

SOUTHERN POWER DISTRIBUTION COMPANY OF A.P LIMITED



**Business Plan for 4th Control Period
(FY2019-20 to FY2023-24)**

12th December 2018

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1 Business Plan for APSPDCL for the 4th Control Period

The Andhra Pradesh Electricity Regulatory Commission (APERC), Regulation 10 of 2013 directs the licensees to submit a Business Plan for Hon'ble Commission's approval. The Business Plan shall contain the following

- Year Wise Load Growth
- Year Wise Distribution Loss Reduction with Specific Action Plan
- Metering Plan for Metering Interface Points
- Treatment of Previous Losses
- Cost Reduction Plan
- Other important Financial analysis or parameters

The Guidelines as per Regulation 39 of Regulation 10 of 2013 state that the distribution licensee shall submit a Business Plan for such period as the Commission may direct and shall update plan annually.

The licensee herewith submits the Business Plan for FY 2018-19 to FY 2023-24 for the review and approval of the Hon'ble Commission.

The Business Plan as submitted by the Licensee consists of the following sections

- Year Wise Load Growth
- Year Wise Distribution Loss Reduction with Specific Action Plan
- Metering Plan for Metering Interface Points
- Other important Financial analysis or parameters

2 Context of the Business Plan

The business plan for the distribution licensee is based on the resource plan filed by the licensee on 31st July 2018 for 4th and 5th Control period and Multi-year tariff petition filed by the licensee for 4th Control Period. The summary of the Load Forecast Plan and Power Procurement Plan is given below.

2.1 Load Forecast Plan Summary

2.1.1 Historical Sales Summary

The below table captures the 5-year historical sales as presented in Discom Resource Plan.

Category	FY13	FY14	FY15	FY16	FY17	FY18	CAGR
LT Category							
LT-I Domestic	5,155	5,436	6,133	6,954	7,599	8,167	9.6%
LT-II Non-domestic/Commercial	1,212	1,221	1,360	1,551	1,656	1,750	7.6%
LT-III Industrial	1,209	1,113	1,428	1,466	1,686	2,038	11.0%
LT-IV Cottage Industries	30	30	34	37	40	40	6.4%
LT-V Agriculture	7,018	8,010	8,362	8,480	9,269	8,640	4.2%
LT-VI Street Lighting & PWS	566	491	517	540	639	700	4.3%
LT-VII General Purpose	71	70	81	89	96	101	7.4%
LT-VIII Temporary Supply	1.1	1.2	23.6	0.7	1.5	1.3	2.3%
LT Total	15,262	16,373	17,939	19,116	20,986	21,438	7.0%
HT Category							
HT-I Industry	5,208	5,741	6,792	7,269	6,586	6,455	4.4%
HT-I (B) Ferro-Alloys	201	340	434	236	301	398	14.7%
HT-II Others (Commercial)	474	498	562	693	703	774	10.3%
HT-III Public Infrastructure and Tourism	1	11	20	22	49	56	112.8%
HT - IV Agriculture	124	345	565	339	1,011	1,079	54.2%
HT-V Railway Traction	610	652	752	693	650	740	3.9%
HT-VI Townships and Residential Colonies	48	41	38	42	35	26	0.0%
HT-VII Green Power	0	0	0	0	0	0	0.0%
HT-VII RESCOs	239	265	284	298	413	369	9.1%
HT-VIII Temporary Supply	0.28	0.67	0.91	0.00	0.07	0.48	11.4%
HT Total	6,905	7,894	9,446	9,593	9,748	9,897	7.5%
LT+HT Total	22,167	24,267	27,385	28,710	30,734	31,335	7.2%

2.1.2 Sales Forecast

2.1.2.1 Category wise sales projection

Below table below summarizes the category-wise sales projection for the period FY 2017-18 to FY 2023-24.

Consumer Category	FY18 (Actual)	FY19*	FY20*	FY21	FY22	FY23	FY24	CAGR
LT Category								
LT-I Domestic	8,167	8,578	9,119	9,651	10,797	12,098	13,572	9.61%
LT-II Non-domestic/Commercial	1,750	1,863	1,993	2,193	2,447	2,735	3,067	10.48%
LT-III Industrial	2,038	2,293	2,592	3,001	3,440	3,956	4,563	14.75%
LT-IV Cottage Industries	40	45	49	50	54	59	63	6.96%
LT-V Agriculture	8,640	9,894	10,293	10,639	10,984	11,330	11,675	3.37%
LT-VI Street Lighting & PWS	700	693	725	803	842	882	925	5.95%
LT-VII General Purpose	101	107	114	123	133	142	153	7.41%
LT-VIII Temporary Supply	1.3	1.2	1.2	1.39	1.44	1.49	1.55	5.25%
LT Total	21,437	23,474	24,886	26,460	28,698	31,203	34,019	7.70%
HT Category								
HT-I Industry	6,455	7,322	7,877	7,731	8,254	8,834	9,480	5.30%
HT-I (B) Ferro-Alloys	398			484	517	554	595	
HT-II Others (Commercial)	774	814	862	977	1,080	1,201	1,342	10.52%
HT-III Public Infrastructure and Tourism	56	54	57	65	68	72	76	7.07%
HT - IV Agriculture	1,079	2,240	2,979	2,742	2,916	3,102	3,302	8.07%
HT-V Railway Traction	740	825	849	785	801	817	833	0.19%
HT-VI Townships and Residential Colonies	26	27	30	29	30	31	32	3.46%
HT-VII Green Power	0	0	0	0	0	0	0	0.00%
HT-VII RESCOs	369	475	509	478	521	569	620	5.47%
HT-VIII Temporary Supply	0.48	1.6	1.9	0.51	0.52	0.53	0.54	-19.53%
HT Total	9,897	11,759	13,165	13,292	14,188	15,181	16,281	6.72%
LT+HT Total	31,335	35,233	38,051	39,752	42,886	46,384	50,300	7.38%

*Sales for FY19 and FY 20 has been taken as per revised estimates as per ARR filing for FY2019-20. For Remaining years, sales estimates have been revised based on the FY 2019-20 ARR filings for the 4th control period.

2.2 Loss Trajectory Summary

The licensee has taken various steps to reduce the losses like strengthening of the network infrastructure, addition of network elements, and vigorously undertaking the Energy Audit visit to keep a close tab on the losses.

Based the loss reduction measures carried out in the state, the licensee projects the loss for the period FY 2018-19 to FY 2023-24.

APSPDCL	FY 2018-19*	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Annual LT Loss %	4.40%	4.36%	4.31%	4.27%	4.23%	4.18%
Annual 11 kV Loss %	3.38%	3.35%	3.31%	3.28%	3.25%	3.21%
Annual 33 kV Loss %	3.35%	3.32%	3.28%	3.25%	3.22%	3.19%

**Distribution loss in % as approved by the commission in Retail Tariff Order of FY 2017-18*

2.2.1 Energy Requirement (MU)

The methodology followed upon for determination of Energy Input at Discom/State level is described below:

- a) Based on sales forecast and open access sales projected by the Licensee, the energy input at the Discom periphery has been determined by undertaking following steps:
 - Energy Input at LT level = LT sales + LT losses
 - Energy Input at 11 kV level = Energy Input at LT level + 11KV sales+11 kV losses
 - Energy Input at 33 kV level = Energy Input at 11 kV level +33kv Sales+ 33 kV losses
 - The total energy input from various schemes mentioned in section 3.2 at 33 kV level and Energy input from Open access sales at 33 kV level has been separately calculated and added to the discom level Energy input at 33 kV level.
- b) Total Energy Input at Discom periphery = Energy Input at 33 kV level + 132 kV Sales +132 kV Open Access sales.

- c) The Energy Input at State level has been determined by combining the Energy Input of both the Discoms and grossing up that energy with Transmission losses and PGCIL losses.

Based on the category wise sales forecast and loss trajectory, below is the energy requirement

Parameters	FY18 (Actual)	FY19	FY20	FY21	FY22	FY23	FY24
Annual LT Loss %	4.50%	4.40%	4.36%	4.31%	4.27%	4.23%	4.18%
Energy Input at LT level (MU)	22,473	24,127	26,006	28,099	30,432	33,039	35,955
Annual 11 kV Loss %	3.47%	3.38%	3.35%	3.31%	3.28%	3.25%	3.21%
Energy Input at 11KV level (MU)	26,153	28,138	30,383	32,892	35,691	38,820	42,324
Annual 33 kV Loss %	3.44%	3.35%	3.32%	3.28%	3.25%	3.22%	3.19%
Energy Input at 33 kV level (MU)	30,549	33,253	35,794	38,665	41,898	45,523	49,606
Total Energy Input at 33 KV + 132 KV Sales (MU)	34,328	39,593	42,473	45,711	49,343	53,401	57,956

2.2.2 Load Forecast (MW)

Licensee determined the load factors based on following method (Reference to Section 4.3 in Resource Plan):

- State/Discom/Circle level demands have been undertaken for each hour during FY 2017-18. On the basis of this hourly demand monthly average for each hour and yearly average demand have been determined.
- State/Discom/Circle level peak demands for each month and year have also been undertaken for FY 2017-18.
- The Load factor is determined using below formula:

$$\text{Load Factor} = \text{Yearly average demand} / \text{Yearly peak demand}$$

On the basis of Energy Input at 33 kV level for discom and circle and assumed load factors for FY2017-18, licensee projected demand in MW for 4th control period as per formula mentioned below (Reference to Section 4.4 in Resource Plan):

$$\text{Peak Demand (MW)} = \text{Energy required} / (24 \times 365 / 1000) / \text{load factor}$$

The peak load forecasted at state level has been shown below:

Parameters	FY18 (Actuals)	FY19	FY20	FY21	FY22	FY23	FY24	CAGR
Energy Req. at state level (MUs)	56,209	64,030	68,606	73,212	79,146	85,776	93,106	8.8%
State Peak Demand (MW)	8,983	10,532	11,450	12,219	13,209	14,315	15,539	9.6%

On the basis of non-coincident load factors and energy input at 33 kV level each Discom & circle level, mentioned above, non-coincident peak demands at Discom level & at circle level have also been estimated. Summary of the peak demands at APSPDCL is shown below:

Circle/Peaks at 33 kV level	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Vijayawada	903	994	1,104	1,228	1,370	1,530	1,711
Guntur	692	801	887	985	1,097	1,225	1,371
Ongole	595	631	675	724	778	836	900
Nellore	606	666	726	796	877	969	1,075
Tirupati	1,064	1,133	1,201	1,275	1,355	1,441	1,534
Kadapa	684	711	747	787	832	883	938
Anantapur	978	1,081	1,126	1,177	1,233	1,294	1,361
Kurnool	525	541	571	604	642	683	729
SPDCL	5,094	5,545	5,968	6,447	6,986	7,591	8,271

2.3 Power Procurement Plan Summary

- Based on existing and future planned installed capacities, energy availability in MUs has been determined for each power station, based on formula shown below:

$$\text{Energy generation in MUs} = \text{Plant capacity (MW)} * \text{AP Share (\%)} * (1 - \text{Auxiliary power consumption in \%}) * \text{Plant load factor (\%)} * 24 * 365 / 1000$$

where Plant load factor is mentioned in section 5.1 of the Resource Plan

- The table below summarizes projected energy generation have been shown below:

Sources (all figures in MUs)	FY 18 (Actual)	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24
APGENCO Thermal	26,646	24,295	24,018	35,544	32,568	30,050	30,050
APGENCO Hydel	2,392	2,920	3,150	2,477	2,591	3,370	4,051
CGS	19,480	14,992	16,064	19,845	19,845	19,845	19,845
APGPCL/DISCOM Gas	5,195	3,704	3,231	5,195	5,195	5,195	5,195
IPPs - Others	315	9,222	5,352	1,816	1,745	1,709	1,709
NCE - Solar	2,998	4,571	7,202	10,130	10,130	10,130	10,130
NCE - Wind Power	7,282	7,682	8,866	9,245	9,237	9,115	8,987
NCE - Mini Hydel	97	115	111	127	158	147	139
NCE -Others	458	304	590	823	732	642	552
Energy Availability	64,863	67,805	68,584	85,203	82,200	80,204	80,658

The total MU demand is the total Energy Input at Discom level for power procurement determined in section 2.2.1 above.

Based on the energy generation and energy input for power procurement the table below summarises Energy (MUs) balance at state level:

	FY 19	FY20	FY21	FY22	FY23	FY24
State Energy Availability	67,805	68,584	85,203	82,200	80,204	80,658
State Energy input*	63,448	67,713	71,355	76,951	83,152	90,033
State Energy Surplus/ (Deficit)	4,357	870	13,847	5,248	(2,949)	(9,375)

- Based on the MW requirement at each hour and MW availability available at each from various sources, licensee also observed the demand-supply scenario on 24*365 time blocks. On the basis of deficit scenario identified, Licensee has estimated yearly average of hourly maximum deficit, hourly minimum deficit and hourly average deficit. However, the Licensee has considered yearly average of maximum deficit for determining capacity to be procured.
- The capacity procured for meeting such annual average hourly maximum deficit is sufficient to meet 90% of demand. However, Licensee has extrapolated such capacity to be procured so that it is able to meet 95% of demand. Remaining 5% has been estimated to be procured from power exchange on short term basis.
- Licensee expects to meet the capacity to be procured through Round the Clock (RTC) power with a PLF from 60% to 80% considering following factors:
 - 70% of the requirement shall be met through plants having PLF or CUF of 70% or 80%
 - 30% of the requirement shall be met through plants having PLF or CUF of 40% or 60.
- Licensee also expects to procure Spinning Reserve for unit with highest capacity available or 5% of installed capacity whichever is lower. Licensee has considered 800 MW to be procured in FY 2019-20.
- Projected capacity requirements in MW have been shown below:

Power Procurement (MW)	FY19	FY20	FY21	FY22	FY23	FY24
Annual Avg. Maximum Deficit (Based on hourly demand-supply situation) *	-	815	415	1,565	2,574	3,483
Annual Avg. Minimum Deficit (Based on hourly demand-supply situation)	-	-	-	-	158	738

Power Procurement (MW)	FY19	FY20	FY21	FY22	FY23	FY24
Annual Average Deficit (Based on hourly demand-supply situation)	-	-	-	381	1,310	2,075
Estimated PP Capacity to be procured for meeting demand 95% of the time		1,500	800	2,500	4,000	5,400
Estimated PP Capacity to be procured for meeting demand 95% of the time -YoY	-	1,500	-	1,000	1,500	1,400
Spinning Reserve for estimated PP capacity	-	879**	-	53	79	74
Estimated PP Capacity to be procured for meeting demand 95% of the time -YoY	-	2,379	-	1,053	1,579	1,474
RTC Power to be procured (70% of Total PP Capacity with availability @ 80%)	-	1,665	-	737	1,105	1,032
RTC Power to be procured (30% of Total PP Capacity with availability @ 60%)	-	714	-	316	474	442
Short Term Purchase (Meeting 5% of hourly avg. demand)	475	400	519	393	438	464
Estimated PP Capacity to be procured for meeting 100% hourly average demand	475	2,779	519	1,446	2,017	1,938

* - Procurement to meet this deficit will cater 90% of the hourly avg. demand

** - Spinning Reserve (Highest Unit Capacity or 5% of Installed Capacity whichever is lower) for 800 MW considered

2.4 Investment Plan Summary

Below table shows the historical capital expenditure which has been undertaken by the Licensee in last 5 years i.e. FY 2013-14 to FY 2017-18 which has been met by the Licensee through its own funds.

Sr. No.	Item	FY14	FY15	FY16	FY17	FY18
1	Substations (New & Augmentation)	279	229	150	130	129
2	New Consumers Capex	259	212	197	207	257
3	Distribution Transformer Additions	136	225	327	195	150
4	Feeder Additions	0	21	11	84	56
5	Loss reduction measures	7	16	56	54	106
6	Technology Upgradation and R&M	0	33	60	108	35
7	Agri (New Consumer)	8	196	268	319	196
Total		689	932	1069	1097	929

In addition to the capital investment shown above, the Licensee has also undertaken investments under various ongoing schemes such as IPDS, DDUGJY, APDRP, HVDS project, World Bank and other grants, as shown below:

Sr. No.	Item	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29
Actuals				4th Control Period				5th Control Period									
1	HVDS	366	465	312	367	763	590	652	337	228	-	-	-	-	-	-	-
3	Solar	-	-	80	149	173	-	-	-	-	-	-	-	-	-	-	-
4	IPDS	-	-	9	125	178	89	2	2	-	-	-	-	-	-	-	-
5	DDUGJY	-	-	17	219	125	76	85	-	-	-	-	-	-	-	-	-
6	Other Grants	38	8	4	3	1	17	11	-	-	-	-	-	-	-	-	-
Total (Rs. Cr.)		404	473	422	863	1240	772	750	339	228							

It is evident from the above table, that capital investment from ongoing schemes for network strengthening, loss reduction, improving quality and reliability such as IPDS, DDUGJY, HVDS, etc. shall reduce substantially in 4th and 5th control periods.

The table below provides the projected Capital Expenditure of APSPDCL from FY 2018-19 to FY 2023-24 under DISCOM spend.

Sr. No.	Item	FY19	FY20	FY21	FY22	FY23	FY24
1	Substations (New & Augmentation)	338	348	371	439	515	611
2	Distribution Transformer Additions	500	512	542	640	752	888
3	Lines, Cables & Network	620	570	623	746	888	1,064
Total (Rs. Cr.)*		1,458	1,431	1,536	1,826	2,155	2,563

The table below provides the projected total (discoms spend + ongoing schemes) Capital Expenditure of APSPDCL from FY 2018-19 to FY 2023-24 including ongoing schemes.

S. No.	Item	FY19	FY20	FY21	FY22	FY23	FY24
1	CAPEX under ongoing Schemes	772	750	339	228		
2	Capital Expenditure for infrastructure towards new loads (Base Capex)	1,458	1,431	1,536	1,826	2,155	2,563
3	Technology up gradation & Others	90	483	587	689	707	643
Total (Rs. Cr.)		2320	2664	2462	2743	2862	3206

The rationale for the Capital Expenditure projections is provided in the subsequent sections.

3 Metering plan for Metering Interface Points

The distribution licensee has achieved 100% metering of feeders and consumers (excluding agricultural consumers) in its license area. Further, the licensee has metered around 1,29,020 (19.38%) out of 6,65,708 Nos. distribution transformers in its license area as on date.

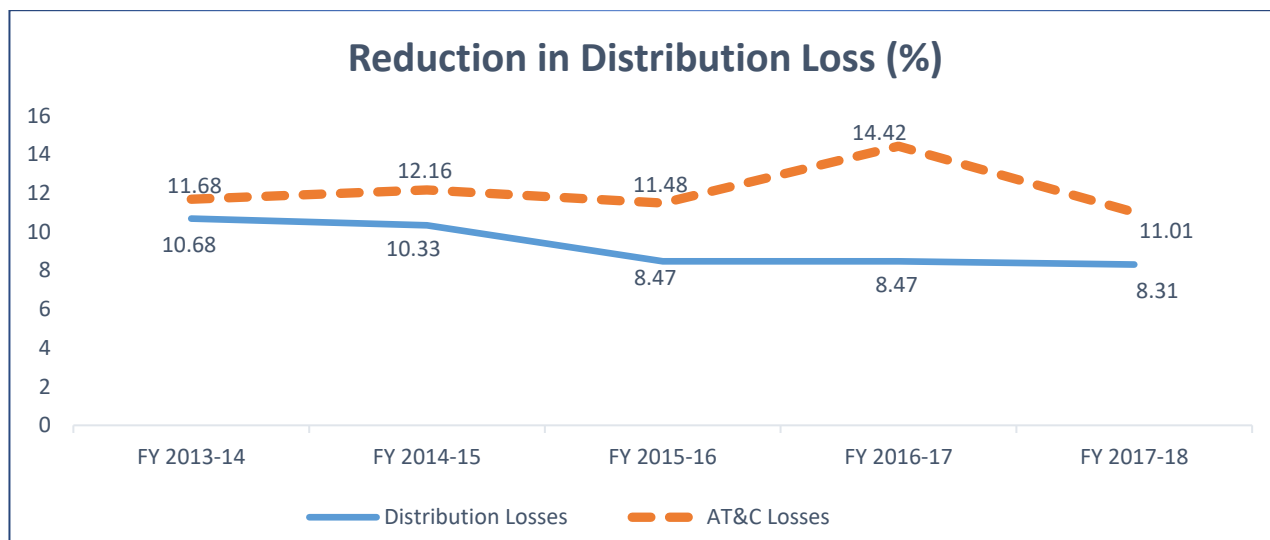
4 Treatment of previous losses

As per the prevailing regulations, i.e., Regulation 4 of 2005 and Regulation 1 of 2014, certain items such as variation in sales and sales mix, variation in agricultural sales, variation in revenue from tariff and variation in non-tariff income which are not in the control of the licensees are treated as controllable items, which leads to losses that cannot be trued-up. In order to avoid further accumulation of losses, a detailed letter has been addressed to the Honourable Commission to suitably amend the current regulations.

5 Performance of APSPDCL as Distribution Licensee

5.1 Reduction in Distribution Loss

The distribution loss has been decreasing steadily over the years. The reduction in AT&C losses, increasing collection efficiency and the Distribution loss trajectory have been highlighted in the figure below.



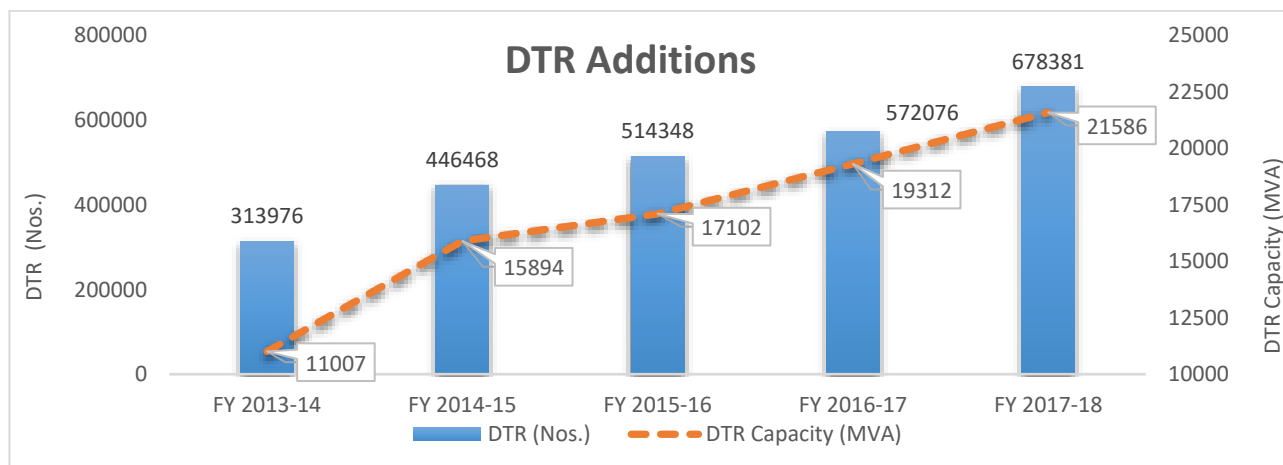
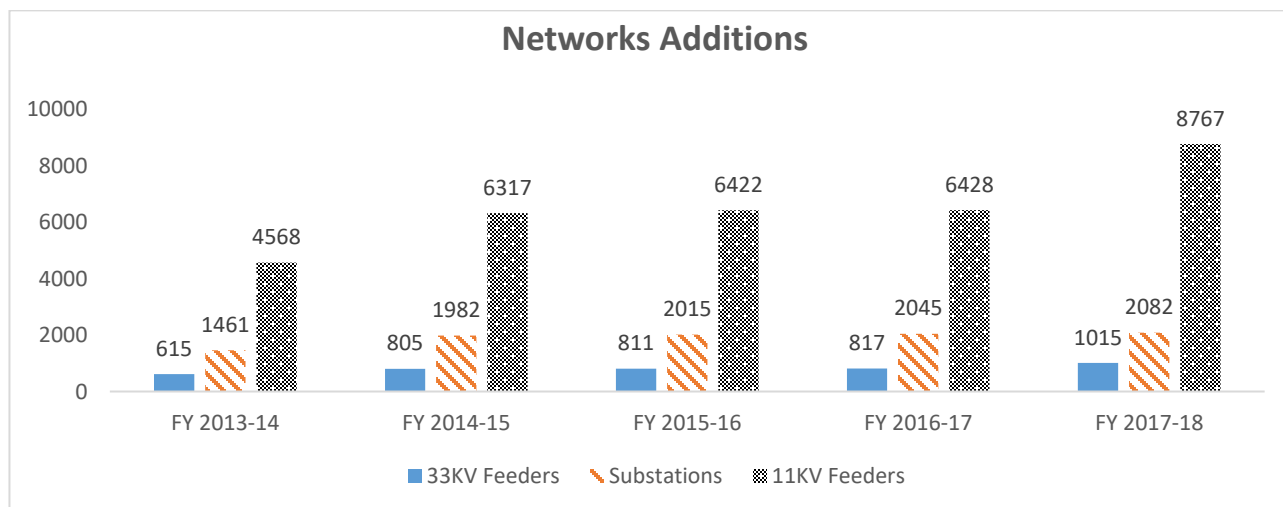
- The above graphs indicates considerable reduction in distribution loss, whereas the AT&C losses have reduced marginally only because of declined collection efficiency. The major contribution for decrease in collection efficiency is large accumulation of arrears from Govt. services particularly from Panchayat Raj and Lift Irrigation schemes.

The following initiatives have taken to reduce distribution losses in APSPDCL.

- Augmentation of conductor / PTR / DTR capacity
- Bifurcation of feeders
- Interlinking lines
- Erection of new substations
- Erection of additional DTRs
- Erection of capacitor banks
- Metering :
 - 100% metering (excluding agriculture)
 - Meters provided to all street light and water works services
 - 79,12,861 Nos. IRDA port meters are provided in place of existing electro mechanical meters as on 29-11-2018
- Introduction of monthly billing system to all the services
- Continuous monitoring of top ten high loss towns and mandal headquarters and preparing action plan to get down AT&C losses to permissible limits.

5.2 Network Additions to sustain Load growth

The licensee have significantly added Substations, DTR's and Lines (33kV, 11kV and LT) to meet the growing demand.



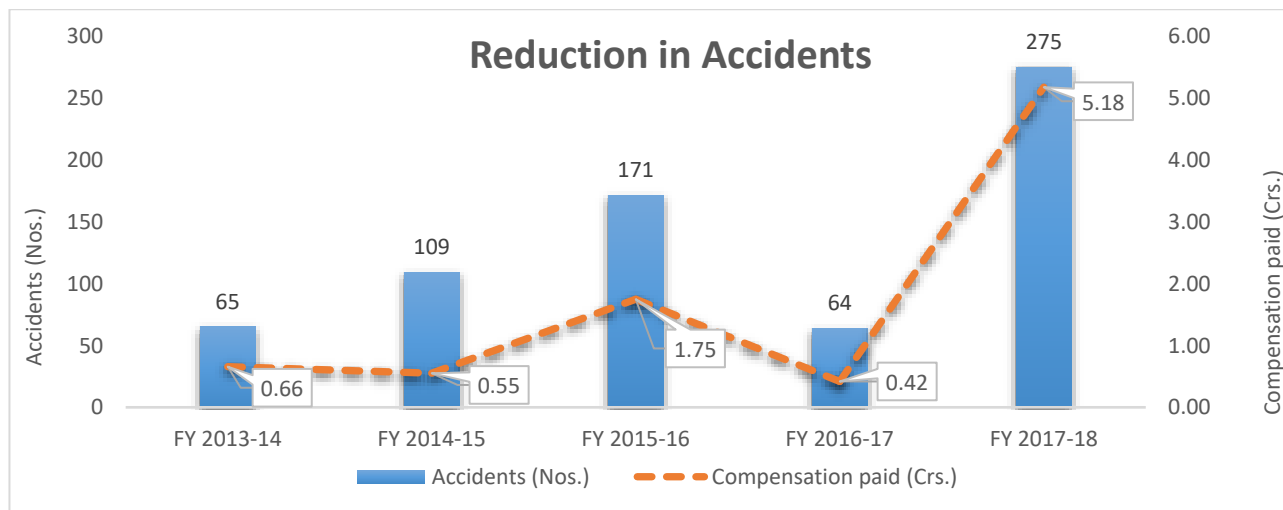
5.3 Focus to improve reliability of power supply

The licensee have taken many measures to improve the reliability of power supply. There has been significant reduction in the SAIDI / SAIFI indices over the past 12 months. The SAIDI / SAIFI trajectory have been highlighted in the table below.

	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
SAIDI (in Hrs.)	4.06	6.00	6.08	3.31	3.30	3.26	3.52	2.54	2.66	0.50	1.25	2.41
SAIFI (Nos. per customer)	11.15	15.03	14.74	14.69	14.67	14.38	9.07	6.03	7.92	1.66	2.72	5.29

5.4 Taken measures to increase the safety and reduce the accidents

- Identified and rectified loose lines by erecting intermittent / strut poles
- Brought awareness among the public to maintain standard clearances whenever they construct buildings
- Brought awareness to the public to be more careful during natural calamities
- Awareness to the department staff to strictly follow the safety rules and safety procedures
- Regular maintenance of lines and equipment including pre-monsoon inspection



5.5 Energy Efficiency Initiatives

The following energy efficiency programmes are implemented (and or being implemented) in APSPDCL

1) DSM based Efficient Lighting Programme (DELP) :

- 1,09,77,087 Nos. LED bulbs are distributed so far in 8 districts of APSPDCL. The energy savings are estimated at 65.15 MU per month which is 782 MU per annum (Rs.300 Crs. Approximately are the savings per annum).

2) Implementation of Domestic Efficient Fans Programme (DEFP) :

- 2,03,117 Nos. energy efficient fans are distributed in Krishna district

3) Implementation of Agricultural Demand side Management Scheme (Ag DSM) :

- Under this scheme 65,000 Nos. inefficient agricultural pumpsets will be replaced with 5 star rated 3 phase submersible energy efficient pumpsets (EEPS). As on 28-11-2018, 30,111 Nos. Energy Efficient pumpsets were installed in APSPDCL.

4) Implementation of Energy Efficient Tube light Programme :

- M/s EESL has submitted a proposal for distribution of energy efficient tube lights in all districts of APSPDCL. The scheme will be proposed for implementation during the current financial year. M/s EESL has distributed 53,633 Nos. Tube lights in APSPDCL

5) Supply of additional 2 Nos. LED Bulbs to SC / ST families :

- With initiation and financial support from the GoAP, two more LED bulbs are distributed to SC / ST families in APSPDCL. So far 16,44,696 Nos. LED bulbs are distributed under this scheme.

6) Capacitor Banks :

- 2 MVAR capacitor banks are being erected at 33/11KV substations for reactive energy compensation. The details of the capacitor banks are furnished below.

Year	11 KV 2 MVAR capacitor banks added to the system
FY 2011-12	136
FY 2012-13	193
FY 2013-14	35
FY 2014-15	75
FY 2015-16	35
FY 2016-17	30
FT 2017-18	112

There are 1577 Nos. 2 MVAR capacitor banks are existing at the end of FY 2016-17.

7) HVDS :

- HVDS is implemented in agricultural sector and 7.37 lakhs agricultural services are already covered under this system. Works are under progress for providing of HVDS to all balance agricultural services in APSPDCL.

8) Solar pumpsets (Off grid) :

- So far 17,520 Nos. solar pump sets are commissioned in SPDCL with 33% grant from GoI.
- Energy savings per day is estimated at 4,56,497 units and will be 137 MU per annum approximately.
- The amount of savings will be around Rs.83 Crs. Per annum with respect to the already commissioned 17,520 Nos. solar pumpsets

9) Solar pumpsets (Grid connected) :

- Tenders were called during the year 2016 for the pilot project of providing grid connected Solar pump-set systems for two nos. 11KV feeders in the Venkatachalam Mandal, SPSR Nellore District. But the Tender was cancelled as the response to the tender was very poor and the rate quoted was not financially viable. A pilot project for 250 Nos. Grid connected solar pump-sets in Vizayanagaram District under EPDCL is under execution. After successful completion of this project and on taking feed back from EPDCL, BLDC programme will be implemented in SPDCL.

5.6 Initiatives in Revenue billing and Revenue Collections :

- Bi monthly billing in rural areas was dispensed and monthly billing system has been implemented for all the services
- Close monitoring of billing schedules
- Delivery of bills on time : Spot billing of all the LT services are being carried out and bills are being issued on the spot
- SMS alert on billing and collection data to consumers mobile
- Introduction of mobile payment and valet payment channels

5.7 IT Initiatives

1) Registration of New connections/ Complaints through Meeseva and APSPDCL Website

Registration of new connection/Service requests applications are completely moved to Meeseva and same has been integrated to CSC application through online. Also consumer can register applications for new connections in APSPDCL website and make payment online. The Estimated demand is generated instantly at Meeseva through integration with SAP and consumer can pay the estimated demand immediately. New features are made available at Meeseva for Registration for solar rooftop project in Tirupati and Vijayawada towns, HVDS conversion of Agriculture services, Grouping of Agriculture Services

2) APSPDCL Customer Mobile APP for Digital Payments

APSPDCL Mobile APP was launched for APSPDCL Consumers to avail various citizen centric services like (1) electricity bill payments, (2) view monthly consumption / payment history for past 12 months, (3) Various customer care services like complaint registration / tracking, (4) New connection application status. 1, 16,613 Nos. Digital Payment Transactions were made in Nov-18 for an amount of Rs. 1318.92 Lakhs.

3) BHIM APP/BHART QR

Bharat Interface for Money (BHIM) using UPI and Bharat QR mode of digital payment modes are made available to all APSPDCL consumers for making CC charges through APSPDCL website or Mobile APP

4) ATP Machines

24 Nos. Any Time payment (ATP) machines were made available for the consumers to make the payment of their electricity bills. 102455 Nos. Payment Transactions were made in Nov-18 for an amount of Rs.1132.50 Lakhs.

5) Payment Gateways

APSPDCL has enabled two new Payment Gateway channels in addition to the existing Payment Gateways in the name of E-Governance CSC (Common Service Centre) and

TAWallet Payment Gateway in the month of November-18 using which the consumers can make payment of Electricity Bills(CC charges).

6) AP Vidyut Pravah APP

This application was developed purely for serving the public to know their power supply position through internet or through their mobile app at 11 KV feeder level by entering Service number/Mobile Number/Village Name. We can see AP state grid demand and frequency from this app. Also district level demand and energy drawls are published. We can also find the SAIDI and SAIFI indexes in this Application

7) E-Office

E-Office was implemented in APSPDCL up to section office level in order make paperless office correspondence and to establish transparency and accountability by reducing turnaround time and to meet the demands of the citizens charter. Total **104318** Nos. files were initiated and circulated by various offices of APSPDCL as on 03-11-2018

8) Customer Care Center (1912)

Customer Care Centre has been established at Corporate Office, APSPDCL with 1912 (toll -free number) to receive and process various types of consumer complaints like fuse off calls, billing, metering, transformer failures etc. The pending complaints are continuously being monitored and escalated till resolved. Out of 18,638 Nos. complaints received during the month of NOV-18, 13,499 Nos. complaints are resolved and 1020 Nos. are pending as on 30-NOV-2018

9) SMS Gateway

SMS Gateway services are being utilized for sending SMSs to consumers regarding Electricity Demand, Reminder for Payments, Receipt of online Payment, notification of New connection/ Service request estimation demand and new connection release

10) APSPDCL Department APP

APSPDCL has developed a unique mobile App for utilization by Lineman and Section officer comprising with Operational activities like DC-List, CCC-Complaints status updation, Meter Changes, Agriculture Services Geo-tagging, Check Readings, Tong tester readings, New Services Release details, Feeder Readings, Geo-tagging of Substations, Consumer Service details, Reports of operational activities, Feeder outages

11) Online Feeder Monitoring System and outage Management (OMS)

OMS is established to provide quality of power to the utmost satisfaction of the consumers by monitoring the SAIDI and SAIFI parameters at section level and feeder level. OMS application is developed purely for serving the public to know their power supply position through internet or through their mobile app at 11 KV level. The present values of SAIDI is 06:15 Hours and SAIFI is 10 Nos. for entire Discom

12) UrjaMitra APP

UrjaMitra APP is implemented in APSPDCL for informing the consumers about the status of scheduled/unscheduled outages to the effected consumers

13) Energy Audit through online system

Feeder wise energy Losses are monitored and steps are taken to reduce the losses at each feeder level for all the 11KV feeders existing in APSPDCL using online Energy Auditing application.

Weekly reviews are conducted with Field officers upto AE level and the losses are reviewed by the Honourable Chairman and Managing Director

14) DTR Tracking System

Transformers failures and replacement is monitored effectively through the DTR tracking system duly integrating with Customer Care Center and SAP

15) APSPDCL Dashboard

Online Reports related to Revenue and Operation wings are made available in the newly Developed APSPDCL Dashboard. Dashboard Reports related to revenue, OMS, CSC, Consumer Service History and Bill details, MATS, Energy Audit, Customer Care Center (CCC), SAP, Tab reports, HT Billing, Substation Coordinates, HTLT Meter inspection applications

16) Desktop Systems and Electronic tabs

1889 Nos. Desktops systems are provided up to Section office level in order to implement e-Office and IT applications. Also 11277 Nos. Electronic Tabs are provided upto Lineman level to digitalize the operational activities through mobile Apps

17) Bio-Metric Attendance system

APSPDCL has established the Bio-Metric attendance system to deliver transparent, Efficient and time bounded services to the public by monitoring the attendance of its employees at all levels

18) Teleconferencing and Video conferencing with all the field officers upto AE level

Continuous pursuance has been done with all field officers from Chief Engineers to Section officers through the Teleconference and Video conferencing Facilities provided in order to speed up the operation activities and reviewing the individual officer activities directly

19) HT LT Meter periodical inspection

An online application for monitoring the HTLT meters inspection made by the DE/M&P, ADEs and AEs of HT meters and CT meters is developed and deployed. Total 17671 Nos. meters were inspected during the Month of Nov-18

20) Solar Pump Sets Cycle

Customization of the complete cycle of Solar Pump Set project is done in SAP. The pricing, material handling and billing process is mapped in SAP so that the complex business process of providing Solar Pump sets to consumers has been made very simple

21) E-Stores Process

The process of e-Stores have been implemented in AP SPDCL on SAP. This is a process in SAP by which the complete cycle of material requisition, allotment and delivery along with acknowledgement is covered. In this e-Stores system, the material is delivered at the door-step of the section Engineer. Every step of this activity is made online (SAP)

22) E-Poles Process

This is a process configured in SAP through which the poles transactions between the Vendor-Section officer-Civil wing can be performed seamlessly. The complete business cycle is mapped in SAP right from supply of material by the vendor to the section office location to the payments made to the vendor

23) GST Implementation

GST is implemented in SAP as per GST act. w.e.f 01.07.2017

24) Energy efficient Pump Sets Cycle

Customization of the complete cycle of Energy efficient pump Set project is done in SAP. The pricing, material handling and billing process is mapped in SAP so that the complex business process of providing Energy efficient pump sets to consumers has been made very simple

25) EODB

Estimate generation at DIC portal: For releasing of service with extension work involvement, Estimate and demand is being generated instantaneously in online through integration with SAP as per the requirements of customer. Out of 4010 Nos. applications registered under EODB, 3282 Nos. applications were cleared. 658 Nos were deleted. At present 70 Nos. applications are pending

26) Integrated Power Development Scheme (IPDS)

IPDS covers IT enablement in 11 towns along with incremental requirements in common DC/DR center and ERP implementation. The project cost 16.79 Crores funded by PFC

5.8 Focus on Industrial Consumers

In order to maintain growth rates in the HT category, certain action points were taken by the Licensee:

- Sustained initiatives by the GoAP to attract investments into the state
- Continue to provide separate feeders and monitor them regularly to minimize interruptions, thereby supplying quality power
- Real Time Feeder Monitoring System was launched

6 Performance Improvement Plan of APSPDCL for FY 2017-18 to FY 2023-24

6.1 Loss Reduction Initiatives

- In order to bring down Distribution losses to a sustainable level, Discoms plan to carry on the following key action points :
 - Continue to invest in schemes which would bring down losses, especially schemes like HVDS and System Improvement
 - Continue metering drive across the state by replacing defective meters and installing IRDA port meters instead of mechanical meters
 - Improve energy audit by the following:
 - Segregation of industrial and town feeders
 - Recording accurate data for each circle related to transformers (33kV/11kV, DTR); distribution line lengths (33kV, 11kV, LT) and; number and capacity of substations (33/11 kV) in order to obtain a correct picture of losses
 - Monitor and record this data on a regular basis and take corrective and preventive measures wherever possible
 - Carry out sustained vigilance initiatives especially related to theft detection and employ tools such as Consumer Analysis Tool (CAT) and Monitoring and Tracking System (MATS) more effectively to enable theft detection

Bring about further accountability in the Discoms by strict monitoring of Energy Input, Billed and Collected at section level and measure employees against Key Performance Indicators (KPIs) related to the same.

7 Key Financial Parameters

The key financial parameters of APSPDCL are detailed below.

7.1 Capital Expenditure

Capital expenditure (CAPEX) is defined as the expenditure incurred by DISCOM on but not limited to acquire or upgrade physical assets such as property, buildings or equipment. It may be noted that the scope of expenditure is limited to physical, immovable assets only.

For the period from FY 2018-19 to FY 2023-24, the licensee has estimated the capital expenditure as below.

S. No.	Item	FY19	FY20	FY21	FY22	FY23	FY24
1	CAPEX under ongoing Schemes	772	750	339	228		
2	Capital Expenditure for infrastructure towards new loads (Base Capex)	1,458	1,431	1,536	1,826	2,155	2,563
3	Technology up gradation & Others	90	483	587	689	707	643
Total (Rs. Cr.)		2320	2664	2462	2743	2862	3206

7.2 Asset Base

Total capitalization for the Base Year and the Control Period has been projected based on the following assumptions:

- 1) Capitalization of Base Investment and Capital Work-in-Progress (CWIP): Capitalization of assets for MYT period has been considered based on historical actual capitalization trends and capital expenditure projected for the Control Period.
- 2) Capitalization of Expenses
 - a) Interest during Construction (IDC): Interest during Construction (IDC) has been calculated as a percentage of the average Capital Works-in-Progress for the year.
 - b) Operational and Maintenance (O&M) Expenses: Operational and Maintenance (O&M) Expenses capitalized has been projected at 11% of capital expenditure incurred for the year.

Thus, the licensee has projected capital investment undertaken and its capitalisation for the Base Year and Control Period as given below:

Closing Balance of CWIP = Opening Balance of CWIP + Capital Expenditure during the year + Expenses Capitalized – Investment Capitalized

Particulars	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
Opening Balance of Capital Work in Progress (CWIP)	3,346	4,533	5,397	4,829	3,170	1,431
Capital Expenditure during the year	2,320	2,663	2,462	2,742	2,862	3,206
Expenses Capitalized	255	293	271	302	315	353
Interest During Construction	222	302	385	407	325	190
Total expenses capitalized	477	595	656	709	640	542
Transfer to fixed assets	1,610	2,394	3,686	5,110	5,241	3,576
Closing CWIP	4,533	5,397	4,829	3,170	1,431	1,603

7.3 Investment

For the period from FY2018-19 to FY2023-24, loan requirement is as follows: additional investment required is calculated as follows.

Particulars (Rs. Cr)	FY19	FY20	FY21	FY22	FY23	FY24
Capital Expenditure	2,320	2,663	2,462	2,742	2,862	3,206
Grants	590	614	640	667	695	725
Loan Requirement	1,730	2,049	1,822	2,075	2,167	2,481
Ongoing Loans (Receipts)	930	662	339	228	0	0
New Loans Requirement (Receipts)	800	1,387	1,483	1,847	2,167	2,481

7.4 O&M Expense

The Operation & Maintenance (O&M) Expenses consist of the following components:

- Employee Expenses (EE) including Salaries, wages and other employee costs;
- Administrative & General costs (A&G) including legal charges, audit fees, rent, rates and taxes;
- Repairs and Maintenance (R&M) including equipment maintenance, repairs, fault corrections, etc.

Licensee has adopted method recommended by commission in 3rd Control period MYT order. The methodology adopted by the licensee for projection of O&M expenses for 4th Control period is as below:

- Repair and Maintenance (R&M) Expenses

As per MYT order for 3rd Control period, commission has recommended all the licensees to project R&M expenses as 2.05% of the opening balance of the Gross Fixed Assets (GFA) for the year however licensee has considered the average of the actual R&M as a % of the opening GFA for the past 5 years as a proxy for future projections. Licensee has also considered the expense component for pay hike to outsourced employees.

Below table shows the projections summary of the R&M expenses:

Name of the Parameter	FY19	FY20	FY21	FY22	FY23	FY24
Average R&M as % of Opening GFA	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%
Opening GFA	13,896	15,506	17,900	21,586	26,696	31,936
Pay to outsourced employees	101	101	101	101	101	101
R&M expenses	456	497	558	652	783	917

b. Employee expenses (EE) and Administrative and General (A&G) expenses

As per MYT order for 3rd Control period, commission has recommended all the licensees to project EE and A&G expense based on the norms linked to Number of Substations (SS), line length (Circuit KM), Number of consumers and Number of DTRs. Licensee has adopted the same methodology for projecting the employee expenses and A&G expenses for 4th Control period. The methodology for projecting employee expenses is explained below. Same methodology has been adopted for projecting A&G expenses:

- (1) For each year, actual Employee expenses is allocated to Substations, Line length, DTRs and Consumers in the ratio of 49%:21%:10%:20%. The following ratios are calculated: Employee expense/ Substation, Employee expense/ circuit km of line length, Employee expense/ DTR, Employee expense/ Consumer.

Below table shows the historical data for Employee expenses, A&G expenses and Number of Substations (SS), line length (Circuit KM), Number of consumers and Number of DTRs.

Parameter	Unit	FY14	FY15	FY16	FY17	FY18
Employee Expenses (EE)	Rs. Crs.	854	1813	1508	1347	1662
A&G Expenses	Rs. Crs.	52	83	87	97	179
No. of Consumers	Nos.	9,915,158	10,272,545	10,701,263	11,379,916	11,822,731
Number of DTRs	Nos.	313,976	446,468	514,348	544,505	594,863
Line Lengths	Kms	274,896	374,153	384,459	432,220	445,500
Number of SS	Nos.	1,253	1,461	1,982	2,015	2,045

Below table shows the historical norms for the ratios:

Parameter	Unit	FY14	FY15	FY16	FY17	FY18
EE / Consumers	Rs./Nos	172	353	282	237	281
EE / DTR	Rs./Nos	2,720	4,061	2,932	2,473	2,793

Parameter	Unit	FY14	FY15	FY16	FY17	FY18
EE / Line	Rs./Kms	6,525	10,177	8,236	6,543	7,832
EE /SS	Rs./Nos.	3,340,095	6,081,131	3,727,783	3,274,756	3,981,220
A&G Exp/ Consumers	Rs./Nos.	11	16	16	17	30
A&G Exp/DTR	Rs./Nos.	167	186	170	178	302
A&G Exp/line	Rs./Kms	401	465	477	470	846
A&G Exp/SS	Rs./Nos.	205,253	277,868	215,852	235,054	430,002

- (2) To arrive at the average of these ratios, the Licensee has considered the data from FY 2013-14 onwards. Average of these ratios for the 5 years between FY2013-14 and FY2017-18 has been considered as the norms for FY2015-16. These norms for FY2015-16 onwards are escalated for by using the escalation rate calculated based on the WPI and CPI index as shown below:

Escalation Rate: For the projections of the expenses, licensee has considered the escalation (inflation) rate as calculated from the WPI and CPI indexes in the 3rd Control period as shown below.

Inflation rate depends on the Consumer Price Index (CPI) for industrial workers and Wholesale Price Index (WPI). The below table lists the CPI (Industrial Worker) and WPI data from FY12 to FY18.

Particulars	FY12	FY13	FY14	FY15	FY16	FY17	FY18
WPI	100.0	106.9	112.5	113.9	109.7	111.6	114.9
CPI	194.8	215.2	236.0	250.8	265.0	275.9	284.4

Source: CPI - www.labourbureau.nic.in, WPI - www.eaindustry.nic.in (Office of the Economic Advisor website)

Basis the observed historical CPI and WPI numbers (CPI- Industrial Workers: 40% and WPI: 60%) and calculated the inflation factor based on the illustrative methodology suggested by CERC as shown below:

Year	WPI	CPI	Composite number	Rt= Yt/Y1	Ln (Rt)	Year - 1	Product
FY12	100	194.8	137.9				
FY13	106.9	215.2	150.2	1.09	0.09	1	0.09
FY14	112.5	236.0	161.9	1.17	0.16	2	0.32
FY15	113.9	250.8	168.7	1.22	0.20	3	0.60
FY16	109.7	265.0	171.8	1.25	0.22	4	0.88
FY17	111.6	275.9	177.3	1.29	0.25	5	1.26
FY18	114.9	284.4	182.7	1.32	0.28	6	1.69
A= Sum of Product column			4.83				
B= 6A			28.98				

Year	WPI	CPI	Composite number	Rt= Yt/Y1	Ln (Rt)	Year - 1	Product
C= n(n-1)(2n-1); n= number of years of data				546.00			
D=B/C				0.05			
g= exp (D)-1				0.05			
Escalation rate= g*100				5.45			

The inflation factor is observed to be 5.45% during 3rd Control period. However, for projections of the expenses, licensee has considered 95% of this escalation rate which is 5.16%.

Below are the projected norms for FY2015-16 onwards.

Parameter	FY16	FY17	FY18
EE / Consumers	265	279	293
EE / DTR	2,996	3,150	3,313
EE / Line	7,863	8,268	8,695
EE /SS	4,080,998	4,291,577	4,513,023
A&G Exp/Consumers	18	19	20
A&G Exp/DTR	200	211	222
A&G Exp/line	532	559	588
A&G Exp/SS	272,800	286,876	301,679

Parameter	FY19	FY20	FY21	FY22	FY23	FY24
EE / Consumers	308	324	341	358	377	396
EE / DTR	3,484	3,664	3,853	4,052	4,261	4,481
EE / Line	9,144	9,615	10,112	10,633	11,182	11,759
EE /SS	4,745,895	4,990,783	5,248,307	5,519,120	5,803,906	6,103,388
A&G Exp/Consumers	21	22	23	24	26	27
A&G Exp/DTR	233	245	258	271	285	300
A&G Exp/line	618	650	684	719	756	795
A&G Exp/SS	317,245	333,615	350,830	368,933	387,970	407,989

- (3) The projected ratios based on the escalation rates are multiplied by the projected Number of Substations (SS), line length (Circuit KM), Number of consumers and Number of DTRs in order to arrive at the employee expenses and A&G expenses for the respective years of 4th Control period.
- (4) Licensee has also considered the expense component for pay hike to outsourced employees.

Below table shows the projected Number of Substations (SS), line length (Circuit KM), Number of consumers and Number of DTRs and the projected employee expense and A&G expenses:

Parameter	Unit	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
No. of Consumers	Nos.	11,251,542	11,925,805	12,522,096	13,148,199	13,805,609	14,495,892
Number of DTRs	Nos.	697,461	716,091	734,871	755,981	779,591	806,141
Line Lengths	Kms	462,305	477,812	493,783	511,864	532,219	555,280
Number of SS	Nos.	2,328	2,569	2,814	3,090	3,398	3,746
Pay to outsourced employees	Rs. Cr.	26	26	26	26	26	26
Employee Expenses	Rs. Cr.	2,143	2,416	2,712	3,053	3,446	3,901
A&G Expenses	Rs. Cr.	142	161	181	203	230	260

O&M projections summary for the Control period and break-up are shown in the table below.

Parameter	Unit	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
Employee Cost	Rs. Crs	2,143	2,416	2,712	3,053	3,446	3,901
A&G Cost	Rs. Crs	142	161	181	203	230	260
R&M Cost	Rs. Crs	456	497	558	652	783	917
Total O&M Expenses	Rs. Crs	2,741	3,074	3,451	3,909	4,458	5,078

7.5 Depreciation

The depreciation every year for the particular asset class has been calculated as per below formula considering the Depreciation rates for respective asset class of asset base and also Fully Depreciated Assets during the control period.

Depreciation for the year = (Opening balance of the gross fixed assets for the year – Fully Depreciated Assets till previous year) * Rate of depreciation

The Depreciation rates as per Ministry of Power guidelines have been assumed to arrive at next 5 years depreciation which is shown below:

Asset Class	Rate of Depreciation
Buildings and Other Civil Works	3.02%
Battery Chargers	33.40%
Material Handling Equipment	7.84%
Meters / Meter Equipment	12.77%
Office Equipment and Air Conditioners	12.77%
Plant & Machinery and Lines, Cables & Network	7.84%
Capacitor Banks	5.27%
Furniture & Fixtures	12.77%
Vehicle – Car / Jeep / Scooter / Motor Cycle/ Lorry / Truck	33.40%

Asset Class	Rate of Depreciation
Computers and IT Equipment	12.77%
Intangible assets (Software, Goodwill etc.)	10.00%

The Fully depreciated assets till the year have been deducted from the opening balance of the next year to calculate the depreciation. Depreciation computation after considering the Fully Depreciated Assets (FDA) balances is tabulated below:

Particulars (Rs. Cr.)	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
Opening Balance of assets	13,896	15,506	17,900	21,586	26,696	31,936
Asset Additions during the Year	1,610	2,394	3,686	5,110	5,241	3,576
Fully Depreciated assets during the year	92	158	591	908	534	414
Depreciation During the Year	799	922	1,103	1,355	1,699	2,084

7.6 Consumer Contribution and Grants

The consumer contribution additions and Grants has been estimated based on the past trend and new consumer additions in the next 5 years of the control period.

Below table provides the projections of the Consumer Contribution in 4th Control period.

Particulars	FY19	FY20	FY21	FY22	FY23	FY24
Opening Balance	2,252	2,386	2,509	2,619	2,713	2,788
Additions during the year	490	514	540	567	595	625
Deductions during the year	355	391	430	473	520	572
Closing Balance	2,386	2,509	2,619	2,713	2,788	2,841

Below table provides the projections of the Grants in 4th Control period.

Particulars	FY19	FY20	FY21	FY22	FY23	FY24
Opening Balance	551	651	751	851	951	1,051
Additions during the year	100	100	100	100	100	100
Deductions during the year	0	0	0	0	0	0
Closing Balance	651	751	851	951	1,051	1,151

7.7 Regulated Rate Base

The Hon'ble Commission has outlined principles for computation of Regulated Rate Base (RRB) in Regulation 4 of 2005.

Calculation of RRB

The honourable commission has proposed a computation methodology (in the excel spreadsheet) for the RRB calculation for the year, which is as follows:

“RRB = (OCFA – AD – CC) + ΔRAB+WC where,

- **OCFA:** Original Cost of Fixed Assets at the beginning of the Year available for use and necessary for the purpose of the licensed business.
- **AD:** Amounts written off or set aside on account of depreciation of fixed assets pertaining to the regulated business at the beginning of the Year.
- **CC:** Total contributions made by the users towards the cost of construction of distribution/service lines by the Licensee and also include the capital grants/subsidies received for this purpose at the beginning of the year.
- **ΔRAB:** Change in the Rate Base in the year. This component would be the average of the value at the beginning and end of the year as the asset creation is spread across a year and is arrived at as follows:

$$\Delta RAB = (Inv - D - CC)/2$$

- Inv: Investments projected to be capitalised during the year of the Control Period and approved.
- D: Amount set aside or written off on account of Depreciation of fixed assets for the year of the Control Period.
- CC: User Contributions pertaining to the ΔRAB and capital grants/subsidies received during year of the Control Period for construction of service lines or creation of fixed assets.

Based on the above computation methodology, RRB has been calculated as shown below table. The Original Cost of Fixed Assets (OCFA), Accumulated Depreciation and Total Consumer Contribution calculated for Base Year and 4th Control period i.e., from 2018-19 to 2023-24 are as follows:

Particulars	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
Assets	15,506	17,900	21,586	26,696	31,936	35,513
-OCFA Opening Balance	13,896	15,506	17,900	21,586	26,696	31,936
-Additions to OCFA	1,610	2,394	3,686	5,110	5,241	3,576
Acc Depreciation Closing Balance	7,879	8,801	9,904	11,259	12,959	15,042
- Acc Depreciation Opening Balance	7,079	7,879	8,801	9,904	11,259	12,959
- Depreciation for the year	799	922	1,103	1,355	1,699	2,084
Con Contributions closing balance	3,038	3,261	3,471	3,665	3,839	3,992
-Con Contributions Opening Balance	2,803	3,038	3,261	3,471	3,665	3,839
-Additions to Cons Contributions	234	223	210	194	175	153

Particulars	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
Working Capital	283	316	355	404	465	533
Change in Rate Base	288	624	1,186	1,780	1,683	670
Regulated Rate Base	4,585	5,530	7,379	10,395	13,920	16,341

7.8 Weighted Average Cost of Capital (WACC)

The Regulation prescribes that the licensees will be compensated for the financing costs through Return on Capital Employed (ROCE) principles. This principle is aimed to provide the licensee with the return on debt as well as return on equity at a normative level. The licensee has computed the ROCE as provided in the Clause 15 of the Regulation which specifies that the ROCE be computed by multiplying the Regulated Rate Base (RRB) by the Weighted Average Cost of Capital (WACC).

The Regulation specifies the following methodology for computation of ROCE:

Return on Capital Employed (RoCE) for the RRB for the year 'i' shall be computed in the following manner:

$$\text{RoCE}_i = \text{WACC} * \text{RRB}_i$$

Where RRB_i is the Regulated Rate Base for the year 1 and WACC is the Weighted Average Cost of Capital. The detailed computation of RRB is explained in Section 2.5 above. With respect to the WACC, the Regulation specifies the formula as follows:

$$\text{WACC}_{\text{RRB}} = \left[\frac{D/E}{1 + D/E} \right] r_d + \left[\frac{1}{1 + D/E} \right] r_e$$

Where,

D/E is the Debt to Equity Ratio – Licensee is proposing a normative Debt: Equity ratio of 75:25

- r_d is the Cost of Debt – Licensee has considered the cost of debt as the weighted average of the debt rates for the ongoing loans and projected loans.
- r_e is the Return on Equity – It has been the prevailing regulatory practice to consider 14% as the Return on Equity (ROE) in the ARR of Network business of AP Power Utilities. The APDISCOMs request the Hon'ble APERC to continue the same practice for the 4th Control period also, in view of the prevailing equity market conditions.

Based on the RRB explained earlier, the WACC and the ROCE for the 4th Control Period is as follows:

Particulars	FY19	FY20	FY21	FY22	FY23	FY24
Capital Structure						
Debt Percent	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Equity percent	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Cost of Funds						
Cost of Debt percent	10.4%	10.2%	10.3%	10.6%	10.8%	11.0%
Return on Equity percent	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%
WACC	11.3%	11.1%	11.2%	11.4%	11.6%	11.7%

7.9 Return on Capital Employed

The licensee has arrived at RoCE for all five years of the control period as a product of Regulated Rate Base (RRB) and Weighted Average Cost of Capital (WACC) which is as follows:

Particulars	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
Regulated Rate Base	4,585	5,530	7,379	10,395	13,920	16,341
WACC	11.3%	11.1%	11.2%	11.4%	11.6%	11.7%
Return on Capital Employed	517	617	830	1,191	1,618	1,919

7.10 Taxes on Income

The licensee projects 20% tax (Minimum Alternate Tax) on Return on Equity during the current fiscal and during ensuing control period. The details are as follows:

	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
RRB	4,585	5,530	7,379	10,395	13,920	16,341
25% of Regulatory Rate Base	1,146	1,383	1,845	2,599	3,480	4,085
ROE %	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%
Expected Profit @ 14% on 25% of RRB	160	194	258	364	487	572
Tax on Income @ 20%	40	48	65	91	122	143

8 Aggregate Revenue Requirement

Following table shows the projected revenue requirement for the distribution licensee during the 4th Control Period.

Particulars	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
O&M Charges (Net)	2,741	3,074	3,451	3,909	4,458	5,078
Depreciation	799	922	1,103	1,355	1,699	2,084
Advance Against Depreciation	0	0	0	0	0	0
Taxes on Income	40	48	65	91	122	143
Other Expenditure	36	38	39	40	41	42
Special Appropriations	0	0	0	0	0	0
Total Expenditure	3,617	4,082	4,657	5,395	6,320	7,347
Less: IDC and expenses capitalized*	222	302	385	407	325	190

Particulars	FY19 (RE)	FY20	FY21	FY22	FY23	FY24
Less: O&M expenses capitalized	0	0	0	0	0	0
Net Expenditure	3,396	3,780	4,273	4,988	5,995	7,157
Add Return on Capital Employed	517	617	830	1,191	1,618	1,919
Total Distribution ARR	3,913	4,398	5,103	6,179	7,614	9,076
Less: Wheeling Revenue from Third Party/Open Access/NTI (if any)	428	466	508	553	603	657
Revenue Requirement, (Net transferred to Retail Supply Business)	3,485	3,932	4,595	5,626	7,011	8,419

9 Financial Statements of APSPDCL for FY 2017-18 to FY 2023-24

The profit and loss account for Distribution business of APSPDCL and the balance sheet from FY2018-19 to FY2023-24 are presented in the table below. The financial statements are taken as per the Multi-year Tariff Petition filed with Hon'ble Commission on 30th Nov 2018.

Profit and Loss Statement:

Particulars	FY18	FY19	FY20	FY21	FY22	FY23	FY24
INCOME							
Revenue from sale of power	15,371	14,862	16,313	17,724	19,886	22,369	25,228
Revenue Subsidies and grants	4,167	7,039	7,972	7,938	8,890	10,176	11,575
Other Income	961	1,216	1,294	1,360	1,431	1,507	1,588
TOTAL INCOME	20,499	23,117	25,579	27,021	30,207	34,051	38,391
EXPENDITURE							
Purchase of Power	16,642	18,238	20,213	21,008	23,268	25,829	28,740
Repairs & Maintenance (Net of Capitalization)	319	456	497	558	652	783	917
Employee Costs (Net of Capitalization)	1,662	2,143	2,416	2,712	3,053	3,446	3,901
Administration & General Expenses (Net of Capitalization)	179	142	161	181	203	230	260
Depreciation and Related Debits (Net)	721	799	922	1,103	1,355	1,699	2,084
Interest and Finance charges	947	1,323	1,391	1,482	1,588	1,739	1,923
Other Expenses	35	36	38	39	40	41	42
SUB TOTAL	20,504	23,138	25,639	27,083	30,160	33,767	37,866
LESS: EXPENSES CAPITALISED							
Interest and Finance charges capitalized	0	222	302	385	407	325	190
Other expenses capitalized	0	0	0	0	0	0	0
Sub-Total (13+14)	0	222	302	385	407	325	190
Other Debits							
Extra-ordinary items	0	0	0	0	0	0	0
Sub Total (15+16)	0	0	0	0	0	0	0
Total Expenditure(6 TO 12 -13-14+15+16)	20,504	22,917	25,337	26,699	29,753	33,442	37,676
PROFIT/(LOSS) BEFORE TAX	-4.5	201	242	323	455	609	715
Provision for Income tax	0	40	48	65	91	122	143
PROFIT/(LOSS) AFTER TAX	-4.5	160	194	258	364	487	572
Net Prior Period Credit /(Charges)	-2.5	0	0	0	0	0	0
SURPLUS/(DEFICIT)	-7.0	160	194	258	364	487	572

Balance Sheet:

Particulars	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Sources of Funds							
1. Shareholders' Funds							
a) Share Capital	359	359	359	359	359	359	359
b) Reserves and surplus	-5,113	-4,718	-4,301	-3,833	-3,275	-2,613	-1,888
2. Loan Funds							
a) Secured Loans	9,905	11,634	12,149	12,363	13,070	14,202	15,560
b) Other long term liabilities	2,299	4,606	8,783	13,946	17,032	17,496	19,756
b) Long term provisions	750	781	814	849	886	924	964
Total	8,200	12,661	17,804	23,684	28,071	30,368	34,751

Application of Funds							
1. Fixed Assets							
a) Gross Block	13,896	15,506	17,900	21,586	26,696	31,936	35,513
b) Less: Accumulated Depreciation	7,079	7,879	8,801	9,904	11,259	12,959	15,042
c) Net Block	6,817	7,628	9,099	11,682	15,436	18,978	20,470
d) Capital Work-in-progress	3,346	4,533	5,397	4,829	3,170	1,431	1,603
Deferred tax asset	0	0	0	0	0	0	0
Other Non-current assets	0	0	0	0	0	0	0
2. Investments	287	287	287	287	287	287	287
Long term loans and advances	321	330	340	350	361	372	383
3. Current Assets, Loans & Advances							
a) Inventories	79	333	379	362	407	437	495
b) Trade Receivables	3,822	4,224	4,666	5,152	5,687	6,275	6,922
c) Other Receivables	3,698	3,575	3,696	3,814	3,994	4,201	4,439
d) Cash & Bank balances	518	544	571	600	629	661	694
e) Loans & Advances	8,120	8,526	8,952	9,400	9,870	10,364	10,882
	16,236	17,202	18,265	19,328	20,588	21,938	23,432

Less: Current Liabilities and Provisions							
a) Short term Borrowings	1,327	901	901	901	901	901	901
b) Trade Payables	13,789	12,239	10,142	6,953	5,459	5,767	3,936
c) Other current liabilities	3,559	3,984	4,326	4,668	5,094	5,600	6,171
d) Short term Provisions	132	194	214	269	316	369	415
	18,807	17,318	15,584	12,792	11,770	12,637	11,424
Net Current Assets	-2,571	-116	2,681	6,536	8,818	9,301	12,008
Total	8,200	12,661	17,804	23,684	28,071	30,368	34,751