a plan. It is therefore important to improve the process and increase public participation through better availability of data.

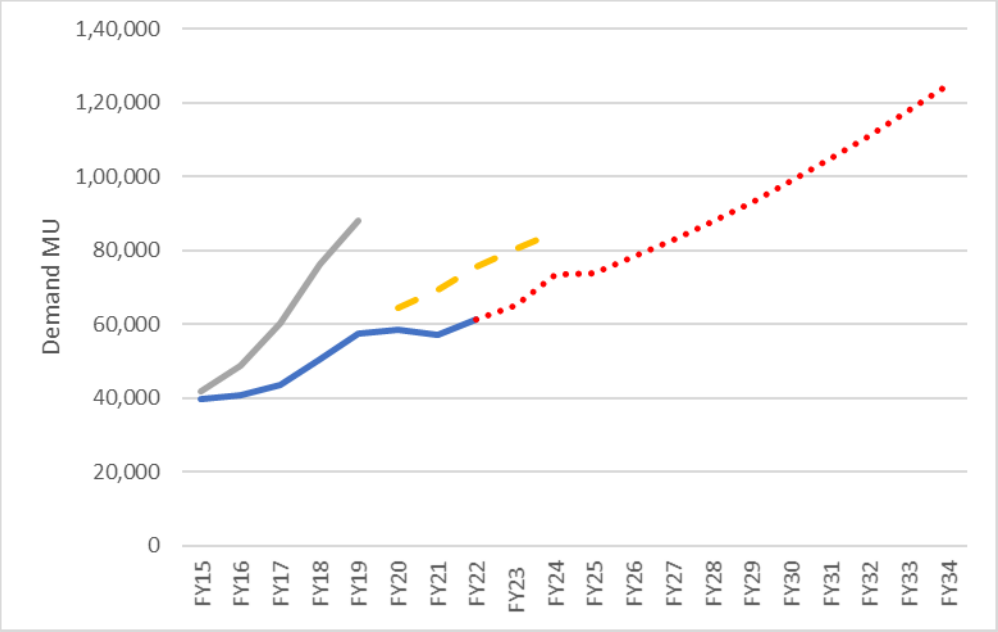
Figure 3 plots the consumer demand based on PFA projections (FY15-19), 4th MYT petition (FY20-24), actuals based on DISCOM data (FY15-22) and projections based on the current petitions (FY29-34). The CAGR for these periods are also given.

Consumer demand forecasts prepared by the Telangana Power For All (2015) initiative and the MYT petition for the 4th Control Period have been ambitious. Generation and network capacity were planned with these forecasts. Actual demand growth has been muted and

[8] The Central Pollution Control Board has prepared draft Guidelines titled “Environmental Guidelines for Decommissioning a Coal/ Lignite Power Plant, July, 2021”, that is yet to be finalised.

many generation projects were delayed, increasing their costs. This reemphasises the need to prepare rigorous demand forecasts and phase-wise approach to capacity addition. Growth rate projected in the current petition is lower than those considered in the past, but as pointed out in the previous sections, it is likely that the actual growth rate may be lower still.

Figure 3: Ambitious demand forecasts



Source: Compiled by Prayas (Energy Group) from: Telangana Power For All (2015), MYT petition of TSTRANSCO for 4th Control Period and the Load forecast and Resource plan petitions of DISCOMs for 5th and 6th Control Periods

Year	Source	CAGR %
FY15-19	PFA	20.5
FY20-24	4th MYT	7.2
FY15-22	Actuals	6.32
FY23-34	Projections	6.14

The current petitions are based on Regulation 9 of the Tariff Regulation 4 of 2005. Regulation 9 is very brief and as such this 2005 Regulation is very much dated. For example, it does not address features such as, optimising generation cost, ensuring resource adequacy and grid management measures to handle high renewable energy penetration and the process for a mid-term review for course correction. These Regulations need to be revised along the lines of the draft guidelines for medium and long term load forecast (2023), resource adequacy planning (2022) of the Central Electricity Authority[9], Guidelines/Regulations prepared in recent years by some SERCs and the CERC's revised Indian Electricity Grid Code (2023), in which Chapter 2 covers Resource Planning Code,

[9] Prayas submissions on load forecast and resource adequacy draft guidelines are available here and here.

applicable to State distribution and transmission licensees also. But even before such revisions are undertaken, it is important that TS utilities and TSERC use the available good practices and suggestions in the current exercise, to the extent possible.

It is also important to make the finalised plan mandatory for the utilities, and insisting on similar participatory process for any major revisions.

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