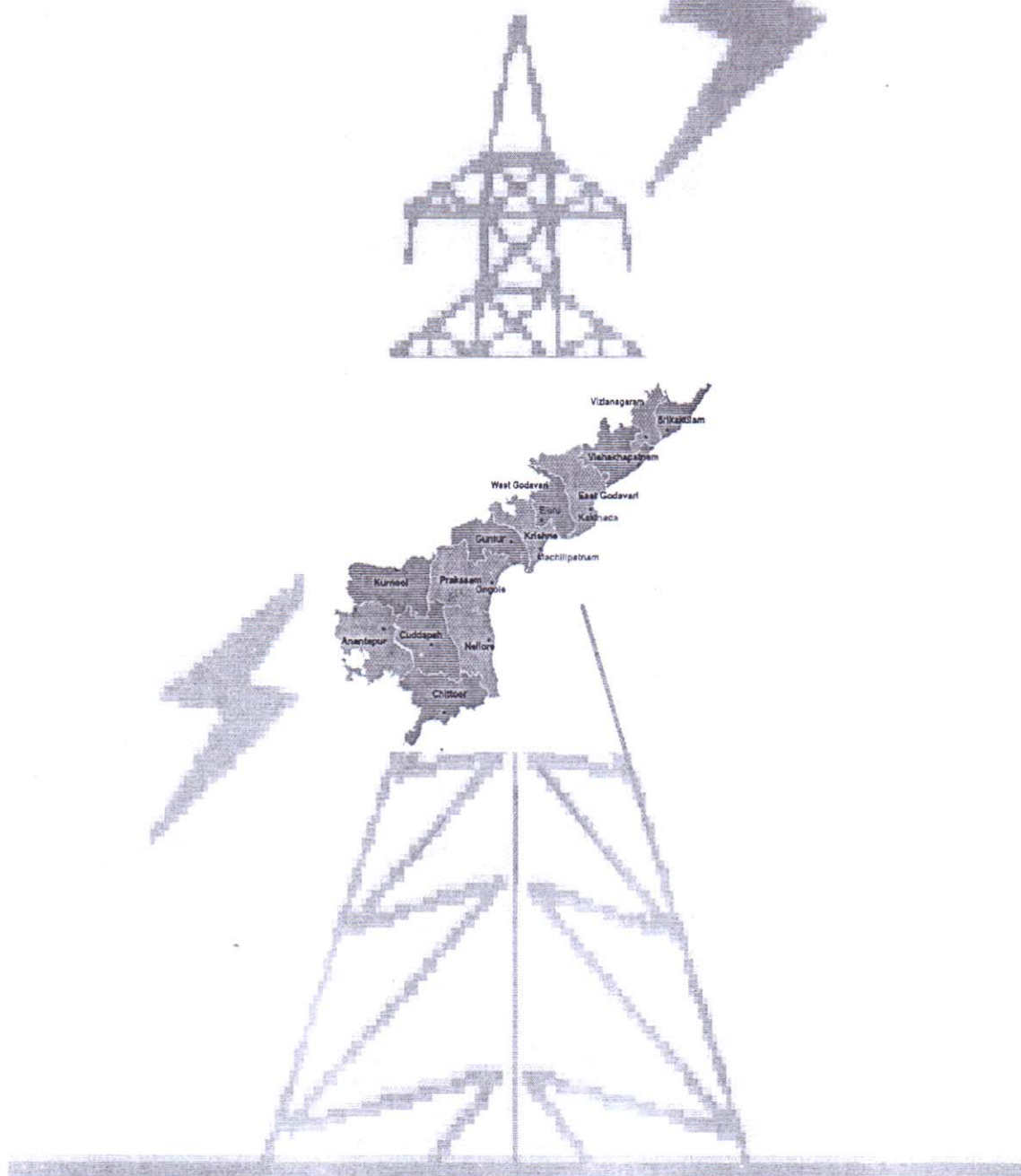


**Filing for Proposed Annual Fee and Operating Charges
for SLDC Activity for the Fourth Control Period
(FY 19-20 to FY 23-24)**

06th December 2018

BEFORE THE HONOURABLE ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION

AT ITS OFFICE AT IVth FLOOR, SINGARENI BHAVAN, RED HILLS, HYDERABAD

FILING NO. _____/2018

CASE NO. _____/2018

In the matter of:

Filing of the Aggregate Revenue Requirement (ARR), Filing for Proposed Tariff (FPT) for the Fourth Control Period (FY 19-20 to FY 23-24) for its SLDC Activity under Section 26(5) of the Andhra Pradesh Electricity Reform Act, 1998 (hereinafter referred to as 'the Act') and under Part VII (Section 61 to Section 64) of the Electricity Act, 2003 read with the relevant APERC Guidelines and Regulations till date, by the Transmission Corporation of Andhra Pradesh Limited ('APTransco' or 'the Licensee') as the Transmission Licensee and SLDC operator.

In the matter of:

TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED

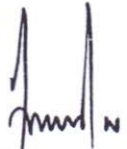
... Applicant

AFFIDAVIT OF APPLICANT VERIFYING THE APPLICATION ACCOMPANYING FILING OF AGGREGATE REVENUE REQUIREMENTS

I, K Vijayanand, S/o K Narasimhulu, working for gain at the Transmission Corporation of Andhra Pradesh Limited do solemnly affirm and say as follows:


1. I am the Chairman and Managing Director (FAC) of APTransco, the licensee company operating and controlling the Transmission & SLDC Activity of electricity in Andhra Pradesh pursuant to the license granted by the Hon'ble Commission and in terms of Government of Andhra Pradesh (GoAP) orders vide G.O.Ms.No.33 dated 11-07-2014. I am competent and duly authorised by APTransco to affirm, swear, execute and file this affidavit in the present proceedings.
2. I have read and understood the contents of the accompanying Filing of Aggregate Revenue Requirement for SLDC Activity. The statements made in the paragraph 9 of the accompanying application now shown to me are true to my knowledge, derived from the

official records made available to me and are based on information and advice received which I believe to be true and correct.

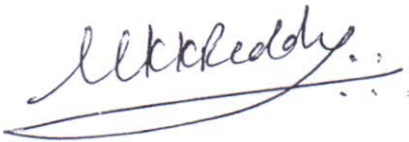

DEPONENT

VERIFICATION:

I, the above named Deponent solemnly affirm at Vijayawada on this 6th December, 2018 that the contents of the above affidavit are true to my knowledge, no part of it is false and nothing material has been concealed there from.


DEPONENT

Solemnly affirmed and signed before me


Company Secretary
APTRANSCO, VIDYUT SOUDHA,
GUNADALA, VIJAYAWADA-520004.

BEFORE THE HONOURABLE ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION
AT ITS OFFICE AT IVth FLOOR, SINGARENI BHAVAN, RED HILLS, HYDERABAD

FILING NO. _____/2018

CASE NO. _____/2018

In the matter of:

Filing of the Aggregate Revenue Requirement (ARR), Filing for Proposed Tariff (FPT) for the Fourth Control Period (FY 19-20 to FY 23-24) for its SLDC Activity under Section 26(5) of the Andhra Pradesh Electricity Reform Act, 1998 (hereinafter referred to as 'the Act') and under Part VII (Section 61 to Section 64) of the Electricity Act, 2003 read with the relevant APERC Guidelines and Regulations till date, by the Transmission Corporation of Andhra Pradesh Limited ('APTransco' or 'the Licensee') as the Transmission Licensee and SLDC operator.

In the matter of:

TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED

... Applicant

The Applicant respectfully submits as under: -

1. Pursuant to the applicable provisions of the Andhra Pradesh Electricity Reform Act, 1998, the Government of Andhra Pradesh undertook the reform and restructuring of the erstwhile Andhra Pradesh State Electricity Board ('APSEB'). APTransco has been formed as a successor entity of the erstwhile APSEB through the First statutory transfer scheme, which was notified in the Official Gazette of the Government of Andhra Pradesh on February 1st 1999 to manage the Transmission and Distribution of erstwhile APSEB. Subsequently, the State Government notified the Second Transfer Scheme on March 31st, 2000 wherein APTRANSCO retained the Transmission, SLDC and Bulk Supply Activity of the State with itself, while transferring the Distribution and Retail Supply of the State to the four Distribution Companies formed in the State viz., (i) Eastern Power Distribution Company of Andhra Pradesh Limited, (ii) Southern Power Distribution Company of Andhra Pradesh Limited, (iii) Central Power Distribution Company of Andhra Pradesh

Limited, and (iv) Northern Power Distribution Company of Andhra Pradesh Limited (collectively referred to as 'Discoms').

2. Pursuant to obtaining independent licences by the Discoms in December 2000, APTransco has relinquished its Distribution & Retail Supply Licence.
 3. Subsequently on June 7, 2005, the State Government notified the Third Transfer Scheme in its official gazette wherein the Bulk Supply business and undertaking of APTRANSCO is vested to the DISCOMs with effect from June 9, 2005. As a result, APTRANSCO is presently carrying out solely the Transmission Business & SLDC Activity as the State Transmission Utility (STU) in the State.
 4. The erstwhile Andhra Pradesh State was reorganized into the Andhra Pradesh and Telangana States on 2nd June 2014. Post bifurcation, APEPDCL and APSPDCL, on geographical basis were allotted to residual Andhra Pradesh, while APCPDCL and APNPDCL were renamed as TSSPDCL and TSNPDCL and allotted to Telangana State.
 5. This filing for Levy of Annual fee and Operating charges for SLDC Activity is in accordance with the provisions of the Reform Act, the Electricity Act 2003, the License granted by the Hon'ble Commission to APTransco on January 31, 2000 and the Guidelines and Regulation No.1 of 2006, issued by the Honorable Commission.
 6. Sub-section (1) of section 31 of the Electricity Act, 2003, provides that the State Government shall establish a State Load Despatch Center (SLDC). Sub-section (2) of the Section 31 provides that the said SLDC shall be operated by a Government company/authority/corporation constituted by or under any State Act and that until such company /authority /corporation is notified by the State Government, the State Transmission Utility (STU) shall operate the SLDC. The Government of AP notified in G.O.Ms.No.33 dated 11-07-2014 that the existing SLDC shall continue as SLDC and be operated by the Transmission Corporation of AP Ltd., being the STU, until the State Government establishes a Government Company or any authority or Corporation.
-

7. While filing the present petition for Annual fee and Operating charges for SLDC Activity, APTransco has endeavoured to comply with the various applicable legal and regulatory directions and stipulations including the directions of the Hon'ble Commission in the Business Rules of the Commission, the Guidelines, prior ARR and Tariff Orders and the recent Regulations on Levy and Collection of Fees and Charges by State Load Despatch Centre (Regulation No. 1 of 2006) dated July 27, 2006.
8. Based on the information available, the Applicant has made bonafide efforts to comply with the directions of the Hon'ble Commission and discharge its obligations to the best of its abilities. However, should any further material become available in the near future, the Applicant reserve the right to file such additional information and consequently amend /revise the application.
9. The current petition for Annual fee and Operating charges for SLDC Activity being filed has been discussed and approved by the Board of Directors of APTransco and Sri. K Vijayanand, Chairman and Managing Director (FAC) of APTransco has been authorised to execute and file the said Annual fee and operating charges Petition on behalf of APTransco. Accordingly, the current petition for Annual fee and Operating Charges for SLDC Activity is signed and verified by, and backed by the affidavit of Sri. K Vijayanand, Chairman and Managing Director (FAC).

Summary of the Filing

10. Determination of SLDC Annual Fee for 4th Control Period

APTRANSCO has computed the Annual SLDC charges based on the following methodology:

- Estimation of Year on Year investments for the period FY 2019-20 to 2023-24
- Computation of Capital Cost based on methodology suggested by the Hon'ble Commission
- Determination of Year on Year Generation Capacity
- Computation of SLDC Annual Charges

a) Capital Investment

The plan of Capital Assets to be added for SLDC Activity for the Five Years of 4th Control Period (FY 2019-20 to FY 2023-24) and Revised Estimates for 2018-19 is shown in Table below:

Proposed Capital Investment (INR Crs)						
Name of the Wing	FY 18-19 (R.E)	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Grid Operation	0	22.58	15.17	10.49	12.75	5.75
Commercial/EBC	0	21.48	0.10	0.10	0.10	3.10
Telecom	99.95	99.95	0.00	0.00	0.00	0.00
Power Systems	0	0.57	0.57	0.66	0.66	0.66
Total	99.95	144.58	15.84	11.24	13.51	9.51

b) Capital Cost Projections

Based on the capital investments shown above and 10.5% interest rate, the capital cost computed as per APERC methodology is shown below:

Capital Cost – 4 th Control Period (INR Crs)						
Parameter	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	Total
Capital Cost on New Investment	24.07	2.63	1.87	2.25	1.58	32.39
Capital Cost on Residual Investment	19.31	43.38	46.01	47.88	50.12	206.70
Total Capital Cost	43.38	46.01	47.88	50.12	51.70	239.09

The capital cost of this residual value and the annual capital investments is INR 239.09 Crs over the 4th Control Period.

c) Annual Fee for the Fourth Control Period

As per clause 4.4 of Regulation 1 of 2006, the Annual Fee shall be computed as follows:

Annual SLDC Fee (INR/MW/pa) = Capital Cost (CC) (in INR) / Total Generation Capacity (MW)

Parameter	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Capital Cost (INR Crs)	43	46	48	50	52
Generation Capacity (MW)	20,226	21,662	21,280	21,285	21,486
SLDC Annual Fee (INR/MW/Annum)	21,445	21,240	22,499	23,548	24,064

11. Determination of SLDC Operating Fee for 4th Control Period

As per the guidelines given by the Commission vide para 4.5 of the regulation (Regulation No.1/2006) the basis for determination of the Operating Charges are based on the Employee cost, Administration and General Charges, Repairs and Maintenance expenses and other relevant costs.

a) Operating Expenses for the 4th Control Period

O&M Expenses – Projections (INR Crs)						
Parameter	FY 18-19 (R.E)	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Employee Cost	44.67	51.34	56.19	61.79	68.41	75.81
Administrative and General Expenses	3.64	4.0	4.40	4.84	5.33	5.86
Repair and Maintenance Expenses	2.65	2.92	3.21	3.53	3.88	4.27
Other Expenses	-	-	-	-	-	-
Total Operating Expenses	50.96	58.26	63.80	70.17	77.61	85.94

b) Operating Charges for Fourth Control Period

As per the Regulation no.1 of 2006, the Operating charges are calculated by following formula prescribed in the regulation.

$$\text{Operating Charges (Rs / MW /pm)} = (\text{Annual Operating charges} / \text{Total Generating Capacity (MW)}) * 12$$

The details of the Operating charges as shown in table below:

SLDC Operating Charges – 4 th Control Period					
Parameter	2019-20	2020-21	2021-22	2022-23	2023-24
Operating Expenses (INR Crs)	58.3	63.8	70.2	77.6	85.9
Generation Capacity (MW)	20,226	21,662	21,280	21,285	21,486
SLDC Operating Charges (INR/MW/Month)	2,400	2,454	2,748	3,039	3,333

12. In the aforesaid facts and circumstances, the Applicant requests that the Hon'ble Commission:

- Take the accompanying Annual fee and Operating charges for Petition of APTransco for SLDC Activity on record;

- b. Grant suitable opportunity to APTransco within a reasonable time frame to file additional material information if any;
- c. Grant the waivers prayed for with respect to such filing requirements, as APTransco is unable to comply with at this stage, as more specifically detailed and for the reasons set out in the present Annual fee and Operating charges filing for SLDC Activity.
- d. Treat the filing as complete in view of substantial compliance as also the specific requests for waivers with justification placed on record;
- e. Consider and approve SLDC Annual fee and Operating charges including all requested regulatory treatments in the filing;
- f. Pass such order, as the Hon'ble Commission may deem fit and proper in the facts and circumstances of the case.

TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED
(APPLICANT)

Through


K Vijayanand

CHAIRMAN AND MANAGING DIRECTOR (FAC)

Place: Vijayawada

Dated: December 6th, 2018

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1 Introduction

Pursuant to the applicable provisions of the Electricity Act, 2003 the State Government shall establish a State Load Despatch Center (SLDC). Section 31 (2) of the Act, provides that the said SLDC shall be operated by a Government Company / Authority / Corporation constituted by or under any State Act and that until such Company / Authority / Corporation is notified by the State Government, the State Transmission Utility (STU) shall operate the SLDC. The Government of AP notified in G.O.Ms.No.33, dated 11-07-2014 that the existing SLDC shall continue as SLDC and be operated by the APTransco being the STU, until the State Government establishes a Government Company / Authority / Corporation. As a result APTransco is presently carrying out solely, the Transmission & SLDC business as the State Transmission Utility (STU) in the state.

The purpose of this filing is to propose for levy and collection of annual fee and operating charges of SLDC Activity. Section 32 (3) of the Electricity Act, 2003 provides for levy and collection of such fees and charges from the generating companies and licensees engaged in the intra-state transmission of electricity as may be specified by the State Commission.

As per the clause 6 of Regulation (Regulation No. 1 of 2006 dated July 27, 2006), on levy and collection of fees and charges by State Load Dispatch, APTRANSCO has to file with the Commission, the proposals for fee and charges for the Fourth Control Period of 5 years for FY 19-20 to FY 23-24.

In compliance with the APERC Regulations and Guidelines, APTransco, the State Transmission Utility & Transmission licensee managing the SLDC business (as per G.O.Ms.No. 33 dated 11.07.2014) herein submits the following in this Petition:

- (1) Annual Fee for the Fourth Control Period
- (2) Operating Charges for the Fourth Control Period

2 Determination of SLDC Annual Fee for 4th Control Period

The Hon'ble Commission has notified the Regulation No.1 on "Levy and collection of Fees and Charges by SLDC" (Regulation No. 1 of 2006) dated July 27th 2006. As per the above

regulation, the APTRANSCO has to file an application for Annual Fee and Operating Charges for the Fourth Control period of 5 years from FY 2019-20 to FY 2023-24.

Filing for Annual Fee

In compliance with the Clause 4 of APERC Regulation, APTransco has to submit the Annual fee for the SLDC business for the fourth control period of 5 years i.e. 2019-20 to 2023-24. As per the guidelines given by the Commission vide para 4.4 of the above regulation, the basis for determination of the annual fee is based on the Capital cost to cover the repayment of principal and payment of interest on investments in a year, plus any residual capital cost of past investment.

Annual SLDC Fee (Rs /MW/Annum) = Capital Cost (CC) (in Rs) / Total Generation Capacity (MW)

APTRANSCO has computed the Annual SLDC charges based on the following methodology:

- Estimation of Year on Year investments for the period FY 2019-20 to 2023-24
- Computation of Capital Cost based on methodology suggested by the Hon'ble Commission
- Determination of Year on Year Generation Capacity
- Computation of SLDC Annual Charges

2.1 Capital Investments

The plan of Capital Assets to be added for SLDC Activity for the Five Years of 4th Control Period (FY 2019-20 to FY 2023-24) and Revised Estimates for 2018-19 is shown in Table below:

Table 1: Proposed Capital Investment for the 4th Control Period

Proposed Capital Investment (INR Crs)						
Name of the Wing	FY 18-19 (R.E)	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Grid Operation	0	22.58	15.17	10.49	12.75	5.75
Commercial/EBC	0	21.48	0.10	0.10	0.10	3.10
Telecom	99.95	99.95	0.00	0.00	0.00	0.00
Power Systems	0	0.57	0.57	0.66	0.66	0.66
Total	99.95	144.58	15.84	11.24	13.51	9.51

The new Capital Assets proposed to be added during the Fourth Control Period and the need for such capital assets for SLDC Activity in each of the wings viz., Grid Operation, Telecommunication, Power System and Commercial/Energy Billing Centre wings is detailed below.

A. Grid Operation Wing

In the above investment plan, Grid Operation wing is proposing to setup Backup SLDC at Tirupati to implement a remotely located (in a different seismic zone) fully functional replica Control Center as part of Disaster Management Plan in terms of Satnam committee Report to have Main and Backup SLDC Control Centres.

The project execution is being carried out under the consultancy of Powergrid and is scheduled to be commissioned by ending of FY 2020-21. Hence, the large capital investment proposed in FY 2020-21.

At present the Real Time data is being transmitted to the APSLDC control centre from 250 field stations which are being monitored. As per security standards for critical infrastructure, redundancy of Control Centre is essential. With the establishment of fully functional Backup Control Centre, all the field locations report the real-time data parallel, on a redundant communication path. The communication protocol is being upgraded from the present serial communication link-based IEC 60870-5-101 to the Ethernet based IEC 60870-5-104 for enhancing the data rate. For this purpose, the APTRANSCO communication system is also being augmented.

The new system has a provision for the acquisition of data from over 1500 field locations by means of newer communication protocols and hardware. Data Concentrator Cum Protocol Converters (DCPCs) are located at 10 identified broadband locations for collecting data from the existing and new RTU stations, which will report to the DCPC over IEC 60870-5-101 protocol. The DCPCs will in turn report to both the main and backup SLDC over redundant communication routes, over IEC 60870-5-104 protocol. Also, it is planned to transmit the data from many of the field locations directly to the SLDC over IEC 60870-5-104 protocol. The planned lifetime of the new project is 7 years as per the CERC regulations.

The Backup Control Center will have a 3x2 Unit video projection system with each unit of size 70" diagonal. A new DTS is also envisaged for training the operators on the new system. It will also aid the new operators in getting trained before being posted on the job.

The new system provides the operators with new tools such as Complex Event Processing (CEP) engines for enormous data storage and it's near instantaneous retrieval; common information model (CIM) based modeling and data exchange, Dispatcher Training Simulator (DTS) for training, tools for better visualization of the SCADA Displays, to aid them in better Grid Control and Visualization. This provides the operator with an excellent visualization for the large grid network. This is in addition to the individual two monitor workstation provided to each operator.

In view of the requirement of having SLDC data on the Internet, a dedicated APSLDC website with real-time and historical data is being developed. The upgraded SCADA system also will integrate seamlessly to this website with recommended cyber security systems and email systems in tow.

The cyber security systems will have dedicated firewalls for internal and external networks apart from IPS and IDS apart from online automated patch management solutions, antivirus solutions, file sharing mechanisms, and single point user authentication systems. A Network Management System is also envisaged.

Historical Data of up to seven years will be available online in the new system. The backup of the system software and data will also be automatically taken periodically at both local and remote location on different media. The AMC of the new system will be done by the supplier for a period of 6 Years after the mandatory 1 year warranty, post commissioning of the system. The AMC is also part of the Project Tender itself.

In addition to that grid operation wing, also proposed to add the assets like computers, printers, LCD Display units, up gradation of software for various PCs in the 4th Control Period.

The existing SCADA system in the Main SLDC at Vijayawada is established during 2014 with state of the art technology in consultation with Power Grid Corporation of India Limited along with the other Southern Region constituents viz., Kerala, Pondicherry and SRLDC and is having a life period of 7 years and also needs to be upgraded during 2021-23. So, in the

investment plan, it is proposed for upgraded SCADA system in the Main SLDC at Vijayawada also.

As Andhra Pradesh is one of the Renewable Energy rich states, it is proposed for establishment of Renewable Energy Management Center (REMC) at SLDC, Vijayawada to get the real time SCADA data from all the RE Generators and also for forecasting and scheduling of Wind and Solar Generation in the state. This project is proposed under grant from MoP and is scheduled to be commissioned during 2019-20 with the life time of the project is 7 years.

B. Telecom Wing

For strengthening and Modernization of Telecom equipment the following schemes are proposed during the fourth control period.

a) Communication to Back up SLDC at Tirupati:

- The provision of communication system in Transmission network for back-up SLDC at Tirupati is proposed during second control period and is being implemented in Third control period. This project is under process and it may complete in Fourth control period (FY 2019-20 to 2023-24). The work progress is enclosed in separate sheet.

b) Reliable Communication and Data Acquisition system up to 132 KV SS in APTRANSCO:

- The Joint Secretary, Ministry of Power, Govt. of India have informed that a need of reliable communication from all sub-stations is considered for catering data and voice communication for efficient management of Power system grid at state and regional level. Further, the communication from sub-stations will also be used during emergency situations arising out of natural calamities. Also mentioned that presently, the reliable communication and data acquisition system is available mostly up to 400 KV and to some extent 220 KV SS and with growing complexity and need for better management of grid, it is planned to have such system up to 33kV, 66kV and 132kV. Also emphasized that the need for reliable communication at 33kV, 66kV and 132 kV sub-stations was also experienced after devastation caused by Hudhud cyclone in AP in Oct'14 and other such occasions where absence of communication

between 33kV sub-stations and control centre had delayed restoration of power supply.

- APTRANSCO has accorded administrative approval for implementation of the project under PSD Funding during FY 2017-18. This project is not included in ARR projections for Third control period as the project is sanctioned in the month of May, 2017 by Ministry of Power, Govt. of India for PSD Funding.
- The amount of grant sanctioned is 50% of accepted cost estimate of Rs.284.96 Crores i.e. Rs.142.48 Crores and. The expenditure beyond sanctioned grant shall be provided by APTRANSCO from own sources/loans etc.
- The project shall be completed in 24 months from the date of release of 1st instalment. The first instalment will release soon.
- This project is scheduled to complete in FY 2018-19 and FY 2019-20.
- The expenditure beyond sanctioned grant i.e, Rs.142.48 Crores and IDC, contingencies shall be met from own sources/Loans.

C. Energy Billing Center Wing

EBC wing of SLDC is proposing for Implementation of Intra State Availability Based Tariff (ABT) at the State level. It was mandated in the National Electricity Policy and Tariff Policy. Energy Accounting is done in AP at Energy Billing Centre under the control of APSLDC. Implementation of Intra State Availability Based Tariff (ABT), the SAMAST framework at the Andhra Pradesh state level – Documentary proofs for the rates (along with Taxes Bifurcation) and Time lines for implementation along with requisite formats A1, A2, A3, A4 and A5 are prepared and applied for PSDF funding for an amount of Rs 52.727Cr.

MoP sanctioned a grant of Rs 21.48 Crores from PSDF towards Implementation of Scheduling, Accounting, Metering and Settlement of Transactions in Electricity (SAMAST) during July 2018. Accordingly APTRANSCO issued administrative approval in Sept 2018 to Implement SAMAST in the state of ANDHRA PRADESH with 90% grant from Power System Development Fund (PSDF) and 10% amount from internal funds towards the scheme “Implementation of Scheduling, Accounting, Metering and Settlement of Transactions in

Electricity (SAMAST) in APTRANSCO, Andhra Pradesh. The Scheme will be implemented during 2019-21.

EBC wing of SLDC is also proposing Implementation of “APERC FORECASTING, SCHEDULING AND DEVIATION SETTLEMENT OF SOLAR AND WIND GENERATION REGULATION, 2017” (REGULATION No. 4OF 2017). The regulation came into force with effect from the 21.08.2017.

In accordance with the regulation, Forecasting, Scheduling and deviation settlement commenced from 01.01.2018, while the levy and collection of deviation charges commenced from 01.07.2018.

For implementation of the above regulation, necessary software and hardware with applicable licenses are needed to improve the accessibility of web application to open access users. As such, the needed infrastructure is proposed in the investment plan which is very essential.

D. Power Systems

It is proposed to upgrade the outdated softwares currently in use for System Software, Generation Planning Software, Transmission Planning Software and Load Forecast Software.

2.2 Capital Cost Projection

Based on the capital investments shown above and 10.5% interest rate, the capital cost computed as per APERC methodology is shown below:

Table 2: Capital Cost for the 4th Control Period

Capital Cost – 4th Control Period (INR Crs)						
Parameter	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	Total
Capital Cost on New Investment	24.07	2.63	1.87	2.25	1.58	32.39
Capital Cost on Residual Investment	19.31	43.38	46.01	47.88	50.12	206.70
Total Capital Cost	43.38	46.01	47.88	50.12	51.70	239.09

The residual value of assets at the end of 2018-19 has been considered to be INR 116.14 Crs. The asset value at the beginning of FY 2018-19 was INR 16.19 Crs and the investments expected to be made during FY 2018-19 is INR 99.95 Crs.

The capital cost of this residual value and the annual capital investments is INR 239.09 Crs over the 4th Control Period.

2.3 Total Generation Capacity

The total generation capacity estimated, including the capacity related to Open Access consumers over the next five years is as shown below:

Table 3: Estimated Generation Capacities (MW)

Estimated Generation Capacity (MW)						
S.No	Source of Power	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
I	APGENCO	6,393	7,192	6,855	6,987	7,297
a	Thermal	4,614	5,412	4,957	4,574	4,574
b	Hydro	1,780	1,780	1,898	2,413	2,723
II	Central Generating Stations	2,686	2,686	2,686	2,686	2,686
III	Joint Setor	792	792	792	792	792
IV	IPPS	233	233	222	217	217
V	Others (NCE, M PP's etc, wind, Mini Hydel)	9,422	10,607	10,575	10,486	10,385
	Total	19,526	21,509	21,131	21,167	21,377
VI	Thirty Party Sales	700	153	150	118	109
	Grand Total	20,226	21,662	21,280	21,285	21,486

Note:- Generating Station-wise details are shown in Annexures - B 1 to 5

2.4 Annual Fee for the Fourth Control Period

As per clause 4.4 of Regulation 1 of 2006, the Annual Fee shall be computed as follows:

Annual SLDC Fee (INR/MW/pa) = Capital Cost (CC) (in INR) / Total Generation Capacity (MW)

Table 4: SLDC Annual Fee for the 4th Control Period

Parameter	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Capital Cost (INR Crs)	43	46	48	50	52
Generation Capacity (MW)	20,226	21,662	21,280	21,285	21,486
SLDC Annual Fee (INR/MW/Annum)	21,445	21,240	22,499	23,548	24,064

The Annual fee for the fourth control period has been calculated based on the total capital cost for the fourth control period on total generation capacity as per SLDC regulation.

3 Determination of SLDC Operating Fee for the 4th Control Period

As per the guidelines given by the Commission vide para 4.5 of the regulation (Regulation No.1/2006) the basis for determination of the Operating Charges are based on the Employee cost, Administration and General Charges, Repairs and Maintenance expenses and other relevant costs.

The details of the Annual Operating charges i.e. Employee cost, Administration and General charges, Repairs and Maintenance charges and other charges are shown in the below table below:

Table 5: Projection – Operating and Maintenance Expenses

O&M Expenses – Projections (INR Crs)						
Parameter	FY 18-19 (R.E)	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Employee Cost	44.67	51.34	56.19	61.79	68.41	75.81
Administrative and General Expenses	3.64	4.0	4.40	4.84	5.33	5.86
Repair and Maintenance Expenses	2.65	2.92	3.21	3.53	3.88	4.27
Other Expenses	-	-	-	-	-	-
Total Operating Expenses	50.96	58.26	63.80	70.17	77.61	85.94

3.1 Employee Cost

The employee cost for the base year FY 2018-19 has been projected by considering the growth in Dearness Allowance based on All India General Index and the annual increments.

The same procedure has been followed for projecting the employee expenses for the 4th control period.

The employee cost, other than the salaries of the personnel, also contain the following components:

- Surrender leave
- Various medical allowances
- Other Allowances and pension contribution

Next wage revision is due with effect from 1st April 2022. The financial commitment of wage revision will be claimed based on actuals

The contribution towards Pension and Gratuity fund, as per actuarial valuation is 6.78% for 2017-18 and 2018-19. For the period 2019-20 to 2023-24, contribution towards Pension and Gratuity fund has been escalated by 2% year-on-year.

3.2 Administration and General Charges

All other expenses including traveling allowance, cost for telephones and vehicles, electricity expenses, insurance charges and other miscellaneous costs have been considered under the head of Administration & General expenses. The Administration and General Charges of SLDC business for the fourth control period are projected by considering a growth of 10% year-on-year.

Table 6: Projections - Administration & General Charges

Administration & General Charges – Projections (INR Crs)						
Parameter	FY 18-19 (R.E)	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Administrative and General Expenses	3.64	4.0	4.40	4.84	5.33	5.86

3.3 Repairs and Maintenance Costs

As per the clause No. 7 of Regulation 2/2006, the Energy Billing Center is also considered as the SLDC Business. Therefore the assets of SLDC Business are mainly in Grid Operation unit,

Energy Billing Center and Telecom units. At present the Telecom unit assets are shared by the Transmission business as well as SLDC business.

However for the purposes of calculation of operating charges certain amount of Repairs and Maintenance expenses have been considered in the SLDC business.

These costs are primarily for the RTU's and the SCADA system. The repairs & Maintenance expenditure is projected based on the requirements of each wing. The Repairs and Maintenance Costs for the fourth control period are projected by considering a growth of 10% year-on-year.

Table 7: Projections – Repairs & Maintenance Costs

Repair and Maintenance Costs – Projections (INR Crs)						
Parameter	FY 18-19 (R.E)	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Repairs & Maintenance Costs	2.65	2.92	3.21	3.53	3.88	4.27

The need for the above R&M costs for SLDC business in each of the three wings viz., Grid Operation, Telecommunication, Power Systems and EBC wings is detailed below.

EBC

For smooth operations of Open Access and data collection system the following are essentially required for AMC viz: Servers, Workstations, HUBs, Switches and procurement of consumables like Printer cartridges and data cartridges to take the database backup and other computer consumables for use in EBC wing is included in R&M cost.

Grid Operation

The R&M expenditure projections cover for Annual Maintenance Charges for the following equipment available in Grid Operation wing.

- AMC of the existing EMS/SCADA system till it's life time gets completed, and also AMC of the proposed new EMS/SCADA in the SLDC building, Gunadala, Vijayawada.
- AMC of proposed Backup SLDC at Tirupati
- AMC of Video Projection System at SLDC, Vijayawada
- AMC of UPS systems at ALDCs and DCPC locations.
- AMC of Air Conditioning Units at SLDC, ALDCs and Backup SLDC.

- AMC of DG sets at SLDC, Backup SLDC, ALDCs.
- AMC of other Servers, PCs and printers etc. at SLDC & ALDCs.
- AMC of networking equipment at SLDC, ALDCs and Backup SLDC.

Further for regular maintenance the consumables are required for computer systems, printers and other equipment.

Telecom

The repairs and maintenance cost of Telecom wing is projected due to AMC contracts of PLCC equipment with different vendors for regular maintenance.

3.4 Operating Charges for Fourth Control Period

As per the Regulation no.1 of 2006, the Operating charges are calculated by following formula prescribed in the regulation.

Operating Charges (Rs / MW /pm) = (Annual Operating charges / Total Generating Capacity (MW) * 12)

The details of the Operating charges as shown in table below:

Table 8: SLDC Operating Charges – 4th Control Period

SLDC Operating Charges – 4th Control Period					
Parameter	2019-20	2020-21	2021-22	2022-23	2023-24
Operating Expenses (INR Crs)	58.3	63.8	70.2	77.6	85.9
Generation Capacity (MW)	20,226	21,662	21,280	21,285	21,486
SLDC Operating Charges (INR/MW/Month)	2,400	2,454	2,748	3,039	3,333

The Monthly Operating Charges for the year 2019-20 is Rs.2,400 / MW / month, for the year 2020-21 is Rs.2,454/MW/month, for the year 2021-22 is Rs. 2,748/MW/month, for the year 2022-23 is Rs.3,039/ MW /month and for the year 2023-24 is Rs.3,333/MW/month.

4 Summary - SLDC charges for Fourth Control Period

The SLDC Operating Charges and Annual Fees to be collected from the generators (including open access consumers) during the 4th control period are tabulated in the table below.

Table 9: Summary – Filing for SLDC for the 4th Control Period

Summary – Filing for SLDC for 4th Control Period						
Parameter	2019-20	2020-21	2021-22	2022-23	2023-24	Total
Capital Cost (INR Crs)	43	46	48	50	52	239
Employee Expenses (INR Crs)	51	56	62	68	76	314
A&G Expenses (INR Crs)	4	4	5	5	6	24
R&M Expenses (INR Crs)	3	3	4	4	4	18
Other Expenses (INR Crs)	-	-	-	-	-	-
O&M Expenses (INR Crs)	58	64	70	78	86	356
Total Cost (INR Crs)	102	110	118	128	138	595
Generation Capacity (MW)	20,226	21,662	21,280	21,285	21,486	
Annual Fee (INR/MW/Annum)	21,445	21,240	22,499	23,548	24,064	
Operating Charge (INR/MW/Month)	2,400	2,454	2,748	3,039	3,333	

5 Change in methodology

In response to draft amendment to Regulation 5 of 2005, the methodology for computation of Transmission charges has been revised by considering State Peak Demand in place of Contracted Capacity. In line with this amendment, the Hon'ble Commission may consider amendment to Regulation 1 of 2006, to consider State Peak Demand in place of Total Generation Capacity for computation of SLDC Annual Fee and Operating Fee.

Table 10: SLDC Charges based on State Peak Demand – 4th Control Period

SLDC Charges based on State Peak Demand – 4th Control Period						
Parameter	2019-20	2020-21	2021-22	2022-23	2023-24	Total
Capital Cost (INR Crs)	43	46	48	50	52	239
O&M Expenses (INR Crs)	58	64	70	78	86	356
State Peak Demand (MW)	11,450	12,219	13,209	14,315	15,539	
Annual Fee (INR/MW/Annum)	37,883	37,654	36,246	35,015	33,273	
Operating Charge (INR/MW/Month)	4,240	4,351	4,427	4,518	4,609	

6 Introduction of New Charges

In addition to the proposed amendment by APERC in Reg. 5 of 2005, we would request Hon'ble commission to kindly consider our request of introducing **Renewable Integration and Ancillary Service Charges** to be levied by AP Transco on account of higher share of RE penetration in the grid.

Background:

AP Transco as a state transmission utility and SLDC as a system operator are contemplating to set up a battery energy storage system (BESS) with a capacity of 250 -500 MW with 2-4 hours of storage, under Opex Model, to address morning and evening/night peak deficits (shorter durations), intermittency problems owing to high RE penetration (15 - 30 mins) and also smoothening of curves. AP Transco and SLDC as a system operator, may plan to set up storage system under Opex Model by paying annuity charges to the Developer. AP Transco may invite bids for the selection of developer based on lowest quoted annuity changes (INR/ Annum). Storage system can be planned either at sub-station level or at source/generation level or at a centralized location i.e. at a sub-station owned by AP Transco for charging. Storage system, at a centralized location would be a cost effective option on account of scale. The total annuity charges

paid to the developer by AP Transco will be socialized and shall be recovered based on the applicability and the usage of the BESS.

Generation from solar plants vary on a daily basis due to weather pattern changes causing cloud cover. This can lead to lower generation, as compared to expected, for a short duration (15-30 minutes). On average, a nearly 130 MW deficit within a 15 minute block was observed during the 3 month period (Aug 1 – Oct 31, 2018). There were several (>50%) instances where a drop in solar generation in a given 15 minute block translated into a drop in demand after 30 minutes (i.e. with a lag of 2 blocks). Based on analysis of the data sample (between Aug 1, 2018-Oct 31, 2018), 375 MW of power for a period of 30 minutes would be able to tide over 75 percentile of deficits in solar generation.

There are 9,523 no. of instances of over-drawal equivalent to ~ 23 MUs of energy quantum over drawn that has resulted in Utilities paying INR 103.5 Crs as penalty charges for the period between Apr-Oct 2018.

Storage systems are planned to be used for the following purposes

a) Peak Load Management (during the day and night):

Though there is surplus generation during day-time, Discoms are facing peak deficits for 2-3hrs during mornings and evenings, across the year. These deficits can be overcome by planning a thermal plant but it is an inefficient way as the plant will have lower utilization. The deficits can be partly met by wind for 2-3 months, during the months of June to August. Introduction of a storage system (Battery or Pumped storage plant) for shifting of surplus generation from RE during day time would also be an effective way to meet the deficits. Battery based storage system may be a cost effective alternative for addressing the peak deficits (<2-4 hours) vis-à-vis pumped storage systems. Storage system can be planned either at sub-station level or at source/generation level or at a centralized location i.e. at a sub-station owned by AP Transco for charging. Storage system, at a centralized location would be a cost effective option on account of scale.

b) Meeting intermittencies due to variation in RE generation:

Andhra Pradesh has an installed capacity of ~ 4000 MW of wind and 2516 MW of solar as on July 2018 and with increasing share of RE generation, the intraday variations are only going to increase. Renewable energy generation, especially from wind and solar, is variable in nature and therefore intermittency of RE is a problem during the daytime. Some of the state utilities are

currently addressing this problem by maintaining a spinning reserve. However it is an inefficient way to address the problem as the asset would be idle for most of the time. Implementation of storage system would facilitate integration of renewable energy generation in an efficient manner. Grid Scale Storage System such as Pumped Storage Plants or Battery Storage Plants may be used for balancing renewable sources of energy. Given that the intermittencies are of short durations (i.e. 15- 30 mins) in nature, battery energy storage system is preferred to pumped storage system.

c) Smoothing of curves (during ramp up and ramp down of solar generation):

The rate of solar generation ramp up during the morning hours and the rate of ramp down in the evening hours are not uniform leading to a gap between supply and demand. During hours of ramp up/ramp-down there can be a multi-fold increase/decline in supply within a period of 2-3 hours. Since demand during these hours does not follow the pattern of increase/decline in solar generation, there is a need for a storage system to augment the solar generation and thus smoothen the supply curve from solar generation.

Proposed charges to be levied:

The annuity charges paid to the developer by AP Transco shall be recovered in the form of Renewable Integration Charges (RIC) and Ancillary Service Charges levied to Discoms, RE developers and other users of transmission system.

The fixed cost of battery energy storage system of 500 MWh capacity is estimated to be about ~ INR 975 Crores. Assuming the system to operate over a period of 10 Years (2 cycle operation), the total annuity charges to be paid by AP Transco to the developer shall be of INR 185 Crs (that may be recovered in the form of Renewable Integration Charges (RIC) to meet the intermittency and smoothening of the solar generation and Ancillary service charges for peak load management (during day and night). AP Transco shall propose the following

- RIC charges may be levied only to RE developers (Solar/Wind).
- Ancillary service charges may be levied to all the consumers including Licensees, OA consumers and any other users of transmission system.

As per EA 2003, Section 32 (2) (e)

The State Load Despatch Centre shall be responsible for carrying out real time operations for grid control and dispatch of electricity within the State through secure and economic operation of the State grid in accordance with the Grid Standards and the State Grid Code.

As per EA 2003, Section 31 (1)

Provided further that no State Load Despatch Centre shall engage in the business of trading in electricity.

Hence, the RIC shall be proposed to be levied by SLDC and the Ancillary Service Charges to be levied as part of Transmission Business.

Currently the recovery of Net ARR is entirely through transmission tariff and the proposed charges including Net ARR incurred by AP Transco and SLDC for providing the above mentioned services would be recovered as follows

Charge	Applicability
90% of Net ARR	All the consumers including Licensees, OA consumers (LTOA/MTOA)
10% of Net ARR	All the STOA consumers
Renewable integration charges: 70 % of Annuity Charges (INR/MW/Month)	Only to RE developers (Wind/Solar)
Ancillary support charges: 30 % of Annuity Charges (INR/Unit)	All the consumers including Licensees, OA consumers

Renewable Integration Charges (RIC) INR/MW/Month = Total Annuity Charges – {Ancillary Service Charges (INR/Unit) * Quantum of energy supplied by battery energy storage systems for providing ancillary services during the year}

SLDC shall levy RIC to only RE developers as operating RIC charges (INR/MW/Month).

The Renewable Integration Charges is estimated as INR 121 Crs based on following assumptions

- Capacity of BESS: 500 MWh
- Utilitison of BESS in a year: 200 days
- Charge and discharge cycles in a day: 2
- Proposed ancillary service charge: INR 3.2/kWh (Deviation penalty paid by the state utilities for the period Apr-Oct '18)

Total Ancillary service charges = BESS capacity * Utilization of BESS in No. of days/Year * No. of cycles in a day * Ancillary Service Charge (INR/Unit)

$$= 500 \text{ MWh} * 200 \text{ days} * 3.2 * 2$$

$$= \text{INR } 64 \text{ Crores}$$

7 ANNEXURE-A

LIST OF DIRECTIVES FOR THIRD CONTROL PERIOD

Dir. No.	Description of Directive	Status
1	APTRANSCO shall file the details of completed capital works pertaining to SLDC operations along with Project Completion Certificate (PCC) and Financial Completion Certificate (FCC) as is being done for transmission projects. APTRANSCO shall also file a monthly report with the Commission on progress in capital works pertaining to SLDC operations by 25 th of every month for the previous month.	The directive is complied with
2	APTRANSCO shall file the actual costs and revenues by 25 th of every month for the previous month in the format prescribed for this purpose by the Commission. APTRANSCO may also state its own observations on cost, revenues and capacities along with the monthly report.	The directive is complied with
3	<p>Segregation of Employees Cost</p> <p>a) APTRANSCO shall apportion the cost of employees of Telecom wing to SLDC business and Transmission business in the next filing as per Grid Code. Since, in the present filing all employees cost of Telecom wing is shown in SLDC business. Further the cost of expansion of Telecom shall be shown in the concerned business as per Grid Code.</p> <p>b) In the present filing the total employee cost of power system is shown under the SLDC business. The employees of power system wing are dealing with SLDC business and Transmission business. The APTRANSCO is directed to segregate the cost of employees between Transmission business and SLDC business.</p>	The directive is complied with

4	As per clause 4.5.1 (employees cost) of Regulation No.1 of 2006 of APERC the staffing plan shall be submitted to the Commission to get approval. As per clause 4.5.2 of Regulation No.1 of 2006, for the A&G costs and R&M costs the norms have to be determined. Hence, the APTRANSCO is directed to submit proposals for determining norms for these costs in O&M expenses will before the next filings.	The directive is complied with
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8 ANNEXURE-B

Generating Capacities

FY 2019-20

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
		MW	%	MW	
I	APGENCO - Thermal				
	VTPS I	420	100.00%	420	383.25
	VTPS II	420	100.00%	420	383.25
	VTPS III	420	100.00%	420	383.25
	VTPS IV	500	100.00%	500	462.50
	RTPP I	420	100.00%	420	382.20
	RTPP Stage-II	420	100.00%	420	382.20
	RTPP Stage-III	210	100.00%	210	191.10
	Rayalaseema TPP Stage IV Unit- 6 (600MW)	600	100.00%	600	558.00
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-1	800	100.00%	800	740.00
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-2	800	100.00%	800	748.00
	Total Thermal	5,010.0		5,010.0	4,614
	APGENCO - Hydel				
	MACHKUND PH AP Share	84.0	100.00%	84	83
	TUNGBHADRA PH AP Share	57.6	100.00%	58	57
	USL	240.0	100.00%	240	238
	LSR	460.0	100.00%	460	455
	DONKARAYI	25.0	100.00%	25	25
	SSLM	770.0	100.00%	770	762
	NSRCPH	90.0	100.00%	90	89

SI. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
		MW	%	MW	
	PABM	20.0	100.00%	20	20
	MINI HYDRO (Chettipetta)	1.0	100.00%	1	1
	Nagarjunasagar Tail pond (1x25 MW) Unit-1	25.0	100.00%	25	25
	Nagarjunasagar Tail pond (1x25 MW) Unit-2	25.0	100.00%	25	25
	Total Hydel	1,797.6		1,798	1,780
II	CGS				
	NTPC (SR)	2,100.0	20.70%	435	406
	NTPC (SR) Stage III	500.0	21.61%	108	102
	Talcher Stage 2	2,000.0	11.64%	233	219
	NLC Stage-I	630.0	7.56%	48	43
	NLC Stage-II	840.0	10.34%	87	78
	NPC-MAPS	440.0	4.19%	18	18
	NPC-Kaiga unit I & II	440.0	12.78%	56	56
	NPC-Kaiga unit III & IV	440.0	13.62%	60	60
	NTPC Simhadri Stage I	1,000.0	46.11%	461	437
	NTPC Simhadri Stage II	1,000.0	26.69%	267	253
	Bundled power under JVNSM (or western region)	539.1	100.00%	539	511
	Vallur Thermal Power Plant	1,500.0	5.86%	88	82
	Kudigi	1,600.0	16.99%	272	256
	Tuticorin joint venture plant	1,000.0	12.32%	123	115
	NNTPS	1,000.0	5.25%	52	49
	Total CGS	15,029.1		2,847	2,686
III	APGPCL, APDISCOM				

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
		MW	%	MW	
	& IPP Gas				
	APGPCL I - Allocated capacity	100.0	9.33%	9	9
	APGPCL II - Allocated capacity	172.0	14.51%	25	24
	Godavari Gas Power Plant	216.8	100.00%	217	208
	Spectrum	205.2	100.00%	205	199
	Kondapalli (Gas)	361.9	100.00%	362	351
	Total APGPCL, APDISCOM & IPP Gas	1,055.9		818.2	792
IV	IPPs - Others				
	Srivathsa	17.2	100.00%	17	17
	Thermal Power Tech	500.0	46.11%	231	217
	Total IPPs - Others	517.2		248	233
V	Non Conventional Sources				
	NCE - Solar	4,430.5		4,431	4,431
	NCE - Wind Power	4,729.1		4,729	4,729
	NCE - Mini Hydel	50.7		51	51
	NCE - Others	211.8		212	212
	Total NCE	9,422		9,422	9,422
	Total Generation Capacity	32,832		20,143	19,526
VI	Open Access Generators	700.0		700	700
	Grand Total	33,532		20,843	20,226

FY 2020-21

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
		MW	%	MW	MW
I	APGENCO - Thermal				
	VTPS I	420.0	100.00%	420	383
	VTPS II	420.0	100.00%	420	383
	VTPS III	420.0	100.00%	420	383
	VTPS IV	500.0	100.00%	500	463
	RTPP Stage-II	420.0	100.00%	420	382
	RTPP Stage-III	210.0	100.00%	210	191
	VTPS Stage V (800MW)	800.0	100.00%	800	744
	Royalaseema TPP Stage IV Unit- 6 (600MW)	600.0	100.00%	600	558
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-1	800.0	100.00%	800	740
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-2	800.0	100.00%	800	748
	Krishnapatnam TPP (JVP) Stage II (1X800MW) Unit-3	800.0	100.00%	800	436
	Total Thermal	6,190.0		6,190.0	5,412
	APGENCO - Hydel				
	MACHKUND PH AP Share	84.0	100.00%	84	83
	TUNGBHADRA PH AP Share	57.6	100.00%	58	57
	USL	240.0	100.00%	240	238
	LSR	460.0	100.00%	460	455
	DONKARAYI	25.0	100.00%	25	25
	SSLM	770.0	100.00%	770	762
	NSRCPH	90.0	100.00%	90	89
	PABM	20.0	100.00%	20	20
	MINI HYDRO (Chettipetta)	1.0	100.00%	1	1
	Nagarjunasagar Tail pond (1x25 MW) Unit-1	25.0	100.00%	25	25
	Nagarjunasagar Tail pond (1x25 MW) Unit-2	25.0	100.00%	25	25
	Total Hydel	1,797.6		1,797.6	1,780

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
II	CGS				
	NTPC (SR)	2,100.0	20.70%	435	406
	NTPC (SR) Stage III	500.0	21.61%	108	102
	Talcher Stage 2	2,000.0	11.64%	233	219
	NLC Stage-I	630.0	7.56%	48	43
	NLC Stage-II	840.0	10.34%	87	78
	NPC-MAPS	440.0	4.19%	18	18
	NPC-Kaiga unit I & II	440.0	12.78%	56	56
	NPC-Kaiga unit III & IV	440.0	13.62%	60	60
	NTPC Simhadri Stage I	1,000.0	46.11%	461	437
	NTPC Simhadri Stage II	1,000.0	26.69%	267	253
	Bundled power under JVNSM (or western region)	539.1	100.00%	539	511
	Vallur Thermal Power Plant	1,500.0	5.86%	88	82
	Kudigi	1,600.0	16.99%	272	256
	Tuticorin joint venture plant	1,000.0	12.32%	123	115
	NNTPS	1,000.0	5.25%	52	49
	Total CGS	15,029.1		2,847.1	2,686
III	APGPCL, APDISCOM & IPP Gas				
	APGPCL I - Allocated capacity	100.0	9.33%	9	9
	APGPCL II - Allocated capacity	172.0	14.51%	25	24
	Godavari Gas Power Plant	216.8	100.00%	217	208
	Spectrum	205.2	100.00%	205	199
	Kondapalli (Gas)	361.9	100.00%	362	351
	Total APGPCL, APDISCOM & IPP Gas	1,055.9		818.2	792
IV	IPPs - Others				
	Srivathsa	17.2	100.00%	17	17
	Thermal Power Tech	500.0	46.11%	231	217
	Total IPPs - Others	517.2		247.8	233
V	Non Conventional Sources				
	NCE - Solar	5,596.0		5,596	5,596
	NCE - Wind Power	4,742.3		4,742	4,742

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
	NCE - Mini Hydel	48.4		48	48
	NCE - Others	220.0		220	220
	Total NCE	10,607		10,607	10,607
	Total Generation Capacity	35,197		22,507	21,509
VI	Open Access Generators	153		153	152.93
	Grand Total	35,350		22,660.4	21,662

FY 2021-22

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
		MW	%	MW	MW
I	APGENCO - Thermal				
	VTPS III	420	100.00%	420	383
	VTPS IV	500	100.00%	500	463
	RTPP Stage-II	420	100.00%	420	382
	RTPP Stage-III	210	100.00%	210	191
	VTPS Stage V (800MW)	800	100.00%	800	744
	Rayalaseema TPP Stage IV Unit-6 (600MW)	600	100.00%	600	558
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-1	800	100.00%	800	740
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-2	800	100.00%	800	748
	Krishnapatnam TPP (JVP) Stage II (1X800MW) Unit-3	800	100.00%	800	748
	Total Thermal	5,350		5,350.0	4957
	APGENCO - Hydel				
	MACHKUND PH AP Share	84	100.00%	84	83
	TUNGBHADRA PH AP Share	58	100.00%	58	57
	USL	240	100.00%	240	238
	LSR	460	100.00%	460	455

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
	DONKARAYI	25	100.00%	25	25
	SSLM	770	100.00%	770	762
	NSRCPH	90	100.00%	90	89
	PABM	20	100.00%	20	20
	MINI HYDRO (Chettipetta)	1	100.00%	1	1
	Nagarjunasagar Tail pond (1x25 MW) Unit-1	25	100.00%	25	25
	Nagarjunasagar Tail pond (1x25 MW) Unit-2	25	100.00%	25	25
	Polavaram- (12x80MW) Unit-1	80	100.00%	80	33
	Polavaram- (12x80MW) Unit-2	80	100.00%	80	33
	Polavaram- (12x80MW) Unit-3	80	100.00%	80	33
	Polavaram- (12x80MW) Unit-4	80	100.00%	80	13
	Polavaram- (12x80MW) Unit-5	80	100.00%	80	7
	Total Hydel	2,198		2,197.6	1898
II	CGS				
	NTPC (SR)	2,100	20.70%	435	406
	NTPC (SR) Stage III	500	21.61%	108	102
	Talcher Stage 2	2,000	11.64%	233	219
	NLC Stage-I	630	7.56%	48	43
	NLC Stage-II	840	10.34%	87	78
	NPC-MAPS	440	4.19%	18	18
	NPC-Kaiga unit I & II	440	12.78%	56	56
	NPC-Kaiga unit III & IV	440	13.62%	60	60
	NTPC Simhadri Stage I	1,000	46.11%	461	437
	NTPC Simhadri Stage II	1,000	26.69%	267	253
	Bundled power under JVNSM (or western region)	539	100.00%	539	511
	Vallur Thermal Power Plant	1,500	5.86%	88	82
	Kudigi	1,600	16.99%	272	256
	Tuticorin joint venture plant	1,000	12.32%	123	115
	NNTPS	1,000	5.25%	52	49
	Total CGS	15,029		2,847.1	2686
III	APGPCL, APDISCOM & IPP Gas				

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
	APGPCL I - Allocated capacity	100	9.33%	9	9
	APGPCL II - Allocated capacity	172	14.51%	25	24
	Godavari Gas Power Plant	217	100.00%	217	208
	Spectrum	205	100.00%	205	199
	Kondapalli (Gas)	362	100.00%	362	351
	Total APGPCL, APDISCOM & IPP Gas	1,056		818.2	792
IV	IPPs - Others				
	Srivathsa	17	100.00%	17	6
	Thermal Power Tech	500	46.11%	231	217
	Total IPPs - Others	517		247.8	222
V	Non Conventional Sources				
	NCE - Solar	5,596		5,596	5596
	NCE - Wind Power	4,740		4,740	4740
	NCE - Mini Hydel	51		51	51
	NCE - Others	189		189	189
	Total NCE	10,575		10,575	10575
	Total Generation Capacity	34,725		22,036	21131
VI	Open Access Generators	150		150	150
	Grand Total	34,875		22,186	21280

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Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
		MW	%	MW	MW
I	APGENCO - Thermal				
	VTPS IV	500.0	100.00%	500	463
	RTPP Stage-II	420.0	100.00%	420	382
	RTPP Stage-III	210.0	100.00%	210	191
	VTPS Stage V (800MW)	800.0	100.00%	800	744

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
	Rayalaseema TPP Stage IV Unit-6 (600MW)	600.0	100.00%	600	558
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-1	800.0	100.00%	800	740
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-2	800.0	100.00%	800	748
	Krishnapatnam TPP (JVP) Stage II (1X800MW) Unit-3	800.0	100.00%	800	748
	Total Thermal	4,930.0		4,930	4,574
	APGENCO - Hydel				
	MACHKUND PH AP Share	84.0	100.00%	84	83
	TUNGBHADRA PH AP Share	57.6	100.00%	58	57
	USL	240.0	100.00%	240	238
	LSR	460.0	100.00%	460	455
	DONKARAYI	25.0	100.00%	25	25
	SSLM	770.0	100.00%	770	762
	NSRCPH	90.0	100.00%	90	89
	PABM	20.0	100.00%	20	20
	MINI HYDRO (Chettipetta)	1.0	100.00%	1	1
	Nagarjunasagar Tail pond (1x25 MW) Unit-1	25.0	100.00%	25	25
	Nagarjunasagar Tail pond (1x25 MW) Unit-2	25.0	100.00%	25	25
	Polavaram- (12x80MW) Unit-1	80.0	100.00%	80	79
	Polavaram- (12x80MW) Unit-2	80.0	100.00%	80	79
	Polavaram- (12x80MW) Unit-3	80.0	100.00%	80	79
	Polavaram- (12x80MW) Unit-4	80.0	100.00%	80	79
	Polavaram- (12x80MW) Unit-5	80.0	100.00%	80	79
	Polavaram- (12x80MW) Unit-6	80.0	100.00%	80	73
	Polavaram- (12x80MW) Unit-7	80.0	100.00%	80	59
	Polavaram- (12x80MW) Unit-8	80.0	100.00%	80	46
	Polavaram- (12x80MW) Unit-9	80.0	100.00%	80	33
	Polavaram- (12x80MW) Unit-10	80.0	100.00%	80	20
	Polavaram- (12x80MW) Unit-11	80.0	100.00%	80	7
	Total Hydel	2,677.6		2,678	2,413

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
II	CGS				
	NTPC (SR)	2,100.0	20.70%	435	406
	NTPC (SR) Stage III	500.0	21.61%	108	102
	Talcher Stage 2	2,000.0	11.64%	233	219
	NLC Stage-I	630.0	7.56%	48	43
	NLC Stage-II	840.0	10.34%	87	78
	NPC-MAPS	440.0	4.19%	18	18
	NPC-Kaiga unit I & II	440.0	12.78%	56	56
	NPC-Kaiga unit III & IV	440.0	13.62%	60	60
	NTPC Simhadri Stage I	1,000.0	46.11%	461	437
	NTPC Simhadri Stage II	1,000.0	26.69%	267	253
	Bundled power under JVNSM (or western region)	539.1	100.00%	539	511
	Vallur Thermal Power Plant	1,500.0	5.86%	88	82
	Kudigi	1,600.0	16.99%	272	256
	Tuticorin joint venture plant	1,000.0	12.32%	123	115
	NNTPS	1,000.0	5.25%	52	49
	Total CGS	15,029.1		2,847	2,686
III	APGPCL, APDISCOM & IPP Gas				
	APGPCL I - Allocated capacity	100.0	9.33%	9	9
	APGPCL II - Allocated capacity	172.0	14.51%	25	24
	Godavari Gas Power Plant	216.8	100.00%	217	208
	Spectrum	205.2	100.00%	205	199
	Kondapalli (Gas)	361.9	100.00%	362	351
	Total APGPCL, APDISCOM & IPP Gas	1,055.9		818	792
IV	IPPs - Others				
	Thermal Power Tech	500.0	46.11%	231	217
	Total IPPs - Others	500.0		231	217
V	Non Conventional Sources				
	NCE - Solar	5,596.0		5,596	5,596
	NCE - Wind Power	4,679.0		4,679	4,679
	NCE - Mini Hydel	46.1		46	46
	NCE - Others	164.9		165	165

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
	Total NCE	10,486		10,486	10,486
	Total Generation Capacity	34,679		21,990	21,167
VI	Open Access Generators	117.9		118	117.93
	Grand Total	34,797		22,107	21,285

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Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
		MW	%	MW	MW
I	APGENCO - Thermal				
	VTPS IV	500	100.00%	500	463
	RTPP Stage-II	420	100.00%	420	382
	RTPP Stage-III	210	100.00%	210	191
	VTPS Stage V (800MW)	800	100.00%	800	744
	Royalaseema TPP Stage IV Unit- 6 (600MW)	600	100.00%	600	558
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-1	800	100.00%	800	740
	Krishnapatnam TPP (JVP) Stage I (2X800MW) Unit-2	800	100.00%	800	748
	Krishnapatnam TPP (JVP) Stage II (1X800MW) Unit-3	800	100.00%	800	748
	Total Thermal	4,930		4,930	4,574
	APGENCO - Hydel				
	MACHKUND PH AP Share	84	100.00%	84	83
	TUNGBHADRA PH AP Share	58	100.00%	58	57
	USL	240	100.00%	240	238
	LSR	460	100.00%	460	455
	DONKARAYI	25	100.00%	25	25
	SSLM	770	100.00%	770	762

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
	NSRCPH	90	100.00%	90	89
	PABM	20	100.00%	20	20
	MINI HYDRO (Chettipetta)	1	100.00%	1	1
	Nagarjunasagar Tail pond (1x25 MW) Unit-1	25	100.00%	25	25
	Nagarjunasagar Tail pond (1x25 MW) Unit-2	25	100.00%	25	25
	Polavaram- (12x80MW) Unit-1	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-2	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-3	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-4	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-5	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-6	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-7	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-8	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-9	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-10	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-11	80	100.00%	80	79
	Polavaram- (12x80MW) Unit-12	80	100.00%	80	73
	Total Hydel	2,758		2,758	2,723
II	CGS				
	NTPC (SR)	2,100	20.70%	435	406
	NTPC (SR) Stage III	500	21.61%	108	102
	Talcher Stage 2	2,000	11.64%	233	219
	NLC Stage-I	630	7.56%	48	43
	NLC Stage-II	840	10.34%	87	78
	NPC-MAPS	440	4.19%	18	18
	NPC-Kaiga unit I & II	440	12.78%	56	56
	NPC-Kaiga unit III & IV	440	13.62%	60	60
	NTPC Simhadri Stage I	1,000	46.11%	461	437
	NTPC Simhadri Stage II	1,000	26.69%	267	253
	Bundled power under JVNSM (or western region)	539	100.00%	539	511
	Vallur Thermal Power Plant	1,500	5.86%	88	82

Sl. No	Source of Power	Plant Capacity	AP Share	AP Share	AP share excl Aux Consumption
	Kudigi	1,600	16.99%	272	256
	Tuticorin joint venture plant	1,000	12.32%	123	115
	NNTPS	1,000	5.25%	52	49
	Total CGS	15,029		2,847	2,686
III	APGPCL, APDISCOM & IPP Gas				
	APGPCL I - Allocated capacity	100	9.33%	9	9
	APGPCL II - Allocated capacity	172	14.51%	25	24
	Godavari Gas Power Plant	217	100.00%	217	208
	Spectrum	205	100.00%	205	199
	Kondapalli (Gas)	362	100.00%	362	351
	Total APGPCL, APDISCOM & IPP Gas	1,056		818.2	792
IV	IPPs - Others				
	Thermal Power Tech	500	46.11%	231	217
	Total IPPs - Others	500		231	217
V	Non Conventional Sources				
	NCE - Solar	5,596		5,596	5,596
	NCE - Wind Power	4,615		4,615	4,615
	NCE - Mini Hydel	43		43	43
	NCE - Others	131		131	131
	Total NCE	10,385		10,385	10,385
	Total Generation Capacity	34,658		21,969	21,377
VI	Open Access Generators	109		109	109
	Grand Total	34,767		22,078	21,486