**Annexure-II**

**Justification for the Energy Balance of 5th and 6th Control Periods**

The energy balance of the State as submitted in the Resource Plan filings for 5th and 6th Control Periods is as follows:

Table 1 Energy Balance of the State as submitted in Resource Plan filing (Figures in MU)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Particular** | **Energy Balance in Telangana State** | | | | | | | | | |
| **5th Control Period** | | | | | **6th Control Period** | | | | |
| **2024-25** | **2025-26** | **2026-27** | **2027-28** | **2028-29** | **2029-30** | **2030-31** | **2031-32** | **2032-33** | **2033-34** |
| Energy Availability | 121754 | 127451 | 127126 | 126658 | 122090 | 115424 | 114555 | 114608 | 114601 | 114657 |
| Energy Requirement | 84997 | 89768 | 94774 | 100285 | 105957 | 111638 | 118116 | 125101 | 132599 | 140637 |
| **Surplus/(Deficit)** | **36758** | **37683** | **32352** | **26374** | **16133** | **3786** | **(3561)** | **(10493)** | **(17997)** | **(25981)** |
| % of Surplus to Availability | 43% | 42% | 34% | 26% | 15% | 3% | -3% | -8% | -14% | -18% |

From the above Energy Balance, it can be seen that there is a surplus of power in the 5th Control Period which is decreasing from 43% in FY 2024-25 to 15% in FY 2028-29 and in the 6th Control Period there is a deficit which is increasing from 3% to 18% except in the first year of 6th Control Period where there is a nominal surplus of 3%.

The above energy balance i.e., both Energy Availability & Energy Requirement gets effected significantly in the following circumstances.

1. Projected sales from I&CAD for the Lift Irrigation Schemes for 5th and 6th Control Period
2. Delay in Commissioning of new Generating Stations
3. Variation of Actual PLF when compared to Normative

**A) Projected sales from I&CAD for the Lift Irrigation Schemes for 5th and 6th Control Period**

The energy balance of the State provided in the Resource Plan is considering the energy requirement which is dependent on the projection of sales of individual categories of consumers and any variation of actual sales with projected sales will have an impact on the energy balance.

The projection of one of the major contributors of sales of Discoms i.e., sales of Lift Irrigation Schemes (falling under 132 kV level of HT IV A Category) is very challenging. The growth trend in this category has many variations due to variations in the operation of Lift Irrigation pumps based on rainfall, water levels in reservoirs, etc. Considering the implementation of ambitious lift irrigation projects, the projections for this category for 4th and 5th Control Period have been made considering the submissions made by I & CAD Department. The quantum of sales considered during the Resource Plan filings done for 4th and 5th Control Period are as follows:

Table 2 Sales of Lift Irrigation schemes considered in Resource Plan filings for 4th and 5th CP (MU)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Particulars** | **2018-19** | **2019-20** | **2020-21** | **2021-22** | **2022-23** | **2023-24** | **2024-25** | **2025-26** | **2026-27** | **2027-28** | **2028-29** |
| TSSPDCL | 4127 | 8459 | 11445 | 14420 | 17455 | 19178 | 19561 | 19952 | 20351 | 20758 | 21174 |
| TSNPDCL | 8407 | 18804 | 18804 | 21656 | 21656 | 21656 | 21656 | 21656 | 21656 | 21656 | 21656 |
| **Total** | **12533** | **27263** | **30249** | **36076** | **39111** | **40834** | **41217** | **41608** | **42007** | **42414** | **42830** |

Considering the above ambitious projections made by I&CAD Department, Discoms have made their power procurement plans and accordingly have made PPAs with new generating stations and while entering into PPAs with new generating stations, PPAs with Renewable Energy stations especially from Solar stations have been entered considering that the price per unit is lower than the variable charges of thermal power generation stations so that it shall optimize the average cost of power purchase of the Discoms. Further, as the power from Renewable power projects is not available throughout the day, in order to compensate the same PPAs with conventional sources have also been entered.

However, the actual sales recorded under this category were much lower than the projections and the same are follows:

Table 3 Actual Sales recorded against Lift Irrigation Schemes in 4th Control Period till FY 2022-23

| **Particulars** | **2019-20** | **2020-21** | **2021-22** | **2022-23** |
| --- | --- | --- | --- | --- |
| TSSPDCL | 1862 | 1561 | 1878 | 1642 |
| TSNPDCL | 2601 | 1892 | 1793 | 1490 |
| **Total** | **4463** | **3453** | **3670** | **3132** |

Considering the lower actual sales recorded, the Discoms in the current Resource Plan filings have sought for the realistic projections from I&CAD, however, there has been a delay in receipt of the projected sales from I&CAD department. 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). The quantum of sales considered in the current Resource Plan filings are as follows:

Table 4 Sales of Lift Irrigation schemes considered in current Resource Plan filings (MU)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Particulars** | **2023-24** | **2024-25** | **2025-26** | **2026-27** | **2027-28** | **2028-29** | **2029-30** | **2030-31** | **2031-32** | **2032-33** | **2033-34** |
| TSSPDCL | 2015 | 2217 | 2439 | 2682 | 2951 | 3246 | 3570 | 3927 | 4320 | 4752 | 5227 |
| TSNPDCL | 2169 | 2386 | 2625 | 2887 | 3176 | 3493 | 3843 | 4227 | 4650 | 5115 | 5626 |
| **Total** | **4184** | **4603** | **5063** | **5570** | **6126** | **6739** | **7413** | **8154** | **8970** | **9867** | **10853** |

Subsequently, TS Discoms have received the projected sales from I&CAD for the Lift Irrigation Schemes which are operational as on date and are expected to be commissioned in the 5th Control Period.

The quantum of sales received from I&CAD for the 5th and 6th Control Period are as follows:

Table 5 Sales of Lift Irrigation schemes as submitted by I&CAD for 5th and 6th CP (MU)

| **Particulars** | **2023-24** | **2024-25** | **2025-26** | **2026-27** | **2027-28** | **2028-29** | **2029-30** | **2030-31** | **2031-32** | **2032-33** | **2033-34** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TSSPDCL** | **1989** | **4869** | **4869** | **4869** | **4869** | **4869** | **4869** | **4869** | **4869** | **4869** | **4869** |
| *Inservice* | *1989* | *1989* | *1989* | *1989* | *1989* | *1989* | *1989* | *1989* | *1989* | *1989* | *1989* |
| *Upcoming* |  | *2881* | *2881* | *2881* | *2881* | *2881* | *2881* | *2881* | *2881* | *2881* | *2881* |
| **TSNPDCL** | **3868** | **5185** | **5185** | **5185** | **5185** | **5185** | **5185** | **5185** | **5185** | **5185** | **5185** |
| *Inservice* | *3278* | *3278* | *3278* | *3278* | *3278* | *3278* | *3278* | *3278* | *3278* | *3278* | *3278* |
| *Upcoming* | *590* | *1907* | *1907* | *1907* | *1907* | *1907* | *1907* | *1907* | *1907* | *1907* | *1907* |
| **Total** | **5857** | **10055** | **10055** | **10055** | **10055** | **10055** | **10055** | **10055** | **10055** | **10055** | **10055** |

It is further to be noted that the sales from upcoming projects are expected to be realized considering the commissioning of Palamuru Ranga Reddy Lift Irrigation Scheme (8x145 MW Pumps) by the end of September 2023 (Source: <https://www.thehindu.com/news/national/> telangana/prlis-engineers-plan-to-commission-yellur-pump-house-by-month-end/article 67269626.ece) along with increased pace of construction of distributary canals which will increase the utilization of existing as well as upcoming lift irrigation projects.

Considering the difference in approach of projection by I&CAD for 5th and 6th Control Periods, it is expected that there shall be not much variation between the projected and actual sales in the 5th and 6th Control Periods.

The revised energy balance of TS Discoms by revising the energy requirement by considering the sales projections received from I&CAD for 5th and 6th Control Period with the availability as submitted in Resource Plan for 5th and 6th Control period is as follows:

Table 6 Impact of considering LIS projections as submitted by I&CAD for 5th and 6th CP and availability as submitted in 5th and 6th CP filings (based on Normative PAF)

| **Particular** | **Impact of Energy Balance in Telangana State** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **5th Control Period** | | | | | **6th Control Period** | | | | |
| **2024-25** | **2025-26** | **2026-27** | **2027-28** | **2028-29** | **2029-30** | **2030-31** | **2031-32** | **2032-33** | **2033-34** |
| Energy Availability | 121754 | 127451 | 127126 | 126658 | 122090 | 115424 | 114555 | 114608 | 114601 | 114657 |
| Energy Requirement | 90587 | 94885 | 99371 | 104310 | 109354 | 114344 | 120062 | 126205 | 132790 | 139819 |
| **Surplus/(Deficit)** | **31168** | **32566** | **27756** | **22348** | **12736** | **1080** | **(5507)** | **(11597)** | **(18189)** | **(25163)** |
| % of Surplus to Availability | 34% | 34% | 28% | 21% | 12% | 1% | -5% | -9% | -14% | -18% |

**B) Delay in Commissioning of new Generating Stations**

In the Resource Plan filings, the Discoms have submitted that power from the following new generating stations have been considered in 5th and 6th Control Period:

Table 7 New Generating Stations availabilities considered in Resource Plan filings

| **Station** | **Capacity (MW)** | **Date of Commissioning & Capacities** |
| --- | --- | --- |
| YTPS | 4000 | Unit#1, Dec' 2023,  Unit#2, Mar' 2024,  Unit#3, May' 2024,  Unit#4, July' 2024,  Unit#5, Sept' 2024. |
| Telangana STPP | 1360 | Unit-I Apr-23 Unit-II Jun-23 |
| SECI 400 MW | 130 | 270 MW is already Commissioned Balance 130 MW - Apr'23 |
| SECI 1000 MW | 1000 | 1000 MW - Oct'23 |
| NTPC CPSU 1692 MW | 260 | 1432 MW is already Commissioned Balance: 100 MW - Mar'23 10 MW - Apr'23 150 MW - Mar'24 |
| NTPC CPSU 1045 MW | 1045 | 735 MW - Nov'23 310 MW - Apr'24 |
| NHPC CPSU 500 MW | 500 | 500 MW - Apr'24 |

The availability of power from the above stated generating sources has been considered from their CODs in the 5th and 6th Control Period as follows:

Table 8 Availability of power from New Generating Stations considered in Resource Plan filings

| **Generating Station** | **2024-25** | **2025-26** | **2026-27** | **2027-28** | **2028-29** | **2029-30** | **2030-31** | **2031-32** | **2032-33** | **2033-34** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| YTPS - 4000 MW | 23811 | 29784 | 29784 | 29784 | 29784 | 29784 | 29784 | 29784 | 29784 | 29784 |
| TSTPP – 1360 MW | 11718 | 11682 | 12216 | 12216 | 12074 | 12038 | 12216 | 12216 | 12074 | 12216 |
| SECI ISTS Tr-VI -400 MW | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 |
| NTPC CPSU Tr-I &II - 1692 MW | 3706 | 3706 | 3706 | 3706 | 3706 | 3706 | 3705 | 3705 | 3705 | 3705 |
| NTPC CPSU Tr-III - 1045 MW | 2289 | 2289 | 2289 | 2289 | 2289 | 2289 | 2289 | 2289 | 2289 | 2289 |
| NHPC CPSU Tr-III - 500 MW | 1095 | 1095 | 1095 | 1095 | 1095 | 1095 | 1095 | 1095 | 1095 | 1095 |
| SECI ISTS Tr-IX - 1000 MW | 2190 | 2190 | 2190 | 2190 | 2190 | 2190 | 2190 | 2190 | 2190 | 2190 |
| **Total MU addition** | **45684** | **51621** | **52155** | **52155** | **52013** | **51977** | **52155** | **52155** | **52013** | **52155** |

However, it is to be noted that in case the commissioning of any of the above stations is delayed it will be having an impact on the energy balance above and accordingly the quantum of surplus in the respective years will come down. It is to be noted that many of the newly constructed power projects are being delayed on account of numerous factors which includes land acquisition.

The updated status of commissioning of new generating stations as per the latest status is as follows:

| **Station** | **Capacity (MW)** | **Date of Commissioning considered in Resource Plans** | **Latest status of Commissioning** |
| --- | --- | --- | --- |
| YTPS | 4000 | Unit#1, Dec' 2023,  Unit#2, Mar' 2024,  Unit#3, May' 2024,  Unit#4, July' 2024,  Unit#5, Sept' 2024. | Unit#1, Dec' 2023,  Unit#2, Dec' 2023,  Unit#3, Oct' 2024,  Unit#4, Sept' 2024,  Unit#5, Dec' 2024. (As received from CE, Thermal Projects Construction, TS Genco dt. 08.06.2023) |
| Telangana STPP | 1360 | Unit-I Apr-23 Unit-II Jun-23 | Unit-I Sept-23 Unit-II Nov-23 (Retained the gap between stations as two months considering original submission in Resource Plan) |
| SECI 400 MW | 130 | 270 MW is already Commissioned Balance 130 MW - Apr'23 | Total Capacity Commissioned |
| SECI 1000 MW | 1000 | 1000 MW - Oct'23 | 1000 MW - May'24 |
| NTPC CPSU 1692 MW | 260 | 1432 MW is already Commissioned Balance: 100 MW - Mar'23 10 MW - Apr'23 150 MW - Mar'24 | 1542 MW is already Commissioned Balance: 150 MW - Mar'24 |
| NTPC CPSU 1045 MW | 1045 | 735 MW - Nov'23 310 MW - Apr'24 | 735 MW - Nov'23 310 MW - Sep'24 |
| NHPC CPSU 500 MW | 500 | 500 MW - Apr'24 | 500 MW - Apr'24 |

Analysis of delay in commissioning of the new generating stations/units and their impact on the energy balance of the State is as follows:

Table 9 Impact of delay in Commissioning of new Generating Stations with availability as submitted in Resource Plan (based on Normative PLF)

| **Particular** | **Impact of Energy Balance in Telangana State** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **5th Control Period** | | | | | **6th Control Period** | | | | |
| **2024-25** | **2025-26** | **2026-27** | **2027-28** | **2028-29** | **2029-30** | **2030-31** | **2031-32** | **2032-33** | **2033-34** |
| Energy Availability | 113113 | 127451 | 127126 | 126658 | 122090 | 115424 | 114555 | 114608 | 114601 | 114657 |
| Energy Requirement | 84997 | 89768 | 94774 | 100285 | 105957 | 111638 | 118116 | 125101 | 132599 | 140637 |
| **Surplus/(Deficit)** | **28116** | **37683** | **32352** | **26374** | **16133** | **3786** | **(3561)** | **(10493)** | **(17997)** | **(25981)** |
| % of Surplus to Availability | 33% | 42% | 34% | 26% | 15% | 3% | -3% | -8% | -14% | -18% |

**C) Variation of Actual PLF when compared to Normative**:

The projections of Energy availability from individual generating stations as shown above have been obtained from the respective generating stations which were usually projected based on the installed capacity and Normative Plant Availability Factor (the average of the daily declared capacities (DCs) for all the days during the period expressed as a percentage of the installed capacity in MW less the normative auxiliary energy consumption) of the plant. However, it is to be noted that the actual PLFs (the ratio of the actual energy generated by a power plant to the maximum possible energy it could have generated during a given period) of generating stations are usually less than the normative on account of various factors like availability of fuel owing to either external factors or internal factors, lower power demand etc.

For example, the all India average PLF of Central Generating Stations for Coal & Lignite based Stations for FY 2022-23 is 64.15% (Source: <https://powermin.gov.in/en/content/power-sector-glance-all-india>) which is less than the normative Plant Availability Factor ranging from 72% to 85%, it is also to be noted that this lower PLF is not on account of lower demand as in FY 2022-23, at India level there was an energy deficit of 0.5% and peak deficit of 4% (Source: <https://powermin.gov.in/en/content/power-sector-glance-all-india>).

Similarly, the actual PLFs of all the generating sources with which the TS Discoms have tied up will be usually less on account of various reasons, however for Hydro generating stations the PLF depends on the monsoon levels and varies accordingly. A snapshot of actual PLFs of all the contracted sources of generating sources is as follows:

| **Station** | **Actual Capacity as on 22-23**  **(MW)** | **FY 19-20** | | **FY 20-21** | | **FY 21-22** | | **FY 22-23** | | **FY 19-20 to FY 22-23 (4 Years)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Energy (MU)** | **PLF (%)** | **Energy (MU)** | **PLF (%)** | **Energy (MU)** | **PLF (%)** | **Energy (MU)** | **PLF (%)** | **Total Energy (MU)** | **AVG PLF (%)** |
| **TSGENCO** |  |  |  |  |  |  |  |  |  |  |  |
| KTPS (ABC) | 720 | 2038 | 32% | 0 | 0% | 0 | 0% | 0 | 0% | 2038 | 8.1% |
| KTPS (D) V | 500 | 3211 | 73% | 2444 | 56% | 2921 | 67% | 3174 | 72% | 11750 | 67.1% |
| KTPS VI | 500 | 3393 | 77% | 3386 | 77% | 2956 | 67% | 3462 | 79% | 13198 | 75.3% |
| RTS B | 63 | 351 | 64% | 250 | 46% | 236 | 43% | 232 | 42% | 1069 | 48.8% |
| Kakatiya - KTPP I | 500 | 2912 | 66% | 2353 | 54% | 3390 | 77% | 2979 | 68% | 11633 | 66.4% |
| Kakatiya - KTPP II | 600 | 4244 | 81% | 3673 | 70% | 3366 | 64% | 4167 | 79% | 15449 | 73.5% |
| KTPS VII | 800 | 3390 | 48% | 5833 | 83% | 5587 | 80% | 4013 | 57% | 18824 | 67.2% |
| Bhadradri - BTPS (units I to IV) | 1080 | 0 | 0% | 1658 | 18% | 4701 | 50% | 5633 | 60% | 11992 | 31.7% |
| TS Genco Hydro | 2325 | 4297 | 21% | 3424 | 17% | 5414 | 27% | 5742 | 28% | 18877 | 23% |
| **Central Generating Stations** |  |  |  |  |  |  |  |  |  |  |  |
| NTPC (SR) - I & II | 345.45 | 2031 | 67% | 2125 | 70% | 2126 | 70% | 1984 | 66% | 8266 | 68% |
| NTPC (SR) Stage III | 86.72 | 536 | 71% | 501 | 66% | 628 | 83% | 473 | 62% | 2138 | 70% |
| Talcher Stage 2 | 214.43 | 1374 | 73% | 1504 | 80% | 1558 | 83% | 1711 | 91% | 6148 | 82% |
| NTPC Simhadri Stage I | 538.90 | 2616 | 55% | 1604 | 34% | 3185 | 67% | 3220 | 68% | 10625 | 56% |
| NTPC Simhadri Stage II | 231.30 | 1204 | 59% | 1092 | 54% | 1406 | 69% | 1536 | 76% | 5239 | 65% |
| NTPC Kudigi - I, II & III | 271.68 | 565 | 24% | 538 | 23% | 828 | 35% | 1135 | 48% | 3066 | 32% |
| NLC Stage-I | 59.89 | 366 | 70% | 295 | 56% | 359 | 69% | 68 | 13% | 1088 | 52% |
| NLC Stage-II | 105.04 | 626 | 68% | 315 | 34% | 557 | 60% | 103 | 11% | 1600 | 43% |
| NNTPP (New Neyveli) | 62.10 | 34 | 6% | 190 | 35% | 365 | 67% | 443 | 81% | 1031 | 47% |
| NLC Expansion 1 | 0.00 | 0 |  | 0 |  | 0 |  | 24 |  | 24 |  |
| NLC Expansion 2 | 0.00 | 0 |  | 0 |  | 0 |  | 10 |  | 10 |  |
| NPC-MAPS | 22.76 | 75 | 38% | 70 | 35% | 43 | 21% | 73 | 36% | 260 | 33% |
| NPC-Kaiga unit I & II | 145.08 | 1085 | 85% | 1052 | 83% | 1106 | 87% | 1087 | 86% | 4330 | 85% |
| NPC-Kaiga unit III & IV |  |  |  |  |  |  |  |  |  | 0 |  |
| NPC- Kudankulam | 50.00 | 179 | 41% | 294 | 67% | 349 | 80% | 351 | 80% | 1174 | 67% |
| Kudankulam (KKNPP) Unit-II |  |  |  |  |  |  |  |  |  | 0 |  |
| Vallur Thermal Power Plant (NTECL - Vallur) | 110.65 | 430 | 44% | 218 | 22% | 571 | 59% | 705 | 73% | 1924 | 50% |
| NLC Tamilnadu Power Ltd (Tuticorin) | 152.33 | 750 | 56% | 806 | 60% | 648 | 49% | 930 | 70% | 3135 | 59% |
| NSM Bundled Ph II | 200.00 | 1378 | 79% | 1156 | 66% | 1223 | 70% | 1516 | 87% | 5274 | 75% |
| NVVNL B.P-Coal | 45.81 | 211 | 52% | 204 | 51% | 220 | 55% | 252 | 63% | 887 | 55% |
| **IPPs** |  |  |  |  |  |  |  |  |  |  |  |
| Sembcorp Unit I | 269.50 | 2273 | 96% | 1879 | 80% | 2145 | 91% | 2186 | 93% | 8484 | 90% |
| Sembcorp Unit II | 570.00 | 4524 | 91% | 4207 | 84% | 4368 | 87% | 4037 | 81% | 17135 | 86% |
| **NCE** |  |  |  |  |  |  |  |  |  |  |  |
| NCE - TSNPDCL | 925.60 | 1771 | 22% | 1786 | 22% | 1759 | 22% | 1754 | 22% | 7070 | 22% |
| NCE - TSSPDCL | 2128.14 | 3831 | 21% | 3905 | 21% | 3837 | 21% | 3960 | 21% | 15533 | 21% |
| NTPC CPSU/NTPC Solar Phase-1 | 1296.00 | - | - | - | - | 65 | 1% | 1439 | 13% | 1503 | 3% |
| SECI | 400.00 | - | - | - | - | 138 | 4% | 617 | 18% | 755 | 5% |
| NTPC Bundled Scheme under JNNSM Ph-1 | 45.81 | 58 | 14% | 52 | 13% | 43 | 11% | 41 | 10% | 193 | 12% |
| NTPC Bundled Scheme under JNNSM Ph-II (400 MW) | 400.00 | 794 | 23% | 815 | 23% | 807 | 23% | 819 | 23% | 3235 | 23% |
| **OTHERS** |  |  |  |  |  |  |  |  |  |  |  |
| Singareni CCL | 1200.00 | 8602 | 82% | 6875 | 65% | 8773 | 83% | 8721 | 83% | 32971 | 78% |
| CSPDCL | 1000.00 | 2245 | 26% | 3275 | 37% | 1631 | 19% | 0 | 0% | 7152 | 20% |

It is also to be noted that when the availability of a generating station is lower than the normative availability, the fixed charges eligible to be recovered by the generating station will also reduce as per the Regulatory provisions of Generation Tariff Regulations. A comparison of approved Fixed Charges paid (as approved in RST Order) and actual Fixed Charges paid for FY 2022-23 and FY 2023-24 (Q1) is as follows:

Table 10 Comparison of approved and actual Fixed Charges paid for FY 2022-23

| **Generating Station** | **Fixed Charges (Rs Cr)** | | **Fixed Charges Variance** |
| --- | --- | --- | --- |
| **Approved** | **Actual** | **Approved-Actual** |
| **TS GENCO Thermal** |  |  |  |
| KTPS V | 372 | 372 | 0 |
| KTPS VI | 522 | 522 | 0 |
| KTPS VII | 1061 | 760 | 301 |
| RTS B | 113 | 84 | 29 |
| KTPP I | 490 | 471 | 19 |
| KTPP II | 720 | 720 | 0 |
| BTPS | 1934 | 1486 | 448 |
| YTPS | 0 | 0 | 0 |
| **TOTAL TSGENCO THERMAL** | **5212** | **4416** | **796** |
| **TS GENCO Hydel** |  |  |  |
| Nagarjuna Sagar complex | 347 | 347 | - |
| SLBHES | 464 | 464 | - |
| LJHES | 265 | 265 | - |
| PCHES | 124 | 124 | - |
| Pochampad II | 10 | 10 | - |
| Small Hydel | 49 | 49 | - |
| Mini Hydel | 9 | 9 | - |
| PJHES | 62 | 62 | - |
| **TOTAL TS GENCO HYDRO** | **1331** | **1331** | **1331** |
| **TOTAL TS GENCO** | **6543** | **5747** | **796** |
| **Central Generating Stations** |  |  |  |
| NTPC (SR)\* | 181 | 191 | **-10** |
| NTPC (SR) Stage III | 54 | 52 | **2** |
| Talcher Stage 2\* | 110 | 172 | **-62** |
| TSTPP | 712 | 0 | **712** |
| NTPC Simhadri Stage I\* | 357 | 668 | **-311** |
| NTPC Simhadri Stage II\* | 245 | 363 | **-118** |
| NLC TS II- Stage I\* | 28 | 33 | **-5** |
| NLC TS II- Stage II | 52 | 7 | **46** |
| NPC-MAPS | 0 | 0 | **0** |
| NPC-Kaiga unit I&ii | 0 | 0 | **0** |
| NPC-Kaiga unit III&IV | 0 | 0 | **0** |
| NPC Kudankulam NPP Unit 2 | 0 | 0 | **0** |
| Vallur Thermal Power Plant | 0 | 219 | **-219** |
| Tuticorin | 0 | 0 | **0** |
| NPC- Kudankulam | 0 | 0 | **0** |
| NLC Tamil Nadu Power Ltd | 0 | 171 | **-171** |
| Kudigi\* | 294 | 347 | **-53** |
| NNTPP\* | 78 | 80 | **-2** |
| Expn I | 0 | 2 | **-2** |
| Expn II | 0 | 2 | **-2** |
| **TOTAL CGS** | **2112** | **2308** | **-196** |
| Singareni | 1416 | 1399 | **17** |
| Thermal Power Tech | 334 | 327 | **8** |
| CSPGCL | 1526 | 0 | **1526** |
| Thermal Power Tech Unit II | 1137 | 1121 | **16** |
| **TOTAL OTHERS** | **4414** | **2847** | **1567** |
| **TOTAL** | **13069** | **10901** | **2168** |

\* The higher fixed charges are on account of True Up of the Generating Stations

Table 11 Comparison of approved and actual Fixed Charges paid for FY 2023-24

| **Station Name** | **Approved Fixed Charges (Rs Cr) for FY 2023-24** | **Approved Fixed Charges (Rs Cr) for FY 2023-24 Q1** | **Actual Fixed Charges (Rs Cr)** | **Variation in Fixed Charges (Rs Cr)** |
| --- | --- | --- | --- | --- |
| **TSGENCO** |  |  |  |  |
| KTPS-V | 394 | 131 | 96 | 36 |
| KTPS-VI | 509 | 170 | 149 | 20 |
| KTPS-VII | 1334 | 445 | 336 | 108 |
| RTS-B | 117 | 39 | 22 | 17 |
| KTPP-I | 402 | 134 | 105 | 29 |
| KTPP-II | 749 | 250 | 187 | 62 |
| BTPS | 1412 | 471 | 308 | 163 |
| YTPS | 111 | 37 | 0 | 37 |
| **Sub-total** | **5028** | **1676** | **1203** | 472 |
| **TSGenco-Hydel** |  |  |  |  |
| PJHES | 49 | 16 | 13 | 4 |
| Nagarjuna Sagar Complex | 321 | 107 | 82 | 25 |
| SLBHES | 425 | 142 | 109 | 32 |
| LJHES | 259 | 86 | 66 | 20 |
| PCHES | 92 | 31 | 23 | 7 |
| Pochampad II | 10 | 3 | 2 | 1 |
| Small Hydel | 57 | 19 | 13 | 6 |
| Mini Hydel | 10 | 3 | 2 | 1 |
| **Sub-total** | **1224** | **408** | **311** | 97 |
| **TSGENCO Total** | **6252** | **2084** | **1514** | 570 |
| **CGS** |  |  |  |  |
| NPC Madras APS | 0 | 0 | 0 | 0 |
| NPC Kaiga APS Units 1 & 2 | 0 | 0 | 0 | 0 |
| NPC Kaiga APS Units 3 & 4 | 0 | 0 | 0 | 0 |
| NPC Kudankulam NPP Unit 2 | 0 | 0 | 0 | 0 |
| NTPC(ER) - Farakka-1 | 0 | 0 | 0 | 0 |
| NTPC(ER)-Kahalgaon | 0 | 0 | 0 | 0 |
| NTPC(ER)-Talcher-I | 0 | 0 | 0 | 0 |
| NTPC FGTPS 2 Pushp | 0 | 0 | 0 | 0 |
| NTPC NSTPS 1 Pushp | 0 | 0 | 0 | 0 |
| NTPC Ramagundam Stage I & II | 178 | 59 | 43 | 16 |
| NTPC Ramagundam Stage III | 53 | 18 | 16 | 1 |
| NTPC Simhadri Stage I\* | 357 | 119 | 140 | -21 |
| NTPC Simhadri Stage II | 258 | 86 | 80 | 6 |
| NTPC Talcher TPS II\* | 109 | 36 | 41 | -4 |
| NTPC Kudgi\* | 286 | 95 | 102 | -7 |
| NLC TPS II Stage I | 2 | 1 | 1 | 0 |
| NLC TPS II Stage II | 3 | 1 | 0 | 1 |
| NNTPP | 78 | 26 | 20 | 6 |
| Neyveli New Unit - 1 | 4 | 1 | 1 | 1 |
| Neyveli New Unit - 2 | 7 | 2 | 1 | 1 |
| TSTPP Unit 1 | 1518 | 506 | 0 | 506 |
| NTECL Vallur TPS | 0 | 0 | 30 | -30 |
| NLC Tamilnadu Power Ltd., | 0 | 0 | 38 | -38 |
| **CGS TOTAL** | **2854** | **951** | **514** | 437 |
| **Others** |  |  |  |  |
| SEIL (LT 1) 269.45 MW | 318 | 106 | 79 | 27 |
| SEIL (LT 2) 570 MW | 1135 | 378 | 280 | 98 |
| STPP | 1330 | 443 | 332 | 111 |
| CSPDCL | 1486 | 495 | 0 | 495 |
| **Sub-TOTAL** | **4268** | **1423** | **692** | 731 |
| **TOTAL** | **13374** | **4458** | **2720** | **1738** |
| *\* The higher fixed charges are on account of True Up of the Generating Stations* | | | | |

Considering the above, analysis has been done where the availability of power various contracted sources has been considered based on the historical averages of actual PLFs for the period FY 2019-20 to FY 2022-23.

Further, the availability of power from one of the contracted sources of TS Discoms i.e., CSPDCL has been considered in the 5th and 6th Control Period as per the normative availability, however, it is to be noted that the power from this station has not been scheduled from April 2022 i.e., from a period of 16 months on account billing issues with CSPDCL.

Since there is no clarity on the availability of power from CSPDCL, the scheduling of power from CSPDCL has not been considered in this analysis. However, there is a possibility that the energy is scheduled after the issues between TS Discoms and CSPDCL are resolved.

The specific considerations of various generation sources is as follows:

| **Power Source** | **Considerations for projection of availability** |
| --- | --- |
| TS Genco – Thermal | Average PLF of the period FY 2019-20 to FY 2022-23 except BTPS and YTPS. For BTPS, PLF is considered as 60% which is the actual PLF for FY 2022-23 for all the years. Similarly, for YTPS, PLF is considered as 60% for the period from CoD of respective units for all the years. |  |
| TS Genco – Hydel | Considered as projected in Resource Plan considering that the availability exceeds only when there are good monsoons which is not so frequent. |  |
| Central Generating Stations | Average PLF of the period FY 2019-20 to FY 2022-23 except (i) NLC exp. 1 & 2 (ii) Nuclear & (iii) TSTPP. For these three plants the projections have been considered as filed in Resource Plan. |  |
| NCES | Considered as projected in Resource Plan. |  |
| Sembcorp Energy (IPPs) | Average PLF of the period FY 2019-20 to FY 2022-23 |  |
| CSPDCL (Chhattisgarh) | Not considered the same since the power is not being scheduled from April 2022 |  |
| Singareni | Average PLF of the period FY 2019-20 to FY 2022-23 |  |

With the above considerations, the availability of power from the contracted sources has come down and accordingly has impacted the energy balance of the State and the same is as follows:

Table 12 Impact of availability considering historical actual availabilities (MU)

| **Particular** | **Energy Balance in Telangana State** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **5th Control Period** | | | | | **6th Control Period** | | | | |
| **2024-25** | **2025-26** | **2026-27** | **2027-28** | **2028-29** | **2029-30** | **2030-31** | **2031-32** | **2032-33** | **2033-34** |
| Energy Availability | 97432 | 100071 | 99840 | 99136 | 96449 | 96416 | 96256 | 93728 | 95907 | 96058 |
| Energy Requirement | 84997 | 89768 | 94774 | 100285 | 105957 | 111638 | 118116 | 125101 | 132599 | 140637 |
| **Surplus/(Deficit)** | **12435** | **10303** | **5066** | **(1149)** | **(9508)** | **(15222)** | **(21860)** | **(31373)** | **(36692)** | **(44579)** |
| % of Surplus to Availability | 15% | 11% | 5% | -1% | -9% | -14% | -19% | -25% | -28% | -32% |

**Conclusion:**

The surplus for 5th and 6th Control Periods will be reduced in case the combined impact of considering LIS projections as received from I&CAD for 5th and 6th Control Period, the delay in commissioning of new generating stations and availability as per historical actual PLFs is considered. The combined impact is as follows:

Table 13 Combined impact of delay of commissioning, LIS projection from I&CAD and availability as per historical actual PLFs

| **Particular** | **Impact of Energy Balance in Telangana State** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **5th Control Period** | | | | | **6th Control Period** | | | | |
| **2024-25** | **2025-26** | **2026-27** | **2027-28** | **2028-29** | **2029-30** | **2030-31** | **2031-32** | **2032-33** | **2033-34** |
| Energy Availability | 93191 | 100071 | 99840 | 99136 | 96449 | 96416 | 96256 | 93728 | 95907 | 96058 |
| Energy Requirement | 90587 | 94885 | 99371 | 104310 | 109354 | 114344 | 120062 | 126205 | 132790 | 139819 |
| **Surplus/(Deficit)** | **2604** | **5186** | **469** | **(5174)** | **(12905)** | **(17928)** | **(23806)** | **(32477)** | **(36884)** | **(43761)** |
| % of Surplus to Availability | 3% | 5% | 0% | -5% | -12% | -16% | -20% | -26% | -28% | -31% |

**D) Spinning Reserve**

It is to be noted that for the power system as a whole of the State there has to be a spinning reserve of 500 MW which corresponds to a 3723 MU with 85% availability. In addition to the above surplus/deficit (combined impact of delay of commissioning, LIS projection from I&CAD and availability as per historical actual PLFs) the Discoms have to maintain such quantum in order to maintain the fluctuations in demand and also to maintain 24x7 reliable supply. However, the surplus/deficit obtained above is less than the requirement of energy corresponding to spinning reserve.

**E) Month wise fluctuations of demand and supply**

It is to be observed that the analysis of the energy balance of the State has been done considering the availability of power as well as demand for the year as a whole, however in actual month on month basis there will be surplus energy available in certain spells of the day as well as months and also energy deficit in certain spells of the day as well as months.

Considering the combined impact of delay of commissioning, LIS projection from I&CAD and availability as per historical actual PLFs in the 5th Control Period, TS Discoms shall explore entering into PPAs with upcoming projects of TS Genco for RGO obligation along with Singareni Phase II (2x800 MW).

In addition to the above stated submissions (A, B, C, D& E), there are numerous other factors which will affect the energy balance of the State.

Notwithstanding to the above, Discoms shall closely monitor the progress of the construction of new generating stations along with the materialization of additional loads (MU) and accordingly estimate the timelines of availability of power from such generating stations and shall strive to better utilize resultant surplus power in the times blocks/ days / months and reduce the burdens on the consumers of the state. In delivering the stated objective, Discoms shall consider the following possibilities either individually or combined:

1. Discoms shall explore the possibility of entering Banking Agreements with other states who have different power requirement patterns based on the availability/requirement of power. Banking of power is always beneficial to Discoms as Power will be received during Peak season where market rates will be higher and returned during non-peak season.
2. Discoms shall utilize the Surplus Power Portal i.e., PUShP platform an initiative by MoP, GoI where it is possible for the Discoms to indicate their surplus power in times blocks/ days / months on portal from all of their tied-up sources. Those Discoms of other States who need power will be able to requisition the surplus power and the new buyer has to pay both Fixed Charges and Variable Charges as determined by the appropriate Regulatory Commission. This shall reduce the fixed cost burden on the Discoms and will also enable all the available generation capacity to be utilized. TS Discoms, have already utilized the services of PUShP platform in order to meet its requirements in the month of May 2023.
3. Apart from the above two possibilities, Discoms shall also strive to materialize revenue from any resultant surplus in smaller time periods by selling the surplus power in the power exchanges. In the year FY 2022-23, TS Discoms have sold 2952 MU and realized a revenue of Rs. 1694 Crore and for FY 2023-24 Q1, TS Discoms have sold 482 MU and realized a revenue of Rs. 179 Crore.
4. 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.