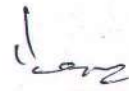


BEFORE THE HONOURABLE
KERALA STATE ELECTRICITY REGULATORY COMMISSION
At its office at C V Raman Pillai Road, Vellayambalam, Thiruvananthapuram

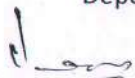
FILING No	
CASE No	
IN THE MATTER OF :	Midterm Performance Review comprising of truing up for 2018-19, Midyear Performance Review for 2019-20 and the revised forecast for 2020-21 and 2021-22 of Generation, Transmission and Distribution functions of KSEBL AND
IN THE MATTER OF :	Kerala State Electricity Board Limited, Vydyuthi Bhavanam, Pattom, Thiruvananthapuram – 4
	APPLICANT 
	DEPUTY CHIEF ENGINEER (COMMERICAL AND PLANNING) With full powers of Chief Engineer Kerala State Electricity Board Limited

**AFFIDAVIT VERIFYING THE APPLICATION ACCOMPANYING THE PETITION FOR
MIDTERM PERFORMANCE REVIEW COMPRISING TRUING UP FOR 2018-19, MIDYEAR
PERFORMANCE REVIEW FOR 2019-20 AND THE REVISED FORECAST FOR 2020-21 and
2021-22 OF GENERATION, TRANSMISSION, AND DISTRIBUTION FUNCTIONS OF
KSEBL.**

I, **B. PRADEEP**, son of **Sri. P. Balachandran**, aged 54 years residing at **Vipanchika, Anayara P O, Thiruvananthapuram** do solemnly affirm and say as follows:

I am working as Deputy Chief Engineer (Commercial & Planning) with full powers of Chief Engineer, Kerala State Electricity Board Limited, Vydyuthi Bhavanam, Pattom, Thiruvananthapuram and the petitioner in the above matter and I am duly authorized by the Board to make this affidavit on its behalf. I solemnly affirm at Thiruvananthapuram on this the 26th day of March 2020 that the contents of the above petition are true to my information, knowledge and belief. I believe that no part of it is false and no material has been concealed there from.


Deponent


Deputy Chief Engineer (Commercial & Planning)
With full powers of Chief Engineer
Kerala State Electricity Board Limited,
Vydyuthi Bhavanam, Pattom
Thiruvananthapuram – 695 004

VERIFICATION


I, the above named deponent, solemnly affirm at Thiruvananthapuram on this, the 26th day of March 2020 that the contents of the affidavit are true to my information, knowledge and belief, that no part of it is false and that no material has been concealed there from.

Deponent


Deputy Chief Engineer (Commercial & Planning)
With full powers of Chief Engineer
Kerala State Electricity Board Limited
Vydyuthi Bhavanam, Pattom
Thiruvananthapuram – 695 004.

Solemnly affirmed and signed before me.




26.3.2020
T.N. OMANA
Advocate & Notary
Thiruvananthapuram Avenue District
Kerala State South India

**BEFORE THE HONORABLE
KERALA STATE ELECTRICITY REGULATORY COMMISSION**

In the matter of : Truing up of Cost and Revenue of Generation, Transmission and Distribution Strategic Business Units of the Kerala State Electricity Board Limited (KSEBL) for the year 2018-19.

Petitioner : Kerala State Electricity Board Limited,
Vydyuthi Bhavanam, Pattom, Thiruvananthapuram - 4

THE PETITIONER HUMBLY STATES THAT:

CHAPTER- 1 : INTRODUCTION

1.1 The petitioner, Kerala State Electricity Board Limited (KSEBL), is a State Public Sector power utility company constituted by the State Government. The petitioner is carrying out the responsibilities as a distribution licensee for the whole state and the State Transmission Utility and also owns generation assets. The petitioner is also duty bound to implement the policies and programmes of the State and Central Government.

1.2 During 2018-19, Government of Kerala launched 'Oorjja Kerala Mission' (14-6-2018) aimed at the integrated development of electricity sector in the state. It aims at implementing five important projects detailed below during the next 3 years.

Soura

State intends to achieve a cumulative solar power capacity of 1000 MWp by 2021, 50% of which is expected from Roof Tops (RTS). Another 150 MW is expected from solar parks and floating solar projects each. Remaining 200 MW is planned to be procured through reverse e-bidding, from solar projects commissioned in the country. Demand aggregation for first phase of RTS is already completed. For the first phase of 200 MW, 42,500 premises were selected from 2.78 Lakh consumers who expressed interest in associating with the project. The tendering process is going on and the first phase is expected to be completed by June 2020.

Filament free Kerala

Through this project all the existing CFL and filament bulbs in domestic and street lighting sector in the State will be replaced with energy efficient and long lasting LED lamps targeting reduction in peak demand, global warming and Hg pollution. More than 13 Lakh consumers have already registered for LED lamps in the 1st phase in which domestic sector was targeted. Tender process has already been initiated for procurement of one crore 9watt LED lamps, distribution of which is targeted in the ensuing summer months when the demand peaks.

Dyuthi 2021

This project included in Oorjja Kerala mission, has commenced during FY 2018-19 with a mission to up lift the distribution grid of KSEB Ltd to international level. The total plan outlay is Rs 4036.30 crores. GIS map preparation & DPR formulation were new experience for Distribution Works. Project Finalization using new tools and DPR preparation spilled the FY 19, which resulted in the slow start of the project for the FY. Further, more attention was focussed on timely completion of the Centrally Aided Projects like DDUGJY and IPDS to ensure maximum drawal of grants from the Central Government. Devastating floods during 2018 & 2019 has also affected the progress of Dyuthi project. This necessitated some rework from the original plan of Dyuthi 2021 with works planned in initial years spilling to subsequent years.

TransGrid 2.0 – 2nd Generation Transmission network

This project aims strengthening of transmission network to meet the future energy requirement of the State and is scheduled to be implemented in two phases. The 1st phase of the project is scheduled for execution during 2017-2022 and 2nd phase for 2019-2024. The works included in the 1st phase of the project are grouped into 13 packages and comprises construction of 12 substations and 2084 Circuit kilometre of EHT lines. Out of these 12 substations, 4 are Air Insulated Substations (AIS) and the remaining 8 are Gas Insulated substations (GIS). 12 substations (AIS - 3 Nos & GIS - 9 Nos) are included in Phase II of the project which is grouped into 12 packages. Total cost for the two phases of the project is estimated approximately at 6,000 Cr, excluding green corridor projects. It is proposed to arrange the finance mainly from KIIFB, PSDF and Green Energy Corridor under MNRE.

Implementation of the projects in Phase I are underway and are progressing as scheduled. All the 13 packages in the 1st Phase have been awarded. Out of the 12 substations (Eleven 220 KV and one 400 KV) targeted in the 1st phase, 7 substations (4 Nos. AIS and 3 Nos GIS), including associated EHT lines, will be completed by July 2020. Remaining 4 substations and associated EHT lines are scheduled for commissioning by March 2021 and Kottayam 400KV substation is expected to be commissioned during 2021-22. Already 257.4 Ckt-Km of EHT lines have been completed under the project. Preliminary works for the projects included in Phase -II have started. Two out of 12 packages have been tendered and DPRs for the remaining packages are under preparation.

eSafe –

The e Safe project to be jointly implemented by Electrical Inspectorate and KSEB is aiming zero electrical accidents .A massive publicity campaign will be the highlight of this project to sensitise the users of electricity on its safety aspects .The project aims at step wise modernization of transmission and distribution sector .Bare conductor will be replaced by covered conductor and underground cables. Safety Procedures will be issued for each work. Work authorization and permit to work will be issued online. Electric safety training will be given to people supervising and engaged in electrical works. In Jagratha scheme, ELCB will be installed in all household belonging to BPL consumers and rewiring, wherever necessary. Awareness Campaign on safety will be done through Asha workers, Kudumba shree, and Ayalkuttam and Resident associations.

1.3 Hon Commission notified MYT Regulation for determination of Tariff in 2018 on 05.10.2018 after repealing the earlier Tariff Regulation, 2014, with a four year control period starting from FY 2018-19 till 2021-22. The regulations contain a performance based approval scheme along with a framework for sharing Gains and Losses and specifying the controllable and un-controllable factors.

1.4 KSEBL had submitted MYT petition for the above mentioned control period containing ARR & ERC and capital investment plan for the four year control period from 2018-19 to 2021-22 in respect of its three SBUs along with tariff revision proposals for the years 2018-19 and 2020-21, before KSERC on 31.10.2018, strictly adhering to the MYT Regulations 2018 notified by KSERC. Hon'ble Commission has issued orders on the MYT petition on 08.07.2019. It was also pleased to revise the electricity tariff of all categories of consumers in the state along with bulk supply tariff applicable to the small licensees. Even though KSEBL had requested tariff revision for two years during the control period, (2018-19 and 2020-21) Hon'ble Commission issued tariff revision orders only for one year (2019-20).

1.5 The petitioner submits this truing up petition for FY 2018-19 and midterm review for the subsequent years of the control period in accordance with Tariff Regulation of 2018. The prescribed formats in the regulation have been followed in this petition. The accounts for the three Business Units are separately filed along with this petition.

1.6 **Indian Accounting Standards (Ind AS) Compliance:** The petitioners Accounts till 31-March-2016 were prepared in line with IGAAP accounting standards and applicable provisions of Companies Act and Electricity Act, 2003. However, the Annual Accounting statements for FY 2016-17 onwards were prepared in compliance with IND AS notified by the Ministry of Corporate Affairs on 16th February 2015. This standard converges with International Financial Reporting Standards (IFRS). The adoption of Ind AS entails a significant change in the financial reporting framework used by Indian companies to report their financial results.

1.7 The summary of the audited Annual statement of Accounts of KSEBL for the year 2018-19 vis-à-vis the amount approved by Hon Commission in the order on the MYT petition is furnished in the Table – 1.1 given below. The Statutory Auditors of KSEBL has conducted audit and issued certificate for the year 2018-19 and a copy of the audited accounts is submitted separately along with this petition.

Table-1.1: Comparison of ARR, ERC and Revenue Gap of KSEBL for 2018-19 (Rs. Cr.)					
No	Particulars	Approved	Audited	Truing up	Difference over approval
1	ARR	13808.70	14292.94	14296.45	-487.75
2	ERC	13776.55	14002.94	13536.57	239.98
3	Revenue gap (1-2)	32.15	290.00	759.88	727.73

1.8 The difference between audited accounts and true-up values for 2018-19 are mainly due to difference in treatment of Return on Equity, claw back depreciation, actuarial liability, IND AS adjustment impact and un disbursed interest on security deposit. The matter is clearly explained in respective paragraphs in Chapters below. Function wise segregation of expenses, revenue and Profit / loss are summarised below.

Table-1.2 : Business Unit wise ARR, ERC and Revenue Gap for 2018-19 (Rs Cr)				
No	Particulars	SBU-G	SBU-T	SBU-D
1	ARR	390.41	738.65	14236.44
2	ERC / Transfer Value	506.79	858.64	13476.56
3	Revenue surplus (gap) (2-1)	116.38	119.99	-759.88

1.9 A summary of the provisional approval granted by the Hon'ble Commission for SBU D for the control period from 2018-19 to 2021-22, true up sought for 2018-19, actual for the half year ended 30.09.2020 and revised projection for the remaining years of the control period are furnished below:

Table Comparison of provisional approval and revised projection for the MYT control period 2018-19 to 2021-22 (Rs Cr)										
No	Particulars	Provisional approval as per KERC order dated 08.07.2019				TU sought	Actual up to	Revised projection as per Mid Term Review		
		2018-19	2019-20	2020-21	2021-22	2018-19	30.09.2019	2019-20	2020-21	2021-22
1	Cost of Generation (SBU-G)	481.41	505.93	586.34	639.86	506.79	322.37	482.31	533.36	676.09
2	Cost of Power Purchase	7847.77	8613.94	8797.94	8964.44	7826.86	4386.83	8600.15	9431.65	9800.79
3	Cost of Intra-State Transmission (SBU-T)	874.60	983.69	1162.47	1283.53	858.64	536.03	953.84	1190.45	1444.24
4	NLDC/RLDC Charges	3.00	3.00	3.00	3.00			3.00	3.00	3.00
5	Interest & Financial Charges									
6	Interest on loans	149.90	222.94	281.40	329.80	180.27	156.04	269.86	382.66	510.34
7	Less: Capitalized						80.04			
8	Net interest					180.27	76.00	269.86	382.66	510.34
9	Interest on GPF	152.55	162.58	172.60	182.63	136.68	72.89	152.70	162.73	172.76
10	Other interest					18.41	0.04			
11	Interest on Master Trust	646.45	612.43	578.40	544.38	652.08	313.78	612.43	578.40	544.38
12	Int on SD	175.33	199.93	218.49	238.74	170.75	172.79	177.31	188.70	207.45
13	Working capital interest						82.81	0.00	0.00	0.00
14	Carrying cost	304.08	223.59	121.78	27.08	592.63		688.90	737.61	814.47
15	-Do-On current year gap					36.48				
16	Total I&F	1428.31	1421.47	1372.67	1322.63	1787.30	718.31	1901.20	2050.10	2249.40
17	Depreciation	72.24	93.47	121.53	154.91	107.98	223.11	151.57	202.40	263.89
18	Addl interest on Master Trust	167.10	167.10	167.10	167.10	167.10		167.10	167.10	167.10
19	Total O&M Expenses	2226.08	2458.95	2658.75	2848.95	2379.04	1586.92	2450.15	2675.54	2910.68
20	Return on equity (14%)	253.50	253.50	253.50	253.50	253.50	89.43	253.50	253.50	253.50
21	Other Expenses					291.38	22.05			
22	Onetime expenses CMDRF					29.25				
23	Claim on T&D loss reduction					28.59				
24	Recovery of past approved gap	400.00	1000.00	850.00	850.00					
25	Total ARR	13754.02	15501.06	15973.31	16487.93	14236.44	7885.04	14962.82	16507.10	17778.68
26	Tariff Income/ Rev from operation	12531.47	13254.67	13874.14	14523.36	12713.93	7217.49	13811.61	14584.39	15216.94
27	Less: PF Incentive	97.79	44.99	32.50	33.95	114.07				
28	Revenue from external sale	756.64	942.70	615.68	405.61	339.34		17.56	657.62	825.35
29	Non-Tariff Income	531.55	548.10	571.23	594.36	537.36	100.98	548.10	571.23	594.36
30	Total ERC	13721.87	14700.48	15028.55	15489.38	13476.56	7318.47	14377.27	15813.24	16639.65
31	Net Revenue surplus (Gap)	-32.15	-800.59	-944.75	-998.53	-759.88	-566.57	-585.55	-693.86	-1139.03

1.10 Following chapters 2 to 6 in this petition deals with Truing up petition for the FY 19 and chapters 7 to 12 deals with the midterm review of subsequent years of the control period.

CHAPTER – 2: TRUING-UP OF ARR OF SBU – GENERATION

2.1 The generation capacity of SBU G comprises a mix of Hydel, Thermal, solar and wind power stations. The total installed capacity as on 31.03.2019 is **2237.59 MW** of which 92.01 % is Hydel, 7.15% is Thermal, 0.75 % from solar and rest from the wind. The source wise generation capacity details are given in the table- G 1 below:

Table- G 1 : Source wise Generation Capacity	
Source	Installed Capacity (MW) as on 31.03.2019
Hydel	2058.75
Thermal	159.96
Wind	2.03
Solar	16.85
Total (Generation)	2237.59

2.2 Energy generated and purchased by the petitioner to meet the demand in the year totals to **25623.58 MU**. Energy generated by the petitioner's Generation Business Unit was **7626.37 MU** (29.76%) out of which 7602.41 MU was from own Hydro-electric Stations and remaining 23.96MU was generated from thermal, wind and solar stations. Source wise generation details are enclosed as Table-G2 below. Details of energy generated and expenses are furnished in paragraphs hereunder.

Table – G2 : Energy Generation from own stations for FY 2018-19 (MU)			
Source	KSERC approval	Audited Accounts	Difference
Gross Generation			
Hydro	7889.48	7602.41	287.07
BDPP	0	0.29	-0.29
KDPP	0	3.799	-3.799
Wind	1.79	1.33	0.46
Solar	14.96	18.54	-3.58
Subtotal	7906.23	7626.37	279.861
Aux consumption			
Hydro	82.05	31.81	50.24
BDPP	0	0.62	-0.62
KDPP	0	0.82	-0.82
Wind		0	
Solar	0.17	0	0.17
Sub total	82.22	33.25	48.97
Net Generation			
Hydro	7807.42	7570.6	236.82
BDPP	0	(-) 0.33	0.33
KDPP	0	2.979	-2.979
Wind		1.33	
Solar	16.58	18.54	(-)3.29
Subtotal	7824.01	7593.119	230.881

2.3 Hydro Generation:

2.3.1 Approved net hydro generation for the FY 2018-19 as per the MYT Order dated 08.07.2018 was **7807.42 MU** whereas the actual hydro generation was **7570.60 MU** leaving a shortage of

236.82 MU (3.03%). The outage of generating stations due to flood had affected the overall generation from the hydro resources. The details of hydel generation and station wise generation details are given in Table- G3 and G4 respectively hereunder. Presently, in hydel stations, there is no provision for metering the energy consumed by excitation systems. Hence the auxiliary consumption as per audited accounts is lower than the approved values. However, in stations, where RMU works in progress, provision for metering the excitation energy is also ensured. For the purpose of true up, the petitioner is only claiming the actual auxiliary consumption as recorded.

Table-G3 : Hydel Generation for FY 2018-19 (MU)							
Month	Generation	Aux Consumption	Net hydro Generation	Month	Generation	Aux Consumption	Net hydro Generation
Apr-18	633.30	2.29	631.01	Oct-18	845.12	2.99	842.13
May-18	604.00	2.84	601.16	Nov-18	527.19	2.54	524.65
Jun-18	565.95	2.60	563.35	Dec-18	360.15	2.24	357.91
Jul-18	841.76	3.26	838.50	Jan-19	359.12	2.08	357.04
Aug-18	1038.63	2.99	1035.64	Feb-19	429.79	2.25	427.54
Sep-18	792.24	2.80	789.44	Mar-19	605.15	2.92	602.23
				Total	7602.41	31.81	7570.60

Table-G4 : Station Wise Hydel Generation for 2018-19					
No	Hydro Electric Stations	Generation (MU)	No	Hydro Electric Stations	Generation (MU)
1	Idukki	2921.48	19	Chembukadav I & II	7.11
2	Sabarigiri	1513.19	20	Kuttiady Tail Race	8.45
3	Kuttiady (Units :1 - 6)	692.75	21	Ranni-Perinadu	3.73
4	Lower Periyar	524.26	22	Addyanpara	0.32
5	Neriamangalam+NES	377.84	23	Peppara	8.23
6	Poringalkuthu + PLBE	192.8	24	Vellathuval SHEP	2.74
7	Idamalayar	345.4699	25	Lower Meenmutty	6.11
8	Sholayar	202.63	26	Madupetty	1.63
9	Pallivasal	185.25	27	Chimony	6.69
10	Kakkad	221.573	28	Malampuzha	4.32
11	Sengulam	123.03	29	Peechi	2.48
12	Panniar	114.95	30	Perunthenaruvi	7.72
13	Kallada	68.34	31	Kakkayam	2.63
14	Malankara	33.25		KSEB Hydro (TOTAL)	7602.41
15	Barapole	1.2		Aux Consumption (MU)	31.81
16	Vilangad	7.82		Auxiliary consumption %	0.42%
17	Poozhithode	7.56		Net Generation in MU	7570.60
18	Urumi	6.86			

2.4 Thermal Generation:

2.4.1 Due to high variable costs no generation has been proposed from the thermal power plants, BDPP & KDPP for the entire control period. However, it was also submitted that the scheduling of these plants will be done in case of contingency only. Accordingly, as per the system requirements, KSEBL was forced to generate a small quantum of energy from KDPP& BDPP stations to the tune of 4.089 MU (3.799 + 0.29) together in FY 2018-19. The monthly split up details of the generation from thermal sources is shown in table G5. KSEBL was able to consume

3200 MT (approximate) of LSHS of BPCL at KDPP at a negotiated cost of Rs.17240/MT during March -2019 and hence KSEB was able to generate power at a reduced rate of Rs.4/ unit from KDPP during peak summer. It may be noted that the market price of LSHS is around Rs. 50,000/-(approx) including GST and transportation.

Table-G5 : Generation from BDPP and KDPP (MU)						
Month	BDPP	KDPP		Month	BDPP	KDPP
Apr-18		1.04		Nov-18		
May-18				Dec-18	0.13	
Jun-18				Jan-19		
Jul-18				Feb-19	0.17	
Aug-18				Mar-19		2.68
Sep-18		0.07				
Oct-18				Total	0.29	3.799

2.5 Solar & Wind projects:

2.5.1 Hon'ble Commission has approved an energy generation of 16.58 MU from Renewable source for the FY 2018-19. As on 31.03.2018, petitioner has an installed capacity of 14.707MW with an annual generation of about 13.45 MU. Further, petitioner was able to add 2.14MW of solar projects in the Year 2018-19 totalling to 16.85MW and the annual generation for the FY was 18.54 MU. The total wind energy capacity of KSEBL as on 31.03.2019 was 2.025MW and the generation for the FY 2018-19 was 1.33 MU. Thus the total generation from renewable source was 18.54 MU.

2.6 ARR&ERC of SBU- G:

2.6.1 The actual ARR, ERC for the Generation Business Unit are furnished in **Form G-P&L**. A statement showing comparison of ARR & ERC approved by the Hon Commission and actual for the year as well as true up sought along with deviations are summarized below. Item wise explanation is furnished thereafter. The detailed explanation on prudence of various expenses and segregation of various costs among the three Strategic Business Units is submitted under chapter -5 of this petition. Accordingly, a gist of reasoning is provided hereunder.

Table-G6 : COMPARISON OF GENERATION SBU ARR (Rs Cr)						
No	Particulars	Trued up sought	2018-19			
		2017-18	Approval	Actuals	TU	Difference over approval
1	Cost of Generation of Power	2.08	0	3.29	3.29	3.29
2	Interest & Finance Charges	146.71	126.27	127.94	127.58	1.31
3	Depreciation	143.48	130.19	132.36	137.60	7.41
4	O&M Expenses (Excl terminal benefits)	171.18	124.15	197.31	132.52	8.37
5	RoE (14% of Rs 1454.53 Cr)	116.38	116.38	153.33	116.38	0
6	Other Expenses & PP expenses	(-)0.92	0	-4.68	-4.68	-4.68
7	Exceptional Items - Flood		0	3.11	0.00	0.00
8	One Time Expense CMDRF		0	0	1.79	1.79
9	Fair Value adjustments			-1.52		
10	Interest on additional bond to Master Trust	27.99	10.26		10.26	0.00
11	ARR	606.90	507.24	611.14	524.73	17.49
12	Less Non-Tariff Income	24.99	25.83	24.48	17.94	-7.89
13	Net ARR (Transferred to SBU-D)	581.91	481.41	586.66	506.79	25.38

2.6.2 It may please be seen that the actual net ARR **586.66** exceeded approval by Rs.105.25 Cr and whereas the amount sought for true up is slightly higher by Rs. 25.38 Cr from the approved figure.

2.7 Cost of generation of power

2.7.1 Rs. 3.29 Cr was actually incurred during the year towards the cost of fuel and lubricants for generation of stations owned by KSEBL, which may kindly be approved. The split up details are given below:

Table–G6 : Cost of generation (Rs Cr)				
Particulars	KDPP	BDPP	Hydro stations	Total
Oil	1.6305	0.1604		1.7909
HSD oil	0.0621	0.1520		0.2141
Lub oil	0.0511	0.0015		0.0526
Lubricants and consumable stores	0.0091	0.3735	0.8503	1.2329
Station supplies				0.0015
Total	1.7528	0.6874	0.8503	3.292

2.8 Interest and Finance charges:

2.8.1. Actual Interest and finance charges for the year 2018-19 is Rs 127.94 as against the approved figure of Rs 126.27 Cr. An amount of Rs 127.58 Cr is claimed under the head in true up. The details are given below.

Table G 7 : Interest and Finance charges (Rs Cr)					
No	Particulars	Approved	Actual	TU	Difference
1	Interest on Outstanding Capital Liabilities	71.15	67.26	69.88	-1.27
2	Interest on GPF	9.37	8.92	8.92	-0.45
3	Other Interests		1.01		
4	Interest on Master Trust Bonds	39.67	42.56	42.56	2.89
5	Interest on Working capital	6.08	8.19	6.21	0.13
6	Total	126.27	127.94	127.58	1.31

2.8.2 **Interest on normative loan:** Regulation 26 of Tariff Regulation 2018 specifies the approval of loan Interest on normative basis. Based on this, while issuing orders on MYT petition, Hon'ble Commission approved Rs.794.60 Cr as opening normative loan as at 01.04.2018 after considering provisional asset addition for the years 2016-17 and 2017-18, contributions and grants etc. Considering interest rate at 9.33% Hon'ble Commission approved normative interest at Rs.71.15 Cr for 2018-19. Further, provisional approval of Rs.65.79 Cr was granted for the asset addition during 2018-19. Actual entitlement of normative loan as on 01.04.2018, GFA addition during 2018-19, repayment during the year and closing normative loan as on 31.03.2019, interest on normative loan along with SBU wise segregation are computed and explained in chapter 5. Based on the computation, an amount of Rs.69.88 Cr is claimed as interest on normative loan for the year 2018-19.

2.8.3 **Interest on PF:** Hon Commission approved Rs 9.37 Cr towards interest on PF. But as per the audited accounts, the actual interest paid on PF was Rs.8.92 Cr, which is less than the approval by Rs.0.45 Cr. The actual interest for SBU- G amounting to Rs.8.92 Cr may kindly be approved.

2.8.4 **Interest on additional bond to Master Trust:** State Government, as per notifications dated 31.10.2013 and 28.01.2015, ordered creation of a Master Trust for meeting the unfunded liability of pension, gratuity and leave surrender as on 31.10.2013, in respect of the personnel transferred from erstwhile KSEB to KSEBL. The total liability as on 31.10.2013 was estimated at Rs.12418.72 Cr and necessary funding arrangements put in place through issue of 2 series of Bonds. Hon Commission recognized the unfunded pension liabilities as above and approved recovery of interest on KSEBL share of Bonds as per Tariff Regulations, 2014. Thus Hon Commission approved Rs.39.67 Cr towards interest on Master Trust bonds. As detailed in chapter 5, actual share of expenses for SBU G has been Rs. 42.56 Cr, which may kindly be approved.

2.8.5 **Interest on Additional Bond to Trust:** In addition to the interest on bonds actually issued, an additional amount of Rs.200 Cr (Rs. 10.26 Cr for SBU G) has been provisionally approved towards unfunded liability. Hon'ble Commission may kindly true up the provisional amount of Rs.10.26 Cr as detailed in chapter 5.

2.8.6 **Interest on working capital:** Even though there was no generation proposed from the thermal stations, KSEBL was forced to use the same during contingencies to the extent of 4.089MU. Accordingly, in the computation of working capital, the cost of fuel is taken as the cost incurred on fuel during the maximum consumption month of KDPP alone. The detailed calculation of the same is shown below.

Table G 8: Computation of interest on working capital for 2018-19		
Sl. No	Particulars	Amount (Rs.Cr)
1	Cost of fuel for 1 month	1.19
2	O&M expense for 1 month	10.36
3	1% of GFA towards maintenance spares	49.61
4	Total	61.16
5	Less: Security deposit	0.00
6	Net working capital	61.16
7	Base rate as on 01.04.2017	8.15%
8	Interest rate @2% above base rate	10.15%
9	Interest on Working capital (6x8)	6.21

2.8.7 In view of the above, the Hon'ble Commission may kindly approve interest and finance charges as detailed above.

2.9 O&M of SBU-G:

2.9.1 Hon'ble Commission had approved Rs.0.38 Cr as O &M expense for new and ongoing hydro and solar projects for 2018-19. Hon'ble Commission has reckoned Kakkayam SHEP alone for the same by considering date of commissioning of the project as October 2018. But Kakkayam project having a generation capacity of 3MW was commissioned on 16.07.2018 i.e. commissioned two months before the target date considered in the MYT Order. So the O&M expense became 0.608 Cr on normative basis. Further, solar projects (capacity 2.143MW) have also been added in

the financial year. The details of the same are furnished below. Considering the early commissioning of the Kakkayam project and solar projects commissioned during the FY 2018-19 an amount of 0.7011 Cr. may be allowed towards O&M expense of new and projects for 2018-19.

Table – G 9 O&M expense of New Generating stations Commissioned					
Project	CoD	Capacity-MW	Energy-MU	Capital cost (RS Cr)	Addl. O&M cost (Cr)
Kakkayam	16.07.2018	3	10.39	43.2	0.608
Solar Projects					
Peerumede	23.04.2018	0.5			0.0352
Roof Top Solar (Tr. Wing)	09.07.2018	0.91		7.64	0.047
Roof Top IPDS South	31.12.2018	0.233			0.0045
Ponani	16.01.2019	0.5	0.77	3.539	0.0064
Total		5.143			0.7011

2.9.2. The actual O&M expenses of the generation Business Unit was **Rs. 197.31 Cr.** Component wise details are given in the **Table-G10** and detailed in Form G4. Hon Commission had approved only **Rs 124.15 Cr** towards O&M expenses based on the norms specified in the Tariff Regulation, 2018. However, based on the commissioning of the new generating stations and provision for pay revision, a claim of Rs. 132.52 is sought for true up for the year 2018-19. The provision for pay revision amounts to Rs.8.05 Cr, over normative values, as detailed in chapter 5.

Table G 10 Details of O&M expenses for 2018-19					
No	Particulars	Approved	Actual	TU requirement	Difference
1	Employee Cost	NA	128.37		NA
2	A&G Expenses	NA	41.81		NA
3	R&M Expenses	NA	27.13		NA
4	Sub total	124.15	197.31	132.52	8.37
5	Terminal benefits	NA	NA		NA
6	Total	124.15	197.31	132.52	8.37

2.9.3 Detailed explanation on the O&M expenses is furnished in Chapter 5 of this petition. It is humbly prayed that the Hon'ble Commission may be pleased to approve the O&M expense as above.

2.10 Depreciation:

2.10.1 The approved depreciation for the Generation assets for the year 2018-19 was Rs 130.19 Cr where as the actual amount was Rs.132.36 Cr and the amount sought for truing up is Rs. 137.60 Cr.

2.10.2. Hon'ble Commission may kindly note that depreciation as per accounts has been worked out in line with IND AS and claw back depreciation was determined and credited to other Income under Note 25(b) of Annual accounts. But, as per MYT Regulation for the control period 2018-22, depreciation is allowable as per the provisions contained in the Tariff Regulations, 2018 in which applicable rates as well as methodology to be followed are specified therein. Accordingly, allowable depreciation for SBU G has been worked out at **Rs. 137.60 Cr** as detailed in Chapter 5. Hon'ble Commission may kindly approve the same.

2.11 Return on Equity:

2.11.1 Hon'ble Commission approved Return on equity at Rs.116.38 Cr. Actual RoE for the Generation SBU as per audited accounts amounts to Rs. 153.33 Cr. Hon'ble Commission may kindly approve Rs.116.38 Cr as detailed in Chapter 5.

2.12 Non Tariff Income:

2.12.1 Hon'ble Commission approved Rs.25.83 Cr under this head. Actual income earned as per accounts has been Rs.24.48 Cr. SBU G seeks to true up Rs.17.94 Cr under the head non tariff income as detailed in chapter 5 after excluding income booked under claw back depreciation. The non Tariff income includes income from sale of scrap, interest on advances to contractors, interest on staff loans and advances, rent from buildings etc. Hon'ble Commission may kindly true up Rs.17.94 Cr under this head.

2.13 Other items and Prior period expenditure:

2.13.1 Net prior period expenses and other expenses amounted to a gain of Rs.4.68 Cr for the year 2018-19, as detailed in chapter 5, which may kindly be approved.

2.14 Onetime expenses:

2.14.1 Share of SBU G's contribution to CMDRF as detailed in chapter 5 amounts to Rs.1.79 Cr. Hon'ble Commission may kindly true up the claim.

2.15 Transfer of Generation Costs:

2.15.1 ARR for SBU G sought for true up is **Rs. 524.73 Cr** and Non tariff income earned is **Rs. 17.94 Cr**. The net expenses of SBU G transferred to SBU-D are **Rs. 506.79 Cr**. This cost is considered as the Cost of own generation in the ARR of SBU-D, which may kindly be approved.

2.16 ARR & Tariff Formats:

2.16.1 Formats relating to Generation Business Units as per the Tariff regulation 2018 are furnished hereafter. However, Forms G-3.1, G-6.5 to G-6.8, G-6.10 to G-7.1 which are not directly relevant or applicable or on which data are not readily available are not included in this submission.

2.17 The Next Chapter thereafter provides the truing up of Transmission Business Unit.

ARR and Tariff Formats
KSEBL Generation Business
INDEX

S.N o.	Form No.	Title of Form
1	2	3
1	Form G 1.1	Summary of Tariff Proposal
2	Form G 1.2	Aggregate Revenue Requirement
3	Form G 3.2	Non-Tariff Income
4	Form G 3.3	Capital Subsidies and Grants
5	Form G 4	O&M Expenses
6	Form G 4a	Employee Expenses
7	Form G 4b	Administrative & General Expenses
8	Form G 4c	Repair & Maintenance Expenses
9	Form G 6.1	Fixed Assets & Depreciation
10	Form G 6.2a	Calculation of Weighted Average Rate of Interest on Actual Loans
11	Form G 6.2b	Calculation of Interest on Normative Loan
12	Form G 6.2c	Interest on Bonds to meet Terminal liabilities
13	Form G 6.4	Consolidated report on additions to Fixed Assets during the year
14	Form G 6.9	Return on Equity/Return on Net Fixed Assets
15	Form G 6.11	Interest on Working Capital
16	Form G 6.13	Inflow Review (Water Year) - (MU)
17	Form G 8	Deviation Analysis
Other Information/Documents		
1	Form G P&L	Profit & Loss Account
2	Form G BS	Balance Sheet at the end of the year
3	Form G CF	Cash Flow for the year

Form G 1.1
Summary of Tariff Proposal
GENERATION BUSINESS UNIT
KERALA STATE ELECTRICITY BOARD LTD.

(Amount in Rs.Cr)

S.No.	Particulars	Ref.of Form No	2018-19				Remarks
			Approved in Tariff Order	Audited	Normative	Truing Up requirement	
1	2	3	4	5	6	7	8
1	Capacity Charge						
1.1	Annual Fixed Charges						
1.1.1	O & M Expenses	4	124.15	197.31	-	132.52	
1.1.2	Depreciation	6.1	130.19	132.36	-	137.60	
1.1.3	Interest on Loan Capital(excluding GPF and other interest)	6.2	71.15	67.26	-	69.88	
1.1.4	Interest on Bonds to meet Terminal Liabilities	6.2 ©	39.67	42.56	-	42.56	
1.1.5	Interest on Working Capital	6.11	6.08	8.19	-	6.21	
1.1.6	Other intersts			1.01			
1.1.6	Return on Equity	6.9	116.38	153.33	-	116.38	
1.1.7	Tax on ROE	6.12					
1.1.8	GPF&Other Interest		9.37	8.92		8.92	
1.1.9	interst on unfunded liability		10.26			10.26	
1.1.10	Prior Period Expenditure& other expense		0	-4.68		-4.68	
1.1.11	Exceptional items-flood			3.11			
1.1.12	One Time Expense CMDRF			0.00		1.79	
1.1.13	Fair value adjustments			-1.52			
1.1.11	Less: Non-Tariff income		-25.83	-24.48	-	-17.94	
1.1	Total Annual Fixed Charges		481.42	583.37	-	503.5	
2	Total- Energy (variable) charges		0.00	3.29	-	3.29	
3	Units sold to Discoms (MU)		7824.01	7593.12		7593.12	
4	Rate of Variable Charges		-	-			
4.1	Rate of Energy Charge from Primary Fuel (REC) _p	5.3	-	-			
4.2	Total-(2) Rate of Energy Charge ex-bus(REC) ^{3A,3B}	5.1		-			

Form G 1.2
Aggregate Revenue Requirement
KERALA STATE ELECTRICITY BOARD LTD.

(Amount in Rs.Cr)

S.No.	Particulars	Reference Form	2018-19				Remarks
			Approved in Tariff Order	Audited	Normative	Truing Up requirement	
1	2	3	4	5	6	7	8
A	Expenditure						
1	Variable Costs, including Fuel Cost	5.1	0	3.29		3.29	
2	Depreciation	6.1	130.19	132.36		137.60	
3	Interest on term Loan & Finance charges(excluding interest on GPF and other interest)	6.2	71.15	67.26		69.88	
4	Return on Equity	6.9	116.38	153.33		116.38	
5	Tax on ROE	6.12					
6	GPF & Other interest		9.37	9.93		8.92	
6	Interest on Working Capital	6.11	6.08	8.19		6.21	
7	O & M Expenses	4	124.15	197.31		132.52	
9	Any other item (Other debits & Prior period exp/(income))			-4.68		-4.68	
10	Prior Period Expenditure						
11	Master trust interest		39.67	42.56		42.56	
12	Interst on unfunded liability		10.26			10.26	
13	Exceptional items-flood			3.11			
14	Fair value adjustments			-1.52			
15	One Time Expense -CMDRF					1.79	
	Total- (A) Expenditure		507.25	611.14		524.73	
B	Receipts						
1	Revenue from Sale of Power (Tariff income)	3.1					
2	Non Tariff income	3.2	25.83	24.88		17.94	
3	Revenue Subsidies, Grants & Subvention from State Govt.						
	Total- (B)						
C	ARR (A-B(2)-B(3))						

Form G 3.2
Non-Tariff Income
KERALA STATE ELECTRICITY BOARD LTD.

Rs. Crore

Sr. No	Particulars	2018-19			Remarks
		Approved in Tariff Order	Audited	Truing Up requirement	
1	2	3	4	5 = 4 - 3	6
	Non-tariff income				
1	Interest on staff loans and advances		0.01	0.01	
2	Income from statutory investments		0.00	0.00	
3	Income from sale of ash/rejected coal			0.00	
4	Income from rent of land or buildings		0.68	0.68	
5	Income from sale of scrap		9.12	9.12	
6	Income from staff welfare activities			0.00	
7	Rental from staff quarters		0.05	0.05	
8	Excess found on physical verification		0.00	0.00	
9	Interest on investments, fixed and call deposits and bank balances		1.14	1.14	
10	Interest on advances to suppliers/contractors		1.18	1.18	
11	Income from hire charges from contractors and others		0.00	0.00	
12	Income from advertisements, etc.			0.00	
13	Miscellaneous receipts		5.75	5.75	
14	Interest on delayed or deferred payment on bills			0.00	
15	Rebate from fuel suppliers			0.00	
16	clawback of grant		6.54		
	Total non-tariff income	25.83	24.48	17.94	

Form G 3.3
Capital Subsidies and Grants
KERALA STATE ELECTRICITY BOARD LTD.

Rs. Crore

S. No.	Particulars	2018-19			Remarks
		Approved in Tariff Order	Audited	Truing Up requirement	
1	2	3	4	5 = 4 - 3	6
1	Subsidy towards cost of Capital Asset				
2	Grant towards cost of Capitals Assets		13.34		
3	Receipts from State Govt. under any scheme as grant/subsidy				
	Total		13.34		

Form G 4						
O&M Expenses						
Name of the Generating Business/Company		KERALA STATE ELECTRICITY BOARD LTD.				
Name of the Generating Station /Unit :		SBU(G)				(Amount in Rs.Cr)
S.No.	Particulars	2018-19				Remarks
		Approved in Tariff Order	Audited	Normative	Truing Up requirement	
1	2	3	4	5	6	7
1	Employee Expenses (as per norms)		128.37			
2	Annual Contribution for Terminal Liabilities based on actuarial valuation					
3	Repair & Maintenance Expenses (as per norms)		26.76			
4	Administrative & General Expenses (as per norms)		41.81			
5	O&M Expenses for new stations (as per Norms)					
6	Total O&M Expenses (as per Norms)	124.15	197.31		132.52	includes O&M expenditure for new stations
7	Total O&M Expenses (actuals)		197.31		132.52	

Form G 4(a)						
Employee Expenses						
KERALA STATE ELECTRICITY BOARD LTD.						
						Rs. Crore
S. No.	Particulars	Reference	2018-19			Remarks
			Approved in Tariff Order	Audited	Truing Up requirement	
1	2	3	4	5	6 = 5 - 4	7
1	Basic Salary			166.44		
2	Dearness Allowance (DA)			38.49		
3	House Rent Allowance			1.77		
4	Conveyance Allowance			0.00		
5	Leave Travel Allowance			0.03		
6	Earned Leave Encashment			11.95		
7	Other Allowances			4.23		
8	Medical Reimbursement			0.80		
9	Overtime Payment			0.24		
10	Bonus/Ex-Gratia Payments			0.46		
11	Staff welfare expenses			0.14		
12	Net Employee Costs			224.55		
13	Contribution of KSEB Ltd. towards National Pension Scheme			0.98		
14	Others			0.02		
15	Gross Employee Expenses			225.56		
16	Less: Expenses Capitalised			97.18		
17	Net Employee Expenses			128.37		

Form G 4(b)						
Administrative & General Expenses						
KERALA STATE ELECTRICITY BOARD LTD.						
						Rs. Crore
S. No.	Particulars	Reference	2018-19			Remarks
			Approved in Tariff Order	Audited	Truing Up requirement	
1	2	3	4	5	6 = 5 - 4	7
1	Rent Rates & Taxes			1.32		
2	Insurance			0.45		
3	Telephone & Postage, etc.			1.45		
4	Legal charges			0.55		
5	Audit Fees			-0.08		
6	Consultancy charges			0.04		
6	Other Professional charges			0.98		
7	Conveyance			4.04		
8	Vehicle Running Expenses Truck / Delivery Van			0.07		
9	Vehicle Hiring Expenses Truck / Delivery Van			0.07		
10	Electricity charges			0.11		
11	Water charges			0.05		
11	Entertainment			0.11		
12	Fees & subscription			0.34		
13	Printing & Stationery			0.34		
14	Advertisements, exhibition publicity			0.28		
15	Contribution/Donations			0.40		
16	Training expenses			0.97		
16	Miscellaneous Expenses			0.27		
17	SRPC expenses			0.15		
18	Sports and related activities			0.08		
19	Freight			1.42		
20	Purchase Related Advertisement Expenses			0.80		
21	Office Expenses			11.07		
21	License Fee and other related fee			4.01		
22	Books & periodicals			0.03		
23	Others			12.56		
24	Others- Other Purchase related Expenses			-0.17		
25	Others - Expenditure in connection with distribution of LED			0.11		
26	Gross A&G Expenses			41.80		
27	Less: Expenses Capitalised			0.00		
28	Net A&G Expenses			41.80		

G4(c)

Form G 4(c)						
Repair & Maintenance Expenses						
	KERALA STATE ELECTRICITY BOARD LTD.					
						Rs. Crore
S. No.	Particulars	Reference	2018-19			Remarks
			Approved in Tariff Order	Audited	Truing Up requirement	
1	2	3	4	5	6 = 5 - 4	13
1	Plant & Machinery			13.39		
2	Buildings			2.93		
3	Civil Works			6.06		
4	Hydraulic Works			3.72		
5	Lines & Cable Networks			0.05		
6	Vehicles			0.60		
7	Furniture & Fixtures			0.05		
8	Office Equipment			0.34		
9	Gross R&M Expenses			27.13		
10	Less: Expenses Capitalised			0.00		
11	Net R&M Expenses			27.13		

G12 / G36

Form G 6.1												
Fixed assets & provisons for depreciation												
KERALA STATE ELECTRICITY BOARD LTD.												
2018-19											(Amount in Rs.Cr)	
S. No.	Particular	Rate of depreciation %	Gross fixed assets				Provisions for depreciation				Net fixed assets at the beginning of the year	Net Fixed Asset at the end of the year
			At the beginning of the year	Additions during the year	Adjustment & deductions	At the end of the year	Cumulative upto the beginning of the year	Additions during the year	Adjustment during the year	Cumulative at the end of the year		
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Land & land rights	10.1	1495.39	0.46		1495.85					1495.39	1495.85
1A	Hydraulic works	10.3	1361.72	36.95	0.04	1398.71	661.41	43.50		704.90	700.31	693.80
2	Building & Civil works of Power plant	10.2 & 10.4	554.74	20.61	0.00	575.35	248.97	10.60		259.57	305.77	315.79
3	Plant & machinery including sub-station equipments	10.5	13414.27	43.78	0.04	13458.10	1823.19	76.38		1899.57	11591.08	11558.52
4	Communication equipment	10.5	3.48	0.00		3.48	3.41	0.01		3.42	0.07	0.06
5	Vehicles	10.7	9.57	0.52		10.09	6.13	0.62		6.75	3.44	3.34
6	Furniture & fixtures	10.8	4.69	0.30		4.99	3.29	0.20		3.49	1.39	1.49
7	Office Equipments	10.9	4.42	0.14		4.55	2.80	0.17		2.96	1.62	1.59
8	Capital spares			0.00						0.00	0.00	0.00
9	IT Equipments	10.9	6.41	0.22		6.63	5.34	0.39		5.73	1.07	0.89
11	Any other items (Lines, Cable Network et	10.6	6.88	0.60	0.00	7.48	4.85	0.37		5.22	2.03	2.26
	Total (1) to (11)		16861.56	103.57	0.09	16965.21	2759.39	132.36	0.00	2891.62	14102.17	14073.60

Form G 6.2(a)					
Calculation of Weighted Average Rate of Interest on Actual Loans					
KERALA STATE ELECTRICITY BOARD LTD.					
				(Amount in Rs.Cr)	
S.No.	Particulars (specify items)	2018-19			Remarks
		Approved in Tariff Order	Audited	Truing Up requirement	
1	2	3	4	5 = 4 - 3	12
1	Loan from LIC				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		0.49		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		0.49		
vi.	Net loan - Closing		0		
vii.	Average Net Loan		0.24		
viii.	Rate of Interest on Loan on annual basis		9		
ix.	Interest on loan		0.01		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
2	Loan from REC-Thottiyar Gene. Scheme				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		53.73		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		0		
vi.	Net loan - Closing		53.73		
vii.	Average Net Loan		53.73		
viii.	Rate of Interest on Loan on annual basis		11.4-11.65		
ix.	Interest on loan		6.18		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
3	Loan from REC on Various Schemes				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		1.78		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		1.78		
vi.	Net loan - Closing		0		
vii.	Average Net Loan		0.89		
viii.	Rate of Interest on Loan on annual basis		8.5-13		
ix.	Interest on loan		0		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
4	Special Loan Assistance from REC				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		330.4		
iv.	Add: Drawal(s) during the Year		85.3		
v.	Less: Repayment (s) of Loans during the year		55.56		
vi.	Net loan - Closing		360.14		
vii.	Average Net Loan		345.27		
viii.	Rate of Interest on Loan on annual basis		9		
ix.	Interest on loan		28.86		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
5	Loan from SOUTH INDIAN BANK-Barapole SHEP				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		85.5		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		4.5		
vi.	Net loan - Closing		81		
vii.	Average Net Loan		83.25		
viii.	Rate of Interest on Loan on annual basis		10		
ix.	Interest on loan		8.3		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
6	Dam Rehabilitation and Improvement Project (DRIP)				
i.	Gross Loan -Opening				

S.No.	Particulars (specify items)	2018-19			Remarks
		Approved in Tariff Order	Audited	Truing Up requirement	
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		49.21		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		0		
vi.	Net loan - Closing		49.21		
vii.	Average Net Loan		49.21		
viii.	Rate of Interest on Loan on annual basis				
ix.	Interest on loan		0		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
7	Loan from RIDF of NABARD Upper Kallar SHEP and Banasurasagar SPVP				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		4.06		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		0		
vi.	Net loan - Closing		4.06		
vii.	Average Net Loan		4.06		
viii.	Rate of Interest on Loan on annual basis		6		
ix.	Interest on loan		0.26		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
8	Loan from PFC-Pallivasal Generation Project				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		191.88		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		191.88		
vi.	Net loan - Closing		0		
vii.	Average Net Loan		95.94		
viii.	Rate of Interest on Loan on annual basis		11.15-11.75		
ix.	Interest on loan		9.95		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
9	Special Loan Assistance from PFC				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		337.52		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		53.24		
vi.	Net loan - Closing		284.28		
vii.	Average Net Loan		310.9		
viii.	Rate of Interest on Loan on annual basis		9		
ix.	Interest on loan		26.37		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
10	Loan from PFC GEL Kakkayam				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		20.58		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		0		
vi.	Net loan - Closing		20.58		
vii.	Average Net Loan		20.58		
viii.	Rate of Interest on Loan on annual basis		9.75-10.5		
ix.	Interest on loan		2		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
11	Loan from PFC GEL Perumthenaruvi				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		38.45		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		1.28		
vi.	Net loan - Closing		37.17		
vii.	Average Net Loan		37.81		
viii.	Rate of Interest on Loan on annual basis		9.75-10		
ix.	Interest on loan		3.84		
x.	<i>Loan repayment effective from (date to be indicated)</i>				

S.No.	Particulars (specify items)	2018-19			Remarks
		Approved in Tariff Order	Audited	Truing Up requirement	
12	Loan-REC				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		122.37		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		122.37		
vi.	Net loan - Closing		0		
vii.	Average Net Loan		61.19		
viii.	Rate of Interest on Loan on annual basis				
ix.	Interest on loan		2.54		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
13	State Bank of India (SBI)				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		183.56		
iv.	Add: Drawal(s) during the Year		0		
v.	Less: Repayment (s) of Loans during the year		183.56		
vi.	Net loan - Closing		0		
vii.	Average Net Loan		91.78		
viii.	Rate of Interest on Loan on annual basis				
ix.	Interest on loan		8.33		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
14	Vijaya Bank				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		0		
iv.	Add: Drawal(s) during the Year		213.24		
v.	Less: Repayment (s) of Loans during the year		127.95		
vi.	Net loan - Closing		85.3		
vii.	Average Net Loan		42.65		
viii.	Rate of Interest on Loan on annual basis		9		
ix.	Interest on loan		5.27		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
15	Canara Bank				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		0.00		
iv.	Add: Drawal(s) during the Year		21.32		
v.	Less: Repayment (s) of Loans during the year		21.32		
vi.	Net loan - Closing		0.00		
vii.	Average Net Loan		0.00		
viii.	Rate of Interest on Loan on annual basis				
ix.	Interest on loan		0.00		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
16	Bank of India (BOI)				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		48.93		
iv.	Add: Drawal(s) during the Year		0.01		
v.	Less: Repayment (s) of Loans during the year		48.95		
vi.	Net loan - Closing		0		
vii.	Average Net Loan		24.47		
viii.	Rate of Interest on Loan on annual basis				
ix.	Interest on loan		0.05		
x.	<i>Loan repayment effective from (date to be indicated)</i>				
17	Total Loan				
i.	Gross Loan -Opening				
ii.	Cumulative repayments of Loans upto previous year				
iii.	Net loan-Opening		1468.46		
iv.	Add: Drawal(s) during the Year		319.87		
v.	Less: Repayment (s) of Loans during the year		812.88		
vi.	Net loan - Closing		975.47		
vii.	Average Net Loan		1221.97		
viii.	Interest on Loan		101.97		
ix.	Weighted average Rate of Interest on Loans(%)		8.34%		

Form G 6.2(b)					
Calculation of Interest on Normative Loan					
KERALA STATE ELECTRICITY BOARD LTD.					
				(Amount in Rs.Cr)	
S.No.	Particulars (specify items)	2018-19			Remarks
		Approved in Tariff Order	Normative	Truing Up requirement	
1	2	3	4	5 = 4 - 3	12
1	Gross Normative loan - Opening				
2	Cumulative repayment of Normative Loan upto previous year				
3	Net Normative loan - Opening			1468.47	
4	Increase/Decrease due to ACE/de-capitalization during the Year			319.88	
5	Repayments of Normative Loan during the year			812.88	
6	Net Normative loan - Closing			975.47	
7	Average Normative Loan			1221.97	
8	Weighted average Rate of Interest of actual Loans			8.34%	
9	Interest on Normative loan			101.98	

Form G 6.2 (c) Interest on Bonds to meet Terminal Liabilities KERALA STATE ELECTRICITY BOARD LTD.
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(Amount in Rs.Cr)

S.No.	Particulars (specify items)	2017-18			Remarks
		Approved in Tariff Order	Normative	Truing Up requirement	
1	2	3	4	5 = 4 - 3	12
A	Bond Series 1				
1	Value of Bond				
2	Rate of Interest on Bond				
3	Interest on Bond				
B	Bond Series 2				
4	Value of Bond		7737	7736.80	
5	Rate of Interest on Bond		10%	10%	
6	Interest on Bond	49.93	42.56	42.56	
C	Bond Series 3				

Form G 6.4									
Consolidated report on additions to Fixed Assets during the year									
KERALA STATE ELECTRICITY BOARD LTD.									
Sr. No.	Asset Description	Asset Code	2018-19						
			(Actuals/audited)						
			Cost	Interest	Finance Charges	Pre-Operative expenses	Exchange fluctuations	Total	Date of commissioning
1	2	3	4	5	6	7	8	9	10
01.	Land & Land Rights	10.1	0.46					0.46	
02.	Buildings	10.2						0.00	
03.	Hydraulic Works	10.3	36.95					36.95	
04.	Other Civil Works	10.4	20.61					20.61	
05.	Plant & Machinery	10.5	43.78					43.78	
06.	Lines, Cable, Network etc.	10.6	0.60					0.60	
07.	Vehicles	10.7	0.52					0.52	
08.	Furniture & Fixtures	10.8	0.30					0.30	
09.	Office Equipments	10.9	0.36					0.36	
	TOTAL		103.57					103.57	

Form G 6.9							
Return on Equity/Return on Net Fixed Assets							
KERALA STATE ELECTRICITY BOARD LTD.							
(Amount in Rs.Cr)							
S.No.	Particulars	Reference	2018-19				Remarks
			Approved in Tariff Order	Audited	Normative	Truing Up requirement	
1	2	3	4	5	6	7	14
1	Equity at the beginning of the year						
2	Capitalisation						
3	Equity portion of capitalisation						
4	Equity at the end of the year						
	Return Computation						
5	Return on Equity at the beginning of the year	14%*(1)	116.38	153.33		116.38	
6	Return on Equity portion of capitalisation (on pro-rata basis)	14%*(3)/2					
7	Total Return on Equity	(5)+(6)	116.38	153.33		116.38	

Form G 6.11
Interest on Working Capital
KERALA STATE ELECTRICITY BOARD LTD.

(Amount in Rs.Cr)

S. No.	Particulars	2018-19				Remarks
		Approved in Tariff Order	Audited	Normative	Truing Up requirement	
1	2	3	4	5	6	13
1	Fuel cost (as per norms)		3.29			
2	Liquid fuel stock (as per norms)		41.63			
3	O & M expenses (as per norms)		196.94			
4	Maintenance Spares (as per norms)					
5	Receivables (as per norms)		56.90			
	Total Working Capital		298.77			
	Rate of Interest (as per norms)					
	Interest on Working Capital	6.08	8.19		6.21	

Form G 6.13**Inflow Review (Water Year) - (MU)****KERALA STATE ELECTRICITY BOARD LTD.**

Sr. No.	Year	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1996-97	614.19	1519.38	1020.47	834.30	735.43	302.99	210.41	127.06	77.63	86.20	83.70	115.96	5727.72
2	1997-98	150.10	1232.26	1049.01	658.18	739.67	922.50	476.93	185.60	113.00	72.74	77.05	108.60	5785.64
3	1998-99	678.70	1476.49	2357.60	1036.91	1243.80	694.70	457.53	157.27	118.00	94.11	96.03	421.89	8833.03
4	1999-00	1046.46	1416.49	973.60	441.59	1198.43	451.57	197.19	130.38	148.00	82.90	104.00	98.60	6289.21
5	2000-01	835.07	946.10	2199.13	789.14	502.59	227.58	198.97	153.05	80.74	47.50	162.21	127.20	6269.28
6	2001-02	1062.21	1765.90	1079.95	501.10	865.14	712.89	231.18	116.03	86.99	81.26	71.06	161.75	6735.46
7	2002-03	489.76	750.90	1255.86	322.19	585.44	391.14	134.13	78.51	63.04	63.21	52.63	81.22	4268.03
8	2003-04	304.74	748.03	916.01	376.53	983.43	325.98	160.00	91.92	78.81	39.28	58.56	426.20	4509.49
9	2004-05	1401.61	986.94	1436.86	510.74	716.44	464.39	208.73	155.27	70.42	72.18	109.30	99.29	6232.17
10	2005-06	569.38	2261.04	1252.98	1475.76	715.88	714.76	442.33	217.85	110.07	170.31	154.37	434.29	8519.02
11	2006-07	725.23	1596.83	1117.81	963.41	1009.56	907.56	253.21	164.44	90.93	111.60	123.39	113.14	7177.11
12	2007-08	1002.94	2797.48	1499.21	1700.29	1095.25	596.39	283.09	140.52	126.85	214.10	180.18	132.23	9768.53
13	2008-09	433.63	1144.88	1358.87	962.98	629.36	297.35	169.30	69.86	44.43	78.41	65.67	115.77	5370.52
14	2009-10	330.87	2023.70	779.47	1147.56	898.70	642.91	242.24	128.35	76.47	81.11	102.16	128.30	6581.83
15	2010-11	800.02	1407.08	1175.58	818.34	921.18	651.47	364.20	167.41	122.62	103.11	208.13	136.99	6876.12
16	2011-12	1236.19	1318.66	1654.19	1192.89	592.55	587.90	262.65	127.97	88.15	90.26	132.78	94.84	7379.01
17	2012-13	340.07	726.86	893.79	744.06	435.67	245.57	102.81	53.31	35.02	76.89	75.53	65.06	3794.63
18	2013-14	1642.94	2392.97	1895.44	1164.50	634.76	441.39	213.84	120.23	68.20	96.72	88.40	180.09	8939.47
19	2014-15	583.25	1678.10	1798.89	1034.02	843.43	540.03	273.58	143.59	79.23	113.48	241.44	255.40	7584.44
20	2015-16	1053.95	1106.83	829.56	614.38	619.18	605.99	420.66	148.70	92.36	86.87	90.83	107.89	5777.20
21	2016-17	582.87	1105.09	748.04	393.75	267.58	152.93	81.91	57.87	40.63	94.90	70.60	107.46	3703.63
22	2017-18	569.72	633.92	1323.47	1269.17	706.25	487.89	326.86	110.03	68.37	113.65	122.90	242.45	5974.68
23	2018-19G	1569.08	3146.60	4471.27	668.14	-	-	-	-	-	-	-	-	-
24	2018-19 N	1460.22	2461.90	492.56	455.14	936.87	338.19	161.65	87.77	69.70	78.24	85.62	113.40	6741.27

Form G 8
Deviation Analysis
KERALA STATE ELECTRICITY BOARD LTD.

(Amount in Rs.Cr)							
S. No.	Particulars	Approved	Actual	Deviation	Reason for Deviation	Controllable	Uncontrollable
1	2	3	4	5	6	7	8
A	Expenditure						
1	Variable Costs, including Fuel Cost	0	3.29	3.29			
2	Depreciation	130.19	132.36	2.17			
3	Interest on term Loan & Finance charges	80.52	77.19	-3.33			
4	Return on Equity	116.38	153.33	36.95			
5	Tax on ROE						
6	Interest on Working Capital	6.08	8.19	2.11			
7	O & M Expenses	124.15	197.31	73.16			
9	Any other item (to be specified)						
	Prior Period Expenditure	0	-4.68	-4.68			
	Master trust interest	39.67	42.56	2.89			
	Interst on unfunded liability	10.26	0	-10.26			
	Exceptional items-flood		3.11	3.11			
	Fair value adjustments		-1.52	-1.52			
	Total (A) Expenditure	507.25	611.14	103.89			
B	Receipts						
1	Revenue from Sale of Power (Tariff income)						
2	Non Tariff income	25.83	24.48	-1.35			
3	Revenue Subsidies, Grants & Subvention from State Govt.						

Form G P&L					
Profit & Loss Account					
KERALA STATE ELECTRICITY BOARD LTD.					
				(Amount in Rs.Cr)	
S.No.	Particulars	Ref	Previous Year		Remarks
			2017-18	2018-19	
1	2	3	4	5	6
	I.INCOME				
	a. Revenue from Sale of Power		680.62	586.66	
	b. Revenue Subsidies and Grants				
	c. Other Income		24.99	24.48	
	Total (a+b+c)		705.61	611.14	
	II. EXPENDITURE				
	a. Repairs and Maintenance.		29.30	27.13	
	b. Employee Cost		202.82	225.56	
	c. Administration and General Expenses		28.56	41.81	
	d.Depreciation		180.01	132.24	
	1) Amortisation of intangible assets			0.12	
	e.Interest and Finance charges		196.05	162.66	
	f. Subtotal (a+b+c+d+e)		636.74	589.52	
	g. Less Capitalised Expenses:				
	- Interest & Finance Charges		11.53	34.72	
	- Other Expenses		65.98	97.18	
	h. Other Debits		-2.09	-4.68	
	Change in fair valuation and other adjustments		-8.62	-1.52	
	i. Extra Ordinary Items			3.11	
	j.Fuel cost (Generation of Power)		2.08	3.29	
	Total Expenditure (f-g+h+i+j)		550.60	457.82	
	III. Profit /(Loss) before Tax (I-II)		155.01	152.30	
	IV. Provision for Income Tax				
	V.Net Prior period credits (Charges)		1.17	-1.03	
	VI. Surplus (Deficit)		153.84	153.33	
	VII. Net Assets at the beginning of the year (Less consumer's Contribution)				
	VIII. Rate of Return (VI / VII)		14	14	

Form G BS Balance Sheet at the end of the year KERALA STATE ELECTRICITY BOARD LTD.					
(Amount in Rs.Cr)					
S.No.	Particulars	Ref	Previous Year		Remarks
1	2	3	2017-18	2018-19	6
	Sources of Funds:				
	(A)Capital Funds:				
	Share Capital (Govt. equity)		831.27	831.27	
	Reserves & Surplus		516.40	600.69	
	Total (A)		1347.67	1431.96	
	(B) Loan from State Government				
	Loan from others :				
	-Secured		12301.46	10685.53	
	-Unsecured		398.22	85.30	
	Total (B)		12699.68	10770.83	
	(C) Contribution, grants & subsidies towards cost of capital assets		75.31	76.36	
	Provident Fund		116.28	121.55	
	Terminal Benefit Fund		304.78	406.09	
	Borrowings for working capital				
	Long term Provision		722.38	1385.19	
	Grand total of sources of funds (A+B+C)		15266.11	14191.98	
	*Application of Funds:				
	A) Fixed assets				
	a) Gross fixed assets		16861.56	16965.21	
	b) Less accumulated depreciation		2759.39	2891.62	
	c) Net Fixed assets((a)-(b))		14102.17	14073.59	
	d) Capital works in progress		1130.89	1247.39	
	e) Assets not in use				
	f) Deferred costs		105.48	108.40	
	g) Intangible assets			0.70	
	h) Investments		8.57	9.52	
	Long term Loans and Advances		98.46	44.70	
	Total (c) +(d)+(e)+(f)+(g)+(h)		15445.57	15484.30	
	B)Subsidy receivable from Government				
	Contribution receivable from State Government towards pension liability		213.64	190.86	
	C) Net Current Assets				
	(1) Current assets, loans and advances				
	a) Inventories*		54.60	41.63	
	b) Receivables against Sale of Power				
	c) Cash & bank balances		25.03	38.90	
	d) Loans and advances			9.93	
	e) Sundry receivables		82.55	56.90	
	Total (C)(1)		162.18	147.36	
	(2) Current liabilities & provisions				
	a) Borrowings for working capital		250.73	492.66	
	b) Payments due on Cap. liabilities				
	c) Other current liabilities		304.55	1137.88	
	Total (C)(2)		555.28	1630.54	
	Net Current Assets (C) [(C(1)) - (C(2))]		-393.10	-1483.18	
	Grand Total of Application of funds (A)+(B)+(C)		15266.11	14191.99	

Form G CF Cash Flow for the year KERALA STATE ELECTRICITY BOARD LTD.					
(Amount in Rs.Cr)					
S.No.	Particulars	Ref	Previous Year 2017-18	Previous Year 2018-19	Remarks
1	2	3	4	5	6
I	Net Funds from Operations				
1a	Net Funds from Earnings :				
	a) Profit before tax and before revenue subsidies and grants		153.84	153.33	
	Less : Income Tax Payment during the year				
	Total of (a)		153.84	153.33	
	b. Add: Debits to rev. account not requiring cash Flow:				
	l) a) Depreciation		180.01	132.23	
	b) Depreciation on ind As Adj.		224.50	0	
	ii) Amortisation of Deferred costs				
	iii) Amortisation of Intangible Assets				
	iv) Investment Allowance Reserve				
	v) Others, if any		581.06	662.81	
	Total of (b)		985.56	795.16	
	c. Less : Credits to revenue Account not involving cash receipts				
	l) Deprecation				
	ii) Subsidies receivables				
	iii) Revenue gap				
	Total of (c)		0.00	0	
	Net Funds from Earnings (a)+(b)-(c)		1139.40	948.49	
2	Contributions, Grants & Subsidies to cost of Capital Assets		75.31	1.05	
4	Proceeds from disposal of fixed Assets				
5	Total Funds from Operations (1+2+3)		1214.71	949.54	
6	Net Increase/(Decrease) in working Capital				
	(a) Increase/(Decrease) in Current Assets				
	l) Inventories		31.55	-12.97	
	ii) Receivables against sale of power				
	iii) Loans and Advances		-5.42	9.93	
	iv) Sundry receivables		-27.40	-25.65	
	v) Subsidy receivables				
	Total of (a)		-1.27	-28.69	
	(b) Increase/(Decrease) in Current liabilities				
	l) Borrowings for working Capital		-101.26	241.93	
	ii) Other current liabilities		-5.44	833.32	
	iii) Others (Increase in Reserve + payment due on cap.liab)		362.56	-69.04	
	Total of (b)		255.86	1006.22	
	Net Increase/(Decrease) in working Capital (a)- (b)		-257.13	-1034.90	
7	Net Funds from operations before subsidies and Grants (5-6)		1471.85	1984.44	
8	Receipts from revenue subsidies and Grants		187.36	22.77	
	Total Net Funds from operations including subsidies & Grants (7+8)		1659.21	2007.22	
II.	Net increase/ decrease in Capital liabilities				
	a). Fresh borrowings				
	l) State Loans				
	ii) Foreign currency Loans / Credits				
	iii) Other borrowings		12533.01	12533.01	
	Total of (a)		12533.01	12533.01	
	b) Repayments :				
	l) State Loans				
	ii) Foreign currency Loans / Credits				
	iii) Other borrowings		1628.89	14461.86	
	Total of (b)		1628.89	14461.86	
	Net Increase/(Decrease) in Capital liabilities (a) - (b)		10904.12	-1928.55	
III.	Increase/(Decrease) in equity Capital		-888.18	0	
IV.	Total Funds available for Capital Expenditure (I+II+III)		11675.15	78.37	
V	Funds utilised on Capital Expenditure				
	a) On projects		358.48	220.16	
	b) Advance to Suppliers & Contractors				
	c) Intangible Assets			0.82	
	d) Deferred Cost		3.19	2.92	
	e) Long Term Loans and Advances		8.19	-53.76	
	Total of V (a+b+c+d)		369.85	170.13	
VI	Net Increase/(Decrease) in Government contribution				
VII	Net Increase/(Decrease) in Terminal benefit fund		-11266.48	101.31	
VIII	Net Increase/(Decrease) in Provident fund		-19.69	5.27	
IX	Net Increase/(Decrease) in investments		0.42	0.95	
X	Net Increase /(Decrease) in cash / bank balance (IV - V- VI-IX)+ (VII+VIII)		18.71	13.86	
XI	Add opening cash & Bank balance		6.32	25.03	
XII	Closing Cash & Bank balance		25.03	38.89	

CHAPTER 3: TRUING UP OF ARR OF SBU – T FOR 2018-19

As per the second Transfer Scheme, SBU-T is entrusted with the construction of 33KV and above system of KSEBL. The voltage level wise capacity of Transmission system and number of substations and transmission lines within the State as on 31st March, 2019 is summarized below:

Table-T1: Transmission System statistics			
No	Item	Unit	Quantity (as on 31-3-2019)
1	400 kV Lines	Ckt-km	855.96*
2	220 kV Lines	Ckt-km	2855.98
3	110 kV Lines	Ckt-km	4662.28
4	66 kV Lines	Ckt-km	2134.44
5	33KV lines	Ckt-km	2006.54
6	400 kV Substations	Nos	5* + 1
7	220 kV Substations	Nos	22
8	110 kV Substations	Nos	157
9	66KV Substations	Nos	74
10	33 KV Substations	Nos	153
11	Total transmission capacity (MVA)	MVA	20820.90
	*PGCIL owned		

The SBU-T handle total energy sold to consumers and licensees within the state, open access power drawn by the consumers and the quantum energy sold outside the state. The ARR, ERC and Transfer cost to SBU-D are furnished as per Form T P&L and Form T1. Transfer price for SBU T as per accounts has been **Rs. 1068.69** Cr against approval of Rs. 874.60 Cr. Net ARR in line with the Tariff Regulation sought for true up in this petition amounts to Rs.858.64 Cr, which is less than Rs.15.96 Cr approved as detailed in table below. Item wise explanation is furnished thereafter.

TABLE – T2 : ARR OF TRANSMISSION BUSINESS UNIT for 2018-19 (Rs Cr)				
No	Particulars	Approved	Actual	Truing up requirement
1	Interest & Finance Charges	251.18	207.64	202.26
2	Depreciation	146.41	239.43	158.88
3	O&M Expenses	363.23	466.88	363.23
4	Provision for pay revision		23.48	23.48
5	Return on equity (14%)	119.99	189.30	119.99
6	Other debits and prior period income		-2.11	-2.11
7	Onetime expense-Flood restoration		0.44	0.00
8	-Do- CMDRF contribution			3.96
9	Interest on additional bond to Master Trust	22.64		22.64
10	Fair value adjustment		0.08	0
	Incentive on transmission availability			8.38
11	ARR	903.45	1125.14	900.71
12	Less: Non tariff Income	28.85	56.45	42.07
13	Net ARR(Cost Transferred to SBU-D)	874.60	1068.69	858.64

3.3 Interest and Finance charges:

3.3.1 An amount of Rs 251.18 Cr had been approved by the Hon Commission under this head. The actual expense incurred was Rs.207.64 Cr (net of capitalized interest Rs.23.35 Cr). Item wise explanation is furnished below.

3.3.2 Interest on Normative loan: While issuing orders on MYT petition, Hon'ble Commission approved Rs.1192.98 Cr as opening normative loan as at 01.04.2018 after considering provisional asset addition for the years 2016-17 and 2017-18 and contributions and grants. The interest was approved at 9.25%. Further, provisional approval of Rs.511.60 Cr was granted for the asset addition during 2018-19. Actual entitlement of normative loan as on 01.04.2018, GFA addition during 2018-19, repayment during the year and closing normative loan as on 31.03.2019, interest on normative loan along with SBU wise segregation are computed and explained in chapter 5. Based on the computation, an amount of Rs.90.89 Cr is claimed as interest on normative loan for the year 2018-19.

3.3.3 Cost incurred for capital works during 2018-19 by SBU-T is Rs.560.43 Cr, out of which Rs.365.43Cr is capitalized during the year 2018-19. The details are tabulated below.

Table-T3: Details of actual capitalization as per accounts			
Sl. no.	Brief description of the work	Cost incurred during the year	Capitalized
		(Rs Cr)	(Rs Cr)
1	Electrical Transmission schemes	389.85	296.55
2	Power System Development Fund related works	113.59	40.45
3	SCADA upgradation project	0.05	0.05
4	Load Despatch & Communication schemes	4.97	3.70
5	Expenditure due to natural calamity	0.41	0.02
6	CWIP-General	12.11	8.50
7	TRANSGRID 2.0 project	39.44	16.17
	Total	560.43	365.43

3.3.4 The details of the substations and lines commissioned during the year 2018-19 are enclosed as **Annexure- 1**; the summary of the same is given below.

Table-T4 : Summary of Capital Works executed in 2018-19		
No	Item	Quantity
1	220KV lines	Nil
2	110KV lines	119.15ckt-km
3	66KV lines	43ckt-km
4	33KV lines	60.90ckt-km
5	EHT Substations	4 numbers
6	33KV Substations	5 numbers
7	Capacity addition/enhancement	913.70MVA

3.3.5 Interest on GPF: Interest paid on GPF during the year amounts to Rs.162.17 Cr as detailed in chapter 5. The share of interest on GPF for SBU-T along with approved figured is furnished below.

Table-T5: Interest on GPF for SBU-T for 2018-19			
	Approved	Actual	True-up requirement
	Rs. Crore	Rs. Crore	Rs.Crore
SBU-T	20.67	16.57	16.57

3.3.6 Interest on Master Trust Bonds: Hon'ble Commission, by virtue of provision contained in Tariff Regulation, 2018 had approved Rs.87.56 Cr towards interest on Master Trust bonds. Actual expenses for SBU T have been Rs. 79.04 Cr as explained in Chapter 5. Thus Hon'ble Commission may please approve Rs.79.04 Cr against approval of Rs.87.56 Cr.

3.3.7 Interest on additional bond to Master Trust: In addition to the interest on bonds actually issued, an additional amount of Rs.200 Cr (Rs. 22.64 Cr for SBU T) has been provisionally approved towards unfunded liability. Hon'ble Commission may kindly true up the provisional amount of Rs.22.64 Cr as detailed in chapter 5.

3.3.8 Interest on Working Capital: As per the Regulation 32(2), interest on working capital is allowed normatively at a rate equal to two per cent higher than the base rate as on the first day of the financial year in which petition is filed. Hon'ble Commission approved the Interest on Working capital at a rate of 10.15% on the working capital of Rs.154.42 Cr and the interest on working capital approved for SBU-T for 2018-19 is Rs. 15.67 Cr. A comparison of the Interest on Working Capital approved by Hon'ble Commission, actual and the true-up requirement calculated on normative basis is given below, which may kindly be approved:

Table-T6: Interest on working capital (Rs Cr)			
	Approved	Actual	True up requirement
O&M Expenses	363.23		386.71
GFA Plants and Equipment	5,126.26		5178.65
Transmission charges	874.60		
O&M Expenses for one month	30.27		32.23
1% of Historical cost of plants & Equipment	51.26		51.79
Receivables (Transmission charges for one month)	72.88		71.30
Total requirement of working capital	154.42		155.32
Rate of interest	10.15%		10.15%
Interest on Working Capital	15.67	15.22	15.76

3.3.9 Summary of Interest & Finance charges: A comparison of the approved and actual values of various items of Interest & Finance charges are given below:

Table- T7 : Summary of Interest and Finance charges (Rs Cr)				
No	Particulars	Approved	Actual	True-up requirement
1	Interest on Outstanding Capital Liabilities	127.28	96.32	90.89
2	Interest on GPF	20.67	16.57	16.57
3	Interest on Master Trust Bonds	87.56	79.04	79.04
4	Interest on Working capital	15.67	15.22	15.76
5	Total	251.18	207.64	202.26

- 3.4 O&M Expenses:** As per the provisions of Regulation 58, the O&M expenses applicable for the SBU-T is based on the number of bays and transmission line length in ckt km for the previous year (2017-18). The no. bays and circuit kilometres and the O&M cost based on the norms approved for 2018-19 and actual are as shown below:

Table-T8: Approved and actual Cost Drivers of Transmission Business for 2017-18		
Item	Approved	Actual
Substation Bays*	2564	2564
Tran Lines***	9529.589	9529.589
* Excluding 33 kV bays *** (in CktKms)		

- 3.4.1 Hon'ble Commission may kindly note that the pay revision is due from July/ August 2018 and a sum of Rs.176 Cr has been provided on this count as detailed in chapter 5. Therefore it is humbly requested that Rs. 23.48 Cr may be approved over and above normative O&M expenses of SBU t as detailed below:

Table-T9 : Components of O&M (Rs Cr)					
No	Particulars	Approved	Actual	True-up requirement	Remarks
1	Employee Cost		336.40		See Form T2(a)
2	A&G Expenses		108.37		See Form T2 (b)
3	R&M Expenses		43.66		See Form T2 (c)
4	Sub Total (O&M Expenses)	363.23	490.36	363.23	See Form T2 (a)
5	Pay revision provision			23.48	
6	Total	363.23	490.81	386.71	

- 3.4.2 It is respectfully submitted that the O&M expenses as per CERC norms (Regulation 29(4) (a) of CERC (T&C of Tariff) Regulations, 2014) for the above drivers are Rs. 37.80 Lakh per bay (weighted average for 220 Kv and 132 Kv and below) and 0.346 for (Double Circuit single conductor) lines. Thus the permissible O&M cost as per CERC Regulations would be (2564 x Rs. 37.80 Lakhs + 9529.589 km x 0.346 =) Rs. 1002.16 Cr. Therefore, it may kindly be noted that the actual O&M expense of the petitioner (Rs.490.81 Cr) is less than half the allowable cost as per CERC norms.

3.5 Depreciation:

- 3.5.1 Hon'ble Commission approved depreciation for the year 2018-19 on the provisionally approved asset additions from 2016-17 and 2017-18. Further, asset addition for 2018-19 was provisionally approved at Rs. 511.60 Cr. Based on Tariff Regulations; the depreciation for the Transmission assets for the year 2018-19 has been approved at **Rs 146.41 Cr**. Hon Commission may kindly note that the depreciation as per audited accounts was **Rs.239.43** Cr as detailed in **Form T3**. The difference in depreciation is because of the asset addition in 2014-15, 2015-16, 2016-17, 2017-18, impact of fully depreciated assets and Ind AS changes as detailed in Chapter 5.
- 3.5.2 Depreciation eligible as per MYT Regulation for the control period 2018-22 has been worked out at Rs. 158.88 Cr as detailed in chapter 5. Comparison of approval, actual and true up requirement is furnished below:

Table-T10: Depreciation (Rs Cr)				
No	Particulars	Approved	Actual	True-up requirement
1	Depreciation	146.41	239.31	158.88

- 3.6 **Return on Equity:** Hon'ble Commission approved Rs.119.99 Cr towards RoE of SBU-T. Same amount is sought for true up in this petition.

Table-T11: Return on Equity (Rs Cr)				
No	Particulars	Approved	Actual	True-up requirement
1	Return on Equity	119.99	189.30	119.99

- 3.7 **Other items and Prior period expenditure:** Net prior period expenses and other expenses amounted to a gain of Rs.2.11 Cr for the year 2018-19, as detailed in chapter 5, which may kindly be approved.

3.8 **Onetime expenses:**

Share of SBU T's contribution to CMDRF as detailed in chapter 5 amounts to Rs.3.96 Cr. Hon'ble Commission may kindly true up the claim.

- 3.9 **Transmission Availability:** The transmission system of KSEBL could achieve an availability of 98.92%. The certificate of SLDC is enclosed as **Annexure-2**. It is respectfully submitted that as per Regulation 56, target availability is 98% and the Transmission licensee is entitled to an incentive on achieving annual availability above the target availability, in line with the following formula:-

$$\text{Incentive} = \frac{\text{Aggregate Revenue Requirements} \times [\text{Annual availability achieved} - \text{Target Availability}]}{\text{Target Availability}}$$

- 3.9.1 The Regulation further stipulates that the computation of incentive shall be undertaken during truing up for each financial year. Accordingly, SBU-T prays approval of Rs. 8.38 Cr as calculated below.

Table –T12 : Incentive on transmission availability (Rs Cr)	
ARR excluding incentive (Rs.Cr.)	892.59
Annual availability achieved	98.92%
Target availability	98%
Incentive	8.38

- 3.9.2 It is humbly requested that the above incentive amounting to **Rs. 8.38 Cr** may kindly be approved as incentive for SBU-T.

- 3.10 **Non-Tariff Income:** Hon'ble Commission approved Rs. 28.85 Cr under this head against which Rs.56.45 Cr has been accounted as per books. The non tariff income sought for true up amounts to Rs.42.07 Cr as detailed under chapter 5, which may kindly be approved.

3.11 **Net ARR (Transfer Cost):** ARR for Transmission Business Unit for the year 2018-19 had been Rs. 900.71Cr and total income earned was Rs. 42.07 Cr. Therefore, Net ARR of SBU-T has been Rs. 858.64 Cr. This cost has been considered as the Cost of intra-state Transmission in the ARR of SBU-D.

3.12 **Transmission loss:** The total energy delivered to the transmission system was 24865.25 MU in FY 2018-19. The losses in the transmission system at different voltage levels are given in the Table below. The actual peak demand met during the year 2018-19 was 4316MW. The losses are segregated based on Load flow studies done up to 33 kV level using computer simulation model in “Mi-Power” Software The methodology adopted for study is similar to that suggested by CEA and Adopted by Forum of regulators (FOR) for loss assessment. Balance losses are attributable to the HT and LT Network. Thus the actual energy losses in the transmission system were 929.57 MU. The transmission loss approved by Hon’ble Commission for the year 2018-19 and the actual are submitted below.

Table-T13: Transmission Losses					
No	Voltage Level (kV)	Approved (%)	Losses MU	Losses up to the voltage level MU	Actual Losses up to voltage level (%)
1	400		55.83	55.83	0.22
2	220		404.129	459.959	1.85
3	110		375.354	835.313	3.36
4	66		94.26	929.573	3.74
5	Transmission loss (%)	4.05			3.74

3.13 Auxiliary consumption of substations of Transmission SBU:

Hon’ble Commission had approved an auxiliary consumption of **15.58 MU** for the year 2018-19. The actual auxiliary consumption was **16.11 MU** as tabulated below. The auxiliary consumption in substations comprise of energy required for lighting, air compressors, battery charging, switch gears operating mechanism etc.

Table-T14: Total Auxiliary consumption of Substations for 2018-19			
Month	Auxiliary consumption in KWH		
	North	South	Total
April	0.72	0.72	1.44
May	0.65	0.68	1.33
June	0.58	0.64	1.21
July	0.56	0.65	1.21
August	0.57	0.66	1.23
September	0.62	0.67	1.29
October	0.62	0.68	1.30
November	0.65	0.71	1.36
December	0.72	0.72	1.44
January	0.72	0.69	1.41
February	0.64	0.68	1.32
March	0.78	0.77	1.55
Total	7.82	8.28	16.11

This energy consumption is actually measured by meters in the respective substations. The energy transferred to SBU-D including sales at EHT level was 23919.57MU after deducting transmission losses and auxiliary consumption.

- 3.14 The formats for Truing up of Transmission Business Units as per the Tariff Regulation 2018 are provided hereunder.
-

Annexure-1

Annexure-1: Substations and Lines Completed during 2018-19							
Substations commissioned during 2018-19							
Sl. No	Name of Substation	Voltage level (kV)	New Capacity (MVA)	Previous Capacity (MVA)	New / Upgn.	District/LA Constituency	Date of Commng.
1	Perumthenaruvi	33	5		New	Pathanamthitta	2.06.2018
2	Thripunithura	66	27		New	Thripunithura	7.12.2018
3	Mundakkayam	110	72.5	20	Upgradation	Poonjar	9.11.2018
4	Blangad	33	10		New	Thrissur/Guruvayoor	21.1.2019
5	Kumily	33	10		New	Idukki/Peerumedu	13.2.2019
6	Pandalam	33	10		New	Adoor	28.03.2019
7	Neyyattinkara	110	32.5	30	Upgn	Thiruvananthapuram	31.3.2019
8	Nedumpoil	110	20	22.5	upgn	Kannur	31.3.2019
9	Rajapuram	33	10		New	Kannur	31.3.2019
	Lines commissioned during 2018-19						
Sl. No	Name of Line		Voltage level (kV)	Length (ckt. km)	New / Upgn.	District	Date of Commng.
1	Malaparamba - Ramapuram		110	11.6	DC to MC	Malappuram	28.04.2018
2	Nilambur-Edakkara 2nd Circuit		66	13.5	New	Malappuram	16.8.2018 Test charged
3	Chavakkad (Punna) - Blangad		33	6.8(OH+UG)	New		21.01.2019
4	LILO form Vytilla - Puthencruz No 1 to Thripunithura UG 400 mm		66	3	New	Ernakulam	7.12.2018
5	Vandiperiyar - Kumily		33	17	New	Idukki	11.2.2019
6	LILO from SL puram - Chellanam		110	0.25	New	Alappuzha	
7	Kanjirappally - Mundakkayam		110	15	upgradation	Kottayam	8.11.2018
8	Azhikode to Coast Guard DC		33	13.74	New	Kannur	8.10.2018
9	Malappuram - Tirur 2nd Circuit		110	26	SC to DC	Malappuram	26.12.2018
10	Kothamangalam - Bhoothathamkettu 66 kV DC		66	26.5	New	Ernakulam	31.1.2019
11	Parassala- Neyyattinkara		110	22	upgradation	Thiruvananthapuram	
12	Edappon-Pandalam SC line		33	8	New		
13	Kuthuparamba-Nedumpoil DC line (upgn.)		110	38	Upgdn	Kannur	29.3.2019
14	Belur-Rajapuram SC line		33	15.36	New	Kannur	30.3.2019
15	Gandhiroad - Chevayur 110 kV SC UG		110	6.3	New	Kozhikode	30.3.2019
	Capacity addition						
Sl. No	Name of Substation		Voltage level (kV)	Capacity added (MVA)	New/Upgn./ Cap. Addn./Cap.enhct.	District	Date of Commng.
1	220kV Substation, Punnapra		220/110	200	Cap.Addn	Alappuzha	21.06.2018
2	33 kV Substation, Kadakkal		33/11	5	Cap.Addn	TVPM	21.11.2018
3	110 kV Substation, Nedumangad		110/33	9	Cap.enhct.	TVPM	25.9.2018
4	110 kV Substation, Medical College		110/11	7.5	Cap.enhct.	TVPM	4.10.2018
5	110 kV Substation, Nedumangad		110/33	9	Cap.enhct.	TVPM	27.02.2019
6	110 kV Substation, Veli		110/11	2	Cap.enhct.	TVPM	13.07.2018
7	110 kV Substation, Kazhakottom		110/11	10	Cap.enhct.	TVPM	13.07.2018
8	110 kV Substation, Adimali		110/11	10	Cap.Addn	Idukki	19.08.2018

9	66 kV Substation, Vandiperiyar	66/33	16	Cap.Addn	Idukki	4.02.2019
10	110 kV Substation, Perumbavoor	110/11	7.5	Cap.enhct.	Ernakulam	2.05.2018
11	33 kV Substation, Kuruppampady	33/11	3	Cap.enhct.	Ernakulam	4..9.2018
12	33 kV Substation, Kuruppampady	33/11	3	Cap.enhct.	Ernakulam	13.12.2018
13	110 kV Substation, Aroor	110/11	10	Cap.enhct.	Alappuzha	25.06.2018
14	66 kV Substation, Vandiperiyar	66/11	2	Cap.enhct.	Alappuzha	24.01.2019
15	33 kV Substation, Mannar	33/11	5	Cap.Addn	Alappuzha	20.12.2018
16	33 kV Substation, Vallikunnam	33/11	5	Cap.Addn	Alappuzha	10.12.2018
17	220 kV Substation, Poovanthuruthu	66/11	16	Cap.Addn	Kottayam	24.01.2019
18	400 kV Substation, Madakkathara	220/110	200	Cap.Addn	Thrissur	17.01.2019
19	110 kV Substation, Irinjalakkuda	110/11	10	Cap.enhct.	Thrissur	12.12.2018
20	110 kV Substation, Valappad	110/11	10	Cap.Addn	Thrissur	14.06.2018
21	110 kV Substation, Arangottukara	110/11	12.5	Cap.Addn	Thrissur	2/2019*
22	33 kV Substation, Konganoor	33/11	6	Cap.enhct.	Thrissur	5/2018*
23	220 kV Substation, Shornur	220/110	100	Cap.enhct.	Palakkad	7.11.2018
24	110 kV Substation, Mundayad	110/33	16	Cap.Addn	Kannur	15.11.2018
25	110 kV Substation, Mulleria	110/33	16	Cap.Addn	Kasargod	18.12.2018
26	33 kV Substation, Perambra	33/11	5	Cap.Addn	Kozhikode	7.02.2019
27	220 kV Substation, Kaniyambetta	66/11	3.7	Cap.enhct.	Wayanad	2.06.2018
28	110 kV Substation, Kizhissery	110/11	7.5	Cap.enhct.	Malappuram	30.01.2019
29	110 kV Substation, Manjeri	110/11	10	Cap.enhct.	Malappuram	10.7.2018

	Form T 1				
	Summary of Aggregate Revenue Requirement (Rs. Crore)				
	SBU-T	KERALA STATE ELECTRICITY BOARD LTD.			
S. No.	Particulars	Reference Form No.	Previous Year		
			2018-19		
			Approved in Tariff Order	Audited	Truing Up requirement
1	Operation & Maintenance Expenses	Form T 2	363.23	490.36	386.71
2	Interest and finance charges on long-term loans	Form T4(b)	127.28	96.32	90.89
3	Interest on Bonds to meet Terminal Liabilities	Form T4 (c)	87.56	79.04	79.04
4	Additional Interest on Master Trust		22.64		22.64
5	Depreciation	T3	146.41	239.43	158.88
6	Interest on Working Capital and deposits from Users	Form T 5	15.67	15.22	15.76
7	Interest on GPF		20.67	16.57	16.57
8	Other debits and prior period items			-2.11	-2.11
9	Onetime expense-Flood restoration			0.44	0.00
10	-Do- CMDRF contribution				3.96
11	Fair value adjustment			0.08	
12	Return on Equity	Form T 7	119.99	189.30	119.99
13	Incentive				8.38
14	Aggregate Revenue Requirement (9+10+11)		903.45	1125.14	900.71
15	Less: Non Tariff Income	Form T 10	28.85	56.45	42.07
16	Aggregate Revenue Requirement from Transmission Tariff		874.60	1068.69	858.64

	Form T 2				
	Operation and Maintenance Expenses				
	SBU-T	KERALA STATE ELECTRICITY BOARD LTD.			
S. No.	Particular	Previous Year			
		2017-18			
		Approved in Tariff Order	Audited	Normative	Truing Up requirement
1	2	4	5	6	7
1	Bay Basis				
a	Op. Balance of no. of Bays	2488.00	2488.00		2488.00
b	Addition of no. of Bays during year		76.00		76.00
c	Deletion of no. of Bay during year				
d	Cl. Balance of no. of Bays	2564	2564.00		2564.00
e	Average no. of Bays during Year				
f	Applicable O&M cost Norm for Bay :- Rs _____ Lakh/Bay				
A	O&M Expense per Bay, Rs L				
2	ckt-km Basis				
a	Op. Balance of ckt-km	9451	9451.00		0.00
b	Addition of ckt-km during year		78.59		78.59
c	Deletion of ckt-km during year				
d	Cl. Balance of ckt-km	9529.589	9529.589		9529.589
e	Average ckt-km during Year				
f	Applicable O&M cost Norm - Rs _____ Lakh / ckt-km				
B	O&M Expense Rs. Lakh				363.23
	Pay revision expenses				23.48
3	Total O&M Expenses (as per norms) (A+B)				
4	Total O&M Expenses (actual)	T 2(a), T 2(b), T 2(c)	490.36		386.71

	Form T 2(a)			
	Employee Expenses (Rs Cr)			
	SBU-T			
S. No.	Particulars	Previous Year – 2018-19		
		Approved in Tariff Order	Audited	Truing Up requirement
1	Basic Salary		300.38	
2	Dearness Allowance (DA)		69.23	
3	House Rent Allowance		5.37	
4	Conveyance Allowance		0.00	
5	Leave Travel Allowance		0.02	
6	Earned Leave Encashment		21.02	
7	Other Allowances		1.93	
8	Medical Reimbursement		1.77	
9	Overtime Payment		0.00	
10	Bonus/Ex-Gratia Payments		0.96	
11	Interim Relief / Wage Revision		0.00	
12	Staff welfare expenses		0.17	
13	VRS Expenses/Retrenchment Compensation		0.00	
14	Commission to Directors		0.00	
15	Training Expenses		0.00	
16	Payment under Workmen's Compensation Act		0.00	
17	Net Employee Costs		400.84	
18	Terminal Benefits			
18.1	Provident Fund Contribution			
18.2	Provision for PF Fund			
18.3	Pension Payments			
18.4	Gratuity Payment			
18.5	Annual Contribution for Terminal Liabilities based on actuarial valuation			
19	Contribution of KSEB Ltd towards National Pension Scheme		1.83	
20	Others		0.04	
21	Gross Employee Expenses		402.71	
22	Less: Expenses Capitalised		64.49	
23	Net Employee Expenses		338.22	

Form T 2(b) (Rs Cr)				
Administrative & General Expenses				
SBU-T				
S. No.	Particulars	Previous Year 2018-19		
		Approved in Tariff Order	Audited	Truing Up requirement
1	2	4	5	6 = 5 - 4
1	Rent Rates & Taxes		0.66	
2	Insurance		0.36	
3	Telephone & Postage, etc.		2.59	
4	Legal charges		0.56	
5	Audit Fees		-0.03	
6	Consultancy charges		0.02	
7	Other Professional charges		0.85	
8	Conveyance		6.89	
9	Vehicle Running Expenses Truck / Delivery Van		0.19	
10	Vehicle Hiring Expenses Truck / Delivery Van		0.27	
11	Electricity charges		0.06	
12	Water charges		0.16	
13	Entertainment		0.22	
14	Fees & subscription		0.51	
15	Printing & Stationery		0.99	
16	Advertisements, exhibition publicity		0.28	
17	Contribution/Donations		0.42	
18	Training expenses		0.07	
19	Miscellaneous Expenses		0.58	
20	DSM activities		0.00	
21	SRPC expenses		0.22	
22	Sports and related activities		0.08	
23	Freight		0.90	
24	Purchase Related Advertisement Expenses		0.79	
25	Bank Charges		0.00	
26	Office Expenses		73.40	
27	License Fee and other related fee		3.96	
28	Cost of services procured		0.00	
29	Outsourcing of metering and billing system		0.00	
30	V-sat, Internet and related charges		0.03	
31	Security arrangements		0.00	
32	Books & periodicals		0.01	
33	Computer Stationery		0.00	
34	Others		12.31	
	Others- Other Purchase related Expenses		1.02	
	Others - Expenditure in connection with distribution of LED		0.11	
35	Gross A&G Expenses		108.48	
36	Ele. Duty u/s 3(I), KED Act		0.00	
37	Less: Expenses Capitalised			
38	Net A&G Expenses		108.48	

	Form T 2(c) (Rs Cr)				
	Repair & Maintenance Expenses				
	SBU-T				
S. No.	Particulars	Previous Year -2018-19			Truing Up requirement
		Approved in Tariff Order	Audited	Flood	
1	2	4	5		6 = 5 - 4
1	Plant & Machinery		27.41	0.06	
2	Buildings		2.47	0.00	
3	Civil Works		4.86	0.10	
4	Hydraulic Works		0.07	0.01	
5	Lines & Cable Networks		7.60	0.14	
6	Vehicles		0.82		
7	Furniture & Fixtures		0.11		
8	Office Equipment		0.44		
9	Gross R&M Expenses		43.66	0.44	
10	Less: Expenses Capitalised				
11	Net R&M Expenses		43.66	0.44	

T3 (Fixed Asset and Depreciation)											
	SBU-T									Rs. Crore	
S.No.	Assets Group (as per notification in respect of depreciation)	Gross fixed assets				Provisions for depreciation				Net fixed assets at the beginning of the year	Net fixed assets at the end of the year
		At the beginning of the year	Additions during the year	Decom. Liability & other Adjustments	At the end of the year	Cumulative up to the beginning of year	Additions during the year	Adjustment during the year	Cumulative at the end of year		
1	2	4	5	6	7	8	9	10	11	12	13
1	Land & land rights	268.75	6.76		275.51				0.00	268.75	275.51
2	Other Civil works	426.25	21.14	0.03	447.43	129.23	15.81		145.03	297.03	302.39
3	EHV		0.00						0.00	0.00	0.00
a)	Transmission lines	1125.46	89.01	0.09	1214.55	646.78	75.90		722.68	478.67	491.87
b)	Sub-station equipments	982.39	84.92	0.08	1067.39	472.01	48.50		520.51	510.38	546.88
i)	Transformers	879.08	43.30	0.04	922.41	482.89	34.84		517.74	396.18	404.68
ii)	Switchgears, Control gear & Protection	48.16	12.37	0.01	60.55	29.56	0.99		30.55	18.61	30.00
iii)	Batteries	24.21	1.63	0.00	25.84	21.41	0.97		22.38	2.80	3.46
iv)	Others	160.98	18.41	0.02	179.41	165.39	11.08		176.47	-4.41	2.94
4	HV & LT		0.00						0.00	0.00	0.00
a)	Transmission lines	741.74	48.91	0.05	790.70	439.44	17.85		457.28	302.31	333.42
b)	Sub-station equipments		0.00						0.00	0.00	0.00
i)	Transformers	68.65	4.98	0.00	73.64	103.55	5.77		109.32	-34.90	-35.68
ii)	Switchgears, Control gear & Protection		0.00						0.00	0.00	0.00
iii)	Batteries		0.00						0.00	0.00	0.00
iv)	Others		0.00						0.00	0.00	0.00
5	Communication equipment	69.39	7.64	0.01	77.04	50.67	4.23		54.90	18.72	22.14
6	Meters	12.62	0.24	0.00	12.85	11.50	0.04		11.54	1.12	1.31
7	Vehicles	6.99	0.58		7.57	5.38	0.28		5.66	1.61	1.91
8	Furniture & fixtures	5.65	0.82		6.47	4.28	0.25		4.52	1.37	1.94
9	Office Equipments	4.31	0.44		4.75	2.33	0.22		2.55	1.98	2.20
10	Assets of Partnership projects etc.		0.00						0.00	0.00	0.00
11	Capital spares of		0.00						0.00	0.00	0.00
a)	EHV transmission		0.00						0.00	0.00	0.00
b)	HV & LT transmission		0.00						0.00	0.00	0.00
12	Assets taken over & pending final valuation		0.00						0.00	0.00	0.00
13	IT equipments	7.59	0.95		8.54	6.41	0.35		6.76	1.18	1.77
	Buildings	336.23	22.74		358.98	146.49	12.23		158.72	189.74	200.26
14	Any other items (Hydraulic Works)	10.20	0.26	0.00	10.46	5.29	10.01		15.30	4.91	-4.84
15	Gross Asset (Total (1) to (14))	5178.65	365.09	0.34	5544.08	2722.61	239.43	0.00	2961.91	2456.04	2582.17
16	Less: Consumer contribution	55.76	29.69	6.38	79.08					55.76	79.08
17	Less: Government	85.51	260.00	29.60	315.90					85.51	315.90

	grants										
18	Less: Deposit Works				0.00					0.00	0.00
19	Less: Capital Subsidies	46.18	0.00	3.26	42.92					46.18	42.92
		1.29	0.00	0.14	1.16					1.29	1.16
20	Net Asset considered for depreciation (15-16-17-18-19)	4989.91	289.69	39.38	5105.03					2267.30	2143.11

Form T 4(a)				
Calculation of Weighted Average Rate of Interest on Actual Loans				
SBU-T				Rs Cr
S.No.	Particulars (specify items)	2018-19		
		Approved in Tariff Order	Audited	Truing Up requirement
1	2	4	5	6 = 5 - 4
1	Loan from L I C			
i.	Gross Loan -Opening			
ii.	Cumulative repayments of Loans upto previous year			
iii.	Net loan-Opening		0.58	
iv.	Add: Drawal(s) during the Year			
v.	Less: Repayment (s) of Loans during the year		0.58	
vi	Net loan - Closing		0.00	
	CFL			
	Ind Adj			
	Net loan - Closing		0.00	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		9%	
ix	Interest on loan		0.02	
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	Loan from REC-TRAN.Kattakkada -Pothencode Scheme			
i.	Gross Loan -Opening		96.12	
ii.	Cumulative repayments of Loans upto previous year		18.53	
iii.	Net loan-Opening		114.65	
iv.	Add: Drawal(s) during the Year		0.00	
v.	Less: Repayment (s) of Loans during the year		14.33	
vi	Net loan - Closing		100.32	
	CFL		14.33	
	Ind Adj		3.79	
	Net loan - Closing		82.20	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		0.12	
ix	Interest on loan		12.30	
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	Loan from REC-TRAN-Group I			
i.	Gross Loan -Opening		59.52	
ii.	Cumulative repayments of Loans upto previous year		11.00	
iii.	Net loan-Opening		70.51	
iv.	Add: Drawal(s) during the Year		5.57	
v.	Less: Repayment (s) of Loans during the year		6.44	
vi	Net loan - Closing		69.65	
	CFL		7.51	
	Ind Adj		4.74	
	Net loan - Closing		57.40	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		10-10.5%	
ix	Interest on loan		6.97	
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	Loan from REC for various schemes			
i.	Gross Loan -Opening		-0.14	
ii.	Cumulative repayments of Loans upto previous year		2.25	
iii.	Net loan-Opening		2.12	
iv.	Add: Drawal(s) during the Year		0.00	

v.	Less: Repayment (s) of Loans during the year		2.12	
vi	Net loan - Closing		0.00	
	CFL		0.00	
	Ind Adj		0.00	
	Net loan - Closing		0.00	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		8.5-13	
ix	Interest on loan			
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	Special Loan Assistance from REC			
i.	Gross Loan -Opening		379.11	
ii.	Cumulative repayments of Loans upto previous year		14.58	
iii.	Net loan-Opening		393.69	
iv.	Add: Drawal(s) during the Year		119.89	
v.	Less: Repayment (s) of Loans during the year		7.38	
vi	Net loan - Closing		506.21	
	CFL		38.94	
	Ind Adj		0.00	
	Net loan - Closing		467.27	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		0.09	
ix	Interest on loan		40.57	
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	KIIFB for Trans Grid 2.0 Projects			
i.	Gross Loan -Opening			
ii.	Cumulative repayments of Loans upto previous year			
iii.	Net loan-Opening			
iv.	Add: Drawal(s) during the Year		41.07	
v.	Less: Repayment (s) of Loans during the year			
vi	Net loan - Closing		41.07	
	CFL			
	Ind Adj			
	Net loan - Closing		41.07	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis			
ix	Interest on loan			
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	Special Loan Assistance from PFC			
i.	Gross Loan -Opening		387.28	
ii.	Cumulative repayments of Loans upto previous year		14.90	
iii.	Net loan-Opening		402.18	
iv.	Add: Drawal(s) during the Year		0.00	
v.	Less: Repayment (s) of Loans during the year		2.59	
vi	Net loan - Closing		399.58	
	CFL		27.56	
	Ind Adj		0.00	
	Net loan - Closing		372.03	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		0.09	
ix	Interest on loan		37.07	
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	Union Bank of India (UBI)			
i.	Gross Loan -Opening		0.00	
ii.	Cumulative repayments of Loans upto previous year		0.00	

iii.	Net loan-Opening		0.00	
iv.	Add: Drawal(s) during the Year			
v.	Less: Repayment (s) of Loans during the year			
vi	Net loan - Closing		0.00	
	CFL			
	Ind Adj		0.00	
	Net loan - Closing		0.00	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		0.00	
ix	Interest on loan		0.00	
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	Loan-REC			
i.	Gross Loan -Opening		145.81	
ii.	Cumulative repayments of Loans upto previous year		0.00	
iii.	Net loan-Opening		145.81	
iv.	Add: Drawal(s) during the Year		0.00	
v.	Less: Repayment (s) of Loans during the year		145.81	
vi	Net loan - Closing		0.00	
	CFL			
	Ind Adj		0.00	
	Net loan - Closing		0.00	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		0.00	
ix	Interest on loan		3.57	
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	State Bank of India (SBI)			
i.	Gross Loan -Opening		218.72	
ii.	Cumulative repayments of Loans upto previous year		0.00	
iii.	Net loan-Opening		218.72	
iv.	Add: Drawal(s) during the Year		0.00	
v.	Less: Repayment (s) of Loans during the year		218.72	
vi	Net loan - Closing		0.00	
	CFL			
	Ind Adj		0.00	
	Net loan - Closing		0.00	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		0.00	
ix	Interest on loan		11.71	
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	Vijaya Bank			
i.	Gross Loan -Opening		0.00	
ii.	Cumulative repayments of Loans upto previous year		0.00	
iii.	Net loan-Opening		0.00	
iv.	Add: Drawal(s) during the Year		299.74	
v.	Less: Repayment (s) of Loans during the year		179.84	
vi	Net loan - Closing		119.89	
	CFL			
	Ind Adj		0.00	
	Net loan - Closing		119.89	
vii	Average Net Loan			
viii	Rate of Interest on Loan on annual basis		0.09	
ix	Interest on loan		7.41	
x	<i>Loan repayment effective from (date to be indicated)</i>			
1	Canara Bank			

i.	Gross Loan -Opening		0.00	
ii.	Cumulative repayments of Loans upto previous year		0.00	
iii.	Net loan-Opening		0.00	
iv.	Add: Drawal(s) during the Year		29.97	
v.	Less: Repayment (s) of Loans during the year		29.97	
vi.	Net loan - Closing		0.00	
	CFL			
	Ind Adj		0.00	
	Net loan - Closing		0.00	
vii.	Average Net Loan			
viii.	Rate of Interest on Loan on annual basis		0.00	
ix.	Interest on loan		0.00	
x.	<i>Loan repayment effective from (date to be indicated)</i>			
1	South Indian Bank			
i.	Gross Loan -Opening		0.00	
ii.	Cumulative repayments of Loans upto previous year		0.00	
iii.	Net loan-Opening		0.00	
iv.	Add: Drawal(s) during the Year		0.00	
v.	Less: Repayment (s) of Loans during the year		0.00	
vi.	Net loan - Closing		0.00	
	CFL			
	Ind Adj		0.00	
	Net loan - Closing		0.00	
vii.	Average Net Loan			
viii.	Rate of Interest on Loan on annual basis		0.00	
ix.	Interest on loan		0.00	
x.	<i>Loan repayment effective from (date to be indicated)</i>			
1	Bank of India (BOI)			
i.	Gross Loan -Opening		58.30	
ii.	Cumulative repayments of Loans upto previous year		0.00	
iii.	Net loan-Opening		58.30	
iv.	Add: Drawal(s) during the Year		0.02	
v.	Less: Repayment (s) of Loans during the year		58.33	
vi.	Net loan - Closing		0.00	
	CFL			
	Ind Adj		0.00	
	Net loan - Closing		0.00	
vii.	Average Net Loan			
viii.	Rate of Interest on Loan on annual basis		0.00	
ix.	Interest on loan		0.07	
x.	<i>Loan repayment effective from (date to be indicated)</i>			
1	M/s. Andhra Bank			
i.	Gross Loan -Opening		0.00	
ii.	Cumulative repayments of Loans upto previous year		0.00	
iii.	Net loan-Opening		0.00	
iv.	Add: Drawal(s) during the Year			
v.	Less: Repayment (s) of Loans during the year			
vi.	Net loan - Closing		0.00	
	CFL			
	Ind Adj		0.00	
	Net loan - Closing		0.00	
vii.	Average Net Loan			
viii.	Rate of Interest on Loan on annual basis			
ix.	Interest on loan		0.00	

x	Loan repayment effective from (date to be indicated)			
4	Total Loan			
i.	Gross Loan -Opening			
ii.	Cumulative repayments of Loans upto previous year			
iii.	Net loan-Opening	1192.98	1406.58	
iv.	Add: Drawal(s) during the Year	511.6	496.27	
	Less: Consumer contribution & grant			
	Addition to normative loan during 2018-19			
v.	Less: Repayment (s) of Loans during the year	146.41	666.11	
vi	Net loan - Closing	1558.17	1236.73	
vii	Average Net Loan	1375.57	1321.65	
viii	Interest on Loan	127.28	119.67	
ix	Weighted average Rate of Interest on Loans	9.25%	9.06%	

Form T4(b)				
Calculation of Interest on Normative Loan				
SBU-T				Rs Cr
S.No.	Particulars (specify items)	2018-19		
		Approved in Tariff Order	Normative	Truing Up requirement
1	2	4	5	6 = 5 - 4
1	Gross Loan -Opening			
2	Cumulative repayments of Loans upto previous year			
3	Net loan-Opening	1192.98	1406.58	1044.26
4	Add: Drawal(s) during the Year	511.6	496.27	365.43
	Less: Consumer contribution & grant			-289.69
	Addition to normative loan during 2018-19			75.74
5	Less: Repayment (s) of Loans during the year	146.41	666.11	158.88
6	Net loan - Closing	1558.17	1236.73	961.12
7	Average Net Loan	1375.57	1321.65	1002.69
8	Interest on Loan	127.28	119.67	90.89
9	Weighted average Rate of Interest on Loans	9.25%	9.06%	9.06%

Form T4(c)				
Interest on Bonds to meet Terminal Liabilities				
	SBU-T			Rs Cr
S.No.	Particulars (specify items)	2018-19		
		Approved in Tariff Order	Normative	Truing Up requirement
1	2	3	4	5 = 4 - 3
A	Bond Series 1			
1	Funding as per Initial Scheme	87.56	79.04	79.04
2	Additional funding for the Trust	22.64	22.64	22.64
3	Total Interest on the total Liability to Master Trust	110.20	101.68	101.68

Form T 5					
Interest on working capital requirement					
	SBU-T				Rs Cr
Sl. No.	Particulars	Previous Year			
		2018-19			
		Approved in Tariff Order	Audited	Normative	Truing Up requirement
1	2	3	4	5	6
1	O&M expenses (as per norms)	30.27			32.23
2	Maintenance Spares (as per norms)	51.26			51.79
3	Receivables calculated on target availability (as per norms)	72.88			71.30
	Less				
4	Amount, if any, held as security deposits except security deposits held in the form of Bank Guarantees from Users of the transmission system				
5	Total Working Capital	154.42			156.31
6	Interest Rate (as per norms)	10.15%			10.15%
7	Interest on Working Capital	15.67	15.22		15.76

Form T 6				
Other items (Other debits or any other items)				
SBU-T KSEBL				Rs Cr
S. No.	Particulars (specify items)	Previous Year		
		2018-19		
		Approved in Tariff Order	Audited	Truing Up requirement
1	2	3	4	5 = 4 - 3
A1	Material Cost Variance		-2.32	-2.32
2	Research and Development Expenses		0.00	0.00
3	Cost Of Trading/Manufacturing Activity		0.00	0.00
3	Miscellaneous Losses and Write Offs		0.23	0.23
4	Loss/(compensation) on account of flood cyclone etc		0.00	0.00
	Total		-2.11	-2.11
	Less			
B	Chargeable to Capital Expenses			
	Net chargeable to revenue(A-B)		-2.11	-2.11

	Form T 7					
	Return on Equity/Return on Net Fixed Assets					
	SBU-T					Rs Cr
S.No.	Particulars	Ref.	Previous Year			
			2018-19			
			Approved in Tariff Order	Audited	Truing Up requirement	
1	2	3	4	5	7	
1	Equity at the beginning of the year		857.05		857.05	
2	Capitalisation					
3	Equity portion of capitalisation		0.00		0.00	
4	Equity at the end of the year		857.05		857.05	
	Return Computation					
5	Return on Equity at the beginning of the year	14%*(1)	119.99		119.99	
6	Return on Equity portion of capitalisation	14%*(3)/2	0.00		0.00	
7	Total Return on Equity	(5)+(6)	119.99	189.30	119.99	

Form T10: Non Tariff Income				
		Approved in Tariff Order	Audited	Truing Up requirement
	Non Tariff Income			
1	Interest on staff loans and advances	0.01	0.02	0.02
2	Income from statutory investments	0	0.00	0.00
3	Income from rent of land or buildings	0.47	0.11	0.11
4	Income from sale of scrap	5.07	18.24	18.24
5	Income from staff welfare activities	0		0.00
6	Rental from staff quarters	0.11	0.11	0.11
7	Excess found on physical verification	0.03	0.00	0.00
8	Interest on investments, fixed and call deposits and bank balances	1.75	2.00	2.00
9	Interest on advances to suppliers/contractors	0.33	0.91	0.91
10	Income from hire charges from contractors and others	0.01	0.00	0.00
11	Income due to right of way granted for paying fibre optic cables/co-axial cables on transmission system	3.79		0.00
12	Income from advertisements, etc.	0		0.00
13	Miscellaneous receipts	17.28	20.68	20.68
14	Interest on delayed or deferred payment of bills			0.00
	Clawback of Grant		14.38	
	Total Non-Tariff Income	28.85	56.45	42.07

Form T 14		
Proposed improvement in performance		
SBU-T		
S.No.	Paritculars	Performance parameters
		Actual for the previous year
		2018-19
1	2	3
1	EHV Transmission losses	3.74%
2	System availability	
a)	400 kV System	99.00%
b)	220 kV System	98.75%
c)	110 kV System	99.06%
d)	66 kV System	98.84%
	Total System Availability	98.92%

Form T 17							
Deviation Analysis							
	SBU-T						
Year :	2018-19						
							(Rs. Crore)
S. No.	Particulars	Approved	Actual	Deviation	Reason for Deviation	Controllable	Uncontrollable
1	2	3	4	5	6	7	8
1	Operation & Maintenance Expenses	363.23	490.36	-127.13			
2	Interest and finance charges on long-term loans	127.28	96.35	30.93			
3	Interest on Bonds to meet Terminal Liabilities	110.20	79.04	31.16			
4	Depreciation	146.41	239.43	-93.02			
5	Interest on Working Capital and deposits from Users of the transmission system	15.67	15.22	0.45			
6	Contribution to contingency reserves						
7	Other items						
8	Adjustment for profit/loss on account controllable/uncontrollable factors						
9	Other items		-2.03	2.02			
	Other Finance Charges	20.67	17.03	3.64			
	Exceptional items		0.44	-0.44			
10	Total Revenue Expenditure	783.46	935.84	-152.38			
11	Return on Equity	119.99	189.30	-69.31			
12	Tax on RoE						
13	Aggregate Revenue Requirement (9+10+11)	903.45	1125.14	221.61			
D	Non Tariff Income	28.85	56.45	42.07			
1	Revenue from sale of electricity	874.60	1068.69	-194.09			

Form T P&L				
Profit & Loss Account				
	SBU-T			Rs Cr
S.No.	Particulars	Ref	2018-19	2017-18
1	2	3	4	5
	I.INCOME			
	a. Revenue from Sale of Power		1068.69	1003.83
	b. Revenue Subsidies and Grants			
	c. Other Income		56.45	28.06
	d. Claw back of Grant			
	Total (a+b+c)		1125.14	1031.89
	II. EXPENDITURE			
	a. Repairs and Maintenance.		43.66	42.27
	b. Employee Cost		402.71	346.81
	c. Administration and General Expenses		108.48	84.19
	d. Depreciation		239.43	232.87
	1). Amortization of Intangible Assets			
	e. Interest and Finance charges		230.99	241.40
	Purchase of Power			
	f. Subtotal (a+b+c+d+e)		1025.37	947.53
	g. Less Capitalized Expenses:			
	- Interest & Finance Charges		23.35	18.12
	- Other Expenses		64.49	50.97
	h. Other Debits		-2.11	0.18
	Change in fair valuation and adjustments		0.08	-11.28
	I. Extra Ordinary Items		0.44	
	Total Expenditure (f-g+h+i)		935.84	867.33
	III. Profit /(Loss) before Tax (I-II)		189.30	164.56
	IV. Provision for Income Tax			
	V.Net Prior period credits (Charges)			3.66
	V.(a). Other Comprehensive Income			-106.61
	VI. Surplus (Deficit)		189.30	54.29
	VII. Net Assets at the beginning of the year (Less consumer's Contribution)		2267.30	2295.90
	VIII. Rate of Return (VI / VII)			

Form T BS			
Balance Sheet at the end of the year			Rs Cr
S.No.	Particulars	2018-19	2017-18
	Sources of Funds:		
	(A)Capital Funds:		
	Share Capital (Govt. equity)	857.05	857.05
	Reserves & Surplus	144.82	79.70
	Total (A)	1001.87	936.75
	(B) Loan from State Government		
	Loan from others :		
	-Secured	1019.97	921.90
	-Unsecured	119.89	475.89
	Total (B)	1139.86	1397.79
	(C) Contribution, grants & subsidies towards cost of capital assets	447.58	187.07
	Provident Fund	225.72	218.33
	Terminal Benefit Fund	754.11	572.26
	Borrowings for working capital		
	Long term Provision	-1072.18	-655.83
	Grand total of sources of funds (A+B+C)	2496.95	2656.37
	*Application of Funds:		
	A) Fixed assets		
	a) Gross fixed assets	5544.08	5178.65
	b) Less accumulated depreciation	2961.91	2722.61
	c) Net Fixed assets((a)-(b))	2582.17	2456.04
	d) Capital works in progress	635.71	440.71
	e) Assets not in use		
	f) Deferred costs	0.01	0.01
	g) Intangible assets	0.70	
	h) Investments	5.31	3.99
	Other Noncurrent assets	129.72	44.49
	Total (c) +(d)+(e)+(f)+(g)+(h)	3353.61	2945.24
	B)Subsidy receivable from Government		
	Contribution receivable from State Government towards pension liability	354.43	401.12
	C) Net Current Assets		
	(1) Current assets, loans and advances		
	a) Inventories*	97.06	41.75
	b) Receivables against transmission charges	0.00	
	c) Cash & bank balances	30.87	25.59
	d) Loans and advances	12.96	
	e) Sundry receivables	98.97	72.96
	Total (C)(1)	239.86	140.30
	(2) Current liabilities & provisions		
	a) Security Deposits from Consumers		
	b) Borrowings for working capital	692.48	298.76
	c) Payments due on Cap. liabilities		
	d) Other current liabilities	758.46	531.53
	Total (C)(2)	1450.94	830.29
	Net Current Assets (C) [(C(1)) - (C(2))]	-1211.09	-689.99
	Grand Total of Application of funds (A)+(B)+(C)	2496.95	2656.37

Cash Flow for the year				
	Name of Transmission Business/Licensee			
S.No.	Particulars	Ref	2018-19	2017-18
1	2	3	4	5
I	Net Funds from Operations			
1a	Net Funds from Earnings :			
	a) Profit before tax and before revenue subsidies and grants		62.88	54.29
	Less : Income Tax Payment during the year			
	: Other Comprehensive Income		-112.05	-106.61
	Total of (a)		174.93	160.90
	b. Add: Debits to rev. account not requiring cash Flow:			
	i) a) Depreciation		239.31	232.87
	b) Depreciation on Assets capitalised in the initial BS of the IND As Accounts		0.00	152.76
	ii) Amortization of Deferred costs			
	iii) Amortization of Intangible Assets		0.12	
	iv) Investment Allowance Reserve			
	v) Others, if any		-416.36	-892.20
	Total of (b)		-176.93	-506.57
	c. Less : Credits to revenue Account not involving cash receipts			
	i) Deprecation			
	ii) Subsidies receivables			
	iii) Revenue gap			
	Total of (c)		0.00	0.00
	Net Funds from Earnings (a)+(b)-(c)		-2.00	-345.68
2	Contributions, Grants & Subsidies to cost of Capital Assets		260.51	92.13
3	Security Deposit from consumers			
4	Proceeds from disposal of fixed Assets			
5	Total Funds from Operations (1+2+3+4)		258.51	-253.55
6	Net Increase/(Decrease) in working Capital			
	(a) Increase/(Decrease) in Current Assets			
	i) Inventories		55.31	-15.07
	ii) Receivables against transmission charges			
	iii) Loans and Advances		12.96	-4.63
	iv) Sundry receivables		26.01	39.27
	v)Subsidy receivables			
	Total of (a)		94.27	19.57
	(b) Increase/(Decrease) in Current liabilities			
	i)Borrowings for working Capital		393.72	34.76
	ii) Other current liabilities		226.93	12.09
	iii) Others (Increase in Reserve + payment due on cap.liab)		-109.81	-81.20
	Total of (b)		510.84	-34.35
	Net Increase/(Decrease) in working Capital (a)- (b)		-416.57	53.92
7	Net Funds from operations before subsidies and Grants (5-6)		675.08	-307.46
8	Receipts from revenue subsidies and Grants		46.69	191.10
	Total Net Funds from operations including subsidies & Grants (7+8)		721.77	-116.36
II.	Net increase/ decrease in Capital liabilities			
	a). Fresh borrowings			
	i) State Loans			
	ii) Foreign currency Loans / Credits			
	iii) Other borrowings		496.27	1460.43
	Total of (a)		496.27	1460.43
	b) Repayments :			
	i) State Loans			
	ii) Foreign currency Loans / Credits			

	iii) Other borrowings		754.19	1161.67
	Total of (b)		754.19	1161.67
	Net Increase/(Decrease) in Capital liabilities (a) - (b)		-257.93	298.76
III.	Increase/(Decrease) in equity Capital		0.00	106.33
IV.	Total Funds available for Capital Expenditure (I+II+III)		463.84	288.73
V	Funds utilised on Capital Expenditure			
	a)On projects		560.43	547.38
	b)Advance to Suppliers & Contractors			
	c) Intangible Assets		0.82	
	d) Deferred Cost		0.00	0.00
	e) Long Term Loans and Advances		85.23	21.66
	Total of V (a+b+c+d)		646.48	569.04
VI	Net Increase/(Decrease) in Government contribution			
VII	Net Increase/(Decrease) in Terminal benefit fund		181.85	956.24
VIII	Net Increase/(Decrease) in Provident fund		7.39	-9.08
IX	Net Increase/(Decrease) in investments		1.32	-0.86
X	Net Increase /(Decrease) in cash / bank balance (IV - V- VI-IX)+ (VII+VIII)		5.28	16.63
XI	Add opening cash & Bank balance		25.59	8.96
XII	Closing Cash & Bank balance (X+XI)		30.87	25.59

Chapter– 4: TRUING UP OF ARR OF SBU – DISTRIBUTION

4.1 An overlook on Kerala Distribution network:

Kerala State Electricity Board Limited supplies electricity to about 3.47 Cr of entire population across 14 districts in Kerala. There are about 97 Lakh domestic consumers, 21.97 Lakh commercial/general consumers, 1.41 Lakh industrial consumers, 4.71 Lakh agricultural consumers. The key statistics of distribution network is given below:

Table-D1 Key Statistics of KSEBL Distribution Network as on 31.03.2019	
Particulars	Statistics
Area Sq.km.	38863 km ²
Districts No's	14
Electrical Circle Offices	25
Population in Cr	3.47
Consumers (Nos)	12552206
Distribution transformers (Nos)	79876
HT lines (Ckt. Kms)	64568.02
LT lines (Kms)	289804
Energy sales in MU	21536.77
Energy consumption (incl open access & captive consumption) in MU	21902.59
Per capita consumption in units	626
Consumption per consumer in units	1731.69
T&D loss in % (including transmission loss)	12.47%
Distribution loss in %	9.07%
AT&C loss in %	8.85%

4.2 Availability of Electricity for Supply:

The petitioner has ensured 100% availability of power for supply in the state. There had been no power cut or load shedding enforced in the State even during the extreme summer months of 2019, except for emergency supply interruptions caused by uncontrollable factors. The gross availability of electricity for supply for 2018-19 as per regulations was 104.91 % and the month-wise details of power availability to meet the base load and peak load is given as **Appendix D1**.

4.3 Energy Sales for 2018-19:

- 4.3.1** Hon'ble Commission, vide order dated 08.07.2019, had approved energy sale of 21647.29 MU for the year 2018-19. Actual energy sale of KSEBL for FY 2018-19 was 21536.77 MU. Embedded open access consumers availed 205.44 MU through open access. Further 152.34 MU was consumed from captive generation. In addition to the above, 8.04 MU was supplied to RGCCPP for meeting auxiliary consumption. Thus the total energy consumption at consumer end was 21902.59 MU. The actual energy sale by KSEBL was 110.52 MU less than approval. Considering the impact of open access, the actual quantum was 94.92 MU more

than the approval quantum (0.44%). A comparison of approved and actual energy sales is given as in Table below:

Table –D2 :-Energy sales comparison(MU)					
Category	Approved*	Actual	Energy drawal thru open access	Energy incl open access	% increase against approval
LT Category					
Domestic	10856.52	10860.01		10860.014	0.03
Commercial	3168.22	3219.41		3219.41	1.60
Industrial	1100.98	1111.67		1111.6682	0.97
Agricultural	350.02	337.65		337.64904	-3.53
Street Lights	380.84	377.78		377.78	-0.80
LT II	4.9	4.33		4.33	-11.63
Advertisement & Hoardings	2.01	2.02		2.02	0.50
LT Total	15863.49	15912.87		15912.87	0.31
HT Category					
HT I	2137.66	2152.18	15.69	2167.86	1.41
HT II	797.91	783.12	7.36	790.48	-0.93
HTIII	9.69	8.92		8.92	-7.91
HT IV	671.26	696.39	0.00	696.39	3.74
HT V	15.41	16.31		16.31	5.85
HT Total	3631.93	3656.92	23.04	3679.96	1.32
EHT Category					
EHT-I	355.56	268.73	66.68	335.40	-5.67
EHT-II	748.67	610.01	105.74	715.75	-4.40
EHT-III	94.83	106.63	9.05	115.68	21.99
EHTGeneral	70.48	66.54		66.54	-5.59
Railway Traction	273.51	303.13		303.13	10.83
KMRL	15.79	14.91		14.91	-5.58
EHT Total	1558.84	1369.95	181.47	1551.4176	-0.48
Bulk consumers/Licensees	593.03	597.04	0.93	597.97	0.83
HT.EHT & Licensees total	5783.8	5623.90	205.44	5829.345	0.79
Total	21647.29	21536.77	205.44	21742.214	0.44

* including the consumption of energy wheeled through open access

- 4.3.2 The energy sale in 2018-19 was 21536.77 MU against 20880.70 MU in 2017-18. The total energy consumption at consumer end for the year 2018-19 was 21902.59 MU against 21258.71 MU during 2017-18. The overall growth in energy sale by KSEBL in 2018-19 over 2017-18 had been 3.05%. The overall growth in energy consumption at consumer end including open access and captive generation was 2.99%. During the year 2018-19, 824.78 MU had been sold outside the state and 168.02 MU has been transferred outside the State through banking arrangements.
- 4.3.3 Details in respect of consumption of different categories of consumers during the year 2018-19 over previous year are given below.

Table-D3: Energy sales in MU for FY-19 Comparison with FY-18				
Category	Tariff code	Energy in MU		Change
		2017-18	2018-19	in %
LT category				
Domestic	LT I	10569.99	10860.01	2.67
Colonies	LT II	4.85	4.33	-12.09
Temporary Connections	LT III	1.47	1.06	-38.26
Industrial	LT IV	1112.33	1111.67	-0.06
Agriculture	LT V	346.03	337.65	-2.48
General	LT VI	1525.03	1567.41	2.70
Commercial	LT VII	1534.99	1650.93	7.02
Public Lighting	LT VIII	373.48	377.78	1.14
Adv and Hoardings	LT IX	1.99	2.02	1.70
LT total		15470.15	15912.87	2.78
HT Category				
HT Industrial	HT I	2062.99	2152.18	4.14
HT General	HT II	761.64	783.12	2.74
HT Agriculture	HT III	9.61	8.92	-7.70
HT Commercial	HT IV	644.82	696.39	7.40
HT Domestic	HT V	14.97	16.31	8.22
EHT category				
EHT 66 KV Industrial	EHT I	247.34	268.73	7.96
EHT 110 KV Industrial	EHT II	631.13	610.01	-3.46
EHT 220 KV Industrial	EHT III	77.99	106.63	26.86
EHT General		70.14	66.54	-5.41
Railway Traction		265.8	303.13	12.32
KMRL		15.35	14.91	-2.96
Bulk Licensees		608.77	597.04	-1.97
HT & EHT & Bulk Supply		5410.55	5623.90	3.79
Total		20880.7	21536.77	3.05
Open Access Drawal		269.86	205.44	
Captive Consumption		108.16	152.34	
RGCCPP		8.6326	8.04	
Grand Total		21267.35	21902.59	2.99

4.3.4 The energy consumption in FY-19 in respect of certain categories of consumers showed significant changes when compared to the consumption in previous year. The domestic consumption increased by only 2.67% against the estimated rate of 5.54% (CAGR from FY-12 to FY-18). This is mainly due to the DSM programmes and captive solar generation.

4.3.5 Embedded open access consumers imported about 216.60 MU and energy injected by IPPs into the grid for sale outside the State through open access was 39.17 MU. The details are furnished below.

Table –D4 Energy availed and sold through OA by embedded open access consumers in FY-19 (MU)			
Particulars	Energy at Kerala Periphery	Energy at injection/drawal point	Loss on accounting of wheeled units
Energy (Import)	216.60	205.44	11.16
Energy (Export)	-37.40	-39.17	1.76
Total loss			12.92

4.3.5 The consumption pattern for 2018-19 is given in table below:

Table-D5 : Consumption pattern for 2018-19			
No	Category	Energy sales	
		MU	%
1	Domestic	10864.34	50.45
2	Industrial	1111.67	5.16
3	Agriculture	337.65	1.57
4	Commercial	3221.43	14.96
5	Public Lighting	377.78	1.75
6	HT & EHT Total	4708.82	21.86
7	Railway Traction	303.13	1.41
8	KMRL	14.91	0.07
9	Bulk Supply	597.04	2.77
10	Total sales (within state)	21536.77	100.00
11	Interstate sale	824.78	
12	Total	22361.55	

4.4 T & D Loss:

4.4.1 Hon Commission, vide order dated 08.07.2019, had approved the loss reduction target of 2018-19 as 0.25%, over the loss level of 2017-18 (13.07%) and approved the loss target at 12.82%. Further, the transmission loss and total AT & C loss were approved at 4.05% and 11.01% respectively with a collection efficiency target of 98 %. The actual T&D loss achieved for the year 2018-19 is 12.47% ie an actual loss reduction of 0.60% was achieved during the year 2018-19.

4.4.2 Hon'ble Commission may kindly note that KSEBL was able to reduce loss by 0.35% over and above the target approved, as detailed below:

Table D6 T&D loss for the year 2018-19		
Sl No	Particulars	2018-19
A	Energy generation by KSEBL excl auxiliary consumption (MU)	7593.12
B	Power Purchase /energy banked at Kerala periphery(MU)	18046.57
C	Sub Total (MU) (A+B)	25639.69
D	Energy injected to the grid by private IPPs for sale outside the State through OA (MU)	39.17
E	Energy wheeled by embedded open access consumers from outside the State at KSEB end (MU)	216.60
F	Energy sales by KSEBL outside the State	824.78
G	Energy transfer outside the State by KSEBL through banking arrangement	168.02
H	Energy sale by private IPPs for sale outside the State through open access (MU)	37.40
I	Energy Input (MU)(C+D+E-F-G-H)	24865.25
J	Substation auxiliary consumption(MU)	16.11
K	Net Energy Input excluding auxiliary consumption(MU) (I-J)	24849.15
L	Energy sales by KSEBL	21536.77
M	Energy consumed by embedded open access consumers at consumer end by wheeling from outside the State (MU)	205.44
N	Energy supplied to RGCCPP for auxiliary consumption during non operative period (MU)	8.04
O	Energy supplied at consumer end(MU) (L+M+N)	21750.25
P	T&D loss (MU) (K-O)	3098.90
Q	T& D loss for 2018-19 in % (P*100/K)	12.47
R	T& D loss in % for 2017-18	13.07
S	Loss reduction achieved during 2018-19	0.60
T	T& D loss target approved for 2018-19 in %	12.82
Q	T& D loss reduction target approved for 2018-19 in %	0.25
R	Achievement in loss reduction in excess of target approved (%)	0.35

4.5 Distribution loss:

- 4.5.1 The actual transmission and distribution loss during the year 2018-19 was 12.47%. It may please be noted that the total transmission loss up to 66 KV level was 3.74%. Based on the above the distribution loss for 2018-19 is assessed as follows:

Table - D7: Distribution losses			
Sl No	Particulars	Quantum	Unit
(i)	Total Generation and Power Purchase at Kerala periphery(K of tableD6)	24,849.15	MU
(ii)	Transmission loss @3.74%	929.5737	MU
(iii)	Total energy input into the distribution system (i)-(ii)	23,919.57	MU
(iv)	Sale of energy at EHT level	2157.42	MU
(v)	Distribution loss associated with sale at EHT level	0	MU
(vi)	Energy available for sale at HT< levels (iii)-(iv)-(v)	21,762.15	MU
(vii)	Sale of energy at HT level	3679.96	MU
(viii)	Sale of energy at LT level	15912.87	MU
(ix)	HT & LT loss (vi)-(vii)-(viii)	2,169.32	MU
(x)	HT & LT loss in % $[(ix)*100/(vi)]$ in %	9.97	%
(xi)	Total distribution loss with EHT sales of energy also taken as energy sales by SBU-D $(ix)*100/(iii)$	9.07	%

- 4.5.2 As already submitted, Hon'ble Commission approved a collection efficiency target of 98% and target of AT&C loss at distribution level as 11.01%. The AT&C loss achieved during 2018-19 was 8.85% as tabulated below.

Table D 8 AT&C loss for FY-19		
	Particulars	Quantum
A	Energy Input (MU)	24,849.15
B	Transmission loss (MU)	929.57
C	Net Energy input (MU) (A-B)	23,919.57
D	Energy Sold (MU)	21,750.25
E	Revenue from sale of power (Rs. Crore)	13053.26
F	Adjusted Revenue based on subsidy received basis (Rs. Cr.)	13053.26
G	Net Opening debtors (Rs. Crore)	2121.96
H	Adjusted closing debtors (Rs. Crore)	2079.85
I	Collection efficiency $(F+G-H)/E*100$	100.24
J	Units realised (MU) $(D*I/100)$	21,802.45
K	Units unrealised (MU) (C-J)	2,117.12
L	AT&C Loss (%) $(K-C*100)$	8.85%

- 4.5.3 Hon Commission may kindly note that, KSEBL has been continuously reducing the T&D loss since the year 2001-02. KSEBL was able to reduce the total T&D loss in the KSEBL system including transmission system to the level of 12.47% during the year 2018-19. Thus the losses in the Distribution system, as a percentage of the total energy input is one of the lowest among the distribution utilities in the country. Consistent T&D loss reduction was one of the major achievements of the Board. It may kindly be noted that, since 2001-02 Board could bring down T&D loss from the level of 30.76% in 2001-02 to 12.47% in 2018-19. This cumulative reduction in T&D loss (18.29%) is equivalent to avoided power purchase of 6501

MU during the year 2018-19 alone. At an average purchase rate of Rs 4.34 per unit, this translates to a saving of Rs 2821.43 Cr under power purchase cost.

- 4.5.4 KSEBL has undertaken a series of measures during 2018-19, as detailed below, in order to achieve the above loss reduction.

Table- D9 Steps taken for T&D loss reduction	
Particulars	Achievement during 2018-19
Substations Commissioned	
110 kV	3
66 kV	1
33 kV	5
Total	9
Lines Commissioned(Ckt km)	
110 kV	119.15
66 kV	43
33 kV	60.9
Total	223.05
Capacity addition/enhancement(MVA)	913.70 MVA
11 KV line constructed(km)	1772.83
LT line constructed(km)	3400.78
No. of distribution transformers	2410
HT re conducting (km)	840
LT re conducting (km)	8355
1 phase to 3 phase conversion(km)	1292
Meter Replacement(Nos)	837858

- 4.5.5 It is respectfully submitted that, due to loss reduction of 0.35% achieved above the target of 0.25%, KSEBL was able to save an additional quantum of 98.82 MU against power purchase. Considering the average power purchase cost of Rs 4.34 per unit for the year 2018-19; KSEBL was able to save 42.89 Cr under cost of power purchase on account of this achievement.

- 4.5.6 As per Regulation 14 of Tariff Regulations, 2014 the aggregate gain on account of controllable factors shall be dealt with the following manner:

- One-third of the amount of such gain shall be passed on to consumers as a rebate in tariffs.*
- The remaining two third of the amount of such gain may be utilised at the discretion of licensee*

- 4.5.7 Thus the gain to be retained by KSEBL amounts to Rs.28.59 Cr and passed on to consumers is Rs 14.30 Cr as detailed below, which may kindly be approved.

Table- D10 Gain attributable to KSEBL on over achievement of T&D loss reduction target.		
Particulars	Quantum	Unit
Energy sales by KSEBL	21536.77	MU
Energy taken by RGCCPP during non operative periods	8.04	MU
Total energy	21544.81	MU
Energy input needed at 12.82% loss	24713.02	MU
Energy input needed at 12.47% loss	24614.2	MU
Energy savings	98.82	MU
Power Purchase cost saved due to over achievement of loss	42.89	Cr.
2/3 of savings	28.59	Cr.

- 4.5.8 The comparison of actual energy sales and energy input as against the approval is given in table below

Table- D11 Summary of energy balance			
Particulars	Approved	Actual	Difference
Energy sales by KSEBL in MU	21647.29	21544.81*	-102.48
Energy input for meeting the energy sales in MU(C-F-G-J) of table D6	24846.15	24630.78	-215.37
Internal Generation in MU (excl aux)			
Hydro	7807.42	7570.60	-236.82
Thermal	0	2.66	2.66
Solar & wind	16.58	19.87	3.29
Subtotal generation	7824.00	7593.12	-230.88
Power Purchase in MU at Kerala periphery			
CGS	10255.41	9241.09	-1014.32
RGCCPP	0	0.81	0.81
IPP-wind & SHPs CPPs & solar prosumers	280.7	280.41	-0.29
LTA	7999.32	7652.05	-347.27
Short term purchase	0	872.21	872.21
Sub Total generation & Power Purchase by KSEBL	26359.43	25639.69	-719.74
Substation auxiliary consumption (MU)	15.58	16.11	0.53
Energy availability	26343.85	25623.58	-720.27
External sale/swap return	1497.70**	992.80	-504.90
Grand Total	24846.15	24630.78	-215.37

*Energy sales by KSEBL to its consumers (21536.77 MU) along with the supply to RGCCPP (8.04 MU) for meeting the auxiliary consumption during non operative period (21536.77+8.04)

**External sale only

- 4.5.9 It may be seen from the table that the energy demand has decreased by about 102.48 MU. Hydro generation was less by 215.37 MU. There was a reduction of 1014.33 MU from CGS and 347.27 MU from IPPs outside the State against the approval granted by the Hon Commission. The shortfall was compensated by purchasing power from exchanges and banking arrangements, which were not originally approved in the order. The sale of power outside the State also came down accordingly.

4.6 Analysis of various ARR components

Cost of Power Purchase

- 4.6.1 The Distribution Business Unit of the petitioner had sold 21536.77 MU to its consumers during the year 2018-19 within the State. The total own generation (net of auxiliary consumption) and power purchase was 25623.58 MU at Kerala periphery. SBU G was able to supply 7593.12 MU (30.73%) only of the total requirement and balance was purchased from CGS and IPPS within and outside the State, power exchanges etc.
- 4.6.2 **Cost of Generation:** The energy generation from own generating stations was 7593.12 MU as detailed in Table D 11. ARR for SBU G for the year 2018-19 was **Rs. 528.31** and Non tariff income earned is **Rs. 17.94 Cr.** The net expenses of SBU G transferred to SBU-D are **Rs. 510.37 Cr.** Deviation from approval is explained in chapter dealing with Truing up of SBU G.

4.6.3 **Cost of Purchase of power:** Hon Commission had approved a cost of Rs. 7847.77 Cr for the purchase of 18535.41 MU from various sources. The actual power purchase quantum was 18046.57 MU at Kerala periphery at a cost of Rs 7869.32 Cr as detailed in **Form D3.1**. The true up requirement is Rs 7826.86 Cr which is less than the approved by Rs 20.91 Cr. A summary of the approved and actual power purchase and trued up requirement is given in Table below. The source wise procurement of power is detailed in **Appendix-D4**. Hon Commission may please note that the petitioner had taken earnest effort to obtain power at the lowest cost from different sources without imposing any load shedding or power restriction in the state.

Table – D12: Power Purchase for the year 2018-19									
No	Particulars	Approved		Actual		Truing up		Variation	
		Energy (MU)*	Cost (Rs Cr)	Energy (MU)*	Cost (Rs Cr)	Energy (MU)*	Cost (Rs Cr)	Energy (MU)*	Cost (Rs Cr)
1	Central Gen. Stations	10255.42	3684.51	9241.09	3418.17	9241.09	3418.17	-1014.33	-266.34
2	Small IPPs within the State	280.70	103.78	280.41	108.97	280.41	101.08	-0.29	-2.70
3	RGCCPP, Kayamkulam (net)	0.00	200.00	0.81	181.70	0.81	204.13	0.81	4.13
4	IPPs / Traders outside state	7999.32	3319.64	7652.05	3371.19	7652.05	3314.19	-347.27	-5.45
5	Short term / Exchanges/UI			872.21	235.84	872.21	235.84	872.21	235.84
6	PTC Balco				32.37		32.37	0.00	32.37
7	Transmission charges		539.84		513.41		513.41	0.00	-26.43
8	Charges in connection with banking of power o/s State				2.28		2.28	0.00	2.28
9	Other charges in connection with sale				5.38		5.38	0.00	5.38
10	Total	18535.44	7847.77	18046.57	7869.32	18046.57	7826.86	-488.87	-20.91
* Energy at KSEB Bus									

4.6.4 **Power Purchase from Central Generating Stations:** A comparison of approved and actual energy purchased from CGS and their costs are given in the Table below.

Table – D13: Power Purchase from Central Generating Stations for the year 2018-19								
Station	Approved		Audited accounts		True up requirement		Variation	
	Energy* (MU)	Cost (Rs Cr)	Energy* (MU)	Cost (Rs Cr)	Energy* (MU)	Cost (Rs Cr)	Energy* (MU)	Cost (Rs Cr)
RSTPS I & II	1763.58	555.18	1608.17	530.31	1608.17	530.31	-155.41	-24.87
RSTPS III	426.1	135.16	400.76	132.78	400.76	132.78	-25.34	-2.38
Talcher Stage-II	3105.98	743.31	2889.61	715.24	2889.61	715.24	-216.37	-28.07
Simhadri TPS Stg II	550.33	244.85	541.92	260.58	541.92	260.58	-8.41	15.73
NLC Stage-I	397.35	132.69	396.01	127.61	396.01	127.61	-1.34	-5.08
NLC Stage-II	557.67	188.45	586.18	189.00	586.18	189.00	28.51	0.55
NLC I Expansion	429.02	146.59	429.78	151.66	429.78	151.66	0.76	5.07
NLC II Expansion	282.58	140.95	281.08	133.64	281.08	133.64	-1.50	-7.31
Vallur STPS	346.7	168.02	267.73	145.30	267.73	145.30	-78.97	-22.72
MAPS	85.3	23.26	60.72	16.63	60.72	16.63	-24.58	-6.63
KAIGA	486.75	176.96	541.76	201.73	541.76	201.73	55.01	24.77
Kudankulam	1285.78	527.94	759.53	330.14	759.53	330.14	-526.25	-197.80
NTPL	486.64	232.35	420.25	207.58	420.25	207.58	-66.39	-24.77
Kudgi	472.19	268.82	458.51	275.99	458.51	275.99	-13.68	7.17
Eastern Region				-0.02		-0.02	0.00	-0.02
Total	10675.97	3684.53	9642.01	3418.17	9642.01	3418.17	-1033.96	-266.34

* Energy at Generator Bus

4.6.5 The reasons for reduction in availability of power are due to following reasons:

- coal shortage.
- flood during August 2018, there was reduction in demand resulting in non scheduling of energy.

- iii. There was shortage of 526.25 MU from Kudamkulam power Station owing to the shutdown of Unit II from February to July -18 and Unit I from August to March-19.
- iv. Unit I of MAPS was under urgent maintenance from 30.01.2018 till September 2018.
- v. NTECL Vallur was under shutdown due to turbine side problem during October 2018 and then due to coal shortage up to December 2018.
- vi. Thus there was an overall reduction in availability from CGS to the extent of 1033.96 MU from the approved quantum during the year 2018-19. Accordingly, actual power purchase cost from CGS had been less by Rs 266.34 Cr from the amount approved by the Hon Commission as detailed in table above.

4.6.6 The refund on account of revision of ULDC charges (Farakka and Kahalgan stations under Eastern Region) for the period 01.03.2010 to 30.04.2013 amounting to Rs 1,31,144 and Rs 67,959 was obtained during the year on account of the revision of ULDC Fees and Charges of ER stations - Farakka I, Kahalgan I and Talcher I for the control period 2009-14 based on CERC order dt 20/9/2018 on Petition no. 213/TT/2017 for truing up of Fees and charges for 2009-14 period. PGCIL had filed the petition for truing up of fees and charges for Fibre Optic Communication System under expansion of Wideband communication Network in eastern region for the 2009-14 control period.

4.6.7 **Power Purchase from wind and small IPPs within the State:** KSEBL had purchased 295.09 MU for Rs.108.97 Cr against the approved quantum of 280.7 MU for Rs 103.78 Cr.

4.6.8 The purchase of power from Independent Power Producers *as well* captive SHP/solar/co generation power producers such as Maniyar, Kuthungal, PCBL and solar prosumers is given in table below.

Table-D14 : Power Purchase from Wind and other small IPPs								
Station	KSERC approval		Audited Accounts		TU requirement		Difference	
	(MU)	(Rs Cr)	(MU)	(Rs Cr)	(MU)*	(Rs Cr)	(MU)	(Rs Cr)
Wind- Ramakkalmedu	27.87	8.75						
Wind-Koundikkal	12.56	3.94						
Wind- Agali	29.72	9.33	49.73	18.18	49.73	18.18	-20.42	-3.84
Wind Ahalya	20.98	10.97	18.15	9.48	18.15	9.48	-2.83	-1.49
INOX	30.84	12.61	38.9	23.49	38.9	15.60	8.06	2.99
Kosamattom	0	0	1.13	0.06	1.13	0.06	1.13	0.06
Wind Sub total	121.97	45.61	107.9	51.22	107.91	43.32	-14.06	-2.29
Ullunkal(EDCL)	17.79	4.34	10.75	2.66	10.75	2.66	-7.04	-1.68
Iruttukanam Stage-I & II(Viyyat)	24.69	6.673	10.51	2.71	10.51	2.71	-14.18	-3.96
Karikkayam HEP(AHPL)	37.56	15.624	45.78	18.92	45.78	18.92	8.22	3.30
Meenvallom(PSHCL)	8.44	4.12	7.41	3.65	7.41	3.65	-1.03	-0.47
Kallar of Idukki District Panchayat	0.08	0.04	0	0.004	0	0.004	-0.08	-0.04
Mankulam of Grama Panchayat	0.09	0.04	0	0.033	0	0.033	-0.09	-0.01
Minar Renewable energy project Ltd	0	0	0.07	0	0.07	0	0.07	0.00
SHEP subtotal	88.65	30.84	74.51	27.98	74.51	27.98	-14.14	-2.86
Solar					0	0	0.00	0.00
Solar IREDA	70.08	27.33	76.53	28.89	76.53	28.89	6.45	1.56
Solar IPP ANERT			2.54	0	2.54	0	2.54	0.00
Grid connected average pooled power purchase cost-solar			18.92	0.75	18.92	0.75	18.92	0.75
Solar subtotal	70.08	27.33	97.99	29.64	97.99	29.64	27.91	2.31
Captive consumers net injection to grid			12.63	0	12.63	0	12.63	0.00
PCBL(Deviation adjustment)			2.05	0.12	2.05	0.12	2.05	0.12
Total	280.7	103.78	295.09	108.97	295.09	101.06	14.39	-2.72

- 4.6.9 **Wind IPPs:** Hon'ble Commission approved 121.97 MU from various wind IPPs for a total cost of 45.61 cr against which, KSEBL purchased 107.90 MU for a total cost of Rs 51.22 Cr as shown in table above.
- 4.6.10 Hon'ble Commission may please note that the power purchase cost of M/s INOX as per audited accounts of 2018-19 is Rs 23.49 Cr which includes the power purchase cost for 2017-18 of 7.89 Cr, which was claimed in the truing up petition of FY-18. Hence KSEBL is seeking Rs. 15.60 Cr toward power purchase cost for the year FY-19.
- 4.6.11 Hon'ble Commission has not approved power from M/s Kosamattom Finance Ltd, which was connected to grid on 20.03.2018 and injected 1.13 MU during FY 2018-19 at a total cost of Rs 0.06 Cr. It may please be noted that KSEBL initialled draft PPA with M/s Kosamattom Pvt Ltd on 27.10.2018 @ interim tariff of Rs 3.07 per unit and submitted the same before Hon'ble Commission for approval.
- 4.6.12 **Small Hydro IPPs:** Hon'ble Commission vide order dated 08.07.2019 approved 88.65 MU from various small hydel IPPs @ of Rs 30.84 Cr. KSEBL has procured 74.51 MU at a cost of Rs 27.98 Cr. There was a reduction of 10 MU from the approved quantum mainly due to flood related destructions.
- 4.6.13 **Solar IPPs:** Hon'ble Commission approved 70.08 MU from Kasargod solar park(IREDA) for a total power purchase cost of Rs 27.33 Cr. KSEBL has purchased 76.53 MU from IREDA at a cost of Rs 28.89 Cr. In addition, 2.54 MU was procured from solar Project Kuzhalmannam of Anert. The PPA with M/s Anert is under process and hence the cost of the same is not accounted in Accounts of 2018-19.
- 4.6.14 **CPPs:** There was a net injection of 12.63 MU by CPPs such as Maniyar, Kuthungal, major solar prosumer CIAL etc during the financial year 2018-19. However, this is considered only for loss calculation purpose. Further there is a net injection of 2.05 MU to grid during 2018-19 in connection with the sale of power through open access by Philips Carbon Black Ltd and the cost accounted is 0.12 Cr.
- 4.6.15 **Solar prosumers:** A net injection of about 4.24 MU has been made by various solar prosumers and the power purchase cost accounted during 2018-19 is Rs 0.75 Cr. at APPC rate.

Thermal IPPs

- 4.6.16 **Power purchase from RGCCPP, Kayamkulam:** Hon'ble Commission, vide order dated 08.07.2019, did not approve any schedule from RGCCPP for the year 2018-19 and was pleased to approve Rs 200 Cr towards fixed charges for 2018-19. M/s RGCCPP injected 0.81 MU on 02.02.2019 as part of conducting mandatory energy audit billed at DSM rate for a total amount of Rs. 12,41,579.16 based on the decision of the OCC meeting by SRPC held on 03.12.2018. The total cost of power purchase from RGCCPP for FY 19 was Rs 202.73 Cr (Rs 200Cr Fixed Charges, Rs -2.62 Cr deviation charges, Rs 5.15 Cr Income Tax, Rs 0.20 Cr other

charges). RGCCPP availed 8.04 MU during non operative period as auxiliary consumption during 2018-19.

4.6.17 The cost of power purchase from RGCCPP as per the accounts of FY-19 amounts to Rs.181.70 Cr as detailed in table below:

Table D15 Power Purchase from RGCCPP (Rs Cr)			
SI No	Particulars	Rs Cr	Remarks
1	Annual Fixed Charges for FY-19	200.00	
2	Revision of Capacity charges for FY-15 (Capacity charge revised from Rs 206.77 Cr to Rs 200 Cr.)	-6.77	
3	Revision of Capacity charges for FY-16(Rs 207.13 - Rs 200 Cr.)	-7.13	Disallowed as per true up order for FY 16.
4	Revision of Capacity charges for FY 17(Rs 207.13 Cr - Rs 200 Cr.)	-7.13	Disallowed as per true up order for FY 17.
5	Net annual fixed charges (A)	178.97	
6	Deviation charges	-2.62	
7	Income Tax	5.15	
8	Other charges	0.20	
9	Others (B)	2.73	
10	Total cost for the year 2018-19 as per accounts (A+B)	181.70	

4.6.18 It may kindly be seen that during the year 2018-19, Rs 21.03 Cr was reduced in accounts on account of the deduction in fixed charges for earlier years (Rs.6.77 Cr for 2014-15, Rs 7.13 for FY-16 and Rs 7.13 for FY 2017) because of which the expense for the year as per accounts is Rs 181.70 Cr (Rs.202.73 Cr-Rs.21.03 Cr) as shown in table D15. Since the adjustments pertaining to the last 3 years were made in accounts in 2018-19, it became imperative to revisit the accounting and true up for these years. The following points are respectfully submitted for the kind consideration of the Hon'ble Commission:

- (i) Hon'ble Commission, while approving ARR of KSEBL for 2015-16 and 2016-17, disallowed the fixed charges for RGCCPP and directed KSEBL to approach CERC for lowering the tariff by applying relaxed norms considering the special case of RGCCPP. KSEBL filed a petition before Hon CERC for a review of the Tariff order. Hon CERC directed KSEBL and NTPC to undertake mutual discussions for settlement of issues and report the outcome. After discussions at various levels NTPC has agreed for a negotiated AFC of Rs 200 Cr for the tariff period 2014-19. However, the reduction of fixed charges was not made in one go because of which adjustments were to be made in successive years. The details of revision of fixed charges and the claims in true up petition is given in table below:

Table-D 16: Details of revision of AFC of RGCCPP (Rs. Cr)							
No	Particulars						Remarks
		2014-15	2015-16	2016-17	2017-18	2018-19	
1	AFC as per true up petition	221.84	211.22	207.13	200	200	
2	AFC approved by KSERC in TU order	NA	200	200			Order not issued for 2014-15
3	Disallowance (1-2) (A)	NA	11.22	7.13			
4	AFC adjusted in same year under different sub head or in accounts of subsequent years						
5	AFC as per true up petition	221.84	211.22	207.13	200	200	
6	2014-15- Amount towards revision of capacity charge from 4/2014 to 3/2015- accounted under supplementary claim under RGCCPP and Simhadri as reduction of power purchase cost		13.54	1.53		6.77	Claimed Rs.221.84 Cr in 2014-15. Refund of AFC accounted and trued up in FY 16 (Rs.13.54 Cr) & FY 17 (Rs.1.53 Cr under other charges in Form D3.1) aggregating Rs.15.07 Cr. Balance refund ie over Rs.200 Cr, Rs.6.77 Cr (Rs.21.84 Cr-Rs.14.07 Cr) offered as reduction on power purchase cost in 2018-19.
7	2015-16-Amount towards revision of capacity charge from 4/2015 to 5/2015-accounted as reduction in power purchase cost.		2.13	1.96		7.13	Claimed Rs.211.22 Cr in 2015-16. Refund of AFC accounted and trued up in FY 16 (Rs.2.13 Cr) & FY 17 (Rs.1.96 Cr under other charges of Simhadri in Form D 3.1) aggregating Rs.4.09 Cr. Balance refund ie over Rs.200 Cr, Rs.7.13 Cr (Rs.11.22 Cr-Rs.4.09 Cr) accounted as reduction on power purchase cost in 2018-19 but already disallowed in truing up.
8	2016-17- Refund of AFC obtained for 2016-17 and accounted in 2018-19					7.13	Accounted as reduction in cost for 2018-19, but this sum has already been disallowed in 2016-17 TU.
9	AFC reduction disclosed as part of supplementary claims in TU petition and actually trued up during the year						
10	Pertaining to 2014-15		13.54	1.53			Adjusted in 2015-16 and 2016-17 against the AFC claim for 2014-15 (Rs.15.07 Cr)
11	Pertaining to 2015-16		2.13	1.96			Adjusted in 2015-16 and 2016-17 against the AFC claim for 2015-16 (Rs.4.09 Cr)
12	Total adjustments made for FY 15 and FY 16 (10+11)		15.66	3.49			
13	Disallowance in AFC by KSERC	NA	11.22	7.13			
14	Refund of AFC considered under supplementary claims (6 & 7 above)	15.07	4.09				Refund for 2014-15 (Rs.13.54 Cr+ Rs.1.53 Cr) and (Rs.2.13 Cr and Rs 1.96 Cr) for 2015-16.
15	Disallowance under AFC and double count under supplementary claim as reduction in cost.(14+15)	15.07	15.31	7.13	0	0	For 2014-15, Rs.15.07 Cr already deducted in TU for 2015-16 and 2016-17. Remaining Rs.6.77 Cr is now offered as reduction in cost for 2018-19.
16	Correct disallowance (207.13 Cr-200 Cr)		7.13	7.13			
17	Excess disallowance (15-16)		8.18	0			

(ii) Thus, it may kindly be seen that the revision of AFC related accounting adjustments were made in 2015-16, 2016-17 and 2018-19.

(iii) It is respectfully submitted that capacity charges revision for 2014-15 and 2015-16 amounting to Rs 13.54 Cr and Rs 2.12 Cr aggregating to Rs. 15.66 Cr was grouped under the supplementary claims and claimed as reduction in cost in truing up petition for FY 2016. A sum of Rs.37.10 Cr had been deducted from the power purchase cost of RGCCPP while claiming the cost TU 16. Kind attention of the Hon'ble Commission is invited to Appendix A 15 (extracted below for ready reference) of the Truing up petition (FY 16) which reveals this information.

Appendix – A15 : Power purchase from RGGCPP for FY 2015-16 (Rs Cr)					
Month	Energy (MU)	Fixed cost (Rs Cr)	Total variable Cost (Rs Cr)	Unit Variable Cost (Rs)	Total cost (Rs Cr)
Apr-15	-0.90	18.49	0.00	0.00	18.49
May-15	-0.80	18.49	0.00	0.00	18.49
Jun-15	3.08	17.42	3.47	11.29	20.90
Jul-15	-0.85	17.42	0.00	0.00	17.42
Aug-15	17.76	17.42	16.33	9.20	33.76
Sep-15	100.65	17.42	74.58	7.41	92.01
Oct-15	14.33	17.42	11.18	7.80	28.60
Nov-15	-0.71	17.42	0.00	0.00	17.42
Dec-15	-0.39	16.90	0.00	0.00	16.90
Jan-16	-0.86	17.95	0.00	0.00	17.95
Feb-16	-0.78	17.42	0.00	0.00	17.42
Mar-16	-0.71	17.42	0.00	0.00	17.42
Total	129.80	211.22	105.57	8.13	316.78
Supplementary claims & provisions					-37.10
Grand total					279.68

- (iv) Break up of supplementary claims is furnished below:

No	Table-D 17: Break up of supplementary claim 2015-16 (Rs Cr)	
1	Revision of energy charge	5.24
2	Revision of capacity charge from 4/2010 to 3/2014	11.45
3	Revision of capacity charge from 4/2014 to 3/2015	13.54
4	Revision of capacity charge from 4/2015 to 5/2015	2.13
5	Interest on revision of capacity charge from 4/2009 to 3/2014	5.59
6	Revision of Variable charge from 3/2014 to 10/2015	5.55
7	UI charges	0.32
8	Total refund under supplementary claim (1 to 7)	43.81
9	Deferred tax liability-additional demand	6.71
10	Net refund considered as reduction in cost for 2015-16 (8-9)	37.10

- (v) It may kindly be noted that, while furnishing the details in Appendix A-15, deductions made towards AFC of Rs.15.67 for 2014-15 (Rs.13.54 Cr) and 2015-16 (Rs.2.13 Cr) could not be specifically made out because of which Hon'ble Commission, as per orders on TU 16, disallowed Rs 11.22 Cr from the fixed charges (Rs 211.22 Cr- Rs.200 Cr). In short, actual AFC sought for true up in 2015-16 was Rs.209.09 Cr (Rs.211.22 Cr- Rs.2.13 Cr) with a reduced supplementary charge of Rs.-34.97 Cr. This has resulted in an excess disallowance of Rs 2.13 Cr under AFC and Rs.2.13 Cr excess adjustment towards supplementary claim.
- (vi) Further deduction of Rs 1.53 Cr and Rs 1.96 Cr towards capacity charges of 2014-15 and 2015-16 (aggregating to Rs.3.49 Cr) was incorporated in the supplementary claims in truing up petition (as well as in accounts) for FY 2017. But this was also not specifically made out as capacity charges revision because of which Hon'ble Commission vide truing up of 2016-17 had fully trued up the reversal of Rs.3.49 Cr in addition to the disallowance of Rs 7.13 Cr (Rs.207.13 Cr-Rs. 200 Cr). As a result reversal of capacity charges for 2015-16 of Rs. 1.96 Cr considered in 2016-17. Thus, annual capacity charges for 2015-16 of Rs.211.22 Cr as per TU petition have actually been subjected to reversal in accounts in FY 16 and FY 17 amounting to Rs.4.09 Cr (Rs.2.13 Cr+Rs.1.96 Cr) with similar amount getting

trued up under supplementary claim. Therefore Hon'ble Commission may be pleased to rectify the same by allowing Rs.8.18 Cr in 2018-19.

- (vii) Adjustment made in accounts for 2018-19 against AFC in respect of 2015-16 and 2016-17 amounting to Rs. 7.13 Cr each has not been considered in TU 19 since only Rs 200 Cr. AFC was considered for true up in respective years.
- (viii) KSEBL claimed Rs.221.84 Cr towards AFC in 2014-15; TU orders for the year are still to be issued. Reversal to the extent of Rs. 15.07 Cr (Rs.13.54 Cr+ Rs.1.53 Cr) has already been trued up in 2015-16 and 2016-17 and now offering Rs.6.77 Cr in 2018-19 for true up. Therefore, entire AFC in excess of Rs. 200 Cr over the sum sought for true up in 2014-15 (Rs.21.84 Cr) is already adjusted in these years. In view of the above, it is humbly prayed that the Hon'ble Commission may true up Rs.221.84 Cr as AFC for RGCCPP in the orders for 2014-15.

4.6.19 Thus, the power purchase cost claimed for FY 2019 for RGCCPP is as shown below:

Table D18 Cost of power purchase from RGCCPP in 2018-19 (Rs Cr)	
Total PP cost for FY-19 as per accounts (Item No 9 of Table D15)	181.70
Add AFC disallowed in Truing up petition FY-16 but accounted in FY-19	7.13
Add AFC disallowed in Truing up petition FY-17 but accounted in FY-19	7.13
Add Excess disallowance in Truing up petition FY-16 & FY-17	8.18
Total power purchase cost for RGCCPP claimed	204.14

4.6.20 Total power purchase from IPPs inside the State is summarized as below:

Table-D19 : Power Purchase from IPPs								
	KSERC approval		Audited Accounts		Truing up requirement		Difference	
Station	Energy (MU)	Cost (Rs Cr)	Energy (MU)	Cost (Rs Cr)	Energy (MU)	Cost (Rs Cr)	Energy (MU)	Cost (Rs Cr)
RGCCPP	0	200	0.81	181.70	0.81	204.14	0.81	4.13
Wind & SHEP	210.62	76.45	182.41	79.20	182.41	71.31	-28.21	-5.13
Solar-IREDA and Anert	70.08	27.33	79.07	28.89	79.07	28.89	8.99	1.56
Grid connected solar prosumers	0.00	0.00	18.92	0.88	18.92	0.88	18.92	0.88
CPPs/PCBL	0.00	0.00	14.68	0.12	14.68	0.12	14.68	0.12
Subtotal	280.70	303.78	295.90	290.79	295.90	305.33	15.20	1.56

4.6.21 **Power Purchase from IPPs outside state through approved firm contracts:** Since the power demand of the state cannot be met fully from resources within the state, KSEBL had, with the approval of Hon Commission, entered into agreements with various generators outside the State. Hon Commission had approved 8321.14 MU for a total amount of 3458.09 Cr from various generators inclusive of power contracted through DBFOO basis against which KSEBL had purchased 7951.08 MU for a total cost of 3371.19 Cr from various contracts. The details of cost of power purchase through long term contracts as per audited accounts are given in table below.

Table-D20 : Power Purchase thru various LTA as per audited accounts approved for FY -19								
Source	KSERC approval		Actual		Truing up		Difference	
	Energy* (MU)	Cost (Rs Cr)	Energy* (MU)	Cost (Rs Cr)	Energy* (MU)	Cost (Rs Cr)	Energy* (MU)	Cost (Rs Cr)
Maithon Power Ltd-I	991.63	415.79	1042.84	441.78	1042.84	441.78	51.21	25.99
Maithon Power Ltd-II	991.63	415.79	1042.86	440.07	1042.86	440.07	51.23	24.28
DVC Mejia	686.96	273.27	586.91	241.26	586.91	241.26	-100.05	-32.01
DVC RTPS	244.94	136.92	131.08	50.63	131.08	50.63	-113.86	-86.29
Jindal Power Ltd-Bid I	1,486.29	555.28	1,410.26	492.50	1410.26	521.98	-76.03	-33.30
Jhabua Power Ltd-PSA II	733.26	332.47	683.83	326.20	683.83	267.41	-49.43	-65.06
Jindal Power Ltd-Bid II	1,117.19	466.45	1,050.85	456.97	1,050.85	472.11	-66.34	5.66
Jhabua Power Ltd-Bid II	625.27	261.06	593.32	317.50	593.32	274.65	-31.95	13.59
JITPL	695.25	290.28	680.58	309.49	680.58	309.49	-14.67	19.21
BALCO	748.98	310.78	728.54	294.8	728.54	294.8	-20.44	-15.98
Subtotal	8321.4	3458.09	7951.08	3371.19	7951.08	3314.19	-370.32	-143.90
* Energy at ex bus								

4.6.22 The cost of power purchase sought for true up differed from the power purchase cost as per audited accounts due to following reasons.

- (i) In the case of Jindal Power Ltd-PSA I (200 MW) and Jindal Power Ltd-PSA II (150 MW), a provision of Rs -44.63 Cr (Rs 29.48 Cr.+ Rs 15.14 Cr.) is made in accounts towards deduction of various charges claimed by them during 2017-18 and not admitted by KSEBL. This was subsequently withdrawn by the generator during 2018-19. KSEBL has already incorporated this deduction from the power purchase cost of FY-18 in the truing up petition for that year. Therefore, the accounting adjustment made in 2018-19 of Rs.44.63 Cr has to be discarded to reflect the actual power purchase cost of M/s Jindal power Ltd. Thus KSEBL is claiming the actual power purchase cost of M/s Jindal Power Ltd (200 MW) amounting to Rs 521.98 Cr. and the actual cost of M/s s Jindal Power Ltd (150 MW) amounting to Rs 472.11 Cr for truing up petition. Hon'ble Commission may kindly approve these figures.
- (ii) Further Rs 58.79 Cr claimed by Jhabua power Ltd (115 MW) under PSA-I, and 42.84 Cr claimed by Jhabua Power Ltd (100 MW) under PSA II towards claims on fixed charges and variable charges was not admitted by KSEBL during FY-19. This is mainly due to difference in value of station heat rate taken by the utility and generator for the computation of fixed charges and fuel charges and due to the difference in methodology taken by KSEBL and generator for the calculation of fuel charges. M/s Jhabua Power Ltd has filed a petition before Hon'ble CERC on the matter since this Hon'ble Commission decided that it does not have jurisdiction in the matter. M/s Jhabua Power Ltd has claimed fixed charge on account of non availability of concessional fuel in certain months which is under dispute and hence is not admitted. Further KSEBL is deducting the SRLDC fees and charges from the monthly bill of M/s Jhabua power Ltd as per clause 5.7 of PSA which was not agreeable to M/s Jhabua Power Ltd. Also M/s Jhabua Power Ltd does not account the STOA, MTOA credits passed on by M/s PGCIL in their monthly bills, but has not disputed the PoC bill claim.

As a result Rs 101.63 Cr towards fixed and variable charges for 2018-19 had not been admitted for the variation of fixed charges and variable charges due to this difference in methodology of computation but was provided in accounts.

(iii) KSEBL has not paid these charges during 2018-19 and therefore not claiming Rs 101.63 Cr (Rs 58.79 Cr.+ Rs 42.84 Cr.) in the truing p petition for FY-19. It is requested that Hon'ble Commission may kindly consider truing up of these claims, if any portion legally materialise on a later date.

(iv) Thus the actual cost claimed by KSEBL for these stations are given below

Table D21 Power purchase Cost of Jindal and Jhabua Power Ltd (Rs Cr)			
Source	Power purchase cost for FY-19 as per accounts	Reversal in accounts for FY-19 of various charges accounted in FY-18 but not claimed in TU-18	Power purchase cost claimed for FY-19
	Rs Cr.	Rs Cr.	Rs Cr.
Jindal Power Ltd-Bid I	492.50	29.48	521.98
Jindal Power Ltd-Bid II	456.97	15.14	472.11
Total	949.47	44.63	994.10
Source	Power purchase cost for FY-19 as per accounts	Unadmitted claims	Power purchase cost claimed for FY-19
	Rs Cr.	Rs Cr.	Rs Cr.
Jhabua Power Ltd-Bid I	326.20	58.79	267.41
Jhabua Power Ltd-Bid II	317.50	42.84	274.65
Total	643.70	101.63	542.07

(v) In the case of M/s Jindal Power Limited (150 MW), M/s Jhabua Power Limited (100 MW) and M/s Jindal India Thermal Power Ltd (100 MW), under bid II, Hon'ble Commission approved scheduling of power for the limited purpose of estimating the ARR&ERC for the control period at rate equivalent to that of power from Balco, as the final approvals from Gol and State Government was still awaited.

(vi) It may kindly be noted that the DBFOO framework allows pass through of actual fuel cost based on predetermined Station Heat Rate, which shall not exceed 2350 kCal/kWh. Further, the Station Heat Rate has to be certified by the generators by following tests prescribed in the PSA prior to date of commissioning. The Station Heat rates duly certified by generators under Bid 2 viz; M/s Jindal Power Ltd (150 MW), M/s Jhabua Power Ltd (100 MW), M/s Jindal India Thermal Power Ltd (100 MW) and M/s BALCO (100 MW) are 2327 kCal/kWh, 2347.9kCal/kWh, 2350 kCal/kWh and 2350 kCal/kWh respectively. Further, the delivered cost of coal to each generator would depend on the grade of coal supplied by Coal India Ltd or its subsidiaries, the notified price of coal of the respective mine from which coal is supplied and the cost of transportation which again depends on the mode of transportation and distance from mine. Hence the charges applicable to BALCO could not be used for these stations for payment purpose as per PSA which is part of the standard bid documents notified by Gol under Section 63 of Electricity Act, 2003.

(vii) It is respectfully submitted that this Hon'ble Commission vide letter dated 22.12.2017 has already allowed the petitioner to draw power from M/s Jindal Power Ltd (150

MW), M/s Jhabua Power Ltd (100 MW), and M/s Jindal India Thermal Power Ltd (100 MW) in view of PSA based on Bid 2. Further this Hon'ble Commission vide order dated 06.06.2019 on OP No 12/2018 has also decided that it has no jurisdiction on matters relating to tariff for interstate sale of energy as per these PSAs. In view of these decisions only tariff as per these PSAs can be followed by the petitioner, while drawing power in accordance with direction dated 22.12.2017. Accordingly in view of the fact that this Hon'ble Commission has already allowed the petitioner to draw the power from M/s Jindal Power Ltd (150 MW), M/s Jhabua Power Ltd (100 MW) , M/s Jindal India Thermal Power Ltd (100 MW) in view of the PSAs entered into with these generators , it is humbly submitted that the claims based on the actual expenses incurred in accordance with these PSAs be trued up. It is also submitted that these PSAs are strictly in accordance with the model bid documents notified ny MoP, Gol as per section 63 of the Electricity Act, 2003.

- (viii) Meanwhile, KSEBL vide letter dated 7.11.2019 has again taken up the matter of getting approval of Government of India for the deviations in the Standard bidding guidelines, with the Government of Kerala for appropriate orders in this matter. Subsequently, MoP vide letter dated 11-12-2019 intimated that the matter has been examined and approval for deviation can be considered by Ministry before issuance of RFQ, RFP and PSA only. The deviations noted by Hon'ble Commission were not in the RFQ, RFP and PSA and was on the matter of evaluation and award of the bid. MoP has remarked that Government of Kerala/KSEB Ltd may take action as appropriate in consultation with Hon'ble Commission on the matter of deviation during evaluation/award. KSEB Ltd has appraised the matter before Government of Kerala for appropriate decision and the same has been intimated to Hon'ble Commission vide letter dated 26.12.2019.
- (ix) Considering the above, Hon'ble Commission may kindly approve the actual expenses incurred for drawing the power as already approved by the Hon'ble Commission.

4.6.23 There was significant **reduction in energy** supplied from **DVC Mejia and DVC Reghunathpur**. The availability of power from Mejia and Reghunathpur TPS was affected due to shortage of coal.

Power purchase considered under short term contracts

4.6.24 In the MYT petition, KSEB Ltd has proposed to procure 229.54 MU of power from short term market to meet the peak deficit anticipated in the summer months. Hon'ble Commission vide order dated 08.07.2019 observed as follows:

"In the control period there will be overall energy surplus though there may be deficit in some months due to increase in peak demand or changes in climatic conditions or reasons such as general elections as mentioned by KSEB Ltd. Since such situations are difficult to predict and KSEB Ltd has proposed the same rate for the purchase and sale, the Commission for the purpose of approving the ARR & ERC has considered the net surplus energy sale only in all the years of the control period."

4.6.25 It may please be noted that during 2018-19 there was reduction in energy availability from Central Generating Stations by 1027.10 MU, energy availability from long term contracts was

also less by 347.27 MU and the hydro generation by 236.27 MU when compared with the approved quantum. This resulted in a total reduction in energy availability by 1598.41 MU over the approved quantum. In order to meet the short fall, peak demand and exigencies, KSEBL purchased 476.99 MU at Kerala periphery through energy exchanges through Day ahead markets and term ahead markets and 252.45 MU through deviation settlement mechanism and availed 142.77 MU through banking arrangements.

- 4.6.26 **Power purchase from Energy exchanges:** KSEBL procured 467.99 MU at Kerala periphery at a cost of Rs 165.61 Cr from IEX and 9 MU at Kerala periphery for a cost of Rs 4.53 Cr from PXIL. The details are as follows:

Table D22 Power purchase through exchanges		
Source	Energy* (MU)	Cost (Rs Cr)
IEX	467.99	165.61
PXIL	9.00	4.53
Sub total	476.99	170.14
* Energy at Kerala periphery		

- 4.6.27 **Power availed through swap arrangement:** - In addition to the above KSEBL had entered into banking arrangements with various utilities for availing supply of power through swap contracts. Hon'ble Commission vide order dated 28.05.2019 on OP No 33/2019 approved the banking arrangements with M/s Rajasthan Urja Vikas Nigam Ltd (RUVNL) through the trader M/s TPTCL with a trading margin of Ps 0.47/unit, and through the trader M/s NVVN with a trading margin of Ps 0.47/unit as detailed in the table below. Further Hon'ble Commission vide order dated 24.10.2019 on OP No 47/2019 approved the banking arrangements with M/s HPPC through the trader MPPL for 150MW with a trading margin of Ps 3.20/unit, with NPCL through the trader MPPL for 50MW with a trading margin of Ps 3.50/unit and with HPPC through Arunachal Pradesh Power Corporation Pvt Ltd (APPCPL) for 100 MW at a trading margin of Ps 3/unit for availing power in FY-19. The summary of the banking arrangements including its supply period, trading margin, return period, quantum of power to be returned etc are given below.

Table D 23 Details of contracts through banking arrangement												
SI No	Supply						Return					
	Trader	Utility	Period		Quantum MW	Duration Hrs	Utility	Return %	Period		Return duration hrs	Total Return MW
			From	To					From	To		
1	MPPL	HPPC	16/2/19	15/3/19	150	20-24	KSEBL	100%	1/7/19	31/7/19	0-6	90.32
2	MPPL	NPCL	1/3/19	31/3/19	50	RTC	KSEBL	105%	1/7/19	30/9/19	RTC	17.69
3	APPCPL	HPPC	1/3/19	15/3/19	100	RTC	KSEBL	105%	1/7/19	31/8/19	RTC	25.40
4	APPCPL	HPPC	16/3/19	31/3/19	150	RTC	KSEBL	105%	1/7/19	31/8/19	RTC	40.65
5	NVVN	KSEBL	1/11/18	15/11/18	90	6-11	RUVNL	102%	1/5/19	30/6/19	RTC	11.91
			15/11/18	30/11/18	60							
			1/12/18	15/12/18	30							
			16/12/18	31/12/18	45							
6	TPTCL	KSEBL	1/11/18	15/11/18	60	6-11	RUVNL	102%	1/5/19	30/6/19	RTC	7.94
			15/11/18	30/11/18	40							
			1/12/18	15/12/18	20							
			16/12/18	31/12/18	30							

- 4.6.28 Based on arrangements under SI No 1 to 4 above, KSEBL has received 142.77 MU at Kerala periphery through swap arrangement in 2018-19 which was returned during FY 2020. A total expenditure of Rs 1.989 Cr has been incurred on this arrangement. Further, 28.9 MU banked with RUVNL through traders such as TATA and NVVN as per arrangement in 2018-19 was availed back during 2019-20 as per arrangement under SI No 5 and 6 of table no. D22. The energy so banked in 2018-19 to be availed in 2019-20 is accounted as energy export in table D 28. The energy received through banking in 2018-19 is detailed in table below.

Table D 24 Power availed thru banking arrangement thru swap			
Particulars	Energy at exbus (MU)	Energy at Kerala periphery (MU)	(Rs Cr)
Power from HPPC through MPPL	16.80	16.39	1.989
Power from HPPC through APPCPL	92.24	90.06	
Power from NPCL through MPPL	37.20	36.32	
Subtotal	146.24	142.77	

- 4.6.29 **Deviation settlement mechanism:** KSEB had received a net energy of 252.45 MU from Southern grid through deviation settlement mechanism (DSM) at an average rate of Rs 2.44 per unit at a cost of Rs.125.12 Cr.
- 4.6.30 In view of the details furnished above, it may kindly be seen that the shortfall in energy availability from approved sources had been effectively met through procurement of power from various sources. Details of approval obtained from the Hon'ble Commission are furnished in **Appendix D2**. The details of purchases through long term, short term contracts are given as **Appendix D3**. The summary of power Purchase from power exchanges and power transfer through deviation settlement mechanism against quantum approved towards short term contracts for FY 2018-19 is furnished below:

Table D 25: Details of power purchase against approval for short term procurement								
Source	Approval (at Kerala periphery)			Actual (at Kerala periphery)			Difference	
	Energy (MU)	Cost (Rs Cr)	Rate Rs/unit)	Energy (MU)	Cost (Rs Cr)	Rate Rs/unit)	Energy (MU)	Cost (Rs Cr)
IEX				467.99	165.61	3.54		
PXIL				9.00	4.53	5.03		
Deviation Settlement Mechanism				252.45	62.76	2.49		
Total	0	0	0	729.44	232.90	3.19	729.44	232.90

- 4.6.31 **Energy sale outside the State:** - Hon'ble Commission approved sale of surplus power of 1513.26MU for a total revenue of Rs 756.64 Cr. KSEBL could sell surplus power to M/s BSHPCL, 50 MW in June 2018, 100 MW during August to October 2018 and 100 MW during August 2018 as per Table D 25, through DEEP portal introduced by Ministry of Power for facilitating the purchase of power by DISCOMS on short-term basis. Approval had been obtained from the Hon'ble Commission vide letter dated 22.10.2018. KSEB Ltd could also sell surplus power to M/s Chhattisgarh State Power Distribution Company Limited (CSPDCL), from 01.10.2018 to 30.11.2018, by participating in the tenders floated by M/s CSPDCL through DEEP portal introduced by Ministry of Power for facilitating the purchase of power by

DISCOMS on short-term basis. Approval for the same has been obtained from Hon'ble Commission vide order dated 28.05.2019. KSEBL sold 144.16 MU through these two contracts. The details are as follows:

Table D26 Energy sale o/s State through contracts						
No	Utility	Period	Timing in Hrs	Quantum	Rate	Sale at Kerala periphery
				MW	Rs /unit	MU
1	BSHPCL	01-06-2018 to 30.06.2018	19.00 to 24.00	50	5.95	75.10
	BSHPCL	01-08-2018 to 31.08.2018	19.00 to 24.00	100	6	
	BSHPCL	01-08-2018 to 31.08.2018	00.00 to 06.00	100	4.23	
	BSHPCL	01.09.2018 to 30.09.2018	19.00 to 24.00	100	6	
	BSHPCL	01.10.2018 to 31.10.2018	18.00 to 24.00	100	6.5	
2	CSPDCL	01.10.2018 to 31.10.2018	00.00 to 7.00	150	4.09	32.99
	CSPDCL	01.11.2018 to 30.11.2018	06.00 to 10.00	200	5.16	36.07
	CSPDCL	01.11.2018 to 30.11.2018	10.00 to 13.00	149	4.37	
	Total				4.85(Kerala periphery)	144.16

4.6.32 KSEBL also sold excess power through exchanges during 2018-19 which was already communicated on a monthly basis to the Hon'ble Commission vide reporting the short term transactions. The total sale of power outside the State by KSEBL through exchanges for the year 2018-19 at Kerala periphery is 680.63 MU @ Rs 3.85 per unit. 656.45 MU was sold through IEX @ Rs 3.84 per unit and 24.18 MU through PXIL @Rs 4.07 per unit. The details of energy sale through exchanges are given in table below:

Table D 27 Energy sale o/s State through contracts			
Sl No	Source	Energy at SR periphery	Energy at KSEB periphery
		MU	MU
1	IEX TAM	6.87	6.96
2	IEX DAM	639.73	649.48
3	IEX Total	646.60	656.45
4	PXIL TAM	14.21	14.43
5	PXIL DAM	9.61	9.76
6	PXIL Total	23.82	24.18
	Total	670.42	680.63

4.6.33 The expenditure associated with sale through power exchanges amounts to Rs 5.34 Cr.

4.6.34 Thus KSEBL sold 824.78 MU for a total amount of Rs 339.34 Cr. @ Rs 4.11 per unit against the approved quantum of 1513.27 MU for Rs 756.64 Cr. It may kindly be noted that KSEB Ltd could realise a higher rate from sales through short term market than the rate derived while procuring power through short term market (Rs 3.19 per unit).

4.6.35 **Power returned through banking arrangement (SWAP):-** KSEBL returned 139.12 MU from 16th June 2018 to 30th September 2018 with time duration from 00.00 hrs to 4.00 hrs and 22.00 hrs to 24 hrs through GMRETL through banking arrangement (swap), which was availed during previous year. Further KSEBL supplied 28.90 MU through NVVN and TATA to RUVNL which was received back in 2019-20. Approval has been obtained from Hon'ble Commission

vide order dated 28.05.2019. Thus the total energy transacted outside the State through banking arrangement during 2018-19 is 168.018 MU as detailed in table below.

4.6.36 The expenditure corresponding to this arrangement is Rs 2.28 Cr.

Table D 28 Energy transacted outside State thru banking arrangement during FY-19

Utility	Trader	Period	Energy at delivery point (MU)	Energy at Kerala periphery (MU)	Expenditure (Rs Cr.)	Approval order date
PSPCL	GMRETL	June-September 2018 (return of previous year supply)	135.90	139.12	1.87	
RUVNL	NVVN	November-December 2018	17.10	17.32	0.245	28.05.2019
RUVNL	TATA	November-December 2018	11.40	11.58		28.05.2019
		Sub total	164.40	168.02	2.28	

4.6.37 Thus KSEBL supplied 168.018 MU during 2018-19 through swap arrangements and the expenditure corresponding to this arrangement is Rs 2.28 Cr. Thus the total energy supplied outside the State through trading and banking arrangement is 992.80 MU at Kerala periphery.

4.6.38 **Amount released towards PTC BALCO (Medium Term Contract):-** An amount of Rs 32.37 Cr has been released towards M/s BALCO through PTC towards compensation for change in law for the period March 2015 to February 2017. KSEBL had executed PPA with M/s.PTC India Ltd on 13.06.2013 for the supply of 100 MW RTC power from M/s. BALCO, Chhattisgarh through Case I bidding for the period from 1.3.2014 to 28.02.2017 which was approved by Hon'ble Commission vide letter no No.828/C.Engg/Case.1/KSERC/2013/594 dated 24.05.2013 and KSEB Ltd received power from March 2015 to February 2017. M/s. BALCO has filed petition before CERC seeking compensation for the change in law events during the operating period vide Petition No. 18/MP/2017 amounting to Rs 38.90Cr. CERC, vide order dated 18.04.2018 had allowed some of the events and disallowed certain other events. KSEBL filed appeal before the APTEL on 16.07.2018 against the CERC order dated 18.04.2018. M/s BALCO also approached Hon'ble APTEL for release of amount allowed by Hon'ble CERC. Hon'ble APTEL, through interim orders, directed to work out the amount on account of change in law that are due with facts and figures and directed the Appellant to furnish details of (at least admitted amount) which have to be paid in respect of change in law items covered under Impugned Order.

4.6.39 Accordingly, M/s BALCO had forwarded a revised claim amounting to Rs. 54,98,20,333/-, which was not certified by statutory auditors. As per CERC order dated 18.04.2018, BALCO is entitled to reconcile the actual payment made towards change in law with the books of accounts duly audited and certified by statutory auditor. However, BALCO failed to furnish certified copies of required documents to the satisfaction of KSEB Ltd. Meanwhile, in compliance with the order of Hon'ble APTEL, KSEBL calculated the provisional amount due, as per change in law order of CERC, which amounts to Rs.32.37 Cr which may change subject to submission of proper documents as well as the final outcome of appeal before Hon'ble APTEL. Upon placing it on record, Hon'ble APTEL vide order 15.05.2019 directed that KSEBL shall immediately pay the admitted amount i.e., Rs. 32.37 Cr. Even though KSEBL approached

Hon'ble Supreme Court challenging the interim order of Hon'ble APTEL, the same was not successful.

4.6.40 Accordingly an amount of Rs 32.37 Cr has been released towards M/s BALCO through PTC towards compensation for change in law, as per the daily orders of Hon'ble APTEL dated 15.05.2019 and 20.05.2019 in IA No. 37 of 2019 in Appeal No. 30 of 2019 and as per the as per the order dated 26.08.2019 of the Hon'ble Supreme Court of India. The same may be admitted.

4.6.41 **Inter-state Transmission charges paid to PGCIL:** Hon'ble Commission, vide order dated 08.07.2019, approved interstate transmission charges of Rs 539.84 Cr for 2018-19. Actual transmission charges incurred by KSEBL during 2018-19, as per audited accounts, were Rs. 513.41 Cr. Actuals may kindly be approved.

4.6.42 In view of the above submission, Hon'ble Commission may kindly true up the total power purchase cost amounting to Rs 7826.86 Cr as detailed in **Appendix D4**, summary of which is provided in table D28 below.

Table D 29 Power Purchase cost for the year 2018-19	
Particulars	Amount (Rs Cr)
Power Purchase as per accounts	7869.32
Add provision of Jindal Power Ltd 200 MW	29.48
Add provision of Jindal Power Ltd 150 MW	15.14
Add provision towards fixed charges of RGCCPP	22.43
Less Provision of 2017-18 of M/s INOX	7.89
Less provision reversal of Jhabua Power Ltd 115 MW	58.79
Less provision reversal of Jhabua Power Ltd 100 MW	42.84
Power Purchase claimed in the truing up petition	7826.86

4.7 O&M Expenses:

4.7.1 Actual O&M expenses for SBU D for the year 2018-19 has been Rs.3106.25 Cr as detailed in Form D3.4.

4.7.2 **Cost Drivers:** Tariff regulation, 2018 considers the following cost drivers for determination of normative O&M expenses. The growth of the drivers is given in the Table – D26 below.

Table – D30 : Distribution Cost Drivers										
Item	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY-18
Consumers (Nos)	9363461	9743476	10127946	10457637	10806890	11192890	11430895	11668031	11994816	12276321
Dist Transformers (Nos)	46359	52149	57954	62329	64972	67546	71199	73460	75759	77724
HT Lines (KM)	41283	44682	48342	51328	52907	53579	57309	59476.66	61398.43	62855
Energy Sales (MU)	12414	13971	14548	15981	16838	17454	18426	19325.07	20087.55	20998

4.7.3 The parameters of FY-18 are taken for computing normative O&M expenses. The normative values of employee cost and A&G expenses is given in table below:

Table D 31 Normative O& M expenses for 2018-19		
No	Parameters	Quantity
1	No. of consumers (Rs. Lakh/1000)	4.80
2	Dist Transformers (Rs. Lakh/DTr)	0.64
3	Length of HT line (Rs. Lakh/km)	0.79
4	Energy sales (Rs/unit)	0.19
5	No. of consumers	12276321
6	No. of Dist Transformers (Nos)	77724
7	HT Line (Ckt-Km)	62855
8	Energy sales in MU	20998
9	Employee, A&G Cost (Rs Cr)	1982.22

4.7.4 As per the provision 79 and Annexure IX of Tariff regulations 2018,, R&M expenses of Distribution licensees is:

- (i) 3% of Opening GFA (excluding value of land and land under lease) of distribution business of each year of the control period.
- (ii) Repair and Maintenance expenses for assets added during the year of the control period shall be allowed after prudence check by the Commission on a pro-rata basis subject to production of details of the assets.

Based on the above normative R&M expense is calculated as follows:

Table D 32 Normative R&M expenses (Rs Cr.)			
Particulars	Amount (Rs Cr)		
Opening GFA Excluding Land value (Rs Cr.)	8246.59		
Land value as per Balance sheet of SBU D	19.91		
Opening GFA less Land value	8226.68		
R&M expenses on opening GFA @ 3% -A	246.80		
Add: Addition of assets during the year	1203.72		
R&M at pro rata basis for assets added during the year			
	GFA addition	Pro rata % based on works in 2018-19	Pro rata R&M expenses
April,2018	68.42	5.68	1.88
May,2018	79.31	6.59	1.98
June,2018	73.71	6.12	1.66
July,2018	184.10	15.29	3.68
August,2018	0.00	0	0.00
September,2018	0.00	0	0.00
October,2018	0.00	0	0.00
November,2018	159.05	13.21	1.59
December,2018	47.75	3.97	0.36
January,2019	145.97	12.13	0.73
February,2019	0.00	0	0.00
March,2019	445.43	37	0.00
R&M expenses for assets added during FY-19 -B			11.88
Total R&M expenses (A+B)			252.35

4.7.5 A comparison of approved normative and actual O&M expenses is given in table below

Table – D33 : Components of O&M Expenses for SBU D (Rs Cr)						
No	Particulars	Approved	As per accounts	Normative	Variation of accounts from approval	Remarks
1	Employee Cost & A&G Expenses	1979.83	2873.29	1982.22	893.46	See Form D3.4 (a)
3	R&M Expenses	246.25	232.96	252.35	-13.29	See Form D3.4 (c)
4	Total	2226.08	3106.25	2234.57	880.17	See Form D 3.4

4.7.6 Hon'ble Commission may kindly note that a provision of Rs.144.47 Cr has been created for pay revision, which is due from July/Aug 2018 as detailed in chapter 5. Therefore, Hon'ble Commission may please approve Rs. 2379.04 Cr (Rs 2234.57 Cr+ Rs.144.47 Cr) towards O&M expenses for the year 2018-19.

4.8 Onetime expenses

4.8.1 Further, Share of SBU-D on contribution to CMDRF works out to Rs. 29.25Cr as detailed in chapter 5. Hon Commission may kindly approve the same.

4.9 Depreciation:

4.9.1 Hon Commission had approved the depreciation of SBU-D for FY 18-19 at Rs 72.24 Cr. Actual Depreciation for the Distribution assets as per accounts for the year 2018-19 has been Rs.433.24 Cr as detailed in **Form D3.5 (2)**.

4.9.2 Hon'ble Commission may kindly note that depreciation as per accounts has been worked out in line with IND AS and claw back depreciation was determined and credited to other income. But, as per MYT Regulation for the control period, depreciation is allowable as per the provisions contained in the Tariff Regulations, 2018 in which applicable rates as well as methodology to be followed are specified therein. Accordingly, allowable depreciation for SBU D has been worked out at **Rs. 107.98 Cr** as detailed in Chapter 5. Hon'ble Commission may kindly approve the same.

4.10 Interest and Finance Charges:

4.10.1 Hon Commission had approved the interest and finance charges of SBU-D for the year 2018-19 at Rs 1428.31 Cr. However, as per the audited accounts, the actual expenses incurred under interest and finance charges were 1263.32 Cr. The details are given below.

Table 34 Comparison of I&FC for 2018-19 (Rs. Cr)				
No	Particulars	Approved	Accounts	True up sought
1	Interest on outstanding Loans and Bonds		348.47	
2	Less: Interest capitalized		202.80	
3	Net interest	149.90	145.67	180.27
4	Interest on Security Deposit	175.33	177.31	170.75
5	Interest on GPF	152.55	136.68	136.68
6	Other Interest	0	26.06	18.41
7	Interest on Master Trust Bond	646.45	652.08	652.08
8	Carrying cost on approved revenue gap	304.08	0	629.11
9	Interest on working capital	0	125.54	0
10	Grand Total (I+II+III+IV+V)	1428.31	1263.32	1787.30

4.10.2 KSEBL has executed capital works to the tune of Rs 1434.67 Cr and added fixed assets of 1203.72 under SBU D during the year as detailed in Chapter 5. Physical addition to fixed assets is summarized below:

Table – D35 : Details of Capital Works during 2018-19	
Particulars	Achievement
Service Connections (Nos)	368673
HT Line construction (km)	1773
LT Line construction (km)	3401
Transformer installation (Nos)	2410
Line conversion (km)	1292
HT re-conductoring (conductor km)	840
LT re-conductoring (conductor km)	8355
Faulty meter replacement (Nos)	837858

4.10.3 Hon Commission, as per Truing up orders for 2015-16 and 2016-17, has decided to approve interest on loans on normative basis. The same is followed in Tariff regulations, 2018 as well as in MYT order dated 08.07.2019. The normative loan at the beginning of the year (01.04.2018) has been determined as per Regulation by considering GFA, Approved depreciation, Consumer contribution and grants and Equity. Based on the methodology adopted by the Hon'ble Commission, normative loan as on 01.04.2018, addition, repayment and closing normative loan as on 31.03.2019, interest on normative loan along with SBU wise segregation are determined and furnished in chapter 5. Based on the computation, KSEBL is entitled to Rs.180.27 Cr as interest on normative loan for the year 2018-19.

4.10.4 Interest on security deposit: Hon Commission approved interest on SD for the year at Rs.175.33 Cr. The Actual Security Deposit balance as per accounts was **Rs3019.12 Cr** at the beginning of the year (01-04-2018) on which the interest at 6.75 % was provided in FY 2018-19 (**Rs 177.31 Cr**). However, the actual sum disbursed in the FY 2018-19 was against the provision made for FY 2017-18 was Rs 170.75 Cr. Hon Commission may please approve the actual disbursement of Rs.170.75 Cr under SBUD.

4.10.5 Interest on working capital: The Normative Working Capital for SBU-D, as per Regulation 32, includes O&M Cost for one month, cost of maintenance spares as one twelfth of average of the book value of stores for that financial year, receivables for two months excluding security deposits. KSEB Ltd has computed the Interest on Working Capital in their petition at a rate of 10.15% (8.15% + 2%) as per Regulation 32(2). The parameters adopted for computation of Interest on Working capital for the control period are furnished below.

Table D36 Parameters for estimation of working capital	
SBU-D	
Opening GFA (Rs.Cr.)	8246.59
One twelfth of average of Inventory (Rs Cr.)	28.72
O&M Cost (Rs.Cr.)	2234.52
Revenue for the year 2018-19	13053.26

- 4.10.6 Based on the above, net working capital computed is negative as calculated below. Therefore no claim is made towards interest on working capital.

Table D 37 Interest on working capital (Rs Cr)	
O&M Exp for 1 month	186.21
Mace spares @ One twelfth of average of opening and closing balance of Inventory	28.72
Revenue (2 months)	2175.54
Total	2390.47
Less Security deposit	3019.12
Net Working Capital	-628.65

- 4.10.7 Since the Working Capital requirement is less than the security deposit held at the beginning of the year, KSEB Ltd is not claiming any interest on working capital for FY-19.
- 4.10.8 **Carrying cost on approved revenue gap:** Hon'ble Commission approved carrying cost of Rs. 304.08 Cr for the year after deducting average GPF balance from the approved gap to determine the revenue gap for which carrying cost is eligible. Actual average interest on loans during 2018-19 had been 10%. Accordingly, a sum of Rs.592.63 Cr towards revenue gap till 2017-18 and Rs.36.48 Cr towards revenue gap in 2018-19 is claimed as carrying cost for the year 2018-19 as detailed in chapter 5. Hon'ble Commission may please approve Rs.629.11 Cr towards carrying cost for 2018-19 under SBU D.
- 4.10.9 **Interest on PF:** Hon Commission approved Rs 152.55 Cr towards interest on PF for FY-19. But as per the audited accounts, the actual interest on PF was Rs.136.68 Cr, which is less by Rs.15.87 Cr. Therefore Rs.136.68 Cr is sought for true up as detailed in chapter 5, which may kindly be approved.
- 4.10.10 **Interest on Master Trust Bonds:** State Government, as per notifications dated 31.10.2013 and 28.01.2015, ordered creation of a Master Trust for meeting the unfunded liability of pension, gratuity and leave surrender as on 31.10.2013, in respect of the personnel transferred from erstwhile KSEB to KSEBL. The total liability as on 31.10.2013 was estimated at Rs.12418.72 Cr and necessary funding arrangements put in place through issue of 2 series of Bonds. Hon Commission recognized the unfunded pension liabilities as above and approved recovery of interest on KSEBL share of Bonds as per Tariff Regulations, 2014. Thus Hon Commission approved Rs.646.45 Cr towards interest on Master Trust bonds against share of SBU D. Actual share of expenses for SBU D has been Rs.652.08 Cr, which may kindly be approved.
- 4.10.11 Further, Hon'ble Commission was pleased to provisionally approve Rs.167.10 Cr towards interest on unfunded terminal liabilities under SBU-D. KSEBL seeks true up of Rs.167.10 Cr also as detailed in chapter 5.
- 4.10.12 In view of the above submission, Hon'ble Commission may kindly approve interest and finance charges as summarized below:

Table D 38 : Comparison of I& F charges-Approved, Actual and TU requirement for 2018-19 (Rs Cr)				
Item	Approval	Actual	TU requirement	Difference over approval
Interest on Loan	149.90	348.47	180.27	28.78
Security Deposit Interest	175.33	177.31	170.75	-4.58
Master Trust Bond Interest	646.45	652.08	652.08	5.63
Overdraft interest	0.00	125.54		0.00
PF interest	152.55	136.68	136.68	-15.87
Other interests	0.00	18.41	18.41	18.41
Interest on fair valuation	0.00	9.13		0.00
Carrying cost	304.08	0.00	629.11	325.03
Total	1428.31	1467.62	1787.30	358.99
Less: Interest capitalized		202.80		
I&FC net of capitalization		1263.32		

4.11 Return on Equity:

Hon'ble Commission vide order dated 08.07.2019 approved Return on equity at Rs 253.50 Cr, which may kindly be trued up.

4.12 Other debits and Prior period expenses/income:

As detailed in chapter 5, a sum of Rs. 291.38 Cr is sought for true up, predominant portion of which represents withdrawal of interest income recognized in 2015-16 on settlement of KWA arrears.

4.13 Non tariff income: Hon'ble Commission approved Rs.531.55 Cr under this head. The share of non tariff income of SBU D as per accounts was Rs. 400.80 Cr, as detailed in Form D 2.4. However, as detailed in chapter 5, a sum of Rs.537.36 Cr is sought for true up against approval of Rs 531.55 Cr. This include Meter Rent/Service Line Rental, Miscellaneous charges (UCM, Service connection fee, Fee for maintenance of Public lighting, Testing fee, Reconnection fee, Penalty charges, Minimum Guarantee charges, Charges for Service connection minimum, Meter charges, Power allocation charges, Wheeling charges & Reactive energy charges , Interest on Staff Loans and Advances, Interest on Advances to suppliers/ Contractors, Interest from Banks, Rebate Received, Income from sale of scrap, RE Charges etc). Hon'ble Commission may kindly approve the same.

4.14 Tariff income: Hon'ble Commission vide order dated 08.07.2019 approved revenue from sale of power as Rs 12531.47 Cr (21647.27 MU) and Rs 756.64 Cr (1513.27 MU) towards revenue from surplus energy sales outside the State. Hon'ble Commission vide order dated 13.08.2018 allowed to recover an amount of Rs 81.65 Cr @ 15 paise per unit as fuel surcharge from LT consumers from August 2018 and from HT & EHT consumers from September 2018 onwards for three months. Against these, the actual revenue from sale of power including fuel surcharge, during the year was Rs. 12713.93 Cr (21536.77 MU) and from external sale was Rs. 339.34 Cr (824.78 MU). The reduction in external sales was due to the reduction in power availability as mentioned earlier in this chapter.

4.14.1 Thus, the revenue from tariff during the year 2018-19 has been Rs. 12713.93 Cr which is inclusive of Fuel Surcharge approved for FY-18 collected during 2018-19 as disclosed in **Form D 2.1**. A summary of the revenue from sale of power inside the State as well as outside State is given below.

Table – D39 : Revenue from Sale of Power within the State					
No	Category	Energy sales		Revenue	
		MU	%	Rs Cr	%
1	Domestic	10864.34	50.45	4621.036	36.35
2	Commercial	3221.43	14.96	3062.803	24.09
3	Public lighting	377.78	1.75	172.7674	1.36
4	Irrigation & Dewatering	337.65	1.57	86.7763	0.68
5	Industrial LT	1111.67	5.16	792.7592	6.24
6	Railway Traction	318.04	1.48	186.3838	1.47
7	Bulk Supply	597.04	2.77	369.1292	2.90
9	HT	3656.92	16.98	2758.593	21.70
10	EHT	1051.91	4.88	663.4755	5.22
11	Miscellaneous			0.1969	0.00
11	Total sales (within state)	21536.77		12713.93	100.00
12	Interstate sale	824.78		339.34	
13	Total	22361.55		13053.27	

4.14.2 Hon'ble Commission, while approving the revenue from sale of power, had deducted Rs 97.79 Cr. as power factor incentive against which the actual is Rs 114.07 Cr. Accordingly power factor incentive to the tune of Rs.114.07 Cr deducted from the revenue from SoP (which was booked under A&G expenses as explained in chapter 5). The revenue from sale of Power includes fixed charges/demand charges, energy charges, the subsidy allowed by the Government in the case of domestic consumers with monthly consumption up to 120 units and LT Agricultural consumers and fuel surcharge. It can be seen that 50.45% of total consumption was domestic which contribute 36.35 % of revenue. Actual revenue was less by Rs.251.12 Cr from approval. A comparison of approved vs actual sale is given in table below.

Table – D40 : Revenue comparison Approved Vs Actuals							
No	Category	Energy sales (MU)			Revenue (Rs. Cr)		
		Approved	Actual	Deviation	Approved	Actual	Deviation
1	Domestic	10861.42	10864.34	2.92	4485.19	4621.04	135.85
2	Industrial	1100.98	1111.67	10.69	784.29	792.76	8.47
3	Agriculture	350.01	337.65	-12.36	83.86	86.78	2.92
4	Commercial	3168.22	3221.43	53.21	2931.98	3062.8	130.82
5	Public Lighting	382.85	377.78	-5.07	177.06	172.77	-4.29
6	HT & EHT Total	4917.25	4708.82	-208.43	3448.96	3422.07	-26.89
7	Railway Traction	273.51	318.04	44.53	167.89	186.38	18.49
8	Bulk Supply	593.03	597.04	4.01	370.59	369.13	-1.46
9	Fuel surcharge				81.65		
10	Total sales (within state)	21647.27	21536.77	-110.5	12531.47	12713.72*	182.25
11	Interstate sale	1513.27	824.78	-688.49	756.64	339.34	-417.3
12	Misc					0.1969	0.1969
13	Total	23160.54	22361.55	-798.99	13288.11	13053.26	-234.85
14	Less Power Factor incentive				97.79	114.07	16.28
15	Revenue from Sale of power	23160.54	22361.55	-798.99	13190.32	12939.20	-251.12

* including fuel surcharge.

- 4.14.3 Hon'ble Commission may kindly true up revenue from sale of power (including external sale) at Rs.12939.20 Cr.

4.15 Summary of truing up for SBU-D

The total annual revenue requirements for the year 2018-19 are detailed in table below:

TABLE – D41 : ACTUAL ARR OF DISTRIBUTION BUSINESS UNIT (Rs Cr)				
Particulars	Approved	Actual	True up	Difference
Cost of Generation (SBU-G)	481.41	586.66	506.79	25.38
Cost of Power Purchase	7847.77	7869.32	7826.86	-20.91
Cost of Intra-State Transmission (SBU-T)	874.60	1068.69	858.64	-15.96
NLDC charges	3.00			-3.00
Interest & Finance Charges	1428.31	1263.32	1787.30	358.99
Depreciation	72.24	433.24	107.98	35.74
O&M Expenses	2226.08	3106.25	2379.04	152.96
Return on equity (14%)	253.50	147.23	253.50	0.00
Other Expenses		209.40	291.38	291.38
Income under FV Adjustments		5.37		0.00
Sharing of gains on account of higher T&D loss reduction			28.59	28.59
Recovery of previous gap	400.00			-400.00
Onetime expenses-CMDRF			29.25	29.25
One Time Expenses-Flood related R&M		12.39		0.00
Interest on additional bond to Master Trust	167.10		167.10	0.00
Total ARR	13754.02	14701.87	14236.44	482.42
Revenue from Tariff	12433.68	13181.87	12599.86	166.18
Revenue from external sale	756.64	339.34	339.34	-417.30
Non-Tariff Income	531.55	400.80	537.36	5.81
Total ERC	13721.87	13922.01	13476.56	-245.31
Net Revenue Gap(-)/Surplus(+)	-32.15	-779.86	-759.88	-727.73

Note: Actual power purchase cost is inclusive of NLDC charges.

- 4.16 Revenue from Tariff (Actuals as per accounts) is inclusive of PFI Rs. 114.07 Cr and Non Tariff Income of Rs.467.94 Cr as explained in chapter 5.
- 4.17 Hon'ble Commission, in the order dated 08.07.2019 had amortized a portion of past approved revenue gap of Rs.400 Cr. It may kindly be seen that revenue surplus actually does not materialize for amortizing any portion of past gap.
- 4.18 As shown above the total revenue gap for the year 2018-19 is Rs.759.88 Cr as against the approved revenue gap of Rs 32.15 Cr.
- 4.19 Appendices described in paragraphs above are attached here under. The forms are attached thereafter. The next chapter contains explanations relating to various expenses and income in general.

Appendix-D1

Power Availability for 2018-19

Particulars	April	May	June	July	August	September	October	November	December	January	February	March	Average
Availability of electricity to meet the Base load													
Hydro	549	460	270	421	1322	1253	730	480	150	124	260	450	539.08
CGS	1300	1300	1250	1150	1100	950	960	1060	1200	1260	1300	1250	1173.33
LTA	990	933	980	960	770	850	850	860	1050	1000	1050	1050	945.25
SWAP Ret./Sale contracted				-190	-293	-190	-150	0	0	0	0	150	-56.08
Purchase by OA consumers				50	40	30	0	20	50	50	40	40	26.67
Sum of Electricity in MW Generated + Contracted for purchase(A)	2839	2693	2500	2391	2939	2893	2390	2420	2450	2434	2650	2940	2628.25
*Base load(B)	2750	2600	2450	2150	2100	2350	2270	2300	2300	2350	2550	2900	2422.50
Availability of electricity to meet the base load (A/B)	103.24%	103.58%	102.04%	111.21%	139.95%	123.11%	105.29%	105.22%	106.52%	103.57%	103.92%	101.38%	108.49%
Availability of electricity to meet the Peak load		0											
Hydro	1507	1564	1582	1482	1656	1411	1461	1425	1310	1322	1500	1575	1482.92
CGS	1300	1300	1250	1150	1100	950	960	1060	1200	1260	1300	1250	1173.33
LTA	990	933	980	960	770	850	850	860	1050	1000	1050	1050	945.25
SWAP Ret./Sale contracted				-53	-156	-156	-100	0	0	0	0	150	-26.25
Purchase by OA consumers				50	30	30	0	0	0	0	0	60	14.17
Sum of Electricity in MW Generated + Contracted for purchase(A)	3797	3797	3812	3589	3400	3085	3171	3345	3560	3582	3850	4085	3589.42
Peak Load(B)	4000	4000	3750	3550	3550	3550	3700	3750	3850	3850	4000	4200	3812.50
Availability of electricity to meet the peak load (A/B)	94.93%	94.93%	101.65%	101.10%	95.77%	86.90%	85.70%	89.20%	92.47%	93.04%	96.25%	97.26%	94.15%
Gross Availability of electricity for Supply	101.16%	101.41%	101.94%	108.68%	128.91%	114.06%	100.39%	101.21%	103.01%	100.94%	102.00%	100.35%	104.91%

Appendix –D2: Details of contracts for procuring power during 2018-19				
Source	Contracted Capacity (MW)	Commission Approval Letter	Period of contract	Approved Tariff
Long Term contracts				
Maithon Power	150	No.2158/C.Engg/Maithon/2013/1398 dated 26.12.2013	25 years	Approved under Section 62 of Electricity Act 2003
Maithon Power	150	Order dated 08 - 07- 2015	25 years	
DVC Mejia	100	No.500/C.Engg/DVC/2014/348 dated 28.03.2014 & Order dated 21.01.2016	25 years	
DVC RTPS	50		25 years	
Jindal Power Ltd- PSA I (DBFOO)	200	Order dated 30.8.2016	25 years	Approved under Section 63 of Electricity Act 2003.
Jhabua Power Ltd-PSA-I (DBFOO)	115	Order dated 22.12.2016	25 years	
Jindal Power Ltd- PSA I (DBFOO)*	150	Letter dated 22.12.2017	25 years	
Jhabua Power Ltd-PSA-I (DBFOO)*	100	Letter dated 22.12.2017	25 years	
JITPL*	100	Letter dated 22.12.2017	25 years	
BALCO	100	Order dated 30.8.2016	25 years	

*Rate yet to be approved

Appendix – D3 : Actual Rate of Power from external IPPs, traders and energy exchanges, DSM, swap				
Name of IPP/trader	Energy at exbus(MU)	Energy at Kerala end (MU)	Cost (Rs Cr)	Rate at exbus (Rs/unit)
Long Term contracts				
Maithon Power Ltd-I	1042.84	1010.56	441.78	4.24
Maithon Power Ltd-II	1042.86	1010.58	440.07	4.22
DVC Mejia	586.91	570.42	241.26	4.11
DVC RTPS	131.08	127.14	50.63	3.86
Jindal Power Ltd-Bid I*	1410.26	1343.61	521.98	3.70
Jhabua Power Ltd-Bid I	683.83	655.21	267.41	3.91
Jindal Power Ltd-Bid II*	1050.85	1011.31	472.11	4.49
Jhabua Power Ltd-Bid II	593.32	568.48	274.65	4.63
JITPL	680.58	653.99	309.49	4.55
BALCO	728.54	700.75	294.80	4.05
Subtotal	7951.08	7652.05	3314.19	4.17
Short term contract				
IEX	479.26	467.99	165.61	3.46
PXIL	9.21	9.00	4.53	4.91
Deviation Settlement Mechanism	252.45	252.45	62.76	2.49
Swap Purchase	146.24	142.77	2.94	
Total	8531.74	8241.52	3128.22	3.67
<i>Note: Except Maithon &DVC all rates are inclusive of interstate transmission charges</i>				

Appendix – D4 : Source wise details of Power Purchase for 2018-19					
No	Source	Approved Energy (MU)	Approved Cost (Rs Cr)	Actual Energy (MU)	True up claim of Cost (Rs Cr)
1	CENTRAL GENERATING STATIONS				
	RSTPS I & II	1763.58	540.11	1608.17	530.31
	RSTPS III	426.1	131.52	400.76	132.78
	Talcher Stage-II	3105.98	699.49	2889.61	715.24
	Simhadri TPS Stage II	550.33	245.51	541.92	260.58
	NLC Stage-I	397.35	147.45	396.01	127.61
	NLC Stage-II	557.67	209.79	586.18	189.00
	NLC 1 Expansion	429.02	161.12	429.78	151.66
	NLC II Expansion	282.58	150.42	281.08	133.64
	Vallur STPS	346.7	161.76	267.73	145.30
	MAPS	85.3	23.81	60.72	16.63
	KAIGA	486.75	176.9	541.76	201.73
	Kudankulam	1285.78	525.4	759.53	330.14
	NTPL	486.64	230.14	420.25	207.58
	Kudgi	472.19	253.07	458.51	275.99
	Eastern region supplementary claims	0	0	0.00	-0.02
	PGCIL losses	420.55		400.92	
	Sub Total	10255.42	3656.49	9241.09	3418.17
2	INDEPENDENT POWER PRODUCERS				
	RGCCPP, Kayamkulam	0	200	0.81	204.13
	Wind- Ramakkalmedu	27.87	8.75	49.73	18.18
	Wind-Koundikkal	12.56	3.94	0.00	0.00
	Wind- Agali	29.72	9.33	0.00	0.00
	Wind Ahalya	20.98	10.97	18.15	9.48
	INOX	30.84	12.61	38.90	15.60
	Kosamattom	0.00	0.00	1.13	0.06
	Wind Sub total	121.97	45.61	107.90	43.34
	Ullunkal(EDCL)	17.79	4.34	10.75	2.66
	Iruttukanam Stage-I & II(Viyyat)	24.69	6.67	10.51	2.71
	Karikkayam HEP(AHPL)	37.56	15.62	45.78	18.92
	Meenvallom(PSHCL)	8.44	4.12	7.41	3.65
	Kallar of Idukki District Panchayat	0.08	0.04	0.00	0.00
	Mankulam of Grama Panchayat	0.09	0.04	0.00	0.03
	Minar Renewable energy project Ltd	0.00	0.00	0.07	0.00
	SHEP subtotal	88.65	30.84	74.51	27.98
	Solar				
	Solar IREDA	70.08	27.33	76.53	28.89
	Solar IPP ANERT	0.00	0.00	2.54	0.00
	Grid connected -solar	0.00	0.00	6.19	0.75
	Solar subtotal	70.08	27.33	85.26	29.64
	Subtotal IPPs	280.70	303.78	268.48	305.09
	Net CPP Energy injection			10.68	
	PCBL(Deviation adjustment)			2.05	0.12
	Sub total	280.70	303.78	281.22	305.21
	Continued...				

No	Source	Approved Energy (MU)	Approved Cost (Rs Cr)	Actual Energy (MU)	True up claim of Cost (Rs Cr)
3	Long Term Contracts				
	Maithon Power Ltd-I	991.63	415.79	1042.84	441.78
	Maithon Power Ltd-II	991.63	415.79	1042.86	440.07
	DVC Mejia	686.96	273.27	586.91	241.26
	DVC RTPS	244.94	136.92	131.08	50.63
	Jindal Power Ltd-Bid I*	1486.29	555.28	1410.26	521.98
	Jhabua Power Ltd-Bid I	733.26	332.47	683.83	267.41
	Jindal Power Ltd-Bid II*	1117.19	466.45	1050.85	472.11
	Jhabua Power Ltd-Bid II	625.27	261.06	593.32	274.65
	JITPL	695.25	290.28	680.58	309.49
	BALCO	748.98	310.78	728.54	294.80
	PGCIL losses	322.08		299.03	
	Sub Total	7999.32	3458.09	7652.05	3314.19
4	Short term/Exchanges/swap				
	IEX			467.99	165.61
	PXIL			9.00	4.53
	Deviation Settlement Mechanism			252.45	62.76
	SWAP-Mittal Processors(P) Ltd				1.10
	SWAP-APPCPL			142.77	1.84
	Subtotal			872.21	235.84
	Transmission charges payable to PGCIL		539.84		513.41
	PTC (previous year expenses)				32.37
	Total	18535.44	7986.24	18046.57	7819.20
	SWAP SALE				
	SWAP-NVVN			139.12	0.24
	SWAP-TPTCL			11.58	0.17
	SWAP-GMRETL			17.32	1.87
	Sale to BSHPCCL			75.10	
	Sale to CSPDCL			69.06	
	Sale through IEX			656.45	
	Sale through PXIL			24.18	5.38
	TNEB				0.00
	Power purchase cost claimed				7826.86
	Power purchase cost as per accounts				7869.32

ARR and Tariff Formats
Distribution Business
INDEX

S.No.	Form No.	Particulars
1	2	3
1	Form D 1.1	Summary of Aggregate Revenue Requirement
2	Form D 2.1	Revenue from Sale of Power
3	Form D 2.2	Income from Wheeling Charges
4	Form D 2.3	Income from sale of surplus power
5	Form D 2.4	Non-tariff Income
6	Form D 2.7	Consumer Contribution, Capital Subsidy and Grant
7	Form D 3.1	Power Purchase Expenses
8	Form D 3.4	Operations and Maintenance Expenses
9	Form D 3.4(a)	Employee Expenses
10	Form D 3.4(b)	Administrative & General Expenses
11	Form D 3.4(c)	Repair & Maintenance Expenses
12	Form D 3.5	Fixed assets & depreciation
13	Form D 3.6(a)	Calculation of Weighted Average Rate of Interest on Actual Loans
14	Form D 3.6(b)	Calculation of Interest on Normative Loan
15	Form D 3.6(c)	Interest on Bonds to meet Terminal Liabilities
16	Form D 3.7	Interest on Working Capital
17	Form D 3.8	Return on Equity/Return on Net Fixed Assets
18	Form D 3.9	Tax on R.O.E.
19	Form D 4.1	Project-wise / Scheme-wise Capital Expenditure
20	Form D 4.2	Consolidated report on additions to Fixed Assets during the year
21	Form D 4.3	General (Other debits, write offs or any other items)
22	Form D 5.1	Consumer category wise Existing Tariff
23	Form D 6.1	Improvement in performance
24	Form D 6.2	Appropriation of Distribution loss
25	Form D 7.1	Year 2018-19
26	Form D 7.3	Collection Efficiency
27	Form D 8	Deviation Analysis
28	Form D 9	Consumer category-wise cross-subsidy

Other Information/Documents		
1	Form D P&L	Profit & Loss Account
2	Form KSEBL SBU-wise P&L	KSEB Limited SBU-wise Profit & Loss Account
3	Form Small Lic Distr P&L	Small Distribution Licensees - Distribution business Profit & Loss Account
4	Form D BS	Balance Sheet at the end of the year
5	Form D CF	Cash Flow for the year

6. Corporate audited/unaudited Balance Sheet and Profit & Loss Accounts with all the Schedules & annexures for the relevant years.

Note : Spread sheet financial models (in CD) shall also be submitted along with the application.

Form D 1.1

Summary of Aggregate Revenue Requirement

Name of Distribution Business/Licensee

KERALA STATE ELECTRICITY BOARD LTD.

S.No.	Particulars	Reference form no.	Previous Year (n-1) -2018-19			
			Approved in Tariff Order	Audited	Normative	Truing Up requirement
1	2	3	4	5	6	7
1	Cost of own power generation/power purchase	3.1	9206.78	9524.67		9192.29
2	Transmission Charges	3.2				
3	NLDC/RLDC/SLDC Charges	3.3				
4	Operation & Maintenance Expenses	3.4				
4.1	Employee Expenses	3.4	2226.08	2425.42		2379.04
4.2	Annual Contribution for Terminal Liabilities based on actuarial valuation					
4.3	Administration & General Expenses	3.4		447.87		
4.4	Repair & Maintenance Expenses	3.4		232.96		
5	Depreciation	3.5	72.24	433.24		107.98
6	Interest and finance charges on long term loans	3.6	149.90	#REF!		180.27
7	Interest on Bonds to meet Terminal Liabilities	3.6	813.55	652.08		819.18
8	Interest on Working Capital	3.7		125.54		18.41
9	Interest on consumer security deposits and deposits from Users of the distribution system		175.33	177.31		170.75
10	Any other item-Carrying cost		304.08			629.11
	Interest on GPF		152.55	136.68		136.68
	Others			24.60		
	Other Interest and finance Charges			26.06		
	Prior Period Expenditure			190.18		291.38
11	Past gap recovery		400.00			
12	Exceptional items/CMDRF			12.39		29.25
13	Adjustment for profit/loss on account of controllable/uncontrollable factors- T&D Loss					28.59
14	Total Revenue Expenditure		13500.51	#REF!		13982.93
15	Return on Equity /Net Fixed Assets	3.8	253.50	147.23		253.50
16	Tax on ROE	3.9	0.00	0.00		
17	Aggregate Revenue Requirement (13+15)		13754.02	#REF!		14236.44
18	Less: Non Tariff Income	2.4	531.55	400.80		537.36
19	Less: Income from wheeling charges	2.2		14.02		
20	Aggregate Revenue Requirement from Retail Tariff		13222.47	#REF!		13699.08

Form D 2.1

Revenue from Sale of Power															
Name of Distribution Business/Licensee		KERALA STATE ELECTRICITY BOARD LTD.									KERALA STATE ELECTRICITY BOARD LTD.				
Licensed Area of Supply															
Year		2018-19													
S.No.	Particulars	Number of consumers	Connected Load of consumers	Units Sold (MU)	% of total Unit sold	Demand/ fixed charges@	Energy Charges @	Fuel Adjustmen t charges@	Total	Excess Load/ excess demand charges@	Other charges if any@	Sub-total	Misc. recoveries @ (Net provision for unbilled revenue)	Sub-total	
			KW	MU					8+9+10			(13) to (19)	(11)+(20)+(21)+(
1	2	3	5	6	7	8	9	10	11	13	18	20	22	23	
A)	Revenue from sale of Electricity														
	to consumers (categories as per														
	Tariff for supply of Electricity)														
	LT Categories														
1	Domestic	9705347	16250.72	10864.34	50.45	378.53	4079.95	49.62	4508.10	0.09		0.09	121.34	4629.52	
					4.00										
2	Commercial	2196919	4027.77	3221.43	14.96	512.05	2511.31	16.47	3039.83	-0.07		-0.07	23.05	3062.80	
3	Public Lighting	34653	157.34	377.78	1.75	1.33	169.43	2.04	172.79			0.00	-0.03	172.77	
4	Irrigation and Dewatering	470517	934.74	337.65	1.57	14.45	73.66	1.34	89.46			0.00	-2.68	86.78	
5	Industrial LT	138834	1736.48	1111.67	5.16	201.06	788.21	7.54	996.80	0.13		0.13	-204.18	792.76	
6	Railway Traction	12	102.00	303.13	1.41	29.94	153.96	1.17	185.08			0.00	1.30	186.38	
7	Miscellaneous						0.18		0.18			0.00	0.01	0.20	
8	HT Categories	5870	1509.58	3656.92	16.98	478.08	2032.29	12.66	2523.04		2.64	2.64	232.91	2758.59	
9	Extra High Tension (EHT)	41.00	311.60	1051.91	4.88	98.33	543.81	4.26	646.41	0.00	17.77	17.77	-0.71	663.48	
10	KMRL	2.00	6.50	14.91	0.07										
11	Bulk Consumers/ Licensees	11.00	106.88	597.04	2.77	46.72	319.92	1.50	368.14			0.00	0.99	369.13	
12	Revenue from sale of power outside the State														
	Sale through power exchange						267.32		267.32			0.00		267.32	
	Sale to other States						72.02		72.02		6.67	6.67	-0.07	78.63	
	Sale through Traders								0.00						

13	Total of items not shown categorywise													
a)	Reactive Energy Charges								0.00			0.00	0.00	
b)	Electricity Duty Recovery									840.00	840.00	-49.06	790.94	
c)	Other state Levies Recovery									24.28	24.28		24.28	
	Total Duty & Levies													
d)	Wheeling charges Recoveries									14.02	14.02		14.02	
e)	Miscellaneous Charges from consumers													
1	UCM									0.00	0.00		0.00	
2	SC Fee, etc.										0.00		0.00	
3	Other Items									158.54	158.54	0.00	158.54	
4	TF/RF									17.98	17.98	0.00	17.98	
5	Other Levies On Fee									97.19	97.19		97.19	
6	LE/SC Minimum									0.44	0.44		0.44	
7	Meter Box Charges										0.00		0.00	
8	Processing Fee for Allocation of Power									2.73	2.73		2.73	
9	STOA - Registration and Application fee									0.23	0.23		0.23	
10	STOA - Open Access charges									11.10	11.10		11.10	
11	Application fee®istration fee for grid coonectivity to solar panels									4.49	4.49		4.49	
12	Penal charge for making the meter inaccessible for billing										0.00		0.00	
13	Energisation charges									0.36	0.36		0.36	
14	Power factor penalty									51.20	51.20		51.20	
14	Gross Revenue From Sale of Power	12552206	25143.62	21536.77		1760.50	11012.07	96.61	12869.18		1249.66	1249.81	122.89	14241.88
	Less: i) Electricity Duty Payable to Govt. (Contra)									840.00	840.00	-49.06	790.94	
	ii)Other State Levies Payable to Govt. (Contra)									24.28	24.28	0.00	24.28	
	iii) Board Cunsumption									8.48	8.48		8.48	
15	Net Revenue from Sale of Power (A29-A30)					1760.50	11012.07	96.61	12869.18		376.89	377.04		13418.17
		Note:-											61710 & 61711	8.66
		* Note : To be furnished separately for each year commencing from (n-1)th year to (n+3)th year.											61601,61602	94.38
		1. Information at Column 3,4 & 5 will be for the end of the year.												13521.21

Form D 2.2

Income from Wheeling Charges

Name of Distribution Business/Licensee KERALA STATE ELECTRICITY BOARD LTD.
Licensed Area of Supply

Year (n-1)*

2018-19

(Rs Cr)

S.No	Open Access Consumer	Open Access Contracted Capacity (kW)	Fixed Charge (Rs/kW/month)	Energy Wheeled	Energy Charge (Rs/kWh)	Any Other Charge as approved by Commission (Please specify)	Revenue from Fixed Charge	Revenue from Energy Charge	Revenue from Other Charge	Total Revenue
	<u>1</u>	2	3	4	5	6	7	8	9	10=7+8+9
1	Philips Carbon Black Limited,			-39.16526						
2	Apollo Tyres Ltd,			11.601785						
3	Koratty,			14.0810125						
4	Kalamassery			31.35563						
5	EICL Limited Pothencode			1.95979						
6	EICL Limited Veli,			1.40642						
7	Kalamassery,			4.635505						
8	Palakkad,			0.02732						
9	Chavara, Kerala			19.28968						
10	Patspin India Limited,			6.165775						
11	FCI OENConnectors Ltd,			0.27867						
12	MRF Limited			12.3678225						
13	Hindalco Industries Limited			1.82378						
14	Precot Meridian Ltd, A Unit			10.6086575						
15	GTN Textiles Ltd, Aluva, Kerala			6.34469						
16	Precot Meridian Ltd, C&D Unit,			5.139645						
17	Vijaya Mohini Mills,			0.9448575						
18	Kanjikode West			16.1237875						
19	2/201), Ernakulam, Kerala			9.4797025						
20	Kerala 670005			5.0526975						
21	Alagappa Textiles (Cochin) Mills,			1.7617325						
22	Kerala Lakshmi Mills, Thrissur			1.942045						
23	Research Centre			8.1541975						
24	Minar Castings Pvt Ltd, NIDA			0.580775						
25	The Travancore Cochin Chemicals Ltd			39.82123						
26	Kairali Steels & Alloys Pvt Ltd			1.56833						
27	Thieh Ingots Pvt Ltd, 410417			1.0097225						
28	Cochin Shipyard Ltd Administrative Building			1.21912						
29	Classic Auto Tubes Ltd Rubber Park			0.79706						
30	Peekay Rolling Mills (P) Ltd Nallalam			0.75349						
31	Tata Consultancy Services Ltd TCS Centre Infopark SEZ Infopark Kochi 682042			0.18018						
32	Terumo Penpol Private Limited Puliyarakonam			0.12706						
	Total			216.60217						14.02

* Note :1. To be furnished separately for each year commencing from (n-1)th year to (n+3)th year.

Note: nth year = FY 2014-15, n+1th year = FY 2018-19, and so on, for the first filing under the KSERC (Terms and Conditions for Determination ofTariff) Regulations, 2014

2. In case of Income from Wheeling Charge for (n+1)th to (n+3)th year, it is mandatory for Distribution business/licensee to indicate the 'Total Revenue' (10), whereas others details may be furnished, if available

		Form D 2.3					
		Income from sale of surplus power					
Name of Distribution Business/Licensee		KERALA STATE ELECTRICITY BOARD LTD.					
		Licensed Area of Supply					
Year (n-1)*		2018-19					(Rs Cr)
Month	Name of buyer	Transaction No.	Nature of transaction- Bilateral /Exchange	Volume of trading in		Sale Price	Income
				MU	Contracted MW	Rs/Unit	
1	2	3	4	5	6	7	8
April	IEX	...		-6.52			
May	IEX	...		-29.28			
	PXIL	...		-2.95			
June	IEX	...		-114.01			
	PXIL	...		-2.36			
	BSHPCL	...		-7.62			
July	IEX	...		-189.72			
	PXIL	...		-2.22			
August	IEX	...		-189.26			
	PXIL	...		-6.44			
	BSHPCL	...		-34.62			
	CSPDCL	...					
September	IEX	...		-22.33			
	PXIL	...		-1.58			
	BSHPCL	...		-15.23			
	CSPDCL	...					
October	IEX			-98.22			
	PXIL			-2.31			

Form D 2.4

Non-tariff Income

Name of Distribution Business/Licensee

KERALA STATE ELECTRICITY BOARD LTD.

Licensed Area of Supply

S. No.	Particulars	Previous Year (n-1)		
		2018-19		
		Approved in Tariff Order	Audited	Truing Up requirement
1	2	3	4	5 = 4 - 3
1	Interest on staff loans and advances		0.04	0.04
2	Income from statutory investments		0.00	0.00
3	Income from trading		0.00	0.00
4	Income from rent of land or buildings		2.04	2.04
5	Income from sale of scrap		34.99	34.99
6	Miscellaneous receipts less KWA arrears		0.00	161.93
7	Rental from staff quarters		0.16	0.16
8	Excess found on physical verification		0.00	0.00
9	Interest on investments, fixed and call deposits and bank balances		4.02	4.02
10	Interest on advances to suppliers/contractors		-0.24	-0.24
11	Income from hire charges from contractors and others		0.01	0.01
12	Income due to right of way granted for laying fibre optic cables/co-axial cables on distribution system		32.75	32.75
13	RE Charges		0.00	20.63
14	Miscellaneous receipts		55.97	55.97
15	Commission for collection of electricity duty			0.00
16	Interest on delayed or deferred payment of bills			0.00
17	Rebate from Central Generating Stations		133.73	133.73
18	Revenue from late payment surcharge		0.00	0.00
19	Recovery for theft and pilferage of energy		0.00	8.66
20	Meter/metering equipment/service line rentals		0.00	94.38
21	Clawback of Grant		137.33	0.00
22	Exclusions and A&G expenses		0.00	-11.71
	Total	531.55	400.80	537.36

Form D 2.7				
Consumer Contribution, Capital Subsidy and Grant				
Name of Distribution Licensee		KSEBL		
	Licensed Area of Supply			
S. No.	Particulars	Till 31.03.2019		
		Approved in Tariff Order	Actually received	Balance Receivable
		3	4	5 = 4 - 3
1	2			
1	Consumers Contribution for service connection lines and associated works		1244.92	
2	Any other contribution by consumers under any scheme.			
	Sub-Total		1244.92	
3	Capital Subsidies from appropriate Government towards cost of Capital Assets		211.21	
4	Receipts from appropriate Government under any scheme as Grants		560.82	
5	Any Other item(to be specified)			
	Total		2016.96	
	TOTAL			

Power Purchase Expenses

KERALA STATE ELECTRICITY BOARD LTD.

KERALA STATE ELECTRICITY BOARD LTD.																
S. No.	Source of Power (Station wise)	Year 2018-19			Total Energy Sent Out (ESO) from the station (MU)	External Losses outside the State (%)	Energy Received at State boundary (MU)	Transmission Losses (%)	Energy received by licensee (%)	Capacity Charges paid/ payable by Utility (Rs Crore)	Variable Cost per unit including Fuel Price Adjustment	Total Variable Charges (Rs Crore)	Incentive (Rs Crore)	Any Other Charges (Please specify the type of charges)	Total Cost of Energy Received (Rs Crore)	Avg cost of energy received (Rs/kWh)
1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
I	Central Generating Stations															
1	RSTPS (Unit 1 to 6)	2100	11.67	245.07	1,608.17	66.88	1,541.29	57.64	1483.65	123.66	2.53	406.25	-1.22	1.63	530.31	3.30
2	RSTPS (Unit 7)	500	12.20	61.00	400.76	16.56	384.20	14.37	369.83	33.76	2.47	98.94	0.00	0.09	132.78	3.31
3	TALCHER STAGE II U 3, 4, 5 & 6	2000	21.35	427.00	2,889.61	121.02	2,768.59	103.55	2665.04	214.87	1.73	499.82	0.00	0.55	715.24	2.48
4	Simhadri TPS Stage II	1000	8.92	89.20	541.92	22.39	519.53	19.43	500.10	103.23	2.90	157.09	0.00	0.27	260.58	4.81
5	NLC II STAGE 1	630	10	63.00	396.01	16.54	379.46	14.19	365.27	31.00	2.58	102.32	0.00	-5.71	127.61	3.22
6	NLC II STAGE 2	840	10.71	89.96	586.18	24.46	561.72	21.01	540.71	46.21	2.59	151.63	-0.08	-8.77	189.00	3.22
7	NLC I EXPANSION	420	15.99048	67.16	429.78	17.76	412.02	15.41	396.61	45.60	2.40	103.00	-0.42	3.48	151.66	3.53
8	NLC II EXPANSION	500	15.99	79.95	281.08	11.58	269.50	10.08	259.43	66.64	2.38	66.96	0.00	0.05	133.64	4.75
9	NTPL	1000	7.25	72.5	420.25	17.32	402.93	15.07	387.86	74.20	3.17	133.29	0.00	0.09	207.58	4.94
10	VALLUR STPS	1500	3.33	49.95	267.73	11.13	256.60	9.60	247.01	64.49	3.01	80.69	-0.07	0.19	145.30	5.43
11	MAPS	440	5.229545	23.01	60.72	2.52	58.20	2.18	56.02	0.00	2.65	16.08	0.00	0.55	16.63	2.74
12	Kaiga	880	8.3	73.04	541.76	22.64	519.12	19.41	499.70	0.00	3.64	197.22	0.00	4.51	201.73	3.72
13	KKNPP	2000	13.615	272.3	759.53	31.07	728.46	27.24	701.21	0.00	4.05	307.26	0.00	22.88	330.14	4.35
14	NTPC KUDGI			73.33	458.51	19.04	439.47	16.44	423.03	100.02	3.84	175.84	0.00	0.12	275.99	6.02
15	Eastern region													-0.02	-0.02	
	Sub Total CGS				9642.01	400.92	9241.09	345.62	8895.47	903.68	39.93	2496.40	-1.80	19.90	3418.17	3.55
II	IPPS/CPPs															
16	KYCCP	359.59		359.59	0.81		0.81	0.03	0.78	200.00		0.00		-18.30	181.70	
17	Wind- Ramakalmedu & Agali	32.85			49.73		49.73	1.86	47.87			18.18			18.18	
18	Wind Ahalya	8.4			18.15		18.15	0.68	17.47			9.48			9.48	
19	INOX	16			38.90		38.90	1.45	37.44			23.49			23.49	
20	Kosamattom	1			1.13		1.13	0.04	1.09			0.06			0.06	
	Small Hydel														0.00	
21	Ullunkal	7			10.75		10.75	0.40	10.35			2.66			2.66	
22	Iruttukanam Stage-I & II	5.5			10.51		10.51	0.39	10.11			2.71			2.71	
23	Karikkayam HEP	15			45.78		45.78	1.71	44.07			18.92			18.92	
24	Meenvallom	3			7.41		7.41	0.28	7.13			3.65			3.65	
25	Kallar of Idukki District Panchayat	0.05			0.00		0.00	0.00	0.00			0.00			0.00	
26	Mankulam of Grama Panchayat	0.11			0.00		0.00	0.00	0.00			0.03			0.03	
27	Pathamkayam	8			0.07		0.07	0.00	0.07			0.00			0.00	
28	Maniar & Kuthungal (net injection)	33			10.68		10.68	0.40	10.28						0.00	
29	PCBL (net injection)				2.05		2.05	0.08	1.98			0.12			0.12	
	Solar						0.00	0.00	0.00						0.00	
30	IREDA	50			76.53		76.53	2.86	73.67			28.89			28.89	

Form D 3.1

Power Purchase Expenses

KERALA STATE ELECTRICITY BOARD LTD.

S. No.	Source of Power (Station wise)	Year 2018-19			Total Energy Sent Out (ESO) from the station (MU)	External Losses outside the State (%)	Energy Received at State boundary (MU)	Transmission Losses (%)	Energy received by licensee (%)	Capacity Charges paid/ payable by Utility (Rs Crore)	Variable Cost per unit including Fuel Price Adjustment	Total Variable Charges (Rs Crore)	Incentive (Rs Crore)	Any Other Charges (Please specify the type of charges)	Total Cost of Energy Received (Rs Crore)	Avg cost of energy received (Rs/kWh)
		Installed Capacity	Utility share (%)	Utility share (MW)												
1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
31	ANERT	2			2.54		2.54	0.09	2.44						0.00	
32	grid connected solar prosumers(net injection)				6.19		6.19	0.23	5.96			0.75			0.75	
	Sub Total IPPs/CPPs	541.5	0	359.59	281.22	0	281.2175088	10.52	270.70	200.00		108.97	0.00	-18.30	290.67	

D3.4 Form D 3.4					
Operations and Maintenance Expenses					

A

Name of Distribution Business/Licensee

KERALA STATE ELECTRICITY BOARD LTD.

Licensed Area of Supply

Year 2018-19

1 Employee & A& G Expenses

S. No.	Particulars	Reference	Previous Year (n-1) - 2018-19		
			Approved in Tariff Order	Audited	Truing Up requirement
1	2	3	4	5	6 = 5 - 4
1	Number of Consumers ('000)		12276321	12276321	12276321
	Norms (Rs. Lakh/'000 consumers)		4.8	4.8	4.8
2	Distribution Transformers (no.)		77724	77724	77724
	Norms (Rs. Lakh/Distribution Transformer)		0.64	0.64	0.64
3	HT line (km)		62835	62855	62855
	Norms (Rs. Lakh/km of HT line)		0.79	0.79	0.79
4	Sales (kWh)		20880.7	20998	20998
	Norms (Rs./unit of sales)		0.19	0.19	0.19
5	Employee Expense (as per norms)		1979.83	1982.22	1982.22
6	Employee Expense (actuals)	3.4(a)		2425.42	

2 Administrative and General Expenses

S. No.	Particulars	Reference	Previous Year (n-1) - 2018-19		
			Approved in Tariff Order	Audited/ Normative	Truing Up requirement
1	2	3	4	5	6 = 5 - 4
1	Number of Consumers ('000)				
	Norms (Rs. Lakh/'000 consumers)				
2	Distribution Transformers (no.)				
	Norms (Rs. Lakh/Distribution Transformer)				
3	HT line (km)				
	Norms (Rs. Lakh/km of HT line)				
4	Sales (kWh)				
	Norms (Rs./unit of sales)				
4	A&G Expense (as per norms)				
5	A&G Expense (actuals)	3.4(b)		447.87	

3 Repair and Maintenance Expense

S. No.	Particulars	Reference	Previous Year (n-1) - 2018-19		
			Approved in Tariff Order	Normative	Truing Up requirement
1	2	3	4	5	6 = 5 - 4
1	Opening GFA (Rs. Crore)		8020.12	8015.69	8015.69
	Norms (% of opening GFA)		3%	3%	3%
2	R&M Expense (as per norms)		246.25	252.35	252.35
3	R&M Expense (actuals)	3.4(c)		232.96	

1 O&M Expenses

S. No.	Particulars	Reference	Previous Year (n-1) - 2018-19		
			Approved in Tariff Order	Audited/ Normative	Truing Up requirement
1	2	3	4	5	6 = 5 - 4
1	Employee Expenses and A&G expenses (as per norms)			1982.22	
	Provision for pay revision			144.47	
2	R&M Expenses (as per norms)			252.35	
4	O&M Expense (as per norms) (1+2+3)		2226.08	2379.04	2379.04
2	O&M Expense (actuals)	3.4(a),3.4(b),3.4(c)		3106.25	3106.25

Form D 3.4(a)

Employee Expenses

Name of Licensee

KERALA STATE ELECTRICITY BOARD

Rs. Crore

S. No.	Particulars	Reference	Previous Year (n-1) 2018-19	Remarks
			Audited	
1	2	3	4	11
1	Basic Salary		2035.90	
2	Dearness Allowance (DA)		439.71	
3	House Rent Allowance		37.87	
4	Conveyance Allowance		0.00	
5	Leave Travel Allowance		0.18	
6	Earned Leave Encashment		148.13	
7	Other Allowances		26.23	
8	Medical Reimbursement		10.30	
9	Overtime Payment		0.05	
10	Bonus/Ex-Gratia Payments		8.02	
11	Interim Relief / Wage Revision		0.00	
12	Staff welfare expenses		3.99	
13	VRS Expenses/Retrenchment Compensation		0.00	
14	Commission to Directors		0.00	
15	Training Expenses		0.00	
16	Payment under Workmen's Compensation Act		0.54	
17	Net Employee Costs		2710.92	
18	Terminal Benefits			
18.1	Provident Fund Contribution			
18.2	Provision for PF Fund			
18.3	Pension Payments			
18.4	Gratuity Payment			
18.6	Contribution of KSEB Ltd towards National Pension		15.07	
19	Others		0.37	
20	Gross Employee Expenses		2726.36	
21	Less: Expenses Capitalised		300.95	
22	Net Employee Expenses		2425.42	

Form D 3.4(b)				
Administrative & General Expenses				
	Name of Licensee	KERALA STATE ELECTRICITY BOARD LTD.		
				Rs. Crore
S. No.	Particulars	Reference	2018-19	Remarks
			Audited	
1	2	3	4	5
1	Rent Rates & Taxes		8.75	
2	Insurance		0.42	
3	Telephone & Postage, etc.		9.11	
4	Legal charges		1.05	
5	Audit Fees		0.57	
6	Consultancy charges		0.06	
7	Other Professional charges		0.84	
8	Conveyance		51.92	
9	Vehicle Running Expenses Truck / Delivery Van		0.67	
10	Vehicle Hiring Expenses Truck / Delivery Van		2.69	
11	Electricity charges		-0.17	
12	Water charges		1.17	
13	Entertainment		0.73	
14	Fees & subscription		0.03	
15	Printing & Stationery		5.80	
16	Advertisements, exhibition publicity		0.57	
17	Contribution/Donations		1.38	
18	Training expenses		1.77	
19	Miscellaneous Expenses		4.26	
20	DSM activities		0.00	
21	SRPC expenses		0.15	
22	Sports and related activities		0.10	
23	Freight		0.80	
24	Purchase Related Advertisement Expenses		0.81	
25	Bank Charges		0.00	
26	Office Expenses		82.87	
27	License Fee and other related fee		3.97	
28	Cost of services procured		0.00	
29	Outsourcing of metering and billing system		0.00	
30	V-sat, Internet and related charges		2.67	
31	Security arrangements		0.00	
32	Books & periodicals		0.04	
33	Computer Stationery		0.00	
34	Others		134.09	
	Others- Other Purchase related Expenses		0.89	
	Others - Expenditure in connection with distribution of LED		6.43	
35	Gross A&G Expenses		324.46	
36	Ele. Duty u/s 3(I), KED Act		123.81	
37	Less: Expenses Capitalised		0.40	
38	Net A&G Expenses		447.87	

Note: nth year = FY 2014-15, n+1th year = FY 2018-19, and so on, for the first filing under the KSEI

Form D 3.4(c)			
Repair & Maintenance Expenses			
	Name of Licensee	KERALA STATE ELECTRICITY BOARD LTD.	
S. No.	Particulars	Reference	2018-19(Audited)
1	2	3	4
1	Plant & Machinery		3.41
2	Buildings		4.57
3	Civil Works		0.26
4	Hydraulic Works		0.13
5	Lines & Cable Networks		221.72
6	Vehicles		0.64
7	Furniture & Fixtures		0.32
8	Office Equipment		1.91
9	Gross R&M Expenses		232.96
10	Less: Expenses Capitalised		
11	Net R&M Expenses		232.96

Form D 3.5

Fixed assets & depreciation

Name of Distributor KERALA STATE ELECTRICITY BOARD LTD.

Year 2018-19

S. No.	Asset Group (as per notification in respect of depreciation)	Rate of depreciation (%)	Gross fixed assets (2018-19)				Provision for depreciation				Net fixed assets at the beginning of the year	Net Fixed Assets at the end of the year
			At the beginning of the year	Additions during the year	Decom. Liability for year	At the end of the year	Cumulative upto the beginning of the year	Additions during the year	Adjustment during the year	Cumulative at the end of the year		
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Land & land right	10.1	19.67	0.24		19.91				0.00	19.67	19.91
2	Other Civil work	10.4	2.16	2.47	0.00	4.63	0.31	2.35		2.66	1.84	1.96
3	HV Distribution system			0.00						0.00	0.00	0.00
a)	Distribution line	10,601,602	55.22	11.83	0.01	67.06	17.72	2.95		20.67	37.50	46.38
b)	Sub-station equip	10543	65.11	6.56	0.01	71.68	29.07	3.16		32.23	36.04	39.45
i)	Transformers	10541	624.25	5.24	0.01	629.49	364.22	26.89		391.11	260.03	238.38
ii)	Switchgears, Cor	10561	0.10	0.00		0.10	0.08	0.01		0.09	0.01	0.00
iii)	Batteries	10563	0.36	0.04	0.00	0.41	0.11	0.02		0.14	0.25	0.27
iv)	Others			0.00						0.00	0.00	0.00
4	LT Distribution system			0.00						0.00	0.00	0.00
a)	Distribution line	10.6	5611.54	940.98	0.97	6553.49	2798.14	350.79		3148.93	2813.40	3404.55
b)	Sub-station equipments			0.00						0.00	0.00	0.00
i)	Transformers	10542	66.13	61.07	0.06	127.27	29.75	4.74		34.49	36.38	92.77
ii)	Switchgears, Control gear & Protection			0.00						0.00	0.00	0.00
iii)	Batteries			0.00						0.00	0.00	0.00
iv)	Others	10.5	49.27	22.15	0.02	71.44	12.10	10.11		22.21	37.17	49.23
5	Communication	10,571,572	0.43	-0.02		0.41	0.26	0.02		0.27	0.18	0.14
6	Meters	10631	1347.31	146.69	0.15	1494.15	882.13			882.13	465.18	612.02
7	Vehicles	10.7	8.02	0.27		8.30	6.45	0.41		6.86	1.57	1.44
8	Furniture & fixtu	10.8	31.90	2.75		34.65	14.61	1.65		16.26	17.29	18.39
9	Office Equipmen	10.9	30.30	0.93		31.23	11.78	1.84		13.62	18.52	17.61
10	Assets of Partnership projects etc.			0.00						0.00	0.00	0.00
11	Capital spares of HV & LT transmissison			0.00						0.00	0.00	0.00
12	Assets taken over & pending final valuation			0.00						0.00	0.00	0.00
13	IT Equipments	10905	91.40	6.01		97.40	62.24	8.16		70.40	29.16	27.00
	Buildings	10.2	64.08	-4.72		59.37	19.48	3.77		23.25	44.60	36.12
15	Any other items	10.3	0.08	0.00	0.00	0.08	0.03	15.38		15.40	0.05	-15.33
16	Gross Asset (Total (1) to (15))		8067.32	1202.49	1.22	9271.04	4248.48	433.24	0.00	4680.74	3818.85	4590.30
17	Less: Consumer	55.1	1025.53	296.18	76.78	1244.92					1025.53	1244.92
18	Less: Governmer	55.2&55.3	432.40	191.01	62.58	560.82					432.40	560.82
19	Less: Deposit Works					0.00						
20	Less: Capital Sub	55.4	173.18	50.78	12.75	211.21					173.18	211.21
21	Net Asset considered for deprecia		6436.21			7254.08					2187.74	2573.34

Calculation of Weighted Average Rate of Interest on Actual Loans
KERALA STATE ELECTRICITY BOARD LTD.

(Rs. Cr)

S.No.	Particulars (specify items)	2018-19		Remarks
		Approved in Tariff Order	Audited	
1	2	3	4	12
1	Loan from LIC			
i.	Gross Loan -Opening			
ii.	Cumulative repayments of Loans upto previous year			
iii.	Net loan-Opening		0.93	
iv.	Add: Drawal(s) during the Year		0.00	
v.	Less: Repayment (s) of Loans during the year		0.93	
vi.	IND Adj		0.00	
vii.	Net loan - Closing*		0.00	
viii.	Average Net Loan		0.47	
ix.	Rate of Interest on Loan on annual basis		9	
x.	Interest on loan		0.03	
xi.				
2	REC-23 Circle scheme			
i.	Gross Loan -Opening			
ii.	Cumulative repayments of Loans upto previous year			
iii.	Net loan-Opening		657.42	
iv.	Add: Drawal(s) during the Year		17.29	
v.	Less: Repayment (s) of Loans during the year		34.14	
vi.	IND Adj			
vii.	Net loan - Closing*		640.57	
viii.	Average Net Loan		649.00	
ix.	Rate of Interest on Loan on annual basis		9.75-10.50	
x.	Interest on loan		65.96	
xi.	<i>*Current Financial Liability Rs.67.64 Cr (Note 19)</i>			
3	REC-For R-APDRP Part B			
i.	Gross Loan -Opening			
ii.	Cumulative repayments of Loans upto previous year			
iii.	Net loan-Opening		605.18	
iv.	Add: Drawal(s) during the Year		22.74	
v.	Less: Repayment (s) of Loans during the year		65.05	
vi.	IND Adj			
vii.	Net loan - Closing*		562.87	
viii.	Average Net Loan		584.03	
ix.	Rate of Interest on Loan on annual basis		9.75-10.50	
x.	Interest on loan		58.69	
xi.	<i>*Current Financial Liability Rs.65.16 Cr (Note 19)</i>			
4	REC-Meter Scheme			
i.	Gross Loan -Opening			
ii.	Cumulative repayments of Loans upto previous year			
iii.	Net loan-Opening		57.25	
iv.	Add: Drawal(s) during the Year		0.00	
v.	Less: Repayment (s) of Loans during the year		14.94	
vi.	IND Adj			
vii.	Net loan - Closing*		42.31	
viii.	Average Net Loan		49.78	

Form D 3.6 (b)

Calculation of Interest on Normative Loan
--

Name of Distribution Licensee

KERALA STATE ELECTRICITY BOARD LTD.

Licensed Area of Supply

S.No .	Particulars (specify items)	Previous Year (n-1) - 2018-19		
		Approved in Tariff Order	Normative	Truing Up requirement
1	2	3	4	5 = 4 - 3
1	Gross Normative loan - Opening	1164.16	1476.48	1476.48
2	Cumulative repayment of Normative Loan upto previous year			
3	Net Normative loan - Opening	1164.16	665.76	665.76
4	Increase/Decrease due to ACE/ de-capitalization during the Year	861.76	0.00	0.00
5	Repayments of Normative Loan during the year	72.24	105.80	105.80
6	Net Normative loan - Closing	1953.58	2036.44	2036.44
7	Average Normative Loan	1558.82	1760.70	1760.70
8	Weighted average Rate of Interest of actual Loans	9.62%	10.00%	10.00%
9	Interest on Normative loan	149.90	176.07	176.07

Form D 3.6 (c)

Interest on Bonds to meet Terminal Liabilities

Name of Distribution Licensee

KERALA STATE ELECTRICITY BOARD LTD.

Licensed Area of Supply

(Rs. Cr)

S.No .	Particulars (specify items)	Previous Year (n-1)			Remarks
		Approved in Tariff Order	Normative	Truing Up requirement	
1	2	3	4	5	12
A	Bond Series 1				
1	Value of Bond				
2	Rate of Interest on Bond				
3	Interest on Bond	646.45	652.08	652.08	
B	Bond Series 2				
4	Value of Bond				
5	Rate of Interest on Bond				
6	Interest on Bond				
C	Additional interest on Master Trust	167.10	167.10	167.10	
	...	813.55	819.18	819.18	

Note: nth year = FY 2014-15, n+1th year = FY 2018-19, and so on, for the first filing under the KSERC (Terms and Conditions for

Form D 3.7					
	Interest on Working Capital				
	Name of Distribution Business/Licensee	KERALA STATE ELECTRICITY BOARD LTD.			
	Licensed Area of Supply				
Sl.No.	Particulars	Previous Year (n-1) - 2018-19			
		Approved in Tariff Order	Audited	Normative	Truing Up requirement
1	2	3	4	5	6
1	O&M expenses (as per norms)	185.51	2379.04	186.21	
2	Maintenance Spares (as per norms)	4.86		28.72	
3	Receivables (as per norms)	2074.97	1288.01	2175.54	
	Less:				
4	Security deposits except security deposits held in the form of Bank Guarantee from Users	2836.96	3359.85	3019.12	
6	Total Working Capital	-571.62	307.21	-628.65	
7	Interest Rate (as per norms)				
8	Interest on Working Capital (actual)	0.00	125.54	0.00	0.00

Form D 3.8

Return on Equity/Return on Net Fixed Assets
--

Name of Distribution Business/Licensee

KERALA STATE ELECTRICITY BOARD LTD.

Licensed Area of Supply

S.No.	Particulars	Ref.	Previous Year (n-1)			
			2018-19			
			Approved in Tariff Order	Audited	Normative	Truing Up requirement
1	2	3	4	5	6	7
1	Equity at the beginning of the year			1810.74	1810.74	1810.74
2	Capitalisation					
3	Equity portion of capitalisation					
4	Equity at the end of the year			0.00		
	Return Computation			1810.74	1810.74	1810.74
5	Return on Equity at the beginning of the year	14%*(1)		253.50	253.50	253.50
6	Return on Equity portion of capitalisation	14%*(3)/2				
7	Total Return on Equity	(5)+(6)	253.5	147.23	253.50	253.50
	In case equity invested in the regulated Business is not clearly identifiable					
8	Net Fixed Assets net of Consumer Contribution & Grants (at the beginning of the year)	(8)				
9	Rate of return	3%				
10	Total return on net fixed assets	3% * (8)				

Form D 3.9

Tax on R.O.E.

Name of Distribution Business/Licensee KERALA STATE ELECTRICITY BOARD LTD.
Licensed Area of Supply

(Rs Cr)									
S. No.	Particulars	Previous Year (n-1) 2018-19			Current Year (n)	Ensuing Year (n+1)	Year (n+2)	Year (n+3)	Remarks
		Approved in Tariff Order	Audited/ Normative	Truing Up requirement	Actual/ Estimated	Projected	Projected	Projected	
1	2	3	4	5 = 4 - 3	6	7	8	9	10
A)	Advance Tax assessed & deposited on----								
a)	for Quarter I & deposited on 15 th June.								
b)	for Quarter II & deposited on 15 th Sept.								
c)	for Quarter III & deposited on 15 th Dec.								
d)	for Quarter IV & deposited on 15 th March.								
	Total---(A)								

Note:- Tax calculated should be only for the distribution business and should not include income from any other income streame like efficiency gain & incentive etc.

Note: nth year = FY 2014-15, n+1th year = FY 2018-19, and so on, for the first filing under the KSERC (Terms and Conditions for Determination ofTariff) Regulations, 2014

Form D 4.1

Project-wise / Scheme-wise Capital Expenditure

KERALA STATE ELECTRICITY BOARD LTD.

Name of Distribution Business/Licensee

Year (n-1)*

2018-19

(Rs Crore)

S. No.	Description of the project/Scheme	Capital Expenditure				
		Opening Balance as on 01.04.2018	Exp. During the year	Interest During Const.	Transfer to fixed Assets	Closing Balance as on 31.03.2019
1	2	3	4	5	6	7
1	Deen Dayal Upadhyay Gram Jyothi Yojana (DDU GJY)	21.48	232.82		187.07	67.23
2	Integrated Power Development Scheme (IPDS)	3.83	122.57		69.70	56.70
3	Kerala Power Improvement Scheme (KPIS)	0.00	0.39		0.39	0.00
4	Rural Electrification Scheme	0.00	0.87		0.83	0.04
5	Distribution Line Extension	0.18	81.92		80.77	1.33
6	Distribution Service Connection	2.28	132.60		130.94	3.95
7	Distribution System Improvement	3.39	186.50		180.67	9.22
8	Electrification of Harijan Colonies	0.00	0.11		0.11	0.00
9	Electrification of Tribal Colonies	0.00	1.25		1.25	0.00
10	Punja Package	0.00	0.49		0.41	0.08
11	System Improvement in other areas	0.00	3.43		3.17	0.26
12	Distbn. Capacitor Installation Scheme	0.00	0.00		0.00	0.00
13	Street Lights	0.66	27.04		25.57	2.13
	Expenditure due to Natural Calamity		13.63		13.57	0.06
14	RGGVY-Village electrification Infrastructure	-22.72	25.86		0.00	3.13
15	RGGVY-For effecting BPL Service Connection	0.24	0.00			0.24
16	Part B Projects of R-APDRP	176.21	102.82		237.90	41.14
17	MLA Asset Development Fund Scheme (MLA ADF)	0.00	1.21		1.21	0.00
18	R- APDRP Scheme	511.62	22.37		136.30	397.68
19	APDRP-Scheme	0.01	0.01		0.02	0.00
20	CWIP - General	178.69	486.20		141.31	523.58
21	Innovation fund	0.00	0.14		0.03	0.11
22	Projects not Identified	1.42	1.09		1.14	1.37
	TOTAL	877.29	1443.30	0.00	1212.35	1108.24

Form D 4.2

Consolidated report on additions to Fixed Assets during the year

Name of Distribution Business/Licensee

KERALA STATE ELECTRICITY BOARD LTD.

Licensed Area of Supply

Year (n-1)*

2018-19

(Rs Cr)

S.No.	Asset Description	Asset Code	Total Addition to Assets	Date of commissioning
1	2	3	4	5
01.	Land & Land Rights	10.1	0.24	
02.	Buildings	10.2	-4.72	
03.	Hydraulic Works	10.3	0.00	
04.	Other Civil Works	10.4	2.47	
05.	Plant & Machinery	10.5	95.04	
06.	Lines, Cable, Network etc.	10.6	1099.50	
07.	Vehicles	10.7	0.27	
08.	Furniture & Fixtures	10.8	2.75	
09.	Office Equipments	10.9	6.93	
	TOTAL		1202.49	

Form D 4.3

General (Other debits, write offs or any other items)

Name of Distribution Business/Licensee KERALA STATE ELECTRICITY BOARD LTD.
Licensed Area of Supply _____

S.No.	Particulars (specify items)	Previous Year (n-1)		
		2018-19		
		Approved in Tariff Order	Audited	Truing Up requirement
1	2	3	4	5 = 4 - 3
1	Material Cost Variance		3.64	
2	Research and Development Expenses		0.00	
3	Cost Of Trading/Manufacturing Activity		(0.06)	
4	Bad and Doubtful Debts Written off / Provided/demand withdrawal of consumers		12.68	
5	Miscellaneous Losses and Write Offs		2.94	
6	Sundry Expenses		0.03	
	Total		19.22	
	Less			
	Chargable to Capital Expenses			
	Net chargable to revenue			

Form D 5.1
Consumer category wise Existing Tariff

KERALA STATE ELECTRICITY BOARD LTD.

S.No.	Particulars	Demand / Fixed charges	Energy Charges	Fuel Adjustment Charges	Capacitor/ Power Factor Penalties	Rebate	LPS	Minimum Billing
		Rs/month	Ps/Unit	<Please specify Unit>	<Please specify Unit>	<Please specify Unit>	<Please specify Unit>	<Please specify Unit>
1	2	3	4	5	6	7	8	9
	LT Categories							
	I LT I Domestic 0-40 units (BPL with CL below 1000 units)	Nil	150					
	LT I Domestic 0-50 units (Telescopic)	SP-20 & 3 Ph - 60	280					
	LT I Domestic 51-100 units (Telescopic)	SP-20 & 3 Ph - 60	320					
	LT I Domestic 101-150 units (Telescopic)	SP-20 & 3 Ph - 60	420					
	LT I Domestic 151-200 units (Telescopic)	SP-20 & 3 Ph - 60	580					
	LT I Domestic 201-250 units (Telescopic)	SP-20 & 3 Ph - 60	700					
	LT I Domestic 0-300 units (Non - Telescopic)	SP-20 & 3 Ph - 60	500					
	LT I Domestic 0-350 units (Non - Telescopic)	SP-20 & 3 Ph - 60	570					
	LT I Domestic 0-400 units (Non - Telescopic)	SP-20 & 3 Ph - 60	610					
	LT I Domestic 0-500 units (Non - Telescopic)	SP-20 & 3 Ph - 60	670					
	LT I Domestic Above 500 units (Non - Telescopic)	SP-20 & 3 Ph - 60	750					
II	LT II Colonies	2200	650					
III	LT III A Temporary Connection		1400 or Rs.140/kw					
	LT III B Temporary Connection	Rs.65/kw						
IV	LT IV(A) Industry							
	Connected Load of and below 10 kW	100	520					
	Connected Load of and above 10 kW	60	520					
	Connected Load of and above 20 kW	125	520					
	LT IV(B) Industry IT and IT enabled Service							
	Connected Load of and below 10 kW	100	580					
	Connected Load of and above 10 kW	60	580					
	Connected Load of and above 20 kW	125	580					
V	LT V Agriculture	8	200					
	LT V (B) Agriculture	8	250					
VI	LT VI General (A)							
	Of and below 500 kwh	50	550					
	above 500 kwh	50	630					
	LT VI General (B)							
	Of and below 500 kwh	70	630					
	above 500 kwh	70	700					
	LT VI General (C)							

Form D 6.1				
Improvement in performance				
Name of Distribution Business/Licensee			KERALA STATE ELECTRICITY BOARD LTD.	
Licensed Area of Supply				
S.No.	Particulars	Ref	Previous Year 2018-19	Remarks
1	2	3	4	11
1	Distribution Losses, (%)		9.07%	
2	Collection Efficiency, (%)		100.24%	
3	Distribution losses for (%)			
(a)	Urban areas with population exceeding 1 lakh			
(b)	Industrial areas of load exceeding 5MVA#			
(c)	Rural areas			
4 (a)	Percentage of consumers billed		100	
4 (b)	Revenue realisation , (Rs Cr)			
5	Stopped Meters %			
6 (a)	Defective meters/metering arrangement%			
6 (b)	Replacement of Defective meters, %			
7	Supply availability %			
(1)	Base Load supply availability			
(a)	Actual contracted Base Load supply in MW		2628.25	
(b)	Base Load in MW		2422.5	
(c)	Base Load supply availability (%) (c=a/b)		108.49%	
(2)	Peak Load supply availability			
(d)	Actual Contracted Peak Load Supply in MW		3589.42	
(e)	Peak load in MW		3812.5	
(f)	Peak Load Supply Availability (%) (c=a/b)		94.15%	
	Supply availability %(0.75*c + 0.25*f)		104.91%	
8	Transformer failure rate			
a.	Distribution transformers (%)			
b.	Power transformers (%)			

Form D 6.2

Appropriation of Distribution loss

Name of Distribution Business/Licensee

KERALA STATE ELECTRICITY BOARD LTD.

Licensed Area of Supply

2018-19

S.No.	Particulars	2018-19				
		(Actual/Audited)				
		Energy Input	Energy Sales	Ennergy sent to lower voltage	Distribution Loss	
		MKWh	MKWh	MKWh	Percent	MKWh
1	2	3	4	5	6	7
	Voltage-wise Apportionment of Distribution losses					
1	33 kV					
2	11 kV					
3	LT					
	Overall Distribution Loss	23919.57	21750.25		9.07	2169.32

Form D 7.1
Category-wise Sales
KERALA STATE ELECTRICITY BOARD LTD.

Year 2018-19

(MU)

S. No.	Consumer Category & Consumption Slab	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	LT IA	1029.26	945.01	872.99	790.32	804.06	866.36	929.18	895.58	896.65	877.03	918.36	1035.23	10860.01
2	LT II	0.40	0.37	0.36	0.39	0.33	0.36	0.36	0.33	0.38	0.35	0.32	0.38	4.33
3	LT III	0.05	0.06	0.04	0.05	0.08	0.04	0.04	0.14	0.28	0.08	0.08	0.12	1.06
4	LT IV	91.68	94.40	84.03	88.08	82.91	99.35	94.87	94.05	95.71	96.06	91.51	99.02	1111.67
5	LT V	30.67	24.47	18.30	14.89	14.69	16.87	20.28	26.67	34.70	47.50	42.35	46.25	337.65
6	LT VI	131.90	130.39	124.15	122.69	116.77	130.62	132.10	134.69	134.61	131.84	132.17	145.47	1567.41
7	LT VII	147.17	140.66	126.95	121.89	120.20	132.69	138.46	140.74	142.17	139.41	142.26	158.33	1650.93
8	LT VIII	31.63	32.92	31.07	30.87	31.49	31.72	31.42	31.50	31.13	31.56	31.61	30.85	377.78
9	LT IX	0.20	0.14	0.19	0.13	0.19	0.14	0.19	0.13	0.21	0.15	0.21	0.14	2.02
	LT Total	1462.97	1368.42	1258.08	1169.29	1170.72	1278.15	1346.91	1323.83	1335.84	1323.98	1358.88	1515.79	15912.87
10	HT I (A) INDUSTRIAL	172.370	180.521	172.769	173.506	154.743	180.859	188.721	179.538	184.438	183.770	174.906	193.107	2139.25
11	HT I (B) INDUSTRIAL	1.164	1.137	1.010	1.030	0.918	1.054	1.067	1.097	1.052	1.058	1.100	1.244	12.93
12	HT II (A) GENERAL	15.680	15.403	14.278	14.462	13.769	15.434	15.796	15.752	15.803	15.473	15.878	18.560	186.29
13	HT II (B) GENERAL	52.014	50.836	46.377	46.482	44.106	49.293	51.648	50.506	50.878	48.156	48.915	57.622	596.83
14	HT III (A) AGRICULTURE	0.696	0.487	0.427	0.424	0.449	0.479	0.451	0.496	0.657	0.684	0.659	0.814	6.72
15	HT III (B) AGRICULTURE	0.219	0.226	0.228	0.207	0.164	0.157	0.156	0.163	0.170	0.184	0.160	0.166	2.20
16	HT IV (COMMERCIAL)	62.017	61.457	53.824	54.512	51.621	55.157	56.795	58.014	61.737	57.204	57.315	66.731	696.39
17	HT V (DOMESTIC)	1.276	1.261	1.315	1.342	1.264	1.327	1.384	1.380	1.491	1.398	1.361	1.511	16.31
	HT Total	305.44	311.33	290.23	291.96	267.04	303.76	316.02	306.95	316.23	307.93	300.29	339.75	3656.92

Form D 7.3

Collection Efficiency

Name of Distribution Business/Licensee KERALA STATE ELECTRICITY BOARD LTD.
Licensed Area of Supply _____

(Rs. Crore)

S. No.	Particulars	Previous Year (n-1)	Current Year (n)	Ensuing Year (n+1)	Year (n+2)	Year (n+3)	Remarks
		(Actuals/Audited)	Estimated	(Projected)	(Projected)	(Projected)	
1	2	3	4	5	6	7	8
	HT Category						
	Category-1						
	Category-n						
	LT Category						
	Category-1						
	Category-n						
	Total	100.24%					

Form D 8

Deviation Analysis

Name of Distribution Business/Licensee

KERALA STATE ELECTRICITY BOARD LTD.

Year (n-1)

2018-19

D8

(Rs. Crore)

S. No.	Particulars	Approved	Actual	Deviation	Reason for Deviation	Controllable	Uncontrollable
1	2	3	4	5	6	7	8
1	Cost of own power generation/power purchase	8329.18	9524.67				
2	Transmission Charges	874.6					
3	NLDC/RLDC/SLDC Charges	3					
4	Operation & Maintenance Expenses	2226.08					
4.1	Employee Expenses		2425.42				
4.2	Administration & General Expenses		447.87				
4.3	Repair & Maintenance Expenses		245.35				
5	Interest and finance charges on long term loans	149.9	#REF!				
6	Depreciation	72.24	433.24				
7	Interest on Working Capital	0	125.54				
8	Interest on consumer security deposits and deposits from Users of the distribution system	175.33	177.31				
	Interest on Master Trust Bonds incl proposed addition	813.55					
	Interest on GPF	152.55					
	Carrying cost on Gap	304.08					
	One Time Expenses CMDRF						
	Recovery of Previous gap	400					
9	Any other item-Carrying cost						
	Others		24.60				
	Other Interest and Finance Charges		#REF!				
	Prior period expenditure		190.18				
10	Contribution to contingecny reserves						
11	Provisioning for Bad debts, if any						
A	Total Expenditure	13500.51	#REF!				
B	Return on Equity	253.5	147.23				
C	Tax on ROE						
D	Revenue						
1	Revenue from sale of electricity	13190.32	13521.21				
2	Other Income	531.55	400.80				

D P&L

Form D P&L
Profit & Loss Account

Name of Distribution Business/Licensee

KERALA STATE ELECTRICITY BOARD LTD.

S.No.	Particulars	Ref	Previous Year	Previous Year	Remarks
			2018-19	2017-18	
1	2	3	4	5	6
	I.INCOME				
	a. Revenue from Sale of Power		13521.21	12318.17	
	b. Revenue Subsidies and Grants				
	c. Other Income		400.80	294.22	
	Total (a+b+c)		13922.01	12612.39	
	II. EXPENDITURE				
	a. Repairs and Maintenance.		232.96	205.78	
	b. Employee Cost		2726.36	2488.78	
	c. Administration and General Expenses		447.87	421.76	
	d.Depreciation		433.24	390.83	
	1). Amortisation of Intangible Assets				
	e.Interest and Finance charges		1466.13	1443.63	
	f. Subtotal (a+b+c+d+e)		5306.56	4950.78	
	g. Less Capitalised Expenses:				
	- Interest & Finance Charges		202.80	36.74	
	- Other Expenses		300.95	287.52	
	h. Other Debits		19.22	-13.93	
	Change in Fair Valuation and other adjustments		5.37	-108.68	
	I. Extra Ordinary Items		12.39		
	j. Purchase of power		9524.67	9210.47	
	k.Generation of Power				
	Total Expenditure (f-g+h+i+j+k)		14364.47	13714.38	
	III. Profit/(Loss) before Tax (I-II)		-442.46	-1101.99	
	IV. Provision for Income Tax				
	V.Net Prior period credits (Charges)		190.18	-3.15	
	V.(a). Other Comprehensive Income				
	VI. Surplus (Deficit)		-632.63	-1098.84	
	VII. Net Assets at the beginning of the year (Less consumer's Contribution)		2187.74	2513.52	
	VIII. Rate of Return (VI/VII)				

Note: Reconciliation between audited accounts and amounts for distribution business should be furnished.

Form D BS

D BS

Balance Sheet at the end of the year

Name of Distribution Business/Licensee

KERALA STATE ELECTRICITY BOARD LTD.

Licensed Area of Supply

S.No.	Particulars	Ref	Previous Year	Previous Year	Remarks
			2018-19	2017-18	
1	2	3	5	6	7
	Sources of Funds:				
	(A) Capital Funds:				
	Share Capital (Govt. equity)		1810.74	1810.74	
	Reserves & Surplus		-11908.57	-10372.71	
	Total (A)		-10097.83	-8561.97	
	(B) Loan from State Government				
	Loan from others :				
	-Secured		#REF!	2711.19	
	-Unsecured		194.81	839.01	
	Total (B)		#REF!	3550.20	
	(C) Contribution, grants & subsidies towards cost of capital assets		2099.02	1639.81	
	Provident Fund		1862.19	1872.75	
	Terminal Benefit Fund		6221.27	4908.58	
	Borrowings for working capital				
	Long term Provision		1342.42	1726.40	
	Grand total of sources of funds (A+B+C)		#REF!	5135.77	
	Application of Funds:				
	A) Fixed assets				
	a) Gross fixed assets		9271.04	8067.32	
	b) Less accumulated depreciation		4680.74	4248.48	
	c) Net Fixed assets((a)-(b))		4590.30	3818.85	
	d) Capital works in progress		1108.24	877.29	
	e) Assets not in use				
	f) Deferred costs		0.08	0.08	
	g) Intangible assets		5.58		
	h) Investments		5.65	7.44	
	Other Non current assets-Other Financial Assets		82.01	112.27	
	Total (c) +(d)+(e)+(f)+(g)+(h)		5791.87	4815.93	
	B)Subsidy receivable from Government		1501.05	40.67	
	Contribution receivable from State Government towards pension liability		2924.00	3440.64	
	C) Net Current Assets				
	(1) Current assets, loans and advances				
	a) Inventories*		559.37	389.55	
	b) Receivables against Sale of Power		1288.01	2299.26	
	c) Cash & bank balances		284.05	295.34	
	d) Loans and advances				
	e) Sundry receivables		67.18	-29.02	
	Total (C) (1)		2198.61	2955.13	
	(2) Current liabilities & provisions				
	a) Security Deposits from Consumers		3359.85	3170.45	
	b) Borrowings for working capital		1125.17	474.98	
	c) Payments due on Cap. liabilities				
	d) Other current liabilities		3488.99	2471.18	
	Total (C) (2)		7974.01	6116.61	
	Net Current Assets (C(1)) - (C(2))		-5775.39	-3161.48	
	Grand Total of Application of funds (A)+(B)+(C)		4441.53	5135.77	
			#REF!	0.00	

Form D CF
Cash Flow for the year

Name of Distribution Business/Licensee _____

S.No.	Particulars	Ref	Previous Year	Previous Year	Remarks
			2018-19	2017-18	
1	2	3	4	5	6
I	Net Funds from Operations				
1a	Net Funds from Earnings :				
	a) Profit before tax and before revenue subsidies and grants		-632.63	-1098.84	
	Less : Income Tax Payment during the year				
	: Other Comprehensive Income		0.00	0.00	
	Total of (a)		-632.63	-1098.84	
	b. Add: Debits to revenue account not requiring cash Flow:				
	I) a) Depreciation		433.24	390.83	
	b) Depreciation on IND As Adj		-0.98	121.74	
	ii) Amortisation of Deferred costs				
	iii) Amortisation of Intangible Assets		0.00		
	iv) Investment Allowance Reserve				
	v) Others, if any		-383.98	-74.16	
	Total of (b)		48.28	438.41	
	c. Less : Credits to revenue Account not involving cash receipts				
	I) Deprecation				
	ii) Subsidies receivables				
	iii) Revenue gap				
	Total of (c)		0	0.00	
	Net Funds from Earnings (a)+(b)-(c)		-584.35	-660.43	
2	Contributions, Grants & Subsidies to cost of Capital Assets		459.21	373.79	
3	Security Deposit from consumers		189.40	54.48	
4	Proceeds from disposal of fixed Assets				
5	Total Funds from Operations (1+2+3+4)		64.26	-232.16	
6	Net Increase/(Decrease) in working Capital				
	(a) Increase/(Decrease) in Current Assets				
	I) Inventories		169.82	159.24	
	ii) Receivables against sale of power		-1011.25	375.86	
	iii) Loans and Advances		0.00	-22.86	
	iv) Sundry receivables		96.20	-522.52	
	Total of (a)		-745.23	-10.28	
	(b) Increase/(Decrease) in Current liabilities				
	I) Borrowings for working Capital		650.19	210.99	
	ii) Other current liabilities		1017.81	582.16	
	iii) Others (Increase in Reserve + payment due on cap.liab)		-903.24	-1865.99	
	Total of (b)		764.76	-1072.84	
	Net Increase/(Decrease) in working Capital (a)- (b)		-1509.99	1062.56	
7	Net Funds from operations before subsidies and Grants (5-6)		1574.25	-1294.72	
8	Receipts from revenue subsidies and Grants		-943.74	219.36	
	Total Net Funds from operations including subsidies & Grants (7+8)		630.52	-1075.36	
II.	Net increase/ decrease in Capital liabilities				
	a). Fresh borrowings				
	I) State Loans				
	ii) Foreign currency Loans / Credits				
	iii) Other borrowings		#REF!	2595.99	
	Total of (a)		#REF!	2595.99	
	b) Repayments :				
	I) State Loans				
	ii) Foreign currency Loans / Credits				
	iii) Other borrowings		#REF!	1654.19	
	Total of (b)		#REF!	1654.19	
	Net Increase/(Decrease) in Capital liabilities (a) - (b)		#REF!	941.80	
III.	Increase/(Decrease) in equity Capital		0.00	781.86	
IV.	Total Funds available for Capital Expenditure (I+II+III)		#REF!	648.30	
V	Funds utilised on Capital Expenditure				
	a) On projects		1434.67	752.13	
	b) Advance to Suppliers & Contractors				
	c) Intangible Assets		6.56		
	d) Deferred Cost		0.00	0.00	
	e) Long Term Loans and Advances		-30.26	43.73	
	Total of V (a+b+c+d)		1410.97	795.87	
VI	Net Increase/(Decrease) in Government contribution				
VII	Net Increase/(Decrease) in Terminal benefit fund		1312.68	-51.84	
VIII	Net Increase/(Decrease) in Provident fund		-10.56	206.16	
IX	Net Increase/(Decrease) in investments		-1.79	0.44	
X	Net Increase /(Decrease) in cash / bank balance (IV - V- VI -IX)+ (VII+VIII)		#REF!	6.31	
XI	Add opening cash & Bank balance		295.34	289.03	
XII	Closing Cash & Bank balance (X+XI)		#REF!	295.34	

CHAPTER – 5: GENERAL EXPLANATION FOR VARIOUS EXPENSES

5.1 Interest and finance charges: An amount of Rs 1805.76 Cr had been approved by the Hon Commission under this head. The actual expense incurred was Rs.1598.90 Cr (net of capitalized interest Rs.260.87 Cr). The variation is primarily under interest on overdrafts and carrying cost. A comparison summary of I & F charges under various heads, as approved by the Hon Commission and actually incurred as per audited accounts, are given below.

Table 5.1 : Interests and finance Charges (Rs Cr)						
		Actual				
Item	Approval	SBU G	SBU T	SBU D	Total	Difference
Interest on Loan	348.33	101.98	119.67	348.47	570.12	-221.79
Security Deposit Interest	175.33	0.00	0.00	177.31	177.31	-1.98
Master Trust Bond Interest	773.68	42.56	79.04	652.08	773.68	0.00
WC/OD interest	21.75	8.19	15.22	125.54	148.95	-127.20
PF interest	182.59	8.92	16.57	136.68	162.17	20.42
Other interests				18.41	18.41	-18.41
Interest on fair valuation		1.01	0.46	7.65	9.13	-9.13
Carrying cost	304.08				0.00	304.08
Total	1805.76	162.67	230.96	1466.13	1859.76	-54.00
Less: Interest capitalized	0.00	34.72	23.35	202.80	260.87	-260.87
I&FC net of capitalization	1805.76	127.95	207.61	1263.33	1598.89	206.87

5.2 Interest on loans: The interest paid on short and long term loan is Rs. 570.12 Cr and exceeded the sum approved by Rs.221.79 Cr. Difference is mainly because of the normative approach adopted by the Hon Commission to assess normative loan till 31.03.2018. Hon'ble Commission considered trued up normative loan for 2015-16 and thereafter provisionally assessed the normative loan for 2016-17 and 2017-18. Normative interest on the same was approved at average actual rate of interest for 2017-18 as summarized below:

Computation of normative loan as on 01.04.2018 by the Hon'ble Commission as per order dated 08.07.2019 (Rs Cr)					
Sl. No	Description	SBU G	SBU T	SBU D	Total
1	Opening levels of normative Loan (as on 1-4-2016)	598.97	785.66	1,219.49	2,604.12
2	Provisional Asset Addition Excluding grants for 2016-17	289.89	212.73	-83.11	419.51
3	Repayment for the year 2016-17 (Depreciation)	-124.59	-147.71	-97.57	-369.87
4	Net Addition to Normative loan 2016-17 (2-3)	165.30	65.02	-180.68	49.64
5	Opening level of normative loans (1-4-2017) (1+4)	764.27	850.68	1,038.81	2,653.77
6	Addition to normative loan 2017-18	162.17	478.78	176.17	817.12
7	Repayment for 2017-18 (Depreciation)	-131.84	-136.48	-50.92	-319.25
8	Net Addition to Normative loan 2017-18 (6-7)	30.33	342.29	125.25	497.87
9	Opening levels of Normative Loan (as on 1-4-2018) (5+8)	794.60	1,192.98	1,164.06	3,151.64

5.3 However, the actual outstanding loan as on 31.03.2018 was Rs.6479.35 Cr as against the assessed normative loan of Rs.3151.64 Cr by the Hon'ble Commission. Actual loan exceeded the assessed levels by Rs. 3327.71 Cr. This has resulted in the increase of actual interest over

approval. Source wise borrowings, repayments and interests are given in **Appendix- 1**. SBU wise details are furnished in **Appendix 1A, 1B and 1C** respectively for SBU G, SBU T and SBU D. Summary of loan details are furnished below:

Table 5.2: Summary of loans, interest and average rate of interest (Rs. Cr)							
SBU	Opening (01/04/18)	Add: additions during the Year	Less: Repayments during the year	Closing (31/03/19)	Interest on loan	Average loan	Average interest rate (%)
SBU G	1468.47	319.88	812.88	975.47	101.98	1221.97	8.35
SBU T	1406.58	496.27	666.11	1236.73	119.67	1321.66	9.05
SBU D	3604.30	905.09	1143.00	3366.39	348.47	3485.34	10.00
Total	6479.35	1721.24	2621.99	5578.59	570.12	6028.97	9.46

5.4 Basis of apportionment loans among SBUs in accounts. The basis adopted in apportioning loan among SBUs in accounts are tabulated below:

Table-5.3 : Basis of apportionment of Loans and Interests (2017-18)		
No	Institution	Basis
A	SECURED LOANS-TERM LOANS	
1	L I C	GFA+CWIP
2	REC ON VARIOUS SCHEMES	GFA+CWIP
3	REC R-APDRP PART-B	DISTRIBUTION
4	R E C – RGGVY	DISTRIBUTION
5	REC – Medium Term Loan	GFA+CWIP
6	PFC-Pallivasal	GENERATION
7	PFC R-APDRP	DISTRIBUTION
8	SOUTH INDIAN BANK-Barapole	GENERATION
9	PFC GEL KAKKAYAM	GENERATION
10	REC-Distribution-23 circle scheme	DISTRIBUTION
11	REC-Distribution-Meter scheme	DISTRIBUTION
12	REC-Thottiyar	GENERATION
13	REC-Transmission-Kattakkada-Pothencode	TRANSMISSION
14	REC-Transmission-Group 1	TRANSMISSION
15	Special loan assistance REC	GFA+CWIP
16	DRIP	GENERATION
17	R E C-DDG Scheme	DISTRIBUTION
18	RIDF of NABARD-Upper Kallar & Banasurasagar	GENERATION
19	Special loan assistance -PFC	GFA+CWIP
20	PFC GEL Perunthenaruvi	GENERATION
B	UNSECURED LOANS TERM LOANS	
1	State Bank of India	GFA+CWIP
2	Vijaya Bank	GFA+CWIP
3	South Indian Bank	GFA+CWIP
4	Bank of India	GFA+CWIP
5	REC	GFA+CWIP
6	Union bank of India	GFA+CWIP
7	Canara Bank	GFA+CWIP
8	Andhra Bank	GFA+CWIP

5.5 Hon Commission may kindly note that since short term loans could be obtained at comparatively lower rate than long term loans, KSEBL had availed short-term loans for meeting capital liabilities in the past. Considering the risk involved in financing capital project through short term loans, KSEBL started availing long and medium term loans for this purpose by restricting STL borrowings to the possible extent. STL as on 31.03.2019 has been Rs. 400 Cr (Rs. 1449.93 Cr as on 31.03.2018) which came down by over Rs.1000 Cr during 2018-19, thereby reduced the

interest burden by Rs.58.28 Cr in comparison to 2017-18. A summary of Short Term loans are given in **Appendix-2**. Thus interest on STL for the year 2018-19 had been Rs.75.97 Cr compared to Rs. 133.78 Cr of previous year. The details are given in **Appendix-3**. But Overdrafts registered an increase of Rs. 1285.84 Cr over 2017-18 with a corresponding increase of interest burden to the tune of Rs.53.95 Cr. Thus aggregate borrowings including OD registered an increase of Rs.360 Cr during the year in comparison with 2017-18.

- 5.6** During 2018-19, KSEBL executed capital works to the tune of Rs.2215.24 Cr during the year and completed works capitalized to the tune of Rs 1672.80 Cr. Project wise details of CWIP are furnished in **Appendix 4**. A summary of capital works is furnished below:

Table 5.4: Summary of capitalization during 2017-18 (Rs. Cr)					
Sl. No	SBU	CWIP as on 01/04/2018	Works executed during the year	GFA Addition	CWIP as on 31/03/2019
1	Generation	1,130.89	220.15	103.66	1,247.39
2	Transmission	440.71	560.43	365.43	635.71
3	Distribution	877.29	1,434.67	1,203.72	1,108.24
4	GRAND TOTAL	2,448.90	2,215.24	1,672.80	2,991.34

- 5.7** Hon Commission, as per Truing up orders for 2016-17 has determined normative loan at Rs.1951.51 Cr as on 31.03.2017 by considering GFA addition till 31.03.2016. Additional normative loan for 2016-17 was not approved for want of details as stipulated in the Tariff Regulation and directed KSEBL to furnish the same so as to determine the extent of additional loan for 2016-17. In compliance of the direction, KSEBL submitted additional details along with computation of normative loan applicable for GFA addition in 2016-17 amounting to Rs.916.65 Cr. Accordingly, after deducting depreciation for the year, closing balance of additional normative loan for 2016-17 would be Rs. 899.91 Cr.

- 5.8** Further, KSEBL was aggrieved on the determination of normative loan balance as on 01.04.2015 (Rs.2276.22 Cr) by the Hon'ble Commission and sought review for an additional claim of Rs.467.60 Cr, which was turned down as per order dated 16.05.2019. It is respectfully submitted that considering the long lasting financial implication, KSEBL has filed an appeal before the Hon'ble APTEL. In view of the above, the quantum of normative loan at the beginning of the year has been considered in this petition at Rs. 3319.02 Cr as detailed below:

Table 5.5 Computation of normative loan as on 01.04.2017 (Rs Cr)		
Sl. No	Description	Amount
1	Closing balance of Normative loan as per True up order for 2016-17	1951.51
2	Add: Additional normative loan for 2016-17 as claimed in separate submission	899.91
3	Add: Claim towards normative loan as on 01.04.2015 pending disposal before APTEL.	467.60
4	Normative loan as on 01.04.2017 considered in this petition (1+2+3)	3319.02

- 5.9** Depreciation on Fixed assets for 2017-18 considered as normative repayment was Rs.536.61 Cr. GFA addition as per Tariff Regulation for the year was Rs. 1201.48 Cr. Normative loan as on

31.03.2018 after considering grants etc amounted to Rs. 3410.43 Cr. On this amount, GFA addition, receipt of consumer contribution and grants and depreciation for the year 2018-19 were considered to arrive at normative loan balance as on 31.03.2019 and interest as detailed in tables 5.6, 5.7 and 5.8 below:

Table 5.6 Computation of normative interest for loan till 31.03.2019 (Rs Cr)					
Sl. No	Particulars	SBU G	SBU T	SBU D	Total
1	Normative loan as on 01.04.2017 as per TU order	564.38	547.59	839.54	1951.51
2	KSEBL claim before Hon'ble APTEL	135.23	131.21	201.16	467.60
3	Additional normative loan for 2016-17-As per additional submission	291.21	241.44	367.26	899.91
4=(1+2+3)	Normative loan as on 01.04.2017	990.82	920.24	1407.96	3319.02
5	Normative loan 2017-18 as per TU Petition	42.35	280.38	305.30	628.03
6=(4+5)	Gross normative loan as on 31.03.2018	1033.17	1200.62	1713.26	3947.05
7	Less: Normative repayment as per TU 2017-18	143.48	156.36	236.78	536.62
8=(6-7)	Normative loan as on 31.03.2018	889.69	1044.26	1476.48	3410.43
9	Depreciation on opening GFA for 2018-19	136.73	156.94	88.69	382.36
10=(8-9)	Net Normative loan as on 31.03.2019	752.96	887.32	1387.79	3028.07
11=(8+10)/2	Average loan (without considering addition during 2018-19)	821.32	965.79	1432.14	3219.25
12	Interest on above A	68.50	87.50	143.21	299.21

5.10 Normative interest on GFA added during 2018-19 has been computed as per Table given below:

Table 5.7 Computation of normative loan for the GFA addition during 2018-19 (Rs. Cr)					
Sl No	Particulars	SBU G	SBU T	SBU D	TOTAL
1	GFA addition for 2018-19 as per accounts	103.66	365.43	1203.72	1672.80
2	Less: Perumthenaruvi project-capitalized in 2017-18	56.71			56.71
3	Less: Consumer contribution, Grants and Subsidies received during the year	13.34	289.69	452.93	755.96
4	Equity infusion during the year	0.00	0.00	0.00	0.00
5=(1-2-3-4)	Additional normative loan for 2018-19	33.61	75.74	750.79	860.14
6	Less: Normative repayment for 2018-19 (Depreciation on assets added in 2018-19 at half the normal rate (@ 5.14%/2=2.57%))	0.86	1.95	19.30	22.11
7=(5-6)	Net additional normative loan	32.74	73.79	731.50	838.03
8 =((5+7)/2)	Average additional normative loan	33.17	74.76	741.15	849.08
9	Average rate of Interest % (Actual)	8.34	9.06	10.00	
10 =(8*9%)	Normative interest on GFA addition for 2018-19	1.38	3.39	37.06	41.83

5.11 Therefore, total normative interest for 2018-19 amounts to Rs 341.04 Cr against approval of Rs. 348.33 Cr and normative loan balance as on 31.03.2019 amounts to Rs. 3866.10 Cr as detailed below:

Table 5.8 Normative interest on loan for 2018-19 (Rs Cr)					
Sl. No	Particulars	SBU G	SBU T	SBU D	Total
1	Normative interest on loan till 01.04.2018	68.50	87.50	143.21	299.21
2	Normative interest on loan during 2018-19	1.38	3.39	37.06	37.63
3	Total	69.88	90.89	180.27	341.04
4	Normative loan balance on assets added till 31.03.2018	752.96	887.32	1387.79	3028.07
5	Normative loan balance on assets added during 2018-19	32.74	73.79	731.50	838.03
6	Normative loan as on 31.03.2019	785.70	961.11	2119.29	3866.10

5.12 Capitalization of expenses: It is respectfully submitted that KSEBL earmarks amounts meant for capitalization of various expenses incurred on capital works carried out during the year. Such amount earmarked for subsequent capitalization is deducted from the actual employee cost and interest on loan annually and directs the ARUs to include the same under CWIP itself. Expenses so earmarked for capitalization during subsequent years amounted to Rs.723.49 Cr. It may kindly be noted that expenses earmarked annually would continue to be disclosed under CWIP till completion of related works and transfer to GFA. Apportionment of expenses earmarked for capitalization among SBUs is furnished below:

Table5.9: Details of expenses capitalized in 2018-19 (Rs Cr)					
Sl. No	Description	Total	SBU G	SBU T	SBU D
1	Interest and Finance charges	34.72	23.35	202.80	260.87
2	Employee cost	97.18	64.49	300.95	462.62
3	Total	131.90	87.84	503.75	723.49

5.13 The accounting treatment followed in annual accounts towards capitalization of expenses differs from that adopted for Regulatory purposes. Regulatory approval of normative interest is granted only for the commissioned assets and no allowance is permissible for CWIP. Similarly, O&M expenses with regard to GFA are allowed on assets put to use at normative basis. The norms were derived based on net trued up expenses of previous years. Therefore, in the truing up petition, normative interest as well as normative O&M expenses are considered as a charge in ARR and no portion earmarked towards subsequent capitalization.

5.14 Interest on Overdraft: A sum of Rs.148.95 Cr (Rs.95 Cr in 2017-18) was incurred during the year under this head, primarily because of the increased level of borrowings to the tune of Rs.1285.84 Cr over 2017-18. Expenses under this head could not be claimed as per Tariff Regulation, 2018 but Hon Commission was pleased to approve carrying cost on un bridged revenue gap for the year. In view of the above, KSEBL is not seeking true up of interest paid on overdraft during 2018-19.

5.15 Carrying cost on approved revenue gap:

5.15.1 Hon'ble Commission had trued up revenue gap of Rs.6739.13 Cr till 2016-17 (excluding 2014-15, for which orders are yet to be issued). Based on the methodology adopted by the Hon'ble Commission in TU 16 & TU 17, average GPF balance of Rs.2208.40 Cr has been excluded from the approved gap to determine the revenue gap for which carrying cost is eligible. Actual average interest on loans during 2018-19 for SBU D had been 10 %. Accordingly, a sum of Rs.453.07 Cr is claimed as carrying cost for the year 2018-19 being 10% of Rs.4530.73 Cr as detailed below:

Table 5.10: Computation of carrying cost on approved revenue gap		
1	Total un bridged revenue gap as on 31-03-2011	424.11
2	Revenue gap as per the orders on truing up for the year 2011-12	1386.97
3	Revenue gap as per the orders on truing up for the year 2012-13	3132.97
4	Remand order dated 09.05.17-2009-10	107.90
5	Remand order dated 19.05.17-2010-11	204.70
6	True up order 2013-14 dated 20.06.2017	195.50
7	RP 2/2017 dated 07.09.2017 on TU 2011-12	4.96
8	True up order 2015-16 dated 21.08.2018	202.97
9	True up order 2016-17 dated 14.09.2018	1031.06
10	RP 3/2019 on TU 2016-17	47.99
11	Total trued up revenue gap	6739.13
12	Less: Average PF balance for 2018-19 (2207.33+2209.47)/2	2208.40
13	Net revenue gap	4530.73
14	Carrying cost at average interest rate of 10 % on above	453.07

5.15.2 It is further submitted that the Hon'ble APTEL, as per judgment dated 08.04.2015 in Appeal 160 of 2012 and batch has laid down the principle based on which carrying cost is to be allowed. The decision was reiterated in judgment dated 22.04.2015 in Appeal 174 of 2013 as well. The same is reproduced below:

42. We find that for carrying cost, the State Commission has considered the revenue gap to be applicable from the end of the year of the occurrence of the revenue gap up to the middle of the year in which the same is proposed to be recovered. This is not correct. The interest to be calculated for the period from the middle of the financial year in which the revenue gap had occurred up to the middle of the financial year in which the recovery has been proposed...This is because the expenditure is incurred throughout the year and its recovery is also spread out throughout the year. Admittedly, the revenue gap will be determined at the end of the financial year in which the expenditure is incurred. However under or over recovery is the resultant of the cost and revenue spread out throughout the year. Similarly, the revenue gap of the past year will be recovered throughout the financial year in which its recovery is allowed. Therefore interest on revenue gap as a result of true up for a financial year should be calculated from the mid of that year till the middle of the financial year in which such revenue gap is allowed to be recovered.

43. To explain this point let us assume that there is a revenue gap of 12 crores in the true up of FY 2010-11. If the cost and the revenue and the permitted expenditure had been properly balances, this gap of 12 crores would have been recovered throughout the 12 months of FY 2010-11. Now, this revenue gap is allowed to be recovered in tariff during FY 2013-14. The recovery of gap of Rs. 12 crores from the distribution licensee consumers will be spread over the 12 months period of 2013-14. Therefore carrying cost would be calculated from the middle of FY 2010-11 to middle of FY 2013-14 ie 3 years.

5.15.3 Hon'ble Commission may kindly note that the additional revenue deficit sought for True up for 2016-17 and true up sought for 2017-18 amounted to Rs.63.76 Cr and Rs.1331.81 Cr respectively. In view of the above judgment, Hon'ble Commission may kindly approve carrying cost for the revenue gap till 2017-18 also, which amounts to Rs.1395.67 Cr (Rs.63.76 Cr+Rs.1331.81 Cr) in addition to what claimed under Table 5.10. Carrying cost for this

amount at average interest rate of 10% amounts to Rs.139.56 Cr. Revenue gap for the year 2018-19 sought to be trued up is Rs.729.60 Cr. In view of the APTEL order, Hon'ble Commission may kindly approve carrying cost for the revenue gap for 2018-19 from the middle of the year at Rs.36.48 Cr.

- 5.15.4 Hon'ble Commission may kindly note that KSEBL has managed the overall finances through borrowings and deferred liabilities like Master Trust payments, electricity duty etc. It may kindly be noted that such deferred liabilities are to be honoured with interest on a later date. Therefore, Hon'ble Commission may please approve Rs.629.11 Cr towards carrying cost for 2018-19 under SBU D as detailed below:

Table 5.11: Computation of carrying cost on additional revenue gap		
1	On approved revenue gap till 2016-17	453.07
2	On additional revenue gap for TU 2016-17 & gap for 2017-18. (Rs.63.76 Cr+Rs.1331.81 Cr)	139.56
3	On current year revenue gap Rs. 743.33 Cr	36.48
	Total	629.11

- 5.16 **Interest on security deposit:** Hon Commission approved interest on SD for the year at Rs.175.33 Cr. The Actual Security Deposit balance as per accounts was **Rs.2836.96 Cr** at the beginning of the year (01-04-2018) on which the interest at 6.25 % is provided in accounts for FY 2018-19 (**Rs 177.31 Cr**) on accrual basis. Actual disbursement in the FY 2018-19 amounted to Rs.170.75 Cr (disbursement against provision made for FY 2017-18 of Rs 175.33 Cr) as per provisions in Supply Code, 2014. Hon Commission may please approve the actual disbursement in 2018-19 amounting to Rs.170.75 Cr under SBUD.

- 5.17 **Interest on PF:** Hon Commission approved Rs 182.59 Cr towards interest on PF. But as per the audited accounts, the actual interest paid on PF was Rs.162.17 Cr, which was less than approval by Rs.20.42 Cr mainly due to fall in interest rate. Hon Commission had considered Rs.2282.33 Cr as average PF balance for 2018-19 and applied interest @ 8%. However, actual average PF balance was Rs.2208.40 Cr. The actual rate of interest, however, was at 7.80% and later on had gone up to 8% during the year. The actual interest as per the audited accounts may kindly be approved among SBUs as given below:

Table 5.12: Interest on GPF (Rs Cr)				
Item	SBU G	SBU T	SBU D	Total
Interest on GPF	8.92	16.57	136.68	162.17

- 5.18 **Interest on Master Trust Bonds:** State Government, as per notifications dated 31.10.2013 and 28.01.2015, ordered creation of a Master Trust for meeting the unfunded liability of pension, gratuity and leave surrender as on 31.10.2013, in respect of the personnel transferred from erstwhile KSEB to KSEBL. Funding arrangements were put in place through issue of 2 series of Bonds for the total liability as on 31.10.2013 amounting to Rs.12418.72 Cr. Hon Commission recognized the unfunded pension liabilities as above and approved recovery of interest on KSEBL share of Bonds as per Tariff Regulations, 2018. Thus Hon Commission approved Rs.773.68 Cr towards interest on Master Trust bonds in the order. Even though KSEBL claimed Rs.372.90 Cr towards unfunded actuarial liability till 31.03.2017

(Rs.3728.98 Cr), Hon'ble Commission provisionally approved Rs.200 Cr with the observation that it shall hold separate proceedings to determine funding requirement.

5.18.1 It is respectfully submitted that the Actuarial liability as on 31.03.2017 towards the unfunded pension liability, gratuity liability and leave surrender liability stood at Rs.16147.70 Cr ie Rs.3728.98 Cr increase in liability for the period from 01.11.2013 to 31.03.2017. As per the actuarial valuation as on 31.03.2018 and as on 31.03.2019, the liability on this count has been assessed at Rs. 17732.57 Cr and Rs.19327.73 Cr respectively. The increase for the year 2018-19 has been Rs.1595.16 Cr and the same was captured in audited accounts as follows:

- (i) Liability pertaining to 2018-19 amounting to Rs.498.37 Cr has been booked under employee cost for the year and
- (ii) Remaining portion, pertaining to earlier years Rs.1096.79 Cr under other comprehensive income in P&L account.

5.18.2 Kerala Service Rules as applicable in the Government are applicable to employees of KSEBL. The details of terminal benefits paid to retired employees in FY 2018-19 through Master Trust amounts to Rs.1378.04 Cr as detailed below:

Table 5.13: Amount paid to pensioners by Trust			
Month	Rs. Cr	Month	Rs. Cr
18-Apr	104.16	18-Nov	118.86
18-May	103.33	18-Dec	127.41
18-Jun	121.55	19-Jan	99.67
18-Jul	116.52	19-Feb	100.39
18-Aug	219.04	19-Mar	97.96
18-Sep	35.14	Total	1378.04
18-Oct	134.01		

5.18.3 KSEBL , as per audited accounts has not claimed pension and terminal liabilities under employee cost by virtue of operationalization of Master Trust and considered 10% interest on Bonds (Rs.8144.40 Cr) amounting to Rs.773.68 Cr among SBUs as detailed below:

Table 5.14: Interest on Master Trust Bonds (Rs Cr)				
Item	SBU G	SBU T	SBU D	Total
Interest on Bonds	42.56	79.04	652.08	773.68

5.18.4 It is respectfully submitted that there is no deviation between interest approved for the year as per the orders of the Hon'ble Commission and the actual interest as per audited accounts. However, there has been minor difference between approval and actual under SBU wise segregation of total interest. In the MYT order, Hon'ble Commission adopted employee cost ratio for 2017-18 as the basis for SBU wise segregation of allowable interest whereas the ratio of working employee strength in SBUs was considered for the purpose in the audited accounts.

5.18.5 Tariff Regulations provide that, the annual pension contribution by KSEBL to the Master Trust based on the actuarial valuation is allowed to recover through tariff on annual basis.

KSEBL has not claimed the entire additional contribution to the Master Trust in one-go as it is likely to result in huge accumulation of Regulatory Asset and subsequent tariff shock. Therefore, KSEBL has sought interest on unfunded portion of actuarial liability in the MYT petition against which Hon'ble Commission provisionally approved Rs. 200 Cr with the following observation:

.....Considering all these factors, the Commission is decided to hold a separate proceedings towards the determination of funds requirements of Master Trust. Till such time, the Commission provisionally allows Rs.200 crore as an additional funding for the Master Trust. Hence the figures shown as additional funding for the trust is only provisional and is subject to a prudency check before the same is finally allowed.

- 5.18.6** Actual pension and terminal benefit disbursement exceeded interest on bonds by Rs. 604.36 Cr. (Rs.1378.04 Cr-Rs.773.68 Cr). KSEBL has also accounted Rs.498.37 Cr against employee expenses to take care of the additional actuarial liability. It is humbly requested that the Hon'ble Commission may kindly true up an additional Rs.200 Cr as approved in MYT order for 2018-19, which may be subject to the final decision on the matter, in view of the fact that KSEBL has no other source to meet these expenses. Therefore, Hon'ble Commission may be pleased to provisionally approve Rs.200 Cr as detailed below against the huge additional actuarial liability.

Table 5.15: Interest on Master Trust Bonds (Rs Cr)				
Item	SBU G	SBU T	SBU D	Total
Interest on Bonds	10.26	22.64	167.10	200.00

- 5.19 Other charges:** Hon Commission has not approved any amount towards other interest. Actual interest on other liabilities as per accounts amounts to Rs.27.54 Cr as detailed below:

Table 5.16: Details of Other interest and charges (Rs Cr)	
Item	
Power purchase interest	15.42
Interest on fair valuation of concessional loans	9.13
Rebate allowed for prompt payment	0.83
Discount to consumers for timely payment of bills	2.16
Total	27.54

- 5.19.1** An amount of Rs. 15.42 Cr incurred towards interest on power purchase bills has been classified under interest to suppliers/contractors. It may kindly be noted that these bills were raised by generators in line with tariff revision ordered by CERC for the control period 2014-19 and the payment is strictly in line with CERC regulations, which allow interest for the differential amount between provisional AFC and final AFC. Interest on fair valuation of concessional loans Rs.9.13 Cr charged as expense under this head has been offered as income under FV adjustments, as detailed in subsequent paragraphs. Since this amount does not involve any cash flow and only an adjustment entry made in line with IND AS compliance, Hon'ble Commission may kindly exclude the same while truing up. Therefore actual expense during the year has been Rs.18.41 Cr, which may kindly be approved in truing up as shown below:

Table 5.17: Other interest (Rs Cr)				
Item	SBU G	SBU T	SBU D	Total
Other interest			15.42	15.42
Rebate allowed for prompt payment			0.83	0.83
Discount to consumers for timely payment of bills			2.16	2.16
Total			18.41	18.41

5.20 In view of the above submission, Hon'ble Commission may kindly approve interest and finance charges as summarized below:

Table 5.18 : Statement showing comparison of I&F charges-Approved, Actual and TU requirement for 2018-19 (Rs Cr)										
Sl No	Item	Approval	As per Accounts				True up requirement			
			SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
1	Interest on Loan	348.33	101.98	119.67	348.47	570.12	69.88	90.89	180.27	341.01
2	Security Deposit Interest	175.33	0.00	0.00	177.31	177.31			170.75	170.75
3	Master Trust Bond Interest	773.68	42.56	79.04	652.08	773.68	42.56	79.04	652.08	773.68
4	Working capital/ OD interest	21.75	8.19	15.22	125.54	148.95	6.22	15.76	0	20.98
5	PF interest	182.59	8.92	16.57	136.68	162.17	8.92	16.57	136.68	162.17
6	Other interests	0	0.00	0.00	18.41	18.41			18.41	18.41
7	Interest on fair valuation	0	1.01	0.46	7.65	9.13				0.00
8	Carrying cost on past approved revenue gap	304.08							592.63	592.63
9	Carrying cost on current year revenue gap								36.48	36.48
11	Total	1805.76	162.67	230.96	1466.13	1859.76	127.59	202.26	1787.30	2117.13
12	Less: Interest capitalized		34.72	23.35	202.80	260.87				
13	I&FC net of capitalization	1805.76	127.95	207.61	1263.33	1598.89	127.59	202.26	1787.30	2117.13

5.21 Depreciation: Hon Commission may kindly note that the depreciation as per audited accounts of Rs.805.03 Cr has been worked out at the rates specified in Tariff Regulations, 2018. From this amount, claw back depreciation was determined at Rs.158.25 Cr and credited to Other Income under Note 25(b) of Annual accounts. Since depreciation is claimed as per Regulations after deducting applicable claw back, it is humbly requested that the income accounted under note 25(b) towards claw back as per accounts may not be considered in True up.

5.22 MYT Regulation for the control period 2018-22 specifies depreciation rates as well as methodology to be followed. Accordingly, allowable depreciation for the year 2018-19 has been worked out in the following lines:

- GFA (net of consumer contribution grants and subsidy) as on 31.03.2016 determined by the Hon'ble Commission in the MYT order (Rs.10611 88 Cr) has been considered as GFA eligible for depreciation as per Regulations on that date.
- GFA addition net of contribution etc for the year 2016-17 and 2017-18 has been considered as per the claims made in this regard in the submission/ TU petition for the respective years.
- Rate of depreciation as specified by the Hon'ble Commission in the MYT order has been adopted for working out depreciation. Paragraph 3.65 of the order is extracted below for ready reference.

Based on the mix of assets, for the first 12 years the average rate of depreciation will be 5.14%. Since the weighted average life of the assets is 31 years, the balance 27%

of the value of assets (90%-63%) is to be depreciated in balance 19 years (31-12 years) of the useful life. Hence the average rate of depreciation for assets more than 12 years old will be 27%/19 ie., 1.4% per year on a straight line basis.

- (iv) Function wise capital contribution and grants till 31.03.2018 has been reduced from GFA value so that depreciation is claimed only on eligible GFA as per Regulations. Gross Consumer Contribution and grants till 31.03.2018 as per accounts amounted to Rs.2170.39 Cr and after excluding concessional loans and decommissioning liability, actual receipt amounts to Rs.2078.85 Cr {2170.39- (70.97+20.56)}. Details of actual receipt, adjustment, claw back and balance as per audited accounts are detailed below:

Table-5.19: Details of consumer contribution and grants as on 31.03.2018 (Rs. Cr)			
No	Particulars	Amount	Amount
1	Consumer contribution	1254.09	
2	Grant and subsidy	593.22	
3	Local bodies etc	231.55	
4	Concessional loan treated as grant (As per IND AS)	70.97	
5	De commissioning liability (IND AS)	20.56	2170.39
6	Less: Clawed back		
7	2013-14	9.12	
8	2014-15	24.65	
9	2015-16	39.39	
10	2016-17	77.1	
11	2017-18	97.39	247.65
11	Contribution and grants (Note 18) as per Accounts.		1922.74

5.23 Hon'ble Commission may kindly note that decommissioning liability and concessional loan considered under this head does not involve cash flow. Therefore actual receipt of Consumer Contribution and grants till 31.03.2018 as per accounts amounted to Rs.2078.85 Cr.

5.24 Accordingly, depreciation for the year is computed at Rs 404.47 Cr as detailed below:

Table5.20 : Computation of depreciation for the year 2018-19 as per Tariff Regulations, 2018 (Rs Cr)					
Sl No	Particulars	SBU-G	SBU-T	SBU-D	Total
1	GFA (net of contribution) 31.03.2016 as per MYT order	4,454.06	4,374.89	1,782.93	10,611.88
2	GFA addition 2016-17-As per Regulations	298.75	324.9	939.94	1563.59
3	Consumer contribution, Grants and Subsidies received during 2016-17-Actuals as per accounts	0	79.12	567.82	646.94
4	IND AS addition considered in TU order 2015-16 (included in 1 above)	13.32	81.26	188.15	282.73
5	GFA Addition 2016-17 eligible for depreciation {2-(3+4)}	285.43	164.52	183.97	633.92
6	GFA as on 31.03.2017 net of contribution (1+5)	4,739.49	4,539.41	1,966.90	11,245.80
7	GFA addition 2017-18 as per TU petition	117.66	384.37	699.45	1201.48
8	Consumer contribution, Grants and Subsidies received during 2017-18	75.31	103.99	394.15	573.45
9	Net GFA addition for 2017-18 (7-8)	42.35	280.38	305.3	628.03
10	GFA as on 31.03.2018 net of contribution (6+9)	4,781.84	4,819.79	2,272.20	11,873.83
11	Assets more than 12 yrs old- GFA as on 01.04.2006 as per Accounts	2923.03	2399.22	2389.37	7711.62
12	Contribution & grants as on 01.04.2006 as per accounts			1678.96	1678.96
13	GFA as on 31.03.2006 net of contribution	2923.03	2399.22	710.41	6032.66
14	Land value @ 2.80% on 11 above	81.84	67.18	19.89	168.91

15	Net GFA eligible for depreciation (more than 12 years old) (13-14)	2841.19	2332.04	690.52	5863.75
16	GFA with <12 years old (10-15)	1,940.65	2,487.75	1,581.68	6,010.08
17	Land value @ 2.80% on 16 above	54.34	69.66	44.29	168.28
18	GFA < 12 years old excluding land value (16-17)	1,886.32	2,418.09	1,537.39	5,841.80
19	Dep on assets > 12 years old (15 @ 1.40%)	39.78	32.65	9.67	82.09
20	Dep on assets < 12 years old (18 @ 5.14 %)	96.96	124.29	79.02	300.27
21	Depreciation on GFA till 31.03.2018 (19+20)	136.73	156.94	88.69	382.36
22	Depreciation on GFA addition in 2018-19 as per Table 5.7	0.86	1.95	19.30	22.11
23	Depreciation for 2018-19 (21+22)	137.60	158.88	107.98	404.47

5.25 The depreciation as above represent the depreciation claim for the year 2018-19 on assets added till 31.03.2019. Hon Commission may kindly approve depreciation of Rs.404.47 Cr for the year 2018-19 as above.

5.26 Contribution and Grants: Details of Consumer Contribution and grants as on 31.03.2019 as per accounts amounted to Rs.2645.15 Cr as detailed below:

Table-5.21: Details of consumer contribution and grants as on 31.03.2019 (Rs. Cr)			
No	Particulars	Amount	Amount
1	Consumer contribution	1579.95	
2	Grant and subsidy	1057.54	
3	Local bodies etc	282.36	
4	Concessional loan treated as grant (As per IND AS)	95.93	
5	De commissioning liability (IND AS)	22.18	3037.96
6	Less: Clawed back		
7	2013-14	9.12	
8	2014-15	24.65	
9	2015-16	39.39	
10	2016-17	77.1	
11	2017-18	97.39	
	2018-19	145.16	392.81
11	Contribution and grants (Note 18) as per Accounts.		2645.15

5.27 Hon Commission may kindly note that decommissioning liability and concessional loan considered under this head does not involve cash flow. Therefore actual receipt of Consumer Contribution and grants till 31.03.2019 amounted to Rs.2919.85 Cr {Rs.3037.96-(95.93+22.18)}. Grant received from Government amounting to Rs.85.03 for the restoration of damages caused by flood, as detailed under onetime expenses in this petition, is to be excluded from this sum (as the same was utilized for restoration works and not for capital investment) to arrive at Contribution & grants for regulatory purpose, which amounts to Rs.2834.82 Cr (Rs.2919.85 Cr-Rs.85.03 Cr). SBU wise break up of consumer contribution and grants as on 31.03.2019 as per accounts are furnished in **Appendix 5** hereto.

5.28 Changes in fair valuation as per Note 34 of audited accounts. An income of Rs.3.94 Cr has been disclosed under this head, because of which the overall expenses as per accounts are understated to this extent. Income under this head is net of expenses on account of fair valuation adjustments (FVA) of interest (Rs. 9.08 Cr) and income on account of loan and grant (Rs. 13.06 Cr). Hon'ble Commission may kindly note that neither fair valuation expense

under interest and finance charges nor fair value adjusted loans or grants was considered in this petition. In other words, interest on loans are sought to be trued up on normative basis and loan/ grants actually received alone were considered in this petition wherever necessary. Therefore the income under fair valuation amounting to Rs.3.94 Cr as detailed below has not been sought for true up in this petition.

Table-5.22 : Fair Valuation Changes 2018-19			
Debit	Credit	Rs. CR	Description
FVA A/c	Grant A/c	-38.02	Fair value of grant is higher than the carrying amount, hence the difference would be debited in the FVA A/c
Interest A/c	FVA A/C	9.86	Fair value amount is higher than the actual interest rate, so the difference is debited to the profit and loss account through FVA A/c
FVA A/C	Interest A/c	-0.73	Difference between the fair value of interest (on the loans discounted @ IRR) and actual interest is adjusted in the profit and loss account.
Loan A/c	FVA A/C	24.96	Fair value of loan is lesser than the carrying amount, hence the difference is credited through FVA A/c
	TOTAL	-3.94	

- 5.29** Hon Commission may kindly note that, as per accounts, fair value adjustments totalling to Rs.22.27 Cr (Rs.22.62 Cr-Rs.0.35 Cr) has been included under Interest account (debited) and corresponding income booked (credited) under Fair value adjustment account, thereby neutralizing its impact in overall accounts. But, Interest on loan is claimed in this petition on normative basis and expenses on account of this adjustment have neither been claimed under interest and finance charges nor considered for computation of average interest. Further, for the Regulatory purpose, loan as well as grants is considered, wherever required, at actuals. Remaining portion of FVA pertains to loans and grants. Therefore it is respectfully submitted that the income under this sub head also need not be considered in truing up, as the same does not involve cash flow and only an adjustment entry made in compliance of IND AS. Therefore, income under this head has not been considered in this petition.
- 5.30** In view of the above submission, income as per accounts under this head (Rs.3.94 Cr) is not proposed for truing up, which may kindly be concurred with.
- 5.31 Others Rs. 202.61 Cr:** Expenses under this head include other expenses (Rs. 13.47 Cr) and prior period charges (Rs.189.14 Cr) showing a total expense of Rs.202.61 Cr. The details as per the audited accounts and item wise explanation are furnished below and detailed explanation of various items are provided there under.

Table-5.23 : Details of Other Expenses (Note 33 of Annual accounts) (Rs Cr)		
No	Particulars	Amount
1	Research and Development Expenses	0.06
2	Bad and Doubtful debts written off/ provided for	12.68
3	Miscellaneous Losses and write-offs	3.32
4	Material cost variance	-2.55
5	Sundries	-0.04
6	Others Total (1 to 5) A	13.47
	Prior period expenses and losses	
7	Operating expenses	2.78
8	Interest	6.55
9	Other charges	192.22
10	Prior period expenses (7+8+9)	201.55
11	Prior period income	12.41
12	Prior period expenses (net) (10-11) B	189.14
13	Other expenses (6+12)	202.61

5.31.1 Bad and doubtful debts written off/ provided for represent withdrawal of credits to revenue in earlier years. The **miscellaneous losses and write-offs** represent the total compensation paid for injuries, death and danger to staff and outsiders. **The material cost variance** represents the difference between the actual rate at which material was procured and the standard rate at which pricing the issue of material was made. As per the ESAAR-1985, the material cost are first accounted as per the standard rates and subsequently difference between the actual and standards are accounted under material cost variance. This policy has been dispensed with consequent to the integration of SCM software (material issues) and SARAS (accounting) software on 01.07.2017 for the distribution function. The credit balance under this head is mainly on account of transactions prior to the integration of SCM & SARAS software ie till 30.06.2017.

5.31.2 Prior period expenses: This includes both expenses as well as income relating to earlier years. During the year, this amounted to Rs. 201.55 Cr and Rs.12.41 Cr respectively; resulting in net prior period expense of **Rs. 189.14 Cr**. Hon Commission did not consider any amount in ARR towards Prior period expenses. It is the considered position of the Hon Commission that prior period charges could be covered in the truing up exercise.

5.31.2.1 It may kindly be seen in Table 5.23, other charges under prior period expenses amounting to Rs. 192.22 C is inclusive of Rs.163.97 Cr on account of reversal of interest income recognized in 2015-16 on the arrear settlement of Kerala Water Authority. Relevant portion of the clarification furnished by KSEBL as part of Truing up proceedings for 2015-16 (Letter dated 28.05.2018) is extracted below for ready reference:

Item No. 33 : KWA dues netted off in Duty

Government of Kerala, as per order G.O.(Ms) No. 24/2015/PD dated 29.06.2015 ordered to set off Rs.500 crore against the Electricity duty payable by KSEBL for clearing a part of arrears of electricity dues of Kerala Water Authority. KSEBL apportioned the amount under various heads as furnished below:

Table- 28 : Details of duty set off against KWA arrears	
Item	Amount (Rs Cr)
Electricity charges	218.04
Duty	8.82
Supply Surcharge	1.74
Meter rent	0.01
Excess consumption penalty	20.79
Fuel surcharge	4.65
Interest	245.95
Total	500.00

*A copy of the G.O is attached as **Annexure 2**.*

5.31.2.2 Hon'ble Commission, as per Truing up order for 2015-16 dated 21.08.2018 has trued up the interest income to the tune of Rs.245.95 Cr. However, Government has modified its earlier decision, necessitating certain accounting adjustments in 2018-19 as detailed below:

5.31.2.3 As per the Minutes of the meeting dated 16.03.2018 convened by the Chief Secretary, it was decided that electricity duty amounting to Rs.500 Cr that had previously been ordered to set off against electricity dues of KWA is to be set off fully against the

principal portion of arrears. Another high level meeting presided over by the Principal Secretary; Finance on 29.10.2018 has determined the KWA arrears till 30.09.2018 at Rs.1062.98 Cr (after adjusting Rs.500 Cr fully against the principal portion of arrears in 2016) and interest @ 6% at Rs.263.71 Cr (re calculated after adjusting principal of Rs.500 Cr in 2016) aggregating to Rs.1326.69 Cr. Further, Government undertook to release the entire arrears with interest in 4 years commencing from 2019-20 @ Rs.331.67 Cr per year through State Budget.

5.31.2.4 Thus, the arrears of KWA till 30.09.2018 along with interest @ 6% were determined at Rs.1326.69 Cr (arrear Rs.1062.98 Cr and interest Rs.263.71 Cr). The rate of interest is same as that approved by the Hon'ble Commission on OTS. Government of Kerala, as per order No. G.O. (Rt) No. 10/2019/Power dated 14.01.2019 has accorded sanction to settle the electricity dues of KWA of an amount of Rs.1326.69 Cr (including interest @ 6%) till 30.09.2018 in four annual instalments @Rs.331.67 Cr from 2019-20 onwards.

5.31.2.5 Thus, in view of the G.O. dated 14.01.2019 and decision as per MoM dated 16.03.2018 and 29.10.2018, Full Time Directors of KSEBL as per order dated 16.03.2019 has accorded sanction to set off Rs. 500 Cr, which was earlier accounted under principal and interest @ 18% in 2015-16, fully against principal portion of KWA arrears and re work the settlement amount at a reduced rate of 6% against 18% adopted in 2015-16. It is respectfully submitted that, on account of the above, the arrears of KWA as on 30.09.2018 has been shown as nil in the books of KSEBL by transferring the arrears and interest under the head receivable from Government. Further, KSEBL was able to recover Rs.73.90 Cr on 16.01.2019 from KWA and effective steps are being taken to arrest the piling up of arrears in future.

5.31.2.6 A gist of the accounting entries passed in the books during 2015-16 and 2018-19 are furnished below:

- (i) Rs.500 Cr was set off against duty payable to Government against HT arrears and interest in the books of SoR by recognizing an interest income of Rs.245.95 Cr (till 31.01.2016) at 18% in 2015-16.
- (ii) Modification in accounting was made in the above accounting in 2018-19 to give effect of the entire Rs.500 Cr ordered to be set off by the Government getting adjusted against principal portion of arrears and no interest realized on account of the transaction. Accordingly, principal portion of HT arrears were re worked out as on 31.01.2016 at Rs.82.44 Cr (Rs.582.44 Cr- Rs.500 Cr).
- (iii) In order to rectify the income recognized in 2015-16 @ 18%, instead of reversing the entire interest of Rs.245.95 Cr (till 31.01.2016), a sum of Rs.163.97 Cr has been accounted in 2018-19 under prior period expenses to give effect of reduction of interest to KWA @ 6% from the originally charged rate of 18% ($245.95 \times 12/18$). Thus, the 2/3 portion of the income recognized in 2015-16 has been withdrawn and balance Rs. 81.98 Cr being 6% interest continued to be recognized in books.
- (iv) It is respectfully submitted that even though interest amounting to Rs.81.98 Cr remain recognized in books, this amount has not been appropriated against Rs. 500

Cr, which in its entirety has been deducted from principal arrears (till 31.01.2016) and interest computed @6% on such reduced arrears (Rs. 82.44 Cr as on 31.01.2016) and further demands till 30.09.2018.

- (v) Interest @ 6% on HT arrears from 01.02.2016 to 30.09.2018 has been determined at Rs.56.27 Cr and that of LT connections for the entire period of arrears at Rs.126.09 Cr. An aggregate income of Rs.182.36 Cr has been recognized in 2018-19 in books under 'Miscellaneous charges from consumers' (an item under Non tariff income of Regulatory accounts).
- (vi) Thus, the aggregate interest income recognized in books in 2015-16 and 2018-19 amounted to Rs.264.34 Cr (Rs. 81.98 Cr+Rs.182.34 Cr). It is respectfully submitted that no portion of the interest income has actually been realized till 31.03.2019.
- (vii) As per G.O dated 16.01.2019, total interest that has been ordered to be recovered amounted to Rs.263.71 Cr. Actual interest recognized exceeded the figures as per G.O. by Rs.0.63 Cr. Principal portion of arrears till 30.09.2018 amounted to Rs.1138.11 Cr (HT Rs.573.59 Cr and LT Rs.564.52 Cr). Principal portion of arrears exceeded Rs.75.13 Cr upon final implementation of the G.O.
- (viii) **Accounting for receivables:** Arrears and interest thus worked out to the tune of Rs.1402.45 (Rs.1138.11 Cr+ Rs.264.34 Cr) is disclosed under the head 'KWA arrears receivable from Government of Kerala' and thus the balance arrears of KWA as on 30.09.2018 has been made nil.

5.32 As already submitted, the arrears with interest are to be received in four years, KSEBL could realize Interest only during these 4 years from 2019-20 onwards through budget allocation.

5.33 In view of the above submission, It is humbly prayed that the Hon'ble Commission may true up the accounts for 2018-19 in the following lines:

- (a) Other charges under prior period expenses (Rs. 192.22 Cr) for 2018-19 which is inclusive of Rs.163.97 Cr towards withdrawal of differential interest of 12% from the interest income recognized in 2015-16 (at 18%) on the arrear settlement of Kerala Water Authority. This amount along with unrealized interest of Rs.81.98 Cr may be trued up as prior period expense so as to fully negate the income trued up in 2015-16.
- (b) It may please be noted that instead of de recognizing the entire interest income at 18%, only 12% de recognized in 2018-19 by debiting prior period expenses. Since no portion of interest is received by KSEBL till 2018-19 and recovery is expected only during the 4 ensuing years, it is prayed that the entire interest in 2015-16 may kindly be de recognized by allowing Rs.245.95 Cr under prior period expenses in the place of Rs.163.97 accounted under this head. In other words, Rs.81.98 Cr may be permitted to claim under Prior period expenses for 2018-19. This adjustment is necessitated as the trued up accounts for 2015-16 cannot be re opened.
- (c) The interest income has been recognized @ 6% in 2018-19 amounting to Rs.182.36 Cr (HT Rs.56.27 Cr and LT Rs.126.09 Cr) under accrual concept and disclosed under head of

account-Miscellaneous charges from consumers. Since no portion of income actually realized till 2018-19, Hon'ble Commission may permit KSEBL to exclude such income in this petition and to offer the same on receipt basis in the 4 ensuing years commencing from 2019-20 onwards upon receipt basis in order to avoid re opening of trued up accounts subsequently in case of changes in accounting entries based on actual releases and G.Os.

- 5.34** Hon'ble Commission may kindly note that the accounting entries are made in books on 'due basis' under accrual concept of accounting. The Regulatory accounts consider various expenses like interest paid on security deposit etc on actual payment basis in view of the fact that expense may be admitted on payment only. It is respectfully prayed that income receivable in future may also be trued up on receipt basis since no such income has actually been received by the licensee during the year in its regulated business.

Table 5.24: Other expenses (Rs Cr)				
Item	SBU G	SBU T	SBU D	Total
Other expenses as per accounts	-4.68	-2.11	209.40	202.61
Add: Differential interest (Rs.245.95 Cr-Rs.163.97 Cr)			81.98	81.98
Total	-4.68	-2.11	291.38	284.59

- 5.35 O&M Expenses:** Hon'ble Commission approved Rs.2713.46 Cr under this head under normative basis against which a sum of Rs.3793.92 Cr was actually incurred during the year 2018-19, exceeding approval by Rs.1080.46 Cr as summarized below:

Table 5.25: Details of O&M expenses for 2018-19 (Rs Cr)									
No	Particulars	Approval as per MYT Order				As per KSEBL Accounts			
		SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
1	Employee cost					225.56	402.71	2726.37	3354.64
2	Less: Capitalized					97.18	64.49	300.95	462.62
3	Balance					128.37	338.22	2425.42	2892.01
4	R&M expenses			261.81		27.13	43.66	232.96	303.75
5	A&G expenses					41.81	108.48	447.87	598.16
6	Less: Capitalized					0.00	0.00	0.00	0.00
7	Balance					41.81	108.48	447.87	598.16
8	O&M New stations								
9	Total O&M Expenses	127.86	363.23	2241.36	2732.45	197.31	490.36	3106.25	3793.92

- 5.36** Hon'ble Commission may kindly note that the variation between amount approved and actual arose mainly towards actuarial liability (Rs. 498.37 Cr), Pay revision provision (Rs.176 Cr) under employee cost, PF incentive (Rs.114.07 Cr), Section 3(1) duty (Rs.123.81 Cr) and operating expenses (Rs.167.35 Cr) , which were not factored in the base year expenses adopted for the determination of normative values. Component wise details of O&M expenses is briefly explained below:

- 5.36.1 Employee cost:** As stated earlier, actuarial additional liability for the year 2018-19 was included under employee cost at Rs.498.37 Cr. It may kindly be seen from the table that the yoy increase under employee cost (from 2015-16 to 2018-19) both in terms of gross employee cost and net employee cost is very meagre. Detailed tabulation is furnished in **Appendix 6.**

Table 5.27: Employee Cost for the period from 2015-16 to 2018-19(Rs. Cr)					
Sl. No	Particulars	2015-16	2016-17	2017-18	2018-19
1	Gross employee cost (before capitalization)-As per accounts	2288.32	2396.47	3038.40	3354.63
	Less: Actuarial liability	0.00	0.00	509.42	498.37
	Less: Provision for pay revision	0.00	0.00	0.00	176.00
2	Employee Cost for the year for TU	2288.32	2396.47	2528.98	2680.26
3	Increase over previous year		108.15	132.51	151.28
4	YOY increase %		4.73	5.53	5.98
5	Less Capitalized	188.29	242.92	333.23	410.54
6	Net employee cost	2100.03	2153.55	2195.75	2269.72
7	YOY increase		53.52	42.20	73.97
8	YOY increase %		2.55	1.96	3.37

5.36.2 R&M expenses The R&M cost depends on the Gross Fixed Assets in use at the beginning of the financial year, age of the assets as well as inflation. R&M expenses as per accounts is furnished below:

Table 5.34 : R&M expenses for 2018-19 (Rs Cr)				
R&M expenses	27.13	43.66	232.96	303.75

5.36.3 R&M expenses for the year is inclusive of Rs.10.38 Cr incurred for flood restoration works, which was inadvertently booked under regular O&M expenses. Therefore normal R&M expenses for the year 2018-19 had been Rs.293.37 Cr against Rs.277.35 Cr and 265.13 Cr respectively in 2017-18 and 2016-17. It may kindly be seen that KSEBL has been able to contain this expense at optimum levels in spite of the ageing assets that are being maintained by KSEBL.

5.36.4 A&G expenses Hon'ble Commission may kindly note that A&G expenses as per accounts amounts to Rs.598.16 Cr. Detailed break up is available in Note 32 of the Annual Statement of Accounts. Expenses under this head contain predominantly, the following expenses:

Table 35 Administrative & General Expenses 2018-19 (Rs Cr)		
1	Conveyance	62.85
2	Other operative expenses	167.35
3	Expenses relating to CGRF & ERC	11.93
4	Electricity Duty u/s 3(I), KED Act	123.81
5	Expenditure in connection with distribution of LED	6.65
6	Power factor incentive to consumers	114.07
7	Contribution to CMDRF	36.20
8	Freight	11.21
9	Material related charges	19.16
10	Telephone etc	13.13
11	All Other A&G expenses	32.19
12	Gross A&G Expenses	598.56
13	Less: Expenses Capitalized	0.40
14	Net A&G Expenses	598.16

5.36.5 KSEBL respectfully submits that the Hon'ble Commission may permit exclusion of power factor incentive from A&G expenses and the same deducted from revenue from sale of power in this petition. Cost of LED bulbs is proposed to be deducted from Non tariff income, where the revenue earned from sale of LED lamps is accounted. Further, contribution to CMDRF (Rs.35 Cr) is claimed as onetime expenses as explained subsequently in this petition.

- 5.36.6** Further, certain income earned and accounted under Non tariff income were refunded and booked as A&G expenses as detailed below, which may kindly be permitted to deduct from non tariff income earned in 2018-19.

Table 36 Details of refund of fees and charges (Rs. Cr)		
1.	Refund of 80% of the solar registration fee to eligible consumers	0.83
2	Refund of liquidated damages	4.24
3	Total	5.07

- 5.36.7** Expenses under this head are also susceptible to business and infrastructure growth. One of the major expense items booked under A&G expense is the section 3(1) duty payable by KSEB to the Government. The section 3(1) duty is a statutory levy. Hon'ble Commission has not been admitting section 3(1) duty as a revenue expenditure quoting the provisions in the "Kerala Electricity Duty Act- 1963" that "(3) The duty under this section on the sales of energy should be borne by the Licensee and shall not be passed on to the consumers". Accordingly, since the year 2003-04, Hon'ble Commission has not admitted duty as pass through in tariff. It is humbly submitted that KSEB had already taken up the matter with the Government and also filed a second appeal before the Hon'ble Supreme Court of India in the matter.

- 5.36.8** Hon'ble Commission may kindly note that the variation between approval and actual were predominantly because of non consideration of certain expenses for the determination of normative values. The above proposals may kindly be approved.

- 5.36.9** Hon'ble Commission may kindly note that the revision of pay and allowances are due from July/August 2018, against which a sum of Rs.176 Cr has been provided in accounts. Regulation 14 (3) of Tariff Regulation, 2018 provides that expenses relating to pay revision, if any, during the control period for the same level of employees as admitted in the truing up of accounts for the year 2016-17 of the Generation business/company or Transmission business/licensee or distribution business/licensee may be considered for pass through after due prudence check. It is respectfully submitted that the pay revision process is yet to be commenced and it may take some more time. As per the prevailing practice, the revised pay is granted with retrospective effect and therefore, complete impact will be in the year of implementation. KSEBL is of the view that this can be minimized if annual provisions are approved in truing up. With this view, KSEBL seeks truing up of Rs.176 Cr over and above its normative entitlement.

- 5.36.10** Based on the Tariff Regulation, KSEBL is entitled to claim O&M expenses of Rs.2898.27 Cr for 2018-19 as explained in the respective chapters. A total o&m expense sought for truing up is Rs.2898.27 Cr which may kindly be approved.

Table 5.37: Normative O&M expenses for 2018-19 (Rs. Cr)					
Sl. No	Particulars	SBU G	SBU T	SBU D	Total
1	As per norms	124.47	363.23	2234.57	2722.27
2	Provision for pay revision	8.05	23.48	144.47	176.00
3	Total O&M expense	132.52	386.71	2379.04	2898.27

5.36.11 In view of the above, Hon'ble Commission may be kind enough to approve the O&M expenses for 2018-19 as detailed below:

Table 5.38: Details of O&M expenses 2018-19 (Rs Cr)													
No	Particulars	Approval				KSEBL Accounts				KSEBL TU Petition			
		SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
1	Employee cost					225.56	402.71	2726.37	3354.64				
	Less:					97.18							
2	Capitalized						64.49	300.95	462.62				
3	Balance					128.37	338.22	2425.42	2892.01				
4	R&M expenses					27.13	43.66	232.96	303.75				
5	A&G expenses					41.81	108.48	447.87	598.16				
	Less:												
6	Capitalized					0.00	0.00	0.00	0.00				
7	Balance					41.81	108.48	447.87	598.16				
8	O&M New stations												
9	Total O&M Expenses	127.86	363.23	2241.36	2732.45	197.31	490.36	3106.25	3793.92	132.52	386.71	2379.04	2898.27

5.37 It is respectfully submitted that the variation between actual and normative expenses emanate from factors of business growth, and admissibility of certain expenses for norm determination. Justification in this regard has already been furnished in the truing up petition for 2017-18 for the kind consideration of the Hon'ble Commission and placed as Exhibit 1 in this petition, which may kindly be considered in 2018-19 also.

5.38 Return on Equity: Return on equity is claimed @14% on the Government equity in KSEBL amounting (Rs.3499.05 Cr) to Rs.489.86 Cr. The function wise break up of equity is made on the basis of equity allocation among SBUs in the Trifurcated Balance sheet as detailed below:

Table 5.39: Allocation of Equity and RoE (Rs. Cr)

Particulars	SBU G	SBU T	SBU D	Total
Equity Capital	831.27	857.05	1810.73	3499.05
RoE @14% on above	116.38	119.99	253.50	489.87

5.39 One Time Expenses:

5.39.1 The state was struck by disastrous torrential rain causing landslides and rivers to overflow and resulting in wide spread flood and damage. The petitioner's installations were badly affected. Five major generating stations and 10 small hydel stations were severely affected. Fifty Substations in Ten districts were impaired by floods and had to be switched off for safety reasons. As many 10 Power transformers submerged in water. Transmission towers toppled and as many as 10 major transmission lines were disrupted. The distribution infrastructure was also damaged severely. Supply services from 16158 distribution transformers were affected. About 1735 Distribution Transformers, 106 RMUs, more than one Lakh poles and 5276 kms of distribution lines were damaged during this disaster. Almost 25 Lakhs of homes were without electricity. KSEBL, despite damage caused, earnestly undertook and successfully accomplished the massive effort "**Mission Reconnect**" in restoring the damaged installations during the subsequent period. The petitioner undertook on war footing for rebuilding the power infrastructure and restore supply to affected homes and consumers.

5.39.2 KSEBL submitted before the Commission in MYT petition for the control period 2018-19 to 2021-22 that the damages that occurred in various SBUs of KSEBL due to natural calamity may kindly be treated as 'Force Majeure' event and allowed at the time of truing up for 2018-19, over and above the normative expenses. Hon'ble Commission, however, observed that the Commission is not in a position to consider the onetime expenses claimed by KSEB Ltd on account of the losses suffered due to flooding.

5.39.3 Meanwhile, based on the representation, Government of Kerala, as per G.O. (Rt) No. 13/2019/DMD dated 07.01.2019 was pleased to release an amount of Rs.85.03 Cr for immediate repair and restoration of damaged infrastructure during flood. The amount was received during 2018-19 and accounted under the head 'Consumer contribution and Grants'.

5.39.4 It is respectfully submitted that in view of the availability of Government funds received for immediate repair and restoration of damaged infrastructure, and in view of the decision contained in MYT order, KSEBL is not claiming the cost incurred for the restoration works in the true up petition. Therefore, it is humbly submitted that KSEBL may be permitted to meet the expenses incurred for flood restoration out of the funds released by the Government. Accordingly, no claim towards onetime expenses is proposed for truing up in this petition. The financial assistance obtained in this regard from the disaster relief fund is excluded from capital grants and contribution in the true up petition and the same treatment is proposed to be followed for the said amount in filings for subsequent years as well to avoid adverse impact on depreciation claim by wrongfully considering the amount as a contribution towards creation of new assets. Hon'ble Commission may kindly approve the proposal.

5.40 Contribution to CMDRF: The Full Board, in view of the huge destruction caused by natural calamity, (as per Agenda 03-08/2018) accorded sanction to contribute an amount of Rs.35 Cr to CMDRF, in pursuant to the provisions of section 181 and other applicable provisions. KSEBL contributed Rs.36.20 Cr in 2018-19 and accounted under A&G expenses, which is in excess of Rs.1.20 Cr. However, while remitting the employees' contribution to CMDRF in 2019-20, such excess remittance of Rs.1.20 Cr has been deducted. Therefore, Hon'ble Commission may be pleased to approve Rs. 35.00 Cr as detailed below:

Table 5.40: Onetime expenses (Rs Cr)				
Item	SBU G	SBU T	SBU D	Total
Contribution to CMDRF	1.79	3.96	29.25	35.00

5.41 Incentives as per Regulation: By virtue of the provisions contained in Tariff Regulations, 2018, KSEBL is entitled to claim incentive on transmission system availability achieved over and above the target set by the Hon'ble Commission in MYT order. KSEBL is claiming Rs.8.38 Cr towards incentive on actual transmission system availability (98.82%) over target availability (98%) as explained in chapter 3. Hon'ble Commission may kindly approve the same as tabulated below:

Table 5.41: Incentive on transmission availability	
ARR excluding incentive (Rs. Cr.)	892.59
Annual availability achieved	98.92%
Target availability	98%
Incentive (Rs Cr)	8.38

5.42 Gains on achievement of T&D loss reduction target: As per Tariff Regulations, 2018, KSEBL is entitled to retain part of the gains on account of achieving loss reduction in excess of target approved. KSEBL was able to achieve T&D loss reduction of 0.35% over the previous year (0.25% approved) and the share of gain on this count amounts to Rs.28.59 Cr as detailed in chapter 4. Hon'ble Commission may kindly approve the same as tabulated below:

Table 5.42: Sharing of gains on account of T&D loss reduction achieved	
Particulars	Quantum
Energy sales by KSEBL (MU)	21536.77
Energy taken by RGCCPP during non operative periods (MU)	8.04
Total energy (MU)	21544.81
Energy input needed at 12.82% loss (MU)	24713.02
Energy input needed at 12.47% loss (MU)	24614.20
Energy savings	98.82
Power Purchase cost saved due to over achievement of loss (Cr)	42.89
Sharing between KSEBL and consumers:	
KSEBL -2/3 share (Rs Cr)	28.59
Consumers -1/3 share (Rs Cr)	14.30
Total	42.89

5.43 Non- Tariff Income: Hon Commission approved Rs.586.23 Cr under Non Tariff income for the year. Actual income earned under this count as per accounts amounted to Rs.949.68 Cr as detailed in Table below. It may kindly note that the disclosure in accounts and truing up petition with regard to non tariff income differ as the revenue from operations are depicted in accounts against revenue from tariff in truing up petition. Therefore certain components of income disclosed under revenue from operations in accounts amounting to Rs.467.94 Cr are classified under non tariff income. Out of Rs.949.68 Cr, remaining Rs.481.74 Cr is disclosed under other operating income and other income as per Note 25.a and 25.b of audited accounts as detailed below.

Table- 5.43 : Non Tariff Income	
Description	Rs. Cr
Revenue from operations Note 24.	
Reactive energy charges	20.63
Meter rent/ Service line rental	94.38
Recovery from theft/malpractices	8.66
Misc charges from consumers	344.27
Subtotal A	467.94
Other operating income Note No. 25.a	
Rebate received	134.11
Interest from suppliers/contractors	7.11
Income from sale of scrap/Tender form	72.63
Miscellaneous receipts	101.96
Subtotal B	315.81

Other income Note No.24.b	
Interest on staff loans and advances	0.01
Income from loans others	0.51
Interest from banks	7.16
Claw back of grant	158.25
Subtotal C	165.93
Non tariff income considered in True up petition (A+B+C)	949.68

5.44 Miscellaneous charges from consumers are detailed in **Appendix 7**. Miscellaneous receipts are detailed in **Appendix 8**. Income from sale of scrap/tender form amounting to Rs.72.63 Cr as detailed in **Appendix 9**.

5.45 As already submitted, KSEBL has recognized an interest income of Rs.182.34 Cr on the arrears of KWA on due basis. This income has been included under miscellaneous charges from consumers. It is respectfully submitted that the Government of Kerala has undertaken to settle the dues including interest in 4 annual instalments commencing from 2019-20 onwards. It is respectfully submitted that KSEBL has not realized any income on account of the settlement in 2018-19 and therefore propose to exclude the income of Rs.182.34 Cr in TU 19 and to offer such income in the year of receipt. Hon'ble Commission may kindly approve the same.

5.46 Income from sale of scrap/tender form amounting to Rs.72.63 Cr includes Rs.5.94 Cr towards sale proceeds of LED bulbs. Further, the cost of LED bulbs amounting to Rs. 6.65 Cr has been accounted under A&G expenses. Hon Commission may kindly note that the purchase value of LED accounted in 2018-19 exceeds sale proceeds by Rs.0.71 Cr primarily because of the delay in accounting. While approving Non-Tariff Income for 2015-16 & 2016-17, Hon Commission was pleased to exclude the LED sale proceeds from NTI while truing up (Rs. 12.86 Cr and Rs. 22.35 Cr respectively) after netting off with cost of LED bulbs. Similar adjustment was also sought for 2018-19. Details are furnished below:

Table- 5.44: Details of income trued up in FY 16 to FY 19					
Particulars	2015-16	2016-17	2017-18	2018-19	Total
Sale proceeds of LED bulbs	25.76	45.94	32.66	5.94	110.30
Cost of LED bulbs	12.90	23.59	41.59	6.65	84.73
Income trued up	12.86	22.35	-8.93	-0.71	25.57

5.47 As stated under A&G expenses, eligible refund of certain income booked in earlier years were accounted as expenses. As A&G expenses are part of O&M expenses and the same is allowable on normative basis, such refunds are not claimed over normative values. Instead, KSEBL propose to deduct such expenses from NT income for the current year since the income has already been fully trued up earlier.

5.48 In view of the above submission, Hon'ble Commission may kindly approve Rs.597.37 Cr as detailed below:

Table 5.45: Non tariff income for 2018-19 (Rs. Cr)					
Sl. No	Particulars	SBU G	SBU T	SBU D	Total
1	Other Income-As per Accounts (Note No. 25) (A)	24.48	56.45	400.80	481.73
2	Items sought to be excluded in TU				
3	Claw back of grant-Considered separately	6.54	14.38	137.33	158.25
4	Cost of LED Bulbs booked under A&G expenses			6.65	6.65
5	Total exclusions (3+4) (B)	6.54	14.38	143.98	164.90
6	Expenses booked under A&G expenses sought to be deducted from NTI				
7	Refund of 80% of solar registration fee for eligible consumers			0.82	0.82
8	Refund of liquidated damages			4.24	4.24
9	Total (8+9) (C)	0.00	0.00	5.06	5.06
10	Total deductions D (B+C)	6.54	14.38	149.04	169.96
11	Balance E (A-D)	17.94	42.07	251.76	311.77
12	Non tariff income booked under Revenue from operation (Note no. 24 of accounts)				
13	RE Charges			20.63	20.63
14	Meter rent			94.38	94.38
15	Recovery of theft/malpractices			8.66	8.66
16	Miscellaneous charges from consumers			344.27	344.27
17	Less: Interest accounted on KWA arrears			182.34	182.34
18	Balance (16-17)			161.93	161.93
19	Total Non tariff income as per accounts considered for TU (F) (13+14+15+18)	0.00	0.00	285.60	285.60
20	NT Income sought for TU 2018-19 G (E+F)	17.94	42.07	537.36	597.37

5.49 Revenue from Tariff: Annual Statement of Accounts discloses Revenue from operation, which is inclusive of certain items that are considered under Non tariff income in the Regulatory accounts. Segregation of revenue from tariff and NTI is furnished below:

Table 5.46: Revenue from tariff for 2018-19 (Rs. Cr)				
Particulars	SBU G	SBU T	SBU D	Total
Revenue from operation-As per Accounts (Note No. 24) (A)				13521.21
Less: Items considered under Non tariff income				
RE Charges			20.63	20.63
Meter rent			94.38	94.38
Recovery of theft/malpractices			8.66	8.66
Miscellaneous charges from consumers			344.27	344.27
Revenue from operation as per accounts considered under NTI- (B)	0	0	467.94	467.94
Revenue from Tariff (C) =(A-B)				13053.27
Less: Power factor incentive accounted under A&G expenses (D)				114.07
Revenue from Tariff as per Truing up petition (C-D)			12939.20	12939.20
Break up				
Revenue from sale within the State including fuel surcharge			12713.93	12713.93
Revenue from external sale			339.34	339.34
Less: Power factor incentive			114.07	114.07
Total			12939.20	12939.20

5.50 Variation between audited accounts and Truing up petition: Loss as per audited accounts for 2018-19 amounted to Rs.290.00 Cr (excluding RoE). Revenue gap as per accounts (inclusive of RoE Rs.489.87 Cr) amounts to Rs.779.86 Cr. The revenue gap sought to be trued up in this

petition is Rs.759.88 Cr. The following table summarizes the variation between loss as per audited accounts and TU petition amounting to Rs.469.87 Cr. Detailed information is furnished in **Appendix 10**.

Table 5.47: Comparison of Accounts and TU Petition (Rs Cr)				
Sl.No	Particulars	As per Accounts	TU Petition	Difference
1	Interest & Finance charges	1598.90	2117.13	518.23
2	Interest on additional bond to Trust	0.00	200.00	200.00
3	Depreciation	805.03	404.47	-400.56
4	O&M Expenses	3793.92	2898.27	-895.65
5	FV Adjustments	3.93	0.00	-3.93
6	Power purchase & PGCIL charges	7869.32	7826.86	-42.46
7	RoE	0.00	489.87	489.87
8	Other debits & PP expenses	202.61	284.59	81.98
9	Generation of power	3.29	3.29	0.00
10	Exceptional items	15.94	0.00	-15.94
11	Retaining gains out of T&D loss reduction beyond target	0.00	28.59	28.59
12	Incentive on transmission availability	0.00	8.38	8.38
13	Onetime expenses-CMDRF (Included under A&G expenses in Accounts)	0.00	35.00	35.00
14	ARR (1 to 14)	14292.94	14296.45	3.51
15	Revenue from tariff	13521.21	12939.20	-582.01
16	Non tariff income	481.73	597.37	115.64
17	ERC	14002.94	13536.57	-466.37
18	Revenue (gap)/Surplus	-290.00	-759.88	469.87

5.51 Detailed explanation with regard to variation under power purchase, revenue from tariff and claim on T&D loss reduction are furnished in chapter 4 of this petition.

5.52 Comparison of approval and truing up sought: The following table summarizes the variation between approval granted by the Hon'ble Commission as per order dated 08.07.2019 and truing up sought for the year 2018-19. Detailed information is furnished in **Appendix 11**.

Table 5.48: Comparison of Approval and TU Petition (Rs Cr)				
Sl.No	Particulars	As per MYT order	TU Petition	Difference
1	Fuel charges for generation	0.00	3.29	3.29
2	POP & Interstate transmission	7850.77	7826.86	-23.91
3	Interest & Finance charges	1805.76	2117.13	311.37
4	Depreciation	348.84	404.47	55.63
5	O&M Expenses	2713.46	2898.27	184.81
6	Other expenses and PP items	0.00	284.59	284.59
7	Retaining gains out of T&D loss reduction beyond target	0.00	28.59	28.59
8	Incentive on transmission availability	0.00	8.38	8.38
9	Interest on additional bond to Trust	200.00	200.00	0.00
10	RoE	489.87	489.87	0.00
11	Onetime expenses-CMDRF (Included under A&G expenses in Accounts)	0.00	35.00	35.00
12	Amortization of past gap	400.00	0.00	-400.00
13	ARR (1 to 13)	13808.70	14296.45	487.75
14	Revenue from tariff	13190.32	12939.20	-251.12
15	Non tariff income	586.23	597.37	11.14
16	ERC	13776.55	13536.57	-239.98
17	Revenue (gap)/Surplus	-32.15	-759.88	727.73

5.53 The Next chapter summarises the expenses and revenues sought for true-up for the year and determines the Net Revenue Gap for the year.

APPENDICES

Appendix 1 : Details of capital liabilities (2018-19)

	NAME OF THE FINANCIAL INSTITUTION	Gross Loan - Opening	Cumulative repayments till previous year (IND Adj)2017-18	Net loan-Opening – 01/04/18	Add: Drawal(s) during the Year	Less: Repayment (s) of Loans during the year	Net loan – Closing – 31/03/2019	Current maturities of long term debt (CFL)	Ind ADJ	Net loan – Closing – 31/03/2019	Average Net Loan	Rate of Interest on Loan on annual basis %	Interest on loan
	(A) SECURED LOANS												
1	Loan from L I C	0.00	2.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	9.18	0.05
2	Loan from REC-Distriburion - 23 Circle Scheme	599.90	57.52	657.42	17.29	34.14	640.57	67.64	34.65	538.28	0.00	9.75-10.5%	65.96
3	Loan from REC- Distriburion - Meter Scheme	39.03	18.22	57.25	0.00	14.94	42.32	14.94	2.45	24.94	0.00	0.10	4.88
4	Loan from REC on Various Schemes	-0.47	7.73	7.26	0.00	7.26	0.00	0.00	0.00	0.00	0.00	#VALUE!	0.00
5	Special Loan Assistance from REC	1300.00	50.00	1350.00	401.79	62.94	1688.85	129.91	0.00	1558.94	0.00	0.27	135.35
6	Loan from R E C - RGGVY	13.96	2.52	16.48	0.00	1.96	14.52	1.96	-0.08	12.63	0.00	10-11%	1.70
7	Loan from SOUTH INDIAN BANK-Barapole SHEP	81.00	4.50	85.50	0.00	4.50	81.00	6.00	0.00	75.00	0.00	0.10	8.30
8	Loan from REC R-APDRP PART-B	513.94	91.24	605.18	22.74	65.05	562.87	65.16	45.04	452.66	0.00	9.75-10.5%	58.69
9	Dam Rehabilitation and Improvement Project (DRIP)	49.21	0.00	49.21	0.00	0.00	49.21	0.00	0.00	49.21	0.00	0.00	0.00
10	Loan from REC for the DDG Scheme	0.13	0.00	0.14	0.00	0.00	0.14	0.00	0.01	0.13	0.00	0.11	0.01
11	Special Loan Assistance from PFC	1328.02	51.08	1379.10	9.87	55.84	1333.13	91.94	0.00	1241.19	0.00	0.27	123.68
12	Loan from PFC R-APDRP	166.15	0.00	166.15	26.26	0.00	192.41	0.00	0.00	192.41	0.00	0.09	45.42
13	Loan from PFC R-APDRP Part B	159.85	0.00	159.85	96.58	9.43	247.01	12.12	0.00	234.88	0.00	0.09	8.61
14	NABARD RIDF Loan : Upper Kallar SHEP and Banasurasagar SPVP	4.06	0.00	4.06	0.00	0.00	4.06	0.81	0.00	3.25	0.00	0.13	0.25
15	PFC Loan : Pallivasal Generation Project	176.75	15.13	191.88	0.00	191.88	0.00	0.00	0.00	0.00	0.00	11.15-11.75%	9.95
16	KIIFB for Trans Grid 2.0 Projects	0.00	0.00	0.00	41.07	0.00	41.07	0.00	0.00	41.07	0.00	0.00	
17	Loan from PFC GEL Perumthenaruvu	35.14	3.32	38.45	0.00	1.28	37.17	2.56	3.35	31.26	0.00	9.75-10	3.84
18	Loan from REC-Thottiyar Gene. Scheme	53.73	0.00	53.73	0.00	0.00	53.73	0.00	0.00	53.73	0.00	11.4-11.65%	6.18
19	Loan from REC-TRAN.Kattakkada -Pothencode Scheme	96.12	18.53	114.65	0.00	14.33	100.32	14.33	3.79	82.20	0.00	0.12	12.30
20	Loan from REC-TRAN-Group I	59.52	11.00	70.51	5.57	6.44	69.65	7.51	4.74	57.40	0.00	10-10.5%	6.97
21	Loan from PFC GEL Kakkayam	19.20	1.38	20.58	0.00	0.00	20.58	1.37	2.00	17.21	0.00	9.75-10.5	2.00
	Total	4,695.25	334.16	5,029.42	621.17	471.99	5,178.59	416.26	95.93	4,666.39	5,104.00	9.68	494.15
	(B) Unsecured Loan												
1	Loan-REC	500.00	0.00	500.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	11.91
2	State Bank of India (SBI)	750.00	0.00	750.00	0.00	750.00	0.00	0.00	0.00	0.00	0.00	0.00	39.08
3	Vijaya Bank	0.00	0.00	0.00	1000.00	600.00	400.00	0.00	0.00	400.00	0.00	0.26	24.73
4	Canara Bank	0.00	0.00	0.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Bank of India (BOI)	199.93	0.00	199.93	0.07	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
	Total	1,449.93	0.00	1,449.93	1,100.07	2,150.00	400.00	0.00	0.00	400.00	0.00	0.26	75.97
	TOTAL LOAN	6,145.19	334.16	6,479.35	1,721.24	2,621.99	5,578.59	416.26	95.93	5,066.39	6,028.97	9.46	570.12

Appendix 1A : Details of capital liabilities (2018-19)-SBU G

SL NO	NAME OF THE FINANCIAL INSTITUTION	Gross Loan - Opening	Cumulative repayments of Loans upto previous year	Net loan- Opening – 01/04/2018	Add: Drawal(s) during the Year	Less: Repayment (s) of Loans during the year	Net loan – Closing – 31/03/2019	CFL	Ind ADJ	Net loan – Closing – 31/03/2019	Average Net Loan	Rate of Interest on Loan on annual basis	Interest on loan
A	SECURED LOANS TERM LOANS												
1	Loan from L I C	0.00	0.49	0.49		0.49	0.00			0.00		9	0.01
2	Loan from REC-Thottiyar Gene. Scheme	53.73	0.00	53.73			53.73			53.73		11.4-11.65%	6.18
3	Loan from REC on Various Schemes	-0.12	1.89	1.78	0.00	1.78	0.00			0.00		8.5-13%	0.00
4	Special Loan Assistance from REC	318.16	12.24	330.40	85.30	55.56	360.14	27.70	0.00	332.43		9%	28.86
5	Loan from SOUTH INDIAN BANK-Barapole SHEP	81.00	4.50	85.50	0.00	4.50	81.00	6.00	0.00	75.00		10%	8.30
6	Dam Rehabilitation and Improvement Project (DRIP)	49.21	0.00	49.21			49.21			49.21			0.00
7	Loan from RIDF of NABARD Banasurasagar SPVP	0.45	0.00	0.45			0.45	0.09		0.36		6%	0.23
8	Loan from RIDF of NABARD Upper Kallar	3.61		3.61			3.61	0.72		2.89		6%	0.03
9	Loan from PFC-Pallivasal Generation Project	176.75	15.13	191.88	0.00	191.88	0.00			0.00		11.15-11.75%	9.95
10	Special Loan Assistance from PFC	325.02	12.50	337.52	0.00	53.24	284.28	19.61		264.67		9%	26.37
11	Loan from PFC GEL Kakkayam	19.20	1.38	20.58			20.58	1.37	2.00	17.21		9.75-10.5	2.00
12	Loan from PFC GEL Perumthenaruvi	35.14	3.32	38.45	0.00	1.28	37.17	2.56	3.35	31.26		9.75-10	3.84
	SUB-TOTAL	1062.17	51.44	1113.61	85.30	308.73	890.17	58.06	5.34	826.77			85.77
	Bond									9858.76			
B	UNSECURED LOANS TERM LOANS												
	From Banks												
	Loan-REC	122.37	0.00	122.37	0.00	122.37	0.00		0.00	0.00			2.54
	State Bank of India (SBI)	183.56	0.00	183.56	0.00	183.56	0.00		0.00	0.00			8.33
	Vijaya Bank	0.00	0.00	0.00	213.24	127.95	85.30		0.00	85.30		0.09	5.27
	Canara Bank	0.00	0.00	0.00	21.32	21.32	0.00		0.00	0.00			0.00
	Bank of India (BOI)	48.93	0.00	48.93	0.01	48.95	0.00		0.00	0.00			0.05
	SUB-TOTAL	354.86	0.00	354.86	234.58	504.14	85.30	0.00	0.00	85.30			16.20
	TOTAL	1417.03	51.44	1468.47	319.88	812.88	975.47	58.06	5.34	912.07	1221.97	8.34	101.97

Appendix 1B : Details of capital liabilities (2018-19) SBU T

SL NO	NAME OF THE FINANCIAL INSTITUTION	Gross Loan - Opening	Cumulative repayments of Loans upto previous year	Net loan-Opening – 01/04/2018	Add: Drawal(s) during the Year	Less: Repayment (s) of Loans during the year	Net loan – Closing – 31/03/2019	CFL	Ind ADJ	Net loan – Closing – 31/03/2019	Average Net Loan	Rate of Interest on Loan on annual basis	Interest on loan
A	SECURED LOANS TERM LOANS												
1	Loan from L I C	0.00	0.58	0.58		0.58	0.00			0.00		9%	0.02
2	Loan from REC-TRAN.Kattakkada - Pothencode Scheme	96.12	18.53	114.65	0.00	14.33	100.32	14.33	3.79	82.20		11.5%	12.30
3	Loan from REC-TRAN-Group I	59.52	11.00	70.51	5.57	6.44	69.65	7.51	4.74	57.40		10-10.5%	6.97
4	Loan from REC on Various Schemes	-0.14	2.25	2.12	0.00	2.12	0.00	0.00	0.00	0.00		8.5-13	
5	Special Loan Assistance from REC	379.11	14.58	393.69	119.89	7.38	506.21	38.94	0.00	467.27		9%	40.57
6	KIIFB for Trans Grid 2.0 Projects				41.07		41.07			41.07			
7	Special Loan Assistance from PFC	387.28	14.90	402.18	0.00	2.59	399.58	27.56	0.00	372.03		9%	37.07
	SUB-TOTAL	921.90	61.84	983.74	166.54	33.44	1116.83	88.34	8.53	1019.97			96.92
B	UNSECURED LOANS TERM LOANS												
1	Loan-REC	145.81	0.00	145.81	0.00	145.81	0.00		0.00	0.00		0	3.57
2	State Bank of India (SBI)	218.72	0.00	218.72	0.00	218.72	0.00		0.00	0.00		0	11.71
3	Vijaya Bank	0.00	0.00	0.00	299.74	179.84	119.89		0.00	119.89		9%	7.41
4	Canara Bank	0.00	0.00	0.00	29.97	29.97	0.00		0.00	0.00		0	0.00
5	Bank of India (BOI)	58.30	0.00	58.30	0.02	58.33	0.00		0.00	0.00		0	0.07
	SUB-TOTAL	422.84	0.00	422.84	329.73	632.67	119.89		0.00	119.89			22.77
	TOTAL	1344.73	61.84	1406.58	496.27	666.11	1236.73		8.53	1139.86	1321.65	9.06	119.69

Appendix 1C : Details of capital liabilities (2018-19) SBU D

	NAME OF THE FINANCIAL INSTITUTION	Gross Loan - Opening	Cumulative repayments of Loans upto previous year (IND Adj)2017-18	Net loan-Opening – 01/04/2018	Add: Drawal(s) during the Year	Less: Repayment (s) of Loans during the year	Net loan – Closing – 31/03/2019	CFL	Ind ADJ	Net loan – Closing – 31/03/2019	Average Net Loan	Rate of Interest on Loan on annual basis	Interest on loan
	SECURED LOANS TERM LOANS												
1	Loan from L I C	0.00	0.93	0.93	0.00	0.93	0.00	0.00	0.00	0.00		9%	0.03
2	Loan from REC-Distriburion - 23 Circle Scheme	599.90	57.52	657.42	17.29	34.14	640.57	67.64	34.65	538.28		9.75-10.5%	65.96
3	Loan from REC- Distriburion - Meter Scheme	39.03	18.22	57.25	0.00	14.94	42.32	14.94	2.45	24.94		10%	4.88
4	Loan from REC on Various Schemes	-0.22	3.58	3.37	0.00	3.37	0.00	0.00	0.00	0.00		8.5-13%	0.00
5	Special Loan Assistance from REC	602.72	23.18	625.90	196.60		822.51	63.27	0.00	759.24		9%	65.92
6	Loan from R E C - RGGVY	13.96	2.52	16.48	0.00	1.96	14.52	1.96	-0.08	12.63		10-11%	1.70
7	Loan from SOUTH INDIAN BANK- Barapole SHEP	0.00		0.00			0.00			0.00		9%	
8	Loan from REC R-APDRP PART-B	513.94	91.24	605.18	22.74	65.05	562.87	65.16	45.04	452.66		9.75-10.5%	58.69
9	Dam Rehabilitation and Improvement Project (DRIP)	0.00		0.00			0.00			0.00			
10	Loan from REC for the DDG Scheme	0.13	0.00	0.14			0.14		0.01	0.13		11%	0.01
11	Special Loan Assistance from PFC	615.71	23.68	639.39	9.87		649.26	44.78	0.00	604.48		9%	60.23
12	Loan from PFC R-APDRP	166.15	0.00	166.15	26.26	0.00	192.41	0.00	0.00	192.41		9%	45.42
13	Loan from PFC R-APDRP Part B	159.85	0.00	159.85	96.58	9.43	247.01	12.12	0.00	234.88		9%	8.61
	SUB-TOTAL	2711.19	220.88	2932.07	369.33	129.82	3171.58	269.87	82.06	2819.66			311.45
	UNSECURED LOANS TERM LOANS												
	From Banks												
1	Loan-REC	231.82	0.00	231.82		231.82	0.00		0.00	0.00			5.80
2	State Bank of India (SBI)	347.72	0.00	347.72		347.72	0.00		0.00	0.00			19.03
3	Vijaya Bank	0.00	0.00	0.00	487.02	292.21	194.81		0.00	194.81		9%	12.05
4	Canara Bank	0.00	0.00	0.00	48.70	48.70	0.00		0.00	0.00			
5	Bank of India (BOI)	92.69	0.00	92.69	0.03	92.73	0.00		0.00	0.00			0.12
	SUB-TOTAL	672.24	0.00	672.24	535.76	1013.18	194.81		0.00	194.81			37.00
	TOTAL	3383.43	220.88	3604.30	905.09	1143.00	3366.39		82.06	3014.46	3485.35	10%	348.45

Appendix-2 : Details of the short-term loans availed for meeting capital liabilities (Rs Cr)										
No	Short term loans	Balance as at 31.03.13	Balance as at 31.03.14	Balance as at 31.03.15	Balance as at 31.03.16	Balance as at 31.03.17	Received in 2017-18	Repaid in 2017-18	Balance as at 31.03.18	Balance as at 31.03.19
1	State Bank Of India	300	300	500	750	500	1000	750	750	
2	Vijaya Bank	199.97	200	200	200	200	400	600	0	400
3	Bank of India	0	199.98	350	450	387.5	1362.5	1550.07	199.93	
3	South Indian Bank	350	400	100	100	200	300	500	0	
4	Syndicate Bank	0	0	100	100	0			0	
4	Dhanalekshmi Bank	0	100	0					0	
5	Canara Bank						500	500	0	
6	REC - STL	150					500	0	500	
5	PFC - STL - 1	250							0	
7	PFC - STL - 2	250							0	
8	KSPIFC - STL	26	26	0					0	
6	Tamilnad Mercantile Bank			100	0				0	
9	Indian Overseas Bank		300	650	0				0	
10	Union Bank of India						401.47	401.47	0	
7	Andhra Bank				300	600	300	900	0	
11	Total	1525.97	1525.98	2000	1900	1887.5	4763.97	5201.54	1449.93	400

Appendix 3- Details of short-term loan Interest from 2012-13 to 2018-19.															
No	Bank	2012-13		2013-14		2014-15		2015-16		2016-17		2017-18		2018-19	
		Rate (%)	Amount (Rs.Cr)	Rate (%)	Amount (Rs.Cr)	Rate (%)	Amount (Rs.Cr)	Rate (%)	Amount (Rs.Cr)	Rate (%)	Amount (Rs.Cr)	Rate (%)	Amount (Rs.Cr)	Rate (%)	Amount (Rs.Cr)
1	SBI	10.40	30.76	10.15	30.96	10.15	44.03			9.05	69.45	8.00	56.69	8.42	39.08
2	SBT	10.75	10.00					9.95	43.76						
3	Canara Bank	10.75	1.12	10.75	3.61			9.65	94.63						
4	Federal Bank	10.75	21.47					9.63	41.70						
5	Vijaya Bank	10.65	20.66	10.25	20.01	10.25	20.13	9.65	26.56	8.65	18.85	8.15	14.50	8.70	24.73
6	South Indian Bank	11.00	26.44	10.50	30.12	10.50	19.73			9.00	17.92	8.25	13.46		
7	REC STL	13.00	4.63	13.00	20.61							8.20	5.05	8.20	11.91
8	PFC STL	12.50	11.16	12.50	42.52										
9	PFC STL	12.75		12.75											
10	KSPIFC STL	11.50	1.33	11.50	2.99	11.50	1.16								
11	Bank of India			10.50	9.07	10.50	43.07			8.75	44.49	8.15	25.02	8.15	0.25
12	IOB			10.25	2.16	10.25	48.54								
13	Dhanalekshmi Bank			11.50	0.82	11.50	4.09								
14	Syndicate Bank					10.25	10.09			9.70	2.39				
15	TMB					10.75	5.60	10.40	0.17						
16	UBI							9.65	19.18						
17	Andhra Bank									8.85	38.97	8.85	19.05		
18	KGB							9.65	3.43						
	Total		127.57		162.86		196.44		229.43		192.06		133.78		75.97

Appendix 4 PROJECT WISE ANALYSIS OF CAPITAL EXPENDITURE FOR THE YEAR ENDED 31/03/2019 (Rs. Cr)

Project Code	Brief Description of Project	Cost as on 01/04/2018	Cost Incurred during the year	Capitalized during the year	As on 31/03/2019
A	GENERATION				
14.02	Idamalayar H E Project	0.00	0.49	0.49	0.00
14.03	Solar Power Project.	10.76	6.68	6.42	11.02
14.07	Kakkad Scheme	0.00	0.90	0.54	0.35
14.08	LNG based Thermal power scheme	2.78	0.00		2.78
14.09	Renovation of Sengulam Pump House		13.02		13.02
14.10	Kuttiadi Augmentation Scheme	0.00	5.00	5.00	0.00
14.11	Kallada Low Head Scheme	0.02	0.00		0.02
14.12	Bhoothathankettu Small H.E Scheme	119.36	59.22		178.58
14.14	Mananthavady Multi Purpose Scheme	2.69	0.00		2.69
14.15	Olikkal Small H.E Scheme	3.60	2.78	0.01	6.37
14.16	Lower Periyar Tunnel Works - Other than W B Aided Works	0.00	0.67	0.67	0.00
14.19	Uppen sengulam Hp	4.90	1.75		6.65
14.20	Western Kallar SHP	0.01	0.03		0.03
14.21	Malampuzha Power Gen. Scheme	0.00	0.01	0.01	
14.25	RMU SHOLAYAR	19.66	28.16	1.64	46.18
14.27	Chimoney Small H E Scheme	0.00	0.07	0.07	0.00
14.28	Poringalkuthu Left Bank Diversion Scheme	0.01	-0.01		0.00
14.30	Wind Generator, Kottamala, Palakkad		0.01	0.01	
14.32	Poringalkuthu Left Bank H E Project Extension Scheme	0.03	0.58	0.61	0.00
14.33	Automatic Demand Management scheme(ADMS)		0.10		0.10
14.36	Anakkayam Small HE Scheme	10.11	2.60	1.66	11.06
14.38	Wanchiyam Small HE Scheme	0.02	0.00		0.02
14.39	Chathankottu Nada Small HE Scheme	22.53	9.83	0.00	32.35
14.40	DRIP Project	70.03	19.23	0.02	89.23
14.41	Renovation Division for Idukki H.E.P.	7.28	23.51	1.09	29.70
14.42	Valanthode SHEP	2.70	0.14	0.00	2.83
14.44	Sengulam Augmentation Scheme	54.34	2.97	0.01	57.30
14.45	Athirapally H E Project	14.26	0.74	0.00	14.99
14.46	Chembukadavu Mini HEP Stage II	0.00	0.02	0.02	

14.48	Urumi Mini H E Project II	0.00	0.07	0.07	0.00
14.49	Poovaramthode Small H.E Scheme	5.45	2.79	0.00	8.24
14.61	Expenditure due to Natural Calamity		0.86	0.46	0.40
14.64	MARMALA SHEP	1.76	0.02	0.02	1.76
14.65	Kuttiadi Small Hydro Electric Project	32.42	6.59	0.78	38.23
14.66	Upper Kallar HE Scheme	13.31	2.87	0.05	16.13
14.68	Peechad Small Hydro Electric project	0.06	0.02		0.08
14.69	RMU-Porinngalkuthu	10.12	2.27	0.53	11.86
14.70	Vakkalar Hydro Electric Project	0.06	0.00		0.06
14.71	Peruvannamuzhi Small Hydro Electric Project	7.23	4.05	0.00	11.27
14.72	Chembukadavu III Small H.E Scheme	4.26	0.16	0.01	4.42
14.74	Chinnar HES	5.39	4.98	0.00	10.37
14.75	Pazhassi Sagar Small H.E Scheme	5.99	5.15	0.04	11.10
14.76	Adyanpara Small Hydro Electric Project	0.11	0.07	0.18	0.00
14.77	Pallivasal Extension Scheme	243.29	36.25	0.04	279.50
14.78	Barapole S.H. Scheme	1.47	0.14	1.61	0.00
14.79	Mangulam Hydroelectric Scheme	20.59	7.20		27.79
14.80	Achencoil SHEP	4.57	0.03	0.02	4.57
14.83	Peechi SHEP	0.00	0.02	0.02	0.00
14.84	Maripuzha SHEP(2 X 3 MW)	0.06	0.11	0.00	0.17
14.85	Bhramapuram D P P	0.00	0.04	0.04	0.00
14.86	120 MW DGPP Kozhikode	0.00	0.18	0.18	0.00
14.88	Kuttiady Addl. Extention Scheme	16.46	0.00		16.46
14.89	LADRUM SHEP	1.78	0.03	0.02	1.79
14.90	CWIP - General	176.24	-67.22	22.35	86.67
14.92	Renovation Modernisation & Upgradation of Sabarigiri HE Project	0.00	0.26	0.26	0.00
14.93	Vilangad Small Hydro Project	0.08	0.00	0.08	0.00
14.95	Perunthenaruvi- SHE scheme	56.05	0.65	56.71	0.00
14.96	Thottiyar HES	95.88	5.63	0.08	101.44
14.97	CWIP - Closed Projects	0.05	1.44	1.43	0.07
14.98	Poringalkuthu Addl.Extn. Scheme	83.13	26.98	0.38	109.74
	SUB TOTAL (A)	1,130.89	220.15	103.66	1,247.39
B	TRANSMISSION LINES & SUB STATIONS				
14.01	Electrical Transmission Schemes	328.15	389.85	296.55	421.45
14.18	Power System Development Fund	20.55	113.59	40.45	93.69
14.22	SCADA Upgradation Project	0.42	0.05	0.05	0.42

14.56	Load Despatch & Communication Schemes	2.57	4.97	3.70	3.84
14.61	Expenditure due to Natural Calamity		0.41	0.02	0.40
14.90	CWIP - General	78.07	12.11	8.50	81.68
14.94	TRANSGRID 2.0 PROJECT	10.94	39.44	16.17	34.22
	SUB TOTAL (B)	440.71	560.43	365.43	635.71
C	DISTRIBUTION				
14.05	Deen Dayal Upadhyay Gram Jyothi Yojana (DDU GJY)	21.48	232.82	187.07	67.23
14.13	Integrated Power Development Scheme (IPDS)	3.83	122.57	69.70	56.70
14.26	Kerala Power Improvement Scheme (KPIS)	0.00	0.39	0.39	0.00
14.50	Rural Electrification Scheme	0.00	0.87	0.83	0.04
14.51	Distribution Line Extension	0.18	81.92	80.77	1.33
14.52	Distribution Service Connection	2.28	132.60	130.94	3.95
14.53	Distribution System Improvement	3.39	186.50	180.67	9.22
14.54	Electrification of Harijan Colonies	0.00	0.11	0.11	0.00
14.55	Electrification of Tribal Colonies	0.00	1.25	1.25	0.00
14.57	Punja Package	0.00	0.49	0.41	0.08
14.58	System Improvement in other areas	0.00	3.43	3.17	0.26
14.59	Distbn. Capacitor Installation Scheme	0.00	0.00	0.00	0.00
14.60	Street Lights	0.66	27.04	25.57	2.13
14.61	Expenditure due to Natural Calamity		13.63	13.57	0.06
14.62	RGGVY-Village electrification Infrastructure	-22.72	25.86	0.00	3.13
14.63	RGGVY-For effecting BPL Service Connection	0.24	0.00		0.24
14.67	Part B Projects of R-APDRP	176.21	102.82	237.90	41.14
14.81	MLA Asset Development Fund Scheme (MLA ADF)	0.00	1.21	1.21	0.00
14.82	R- APDRP Scheme	511.62	22.37	136.30	397.68
14.87	APDRP-Scheme	0.01	0.01	0.02	0.00
14.90	CWIP - General	178.69	477.56	132.67	523.58
14.91	Innovation fund	0.00	0.14	0.03	0.11
14.99	Projects not Identified	1.42	1.09	1.14	1.37
	SUB TOTAL (C)	877.29	1,434.67	1,203.72	1,108.24
	GRAND TOTAL (A+B+C)	2,448.90	2,215.24	1,672.80	2,991.34

Appendix 5 SBU DETAILS OF CONTRIBUTIONS, GRANTS AND SUBSIDIES TOWARDS COST OF CAPITAL ASSETS (GROSS) (Rs. Cr)														
SL No.	PARTICULARS		2016-17				2017-18				2018-19			
			GEN	TRANS	DIST	TOTAL	GEN	TRANS	DIST	TOTAL	GEN	TRANS	DIST	TOTAL
1	Consumer contribution	55.1		31.14	927.63	958.77		65.97	1,189.40	1255.37		94.37	1485.58	1,579.95
2	Subsidies	55.2			125.54	125.54	58.79		93.55	152.35	68.79		93.55	162.35
3	Grants Recd. Towards Cost Of Fixed Assets	55.3		16.44	225.09	241.53	16.52	85.51	338.86	440.88	19.83	345.50	529.85	895.19
4	Others	55.4,.5		47.36	132.2	179.56		47.46	182.8	230.26	0.0279	48.75	233.58	282.36
5	Gross Total		0	94.94	1410.46	1505.4	75.31	198.93	1804.61	2078.86	88.654	488.624	2342.57	2,919.84
6	Add: Concessional loan				49.88	49.88	7.96	8.65	54.37	70.97	5.34	8.52	82.07	95.93
7	Add: Decommissioning liability				18.38	18.38	5	5.54	10.03	20.56	5.08	5.88	11.22	22.18
8	Less :Subsidies & grants amortization				144.44	144.44	7.95	20.51	219.17	247.64	17.64	49.57	325.61	392.81
9	As per Accounts		0	94.94	1334.28	1429.22	80.31	192.61	1649.83	1922.76	81.44	453.46	2110.24	2645.15

Note: Grants received during the year include Rs.85.03 Cr received from Government for the restoration of damages caused by flood.

Appendix 6 : Employee Cost for the period from 2015-16 to 2017-18(Rs. Cr)					
Sl. No	Particulars	2015-16	2016-17	2017-18	2018-19
1	Basic Pay	811.43	1755.52	1806.86	1828.35
	Pension fund -Actuarial valuation			509.42	498.37
	Add: Provision for pay revision	339.00	0.00	0.00	176.00
2	Overtime / Holiday wages	0.20	0.41	0.34	0.29
3	D.A.	930.41	378.10	443.35	547.44
	Add: Provision for DA revision	0.00	0.00	9.00	
		2081.04	2134.03	2768.97	3050.45
4	Other Allowances				
	a) HRA	18.71	44.75	44.72	45.01
	b) Spread over allowances	3.66	4.88	4.98	
	c) Incentive allowances	0.34	0.30	0.27	
	d) Local and other allowances	18.88	28.76	27.67	32.39
5	Bonus	8.25	9.10	9.83	9.44
6	Medical Reimbursement	8.52	10.35	10.83	12.88
7	a) Earned Leave encashment	124.15	145.67	153.10	181.10
	b) Terminal Surrender	22.61			
	LTA			0.21	0.22
8	Payment under workmen compensation Act	0.08	0.50	0.14	0.54
9	Leave Salary and Pension Contribution	0.18	13.78	13.28	
	NPS Contribution				17.87
10	Staff welfare expenses			0.11	0.43
	a) Uniform & Livery expenses	1.82	4.28	4.24	4.29
	b) Cash award for meritorious service etc	0.07	0.05	0.05	
		207.27	262.42	269.43	304.18
11	Gross employee cost (before capitalization)-As per accounts	2288.32	2396.47	3038.40	3354.63
	Less: Actuarial liability	0.00	0.00	509.42	498.37
	Less: Provision for pay revision				176.00
12	Employee Cost for the year for TU	2288.32	2396.47	2528.98	2680.26
13	Increase over previous year		108.15	132.51	151.28
14	YOY increase %		4.73	5.53	5.98
15	Less Capitalized	188.29	242.92	333.23	410.54
16	Net employee cost in TU petition	2100.03	2153.55	2195.75	2269.72
17	YOY increase		53.52	42.20	73.97
18	YOY increase %		2.55	1.96	3.37

Appendix –7: Miscellaneous charge from consumers		
NO	PARTICULARS	Rs Cr
2	Other item (including interest on KWA arrears on LT connections Rs.126.09 Cr)	158.54
3	TF/RF	17.98
4	Other levies on fees(including interest on KWA arrears on HT connections Rs.56.27 Cr)	97.20
5	LE/SC Minimum	0.44
6	Processing fee power allocation	2.73
7	STOA Registration and application	0.23
8	STOA Open access charges	11.10
9	Registration & Application fee grid connectivity	4.49
10	Energization charges	0.36
11	Misc charges-PF penalty	51.20
	TOTAL	344.27

Appendix-8 : MISCELLANEOUS RECEIPTS (Rs Cr)		
No	Particulars	Total
1	Rental from staff quarters	0.33
2	Rental from contractors	0.09
3	Rent from others	2.46
4	Pole rent Cable TV Operators	32.75
5	Infra dev charges and supervision charges	6.11
6	SD Forfeited	8.67
7	Sale of trees	0.04
8	Usufructs	0.19
9	Penalty/LD from contractors/suppliers	11.23
10	Interest/penalty on pole rent SD	0.55
11	Outside students-project	0.93
12	Fee for providing information	0.02
13	Cost of DPR/DIR PVT shp developers	0.31
14	Revenue Energy audit consultancy	0.09
15	Rent from office cum complex	0.28
16	Optical fiber cable leasing	4.57
17	Testing fee from contractors	0.26
18	Centage to SPVs for KHFB project	2.07
19	Centage from Govt deptt/ agencies	3.65
20	Course fee reimbursement	2.31
21	Receipt for Outage Management System	0.41
22	Commission for collection of electricity duty	8.82
23	Others	15.82
24	Total	101.96

Appendix 9 : INCOME FROM SALE OF SCRAP/TENDER FORM (Rs. Cr)		
No	Particulars	Total
1	Sale of scrap	62.35
2	Sale of tender forms	4.23
3	Sale of LED Bulbs	5.94
4	Sale of safety equipments	0.1
5	Hire charge	0.01
4	Total	72.63

Appendix 10 Comparison of accounts and True up (Rs Cr)

No	Particulars	2018-19 KSEBL Accounts				2018-19 KSEBL TU Petition				Variation between Accounts and TU			
		SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
1	Cost of Generation (SBU-G)			586.66	586.66			506.79	506.79			79.87	79.87
2	Cost of Power Purchase			7869.32	7869.32			7826.86	7826.86			42.46	42.46
3	Cost of Inter-State Transmission				0.00				0.00				
4	Cost of Intra-State Transmission (SBU-T)			1068.69	1068.69			858.64	858.64			210.05	210.05
5	Cost of generation of power	3.29			3.29	3.29			3.29				
6	Interest & Financial Charges												
7	Interest on loans	101.98	119.67	348.47	570.12	69.88	90.89	180.27	341.04	32.10	28.78	168.20	229.08
8	Less: Capitalized	34.72	23.35	202.80	260.87								
9	Net interest	67.26	96.32	145.67	309.25	69.88	90.89	180.27	341.04	-2.62	5.43	-34.60	-31.79
10	Interest on GPF	8.92	16.57	136.68	162.17	8.92	16.57	136.68	162.17				
11	Other interest	1.01	0.46	26.06	27.54			18.41	18.41	1.01	0.46	7.65	9.13
12	Interest on Master Trust	42.56	79.04	652.08	773.68	42.56	79.04	652.08	773.68				
13	Int on SD			177.31	177.31			170.75	170.75				
14	Working capital interest	8.19	15.22	125.54	148.95	6.21	15.76		21.97	1.98	-0.54	125.54	126.98
15	Carrying cost				0.00			592.63	592.63	0.00	0.00	-578.90	-578.90
16	Carrying cost on current year gap				0.00			36.48	36.48				
17	Total I&F	127.94	207.64	1263.32	1598.90	127.58	202.26	1787.30	2117.13	0.36	5.38	-523.98	-518.23
18	Interest on un funded liability					10.26	22.64	167.10	200.00	-10.26	-22.64	-167.10	-200.00
19	Depreciation	132.36	239.43	433.24	805.03	137.60	158.88	107.97	404.47	-5.24	80.55	325.26	400.56
20	O&M Expenses					124.47	363.23	2234.57	2722.27				
21	Employee cost	225.56	402.71	2726.37	3354.64	8.05	23.48	144.47	176.00	217.51	379.23	2581.90	3178.64
22	Less: Capitalized	97.18	64.49	300.95	462.62					97.18	64.49	300.95	462.62
23	Balance	128.37	338.22	2425.42	2892.01					128.37	338.22	2425.42	2892.01
24	R&M expenses	27.13	43.66	232.96	303.75					27.13	43.66	232.96	303.75
25	A&G expenses	41.81	108.48	447.87	598.16					41.81	108.48	447.87	598.16
26	Less: Capitalized	0.00	0.00	0.00	0.00					0.00	0.00	0.00	0.00
27	Balance	41.81	108.48	447.87	598.16					41.81	108.48	447.87	598.16
28	O&M New stations									0.00	0.00	0.00	0.00
29	Total O&M Expenses	197.31	490.36	3106.25	3793.92	132.52	386.71	2379.04	2898.27	64.79	103.65	727.21	895.65
30	Return on equity (14%)	153.33	189.30	147.23		116.38	119.99	253.50	489.87	36.95	69.31	-106.27	
31	Other Expenses & PP expenses	-4.68	-2.11	209.40	202.61	-4.68	-2.11	291.38	284.59	0.00	0.00	-81.98	-81.98
32	Exceptional items-Flood	3.11	0.44	12.39	15.94					3.11	0.44	12.39	15.94
33	Fair value adjustments	-1.52	0.08	5.37	3.93					-1.52	0.08	5.37	3.93
34	Claim for over achievement of T&D loss reduction target							28.59	28.59				
35	Transmn availability incentive						8.38		8.38				
36	Onetime expenses-CMDRF					1.79	3.96	29.25	35.00	-1.79	-3.96	-29.25	-35.00
37	Total ARR	611.14	1125.14	14701.87	14292.94	524.73	900.71	14236.44	14296.45	86.41	224.43	465.44	3.50
38	Less Tariff Income/ Rev from operation			13521.21	13521.21			12939.20	12939.20			582.01	582.01
39	Less Non-Tariff Income	24.48	56.45	400.80	481.73	17.94	42.07	537.36	597.37	6.54	14.38	-136.56	-115.64
40	Total ERC/ Transfer price	586.66	1068.69	13922.01	14002.94	506.79	858.64	13476.56	13536.57	76.30	212.58	445.45	466.37
41	Net Revenue Gap			779.86	290.00			759.88	759.88			19.99	-469.87

Appendix 11 Comparison of approval and True up (Rs Cr)													
	Particulars	2018-19 Approval				2018-19 KSEBL TU Petition				Variation between approval and TU			
No		SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
1	Cost of Generation (SBU-G)			481.41	481.41			506.79	506.79			-25.38	-25.38
2	Cost of Power Purchase			7850.77	7850.77			7826.86	7826.86			23.91	23.91
3	Cost of Intra-State Transmission (SBU-T)			874.60	874.60			858.64	858.64			15.96	15.96
4	Cost of generation of power					3.29			3.29	-3.29			-3.29
5	Interest & Financial Charges												
6	Interest on loans					69.88	90.89	180.27	341.04				
7	Less: Capitalized												
8	Net interest	71.15	127.28	149.90	348.33	69.88	90.89	180.27	341.04	1.27	36.39	-30.37	7.29
9	Interest on GPF	9.37	20.67	152.55	182.59	8.92	16.57	136.68	162.17	0.45	4.10	15.87	20.42
10	Other interest				0.00			18.41	18.41	0.00	0.00	-18.41	-18.41
11	Interest on Master Trust	39.67	87.56	646.45	773.68	42.56	79.04	652.08	773.68	-2.89	8.52	-5.63	0.00
12	Int on SD			175.33	175.33			170.75	170.75			4.58	4.58
13	Working capital interest	6.08	15.67		21.75	6.21	15.76		21.97	-0.13	-0.09	0.00	-0.22
14	Carrying cost			304.08	304.08			592.63	592.63			-288.55	-288.55
15	Carrying cost on current year gap							36.48	36.48			-36.48	-36.48
16	Total I&F	126.27	251.18	1428.31	1805.76	127.58	202.26	1787.30	2117.13	-1.31	48.92	-358.99	-311.37
17	Interest on un funded liability	10.26	22.64	167.10	200.00	10.26	22.64	167.10	200.00	-10.26	-22.64	-167.10	-200.00
18	Depreciation	130.19	146.41	72.24	348.84	137.60	158.88	107.97	404.47	-7.41	-12.47	-35.74	-55.63
19	O&M Expenses					124.47	363.23	2234.57	2722.27				
20	Employee cost					8.05	23.48	144.47	176.00	-8.05	-23.48	-144.47	-176.00
21	R&M expenses												
22	A&G expenses												
23	O&M New stations												
24	Total O&M Expenses	124.15	363.23	2226.08	2713.46	132.52	386.71	2379.04	2898.27	-8.37	-23.48	-152.96	-184.81
25	Return on equity (14%)	116.38	119.99	253.50	489.87	116.38	119.99	253.50	489.87	0.00	0.00	0.00	0.00
26	Other Expenses & PP expenses					-4.68	-2.11	291.38	284.59	4.68	2.11	-291.38	-284.59
27	Claim for over achievement of T&D loss reduction target							28.59	28.59			-28.59	-28.59
28	Transmn availability incentive						8.38		8.38		-8.38		-8.38
29	Onetime expenses-CMDRF					1.79	3.96	29.25	35.00	-1.79	-3.96	-29.25	-35.00
30	Past gap recovery			400.00	400.00							400.00	400.00
31	Total ARR	507.24	903.45	13754.02	13808.70	524.73	900.71	14236.44	14296.45	-17.49	2.74	-482.42	-487.75
32	Less Tariff Income/ Rev from operation			12433.68	12433.68			12939.20	12939.20			-505.52	-505.52
33	Less: Revenue from external sale			756.64	756.64							756.64	756.64
34	Less Non-Tariff Income	25.83	28.85	531.55	586.23	17.94	42.07	537.36	597.37	7.89	-13.22	-5.81	-11.14
35	Total ERC/ Transfer price	481.41	874.60	13721.87	13776.55	506.79	858.64	13476.56	13536.57	-28.95	14.80	245.31	239.98
36	Net Revenue Gap			32.15	32.15			759.88	759.88			-727.73	-727.73

Exhibit 1

Extracts from the submission contained in TU petition for 2017-18 as referred to in Para 5.3.7

- 5.42.4 It is humbly submitted that the Hon Tribunal was pleased to grant partial relief under employee cost as per judgment in Appeal 1 & 19 of 2013. Hon'ble High Court of Kerala, in the judgment dated 28.02.2018 in WPC 465/2015, directed the Hon'ble Commission to pass Truing up orders from 2015-16 to 2017-18 with due regard to the findings of the orders of Hon'ble APTEL in Appeal no.1 & 19 of 2013 and also consequential orders passed for the years 2010-11 onwards.
- 5.42.5 In compliance of the direction, Hon'ble Commission, while issuing orders on truing up for 2015-16 and 2016-17 has trued up employee cost corresponding to the working strength prevailed in 2009 (27175 nos). In this connection, kind attention is invited to the following facts.
- 5.42.6 Hon Tribunal, in the Common judgment dated 10.11.2014, in the Appeal Petition 01 of 2013 and 19 of 2013, has directed in para 8.4 to 8.6 of the order, the manner in which employee cost to be approved. These paragraphs are reproduced below:

*"8.4 The State Commission has rightly shown concern about the high employees cost but we are not able to appreciate magnitude in the absence of a specific finding about the excess manpower and non-availability of Regulations. We feel that DA increase which is effected as per the Government orders have to be accounted for and allowed in the ARR as it compensates the employees for the inflation. **The pay revision as per the agreements reached between the management and the unions have also to be honored.** The terminal benefits have also to be provided for.*

*8.5 We find that the State Commission has taken the actual expenses trued-up for FY 2008-09 as the base. **The State Commission should have at least allowed the actual basic pay and DA increase, pay revision and terminal benefits over the actual base year expenses without accounting for increase in manpower from 2008-09 to 2012-13.** The gratuity directed to be paid as per the judgments of the High court dated 10.03.2003 as the Division bench of the High Court had dismissed the Appeal filed against this judgment, and which were disallowed by the State Commission by order in Appeal no. 1 of 2013 should also be allowed.*

8.6 Accordingly, we direct the State Commission to true-up the employees cost from FY 2010-11 to FY 2012-13, as per the above direction"

- 5.42.7 Hon'ble Commission, however, limited the employee cost corresponding to number of employees in 2008-09. Thus, pay and allowances disbursed to 6089 employees amounting to Rs. 217.35 Cr in 2016-17 have been disallowed.
- 5.42.8 However, the legal position is that the Hon'ble APTEL has not fixed any upper ceiling limit on employee cost (but only the lower ceiling) and the Commission is free to examine the

reasonability of cost incurred with regard to inflation, business and infrastructure growth etc. Entire increased staff in 2018 over 2009 belonged to the essential categories like Line man, Mazdoor etc, who are required to maintain quality supply to increasing consumer strength and business growth. Table 5.31 illustrates this fact. It is humbly submitted that KSEBL has the statutory obligation to provide supply to all the consumers and the corresponding increase in employee count cannot be eliminated.

5.42.9 The employee cost of KSEBL includes basic salary, DA and other benefits for serving employees. Employees of KSEBL are recruited through PSC and salary and other benefits including earned leave surrender etc. are provided as per the wage settlement agreement entered into with the trade unions. As per the agreement DA has to be released as and when the same was released by the State Government to its employees, pension and other benefits as per the rules in force and also as per the directions of court of law. In this context, kind attention of the Hon'ble Commission is invited to the extracts from Judgment issued by Supreme Court of India on 3rd October 2002 in the case of West Bengal Electricity Regulatory Commission vs CESC Limited that ***"Therefore, during the pendency of these agreements, it was legally not possible for the Company to stop these payments. Therefore, the amounts spent towards this purpose namely, towards the employees' cost should not be treated as the amounts not properly incurred."***

5.42.10 It is clear from this judgment that KSEBL is not in a position to curtail employee expenses incurred under lawful agreement entered into with workmen. Through the second transfer scheme, which came into effect on 31.10.2013, the Government has transferred the entire employees of the erstwhile KSEB to the rolls of the petitioner and the petitioner has become statutorily bound to bear the cost related to all such employees in view of Section 133 of the Electricity Act, 2003 which mandates that the terms and conditions of transfer of employees after re vesting shall not in any way be less favorable than those which would have been applicable to them if there has been no such transfer as per the transfer scheme.

5.42.11 KSEBL humbly submits that, since it has to provide annual increment to the officers and workmen category as per the wage settlement agreement entered into between KSEBL and Trade Unions and since the same position was upheld by the Hon ATPEL in judgment dated 27.04.2016, actual basic pay as per accounts may kindly be seen as expense that cannot be curtailed in short term.

5.42.12 KSEBL may further submit that, as a distribution utility, STU and the generator of the State, KSEBL was constrained to engage additional employees to provide service connections and maintaining quality supply, in addition to the capital investments in generation, transmission and distribution. However, the increase was mainly on the technical staff including lineman, electricity worker, overseer, Sub Engineer etc associated with the distribution of electricity, which account for the increase in staff strength over 2009.

5.42.13 Considering the fact that, KSEBL has to release the DA to its employees as and when the DA is allowed to the employees of the State Government, the Hon Commission vide the letter No. 1235/ARR&ERC 10-11/KSERC /2010 dated 28th July-2010 addressed to KSEB that DA/DR may be released without reference to the Commission.

5.42.14 The business activity of KSEBL has been continuously increasing over several decades. The business and infrastructure on account of number of consumers, their electricity requirement and fixed assets during last 10 years has registered significant growth. It may be kindly noted that average annual growth during the period has been 3.60%, 7.30% and 10.86% respectively. Correspondingly, the physical assets of KSEBL have also increased substantially.

5.42.15 The number of employees for maintaining the asset to provide quality supply to consumers has also increased. The increase in employees is primarily in Technical areas. It may be seen that entire increase in working strength is because of the increase in technical employees, who are essential to maintain the asset and provide quality supply. The following table illustrates this fact. It is respectfully submitted that, KSEBL was compelled to recruit fresh hands because of the growth of fixed assets, consumer strength and energy sale happened during the period since 2008-09. It may kindly be noted that the recruitments were made only under essential categories, which are not subject to mechanization. A comparison of working strength during the period from 2008-09 to 2017-18 is summarized below:

Sl No	Employee Category	Table-5.31: comparison of working strength during the period from 2008-09 to 2017-18										Increase over 2009 (Nos)
		31-03-09	31-03-10	31-03-11	31-03-12	31-03-13	31-03-14	31-03-15	31-03-16	31-03-17	31-03-18	
		(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	(Nos)	
1	Lineman	7389	7359	8276	8375	8865	8515	8926	9400	9498	9530	2141
2	Electricity Worker	3692	4303	3309	4083	3810	4357	5083	4297	4857	5129	1437
3	Overseer (Ele)	2900	3180	4517	4766	5129	5335	5260	5118	5413	5444	2544
4	Sub Engineer (Ele)	2133	2163	2792	2671	2646	2502	2492	2459	3086	3329	1196
5	Asst Engineer (Ele)	1555	1636	1951	2081	2046	1899	1886	1827	1720	1803	248
6	Meter Reader	1458	1140	544	818	843	840	847	867	665	410	-1048
7	Cashier	914	1006	1071	1101	929	612	786	918	888	803	-111
8	Subtotal (1 to 7)	20041	20787	22460	23895	24268	24060	25280	24886	26127	26448	6407
9	Other categories	7134	7220	7404	7218	7515	7923	7761	7554	7137	7094	-40
10	Total employee strength	27175	28007	29864	31113	31783	31983	33041	32440	33264	33542	6367
11	8 as a % of 10 above	73.75	74.22	75.21	76.8	76.36	75.23	76.51	76.71	78.54	78.85	100.63

5.42.16 It may be seen from the last column of the table, entire increase in staff strength over 2009 has been under essential categories.

5.42.17 KSEBL has the statutory obligation to provide supply to all the consumers and the corresponding increase in employee count cannot be eliminated. Further, KSEBL is making concerted efforts to see that automation is introduced wherever possible. Hon'ble Commission

may kindly note that for the effective compliance of Standards of Performance additional means is essential for its meaningful accomplishment.

5.42.18 Kind attention of the Hon'ble Commission is invited to **All India Electricity Statistics-General Review 2018 (containing data for the year 2016-17)** published by **Central Electricity Authority**. The following comparisons with regard to the working employee strength are submitted for favour of kind consideration. Details of comparison are as follows:

1. Employees per 1000 consumers: For Kerala, 2.80 employees are in service for every 1000 consumers against a national average of 3.17. Table 7.5 of the report contains the working employee strength of State Utilities. It is respectfully submitted that details in respect of certain states are either not furnished in the report or partially furnished. Therefore the comparison is made with available information. Details are furnished in **Appendix 14**.
2. Consumer strength: Kerala ranks 10th among 37 states/ UTs with regard to the number of consumers (excluding pump sets) at 1.15 Crore. It may kindly be seen that more than 78% of the consumers in Kerala fall under domestic category. Details are furnished in **Appendix 15**.
3. Per capita ultimate consumption: Per capita ultimate consumption of electricity in Kerala is one of the lowest in the country with 562.82 units and pegged at 24th among 36 States/UTs. Details given in **Appendix 16**.
4. Sales per consumer: Kerala ranks 31st among 37 State /UTs at 1746.51 units per consumer (national average 4052.79 units) owing to its industrial backwardness. Details are furnished in **Appendix 17**.
5. Category wise % of utilization of energy: Kerala ranks 26th among 37 States and UTs under industrial consumption at 22.32% (national average 41.49 %). But domestic sector consumes 49.14% of energy sold (national average 24.11%). Details are furnished in **Appendix 18**.
6. Employees per length of lines (OH & UG) 31.03.2017 (ckt kms) under Distribution: This analysis reveals that 0.096 employees per ckt km of distribution line length against national average of 0.095. Details are furnished in **Appendix 19**.

5.42.19 From the above submission, the following salient features of Kerala emerge:

- (i) Electric power consumption in Kerala is mainly driven by domestic and institutional consumers and thus has a lower per capita consumption way below national average. Thus, comparison of costs on a 'per unit sale' basis will not provide a realistic picture.

- (ii) Higher number of consumers, predominantly under domestic sector with lower consumption per consumer will result in higher O&M cost, when compared on a per unit sale basis alone.
- (iii) However, number of employees per circuit Km is comparable to the national average and the number of employees per consumer is less than the national average.

5.42.20 In view of the above submission, Hon'ble Commission may kindly see that KSEBL is maintaining the barest minimum necessary working strength and the cost involved is very much reasonable. Therefore, it is humbly pleaded that any curtailment in expenses would cause serious injury to KSEBL, which in turn would incapacitate to fulfil the statutory obligation cast upon it by the Electricity Act, 2003.

5.42.21 In view of the above submission, Hon'ble Commission may kindly approve employee cost for 2017-18 as submitted above.

Appendix 14 Employees per 1000 consumers (2016-17)					
		Table 10	Table 7.5		
Sl. No	State/UT	No of Consumers	No of Employees	Employees per 1000 consumers	Remarks
1	Delhi	5567305	2504	0.45	
2	AP	17295399	37362	2.16	
3	Kerala	12048544	33754	2.80	
4	MP	13002848	36763	2.83	Data on MPPTCL & MPMKVCO not available.
5	Telangana	12916432	38978	3.02	
6	TN	27505638	86997	3.16	
7	Rajasthan	12887496	42495	3.30	Data on JVVNL not available.
8	Maharashtra	28854827	98699	3.42	
9	Haryana	5939958	24301	4.09	
10	Punjab	8975962	42311	4.71	
11	Chandigarh	222292	1127	5.07	
12	Puduchery	473680	3317	7.00	
13	Daman & Diu	60180	514	8.54	
14	Goa	597868	7141	11.94	
15	Meghalaya	414624	5256	12.68	
16	Lakshadweep	23838	337	14.14	
17	Mizoram	219127	4329	19.76	
18	All India	147006018	466185	3.17	

Data on the following States are either not available or only partial data is available

19	Himachal	2324373	NA	NA	
20	J&K	1757177	NA	NA	
21	Dadra & Nagarhaveli	70300	NA	NA	
22	Sikkim	108114	NA	NA	
23	Andaman & Nikobar	123027	NA	NA	
24	Arunachal	213749	NA	NA	
25	Manipur	436774	NA	NA	
26	Nagaland	279974	NA	NA	
27	Tripura	687470	NA	NA	
28	Jharkhand	2894653	Only partial data available		
29	Assam	4029328	Only partial data available		
30	UP	18078478	Only partial data available		
31	Bihar	10295411	Only partial data available		
32	Odisha	6435080	Only partial data available		
33	Chattisgarh	4743151	Only partial data available		
34	Uttarakhand	1989385	Only partial data available		
35	West Bengal	20603460	Only partial data available		
36	Gujarat	16515590	Only partial data available		
37	Karnataka	23248733	Only partial data available		

Appendix 15: : Classification of consumers -2016-17-As per Table 10 of the report

Sl. No	State/UT	Domestic	Commercial	Industrial (LV MV & HV)	Public lighting	Traction	Agriculture	Public water works	Misc	Total
1	TN	20793780	2879384	627464	690752	30	2072753	0	441475	27505638
2	Maharashtra	21574423	2493064	443104	91512	32	4105255	53042	94395	28854827
3	Karnataka	17313323	2009392	443196	136645	192	2516528	161360	668097	23248733
4	West Bengal	18204743	1891996	169017	32376	75	287583	13057	4613	20603460
5	UP	15230021	1347354	199631	5470	35	1100395	17770	177802	18078478
6	AP	14074653	1215278	166424	111465	67	1590859	67699	68954	17295399
7	Gujarat	12717510	1851793	403024	38973	17	1373237	79104	51932	16515590
8	MP	9390966	921326	123127	16974	2	2482277	37843	30333	13002848
9	Rajasthan	10084140	1147028	236303	15631	21	1306088	57025	41260	12887496
10	Kerala	9418838	2013863	144447	20770	12	447816	5	2793	12048544
11	Telangana	9347924	1126190	86820	70729	35	2169492	54058	61184	12916432
12	Bihar	8846280	557167	43109	955	22	159112	1599	687167	10295411
13	Punjab	6458427	1029306	117422	4109	8	1351692	14477	521	8975962
14	Odisha	5940691	339927	26159	2328	31	81813	8607	35524	6435080
15	Delhi	4544596	924713	52985	13644	11	8979	4923	17454	5567305
16	Haryana	4569930	597063	101188	2714	410	308706	20299	339648	5939958
17	Chattisgarh	3897703	310773	33992	6145	21	473832	20636	49	4743151
18	Assam	3690712	242031	19980	1687	0	24501	4670	45747	4029328
19	Jharkhand	2664693	171642	15456	547	13	41783	488	31	2894653
20	Himachal	1953211	260372	34501	905	0	33586	0	41798	2324373
21	Uttarakhand	1739879	205479	10970	939	1	1597	1308	29212	1989385
22	J&K	1502250	199489	20739	279	0	20171	2549	11700	1757177
23	Tripura	611392	56019	5069	1912	0	5286	5553	2239	687470
24	Goa	484886	89263	7305	2844	0	10862	0	2708	597868
25	Puduchery	321112	51460	7303	51297	0	6849	120	35539	473680
26	Manipur	416348	16546	2413	492	0	64	180	731	436774
27	Meghalaya	322507	24067	970	57	0	23	400	66600	414624
28	Nagaland	251173	21968	4677	621	0	1	34	1500	279974
29	Chandigarh	193967	23228	2677	1027	0	120	0	1273	222292
30	Mizoram	188738	16350	801	1259	0	21	58	11900	219127
31	Arunachal	188597	22957	283	1637	0	17	0	258	213749
32	Andaman & Nikobar	103155	18364	546	642	0	258	0	62	123027
33	Sikkim	94552	11308	2220	34	0	0	0	0	108114
34	Dadra & Nagarhaveli	57438	7586	2958	350	0	1263	358	347	70300
35	Daman & Diu	47403	7875	2554	571	0	1283	127	367	60180
36	Lakshadweep	19615	3783	352	88	0	0	0	0	23838
37	All India	207259576	24105404	3559186	1328380	1035	21984102	627349	2975213	261840245

Appendix 16: Per capita ultimate consumption of electricity- State wise /Category wise (Utilities) 2016-17 KWh (Table 9.7)

Sl. No	State/UT	Population (Million)	Domestic	Commercial	Industrial L,M & HV	Pub. Light	Traction	Agricul	Public WW	Misc	Total (Utilities)
1	Dadra & Nagarhaveli	0.43	244.64	71.1	13067.79	19.39	0	14.52	10.66	7.49	13435.6
2	Daman & Diu	0.34	284.05	131.12	4658.99	23.34	0	8.05	9.53	24.23	5139.32
3	Goa	1.99	442.29	185.06	1059.83	18.56	0	15.04	0	24.77	1745.54
4	Puduchery	1.69	389.45	110.35	870.28	15.93	0	34.93	0	88.02	1508.97
5	Punjab	29.27	445.8	127.08	460.49	6.37	6.74	416.71	17.21	24.7	1505.12
6	Gujarat	63.26	219.55	46.69	763.81	5.51	10.32	264.9	30.97	10.61	1352.36
7	Haryana	27.71	266.88	192.75	360.52	3.7	12.98	350.35	29.1	28.71	1244.97
8	Delhi	21.65	650.71	336.77	142.68	22.84	3.3	1.33	27.85	43.48	1228.96
9	TN	69.61	352.39	133.6	458.79	17.27	12.24	168.56	17.27	45.68	1205.8
10	Telangana	37.28	269.71	132.93	280.24	14.34	14.84	420.45	14.31	45.27	1192.1
11	Himachal	7.13	271.84	74.1	639.85	1.82	0	8.04	77.29	45.57	1118.5
12	Uttarakhand	10.71	242.27	111.85	581.39	4.36	1.84	13.23	34.17	52.98	1042.09
13	Maharashtra	120.91	222.23	110.55	279.01	15.2	19	233.24	20.76	101.14	1001.13
14	AP	51.49	240.51	61.88	305.46	7.68	24.09	258.25	9.94	19.84	927.63
15	Karnataka	62.72	188.61	99.86	218.6	15.54	1.08	344.8	43.58	15.14	927.2
16	Chandigarh	1.82	395.81	273.99	144.4	11.79	0	2.33	0	46.2	874.53
17	Chattisgarh	26.07	189.44	55.57	274.17	4.09	34.55	164.57	11.05	1.49	734.92
18	Rajasthan	73.52	156.37	58.12	149.8	4.49	5.08	290.54	20.44	9.19	694.03
19	Sikkim	0.65	252.06	63.09	318.69	0.51	0	0	0.84	35.42	670.61
20	J&K	12.5	261.85	81.93	41.15	4.23	0	25.05	49.22	87.63	632.4
21	MP	78.54	142.4	36.03	113.08	5.36	23.26	220.67	18.23	22.59	581.62
22	Lakshadweep	0.08	427.09	140.82	5.06	7.44	0	0	0	0	580.41
23	Jharkhand	33.92	145.02	15.57	353.79	4.33	37.14	3.25	2.47	14.82	576.39
24	Kerala	35.8	288.87	122.62	108.18	10.57	6.37	9.26	0	18.96	564.82
25	Andaman & Nikobar	0.56	250.14	117.93	30.36	18.53	0	0	0	61.15	478.11
26	West Bengal	94.04	152.09	60.89	173.95	5.55	14.83	15.25	9.34	35.44	467.33
27	Odisha	42.68	161.54	36.56	142.66	2.18	25.86	7.66	3.29	18.29	398.04
28	UP	220.11	151.01	25.51	87.3	4.44	7.53	71.05	8.24	13.23	368.31
29	Meghalaya	2.79	142	31.21	114.74	0.16	0	0.04	12.39	47.74	348.27
30	Mizoram	1.07	218.6	31.65	9.78	4.57	0	0	46.68	19.12	330.41
31	Arunachal	1.32	111.92	33.64	3.29	8.27	0	0.03	0	46.21	280.5
32	Nagaland	2.4	142.8	34.48	25.59	6.1	0	0.01	3.86	52.23	265.06
33	Tripura	3.85	130.41	20.16	6.83	10.02	0	10.53	21.27	26.86	232.48
34	Assam	32.67	104.83	30.94	41.47	0.52	0	1.1	2.66	18.18	199.71
35	Manipur	2.61	126.65	16.69	8.31	1.32	0	0.37	9.01	33.86	196.21
36	Bihar	104.6	80.72	16.27	25.14	0.31	5.99	3.91	0.78	31.8	164.92

Appendix 17 Sales per Consumer-2016-17				
Sl. No	State/UT	Table 10 Consumers	Table 9.6(A) Total energy sold	Sales per consumer
1	Dadra & Nagarhaveli	70300.00	5739.65	81645.09
2	Daman & Diu	60180.00	1739.01	28896.81
3	Jharkhand	2894653.00	25481.28	8802.88
4	Chattisgarh	4743151.00	35883.86	7565.41
5	Chandigarh	222292.00	1591.20	7158.15
6	Gujarat	16515590.00	112741.64	6826.38
7	Odisha	6435080.00	43757.40	6799.82
8	Uttarakhand	1989385.00	12377.32	6221.68
9	Goa	597868.00	3600.57	6022.35
10	Haryana	5939958.00	35557.93	5986.23
11	Puduchery	473680.00	2669.48	5635.62
12	Punjab	8975962.00	46623.09	5194.22
13	UP	18078478.00	91244.73	5047.15
14	Delhi	5567305.00	26606.79	4779.11
15	Rajasthan	12887496.00	61400.91	4764.38
16	J&K	1757177.00	7904.70	4498.52
17	Maharashtra	28854827.00	127942.74	4434.02
18	Sikkim	108114.00	436.57	4038.05
19	MP	13002848.00	49997.09	3845.09
20	Telangana	12916432.00	47593.47	3684.72
21	Himachal	2324373.00	8071.91	3472.73
22	TN	27505638.00	91712.59	3334.32
23	Karnataka	23248733.00	71842.81	3090.18
24	Meghalaya	414624.00	1245.50	3003.93
25	AP	17295399.00	51789.40	2994.40
26	Nagaland	279974.00	634.83	2267.46
27	West Bengal	20603460.00	46491.52	2256.49
28	Andaman & Nikobar	123027.00	265.83	2160.75
29	Lakshadweep	23838.00	47.60	1996.81
30	Assam	4029328.00	7425.99	1842.98
31	Kerala	12048544.00	21042.91	1746.51
32	Arunachal	213749.00	370.82	1734.84
33	Bihar	10295411.00	17590.74	1708.60
34	Mizoram	219127.00	353.54	1613.40
35	Tripura	687470.00	895.27	1302.27
36	Manipur	436774.00	511.92	1172.05
37	All India	261840245.00	1061182.61	4052.79

Appendix 18: Table 9.6 (A) Category wise % of utilization of energy -State wise -Utilities & non utilities 2016-17 % of total energy sold										
Sl. No	State/UT	Domestic	Commercial	Industrial L,M &HV	Pub. Light	Traction	Agricul	Public WW	Misc	Total energy sold
1	Dadra & Nagarhaveli	1.82	0.53	97.27	0.14	0	0.11	0.08	0.06	5739.65
2	Daman & Diu	5.52	2.55	90.66	0.45	0	0.16	0.19	0.47	1739.01
3	Odisha	15.76	3.57	75.09	0.21	2.52	0.75	0.32	1.78	43757.4
4	Jharkhand	19.3	2.07	70.38	0.58	4.94	0.43	0.33	1.97	25481.28
5	Chattisgarh	13.76	4.04	66.53	0.3	2.51	11.96	0.8	0.11	35883.86
6	Uttarakhand	20.97	9.68	60.13	0.38	0.16	1.14	2.96	4.59	12377.32
7	Goa	24.46	10.23	62.08	1.03	0	0.83	0	1.37	3600.57
8	Himachal	24.01	6.54	57.73	0.16	0	0.71	6.83	4.02	8071.91
9	Gujarat	12.32	2.62	66.97	0.31	0.58	14.86	1.74	0.6	112741.6
10	Puduchery	24.71	7	59.5	1.01	0	2.22	0	5.59	2669.48
11	Meghalaya	31.83	7	47.65	0.04	0	0.01	2.78	10.7	1245.5
12	Sikkim	37.59	9.41	47.52	0.08	0	0	0.13	5.28	436.57
13	West Bengal	30.76	12.32	40.66	0	3	3.08	1.89	7.17	46491.52
14	Karnataka	16.47	8.72	38.14	1.36	0.09	30.1	3.8	1.32	71842.81
15	TN	26.75	10.14	43.3	1.31	0.93	12.79	1.31	3.47	91712.59
16	AP	23.91	6.15	38.14	0.76	2.39	25.67	0.99	1.97	51789.4
17	Rajasthan	18.72	6.96	34.83	0.54	0.61	34.79	2.45	1.1	61400.91
18	Assam	46.12	13.61	30.38	0.23	0	0.48	1.17	8	7425.99
19	Arunachal	30.9	11.99	28.67	2.95	0	0.01	0	16.47	370.82
20	Punjab	27.98	7.98	34.43	0.4	0.42	26.16	1.08	1.55	46623.09
21	Haryana	20.8	15.02	31.07	0.29	1.01	27.3	2.27	2.24	35557.93
22	Telangana	21.13	10.41	28.57	1.12	1.16	32.94	1.12	3.55	47593.47
23	UP	36.43	6.15	32.22	1.07	1.82	17.14	1.99	3.19	91244.73
24	Maharashtra	21	10.45	31.75	1.44	1.8	22.04	1.96	9.56	127942.7
25	MP	22.37	5.66	26.39	0.84	3.65	34.67	2.86	3.55	49997.09
26	Kerala	49.14	20.86	22.32	1.8	1.08	1.58	0	3.23	21042.91
27	Bihar	48	9.68	16.88	0.18	3.56	2.33	0.46	18.91	17590.74
28	Chandigarh	45.2	31.29	16.62	1.35	0	0.27	0	5.28	1591.2
29	Tripura	56.09	8.67	5.7	4.31	0	4.53	9.15	11.55	895.27
30	Mizoram	66.16	9.58	2.96	1.38	0	0	14.13	5.79	353.54
31	Manipur	64.55	8.5	4.24	0.68	0	0.19	4.59	17.26	511.92
32	Delhi	52.94	27.4	11.62	1.86	0.27	0.11	2.27	3.54	26606.79
33	J&K	41.39	12.95	6.5	0.67	0	3.96	7.78	13.85	7904.7
34	Lakshadweep	73.58	24.26	0.87	1.28	0	0	0	0	47.6
35	Andaman & Nikobar	52.32	24.67	6.35	3.87	0	0	0	12.79	265.83
36	Nagaland	53.87	13.01	9.65	2.3	0	0	1.46	19.71	634.83
37	All India	24.11	8.46	41.49	0.89	1.48	18.01	1.83	3.74	1061183

Appendix 19 Employees per line length (OH & UG) (ckt kms) 31.03.2017

Table 7.5 Man power as on 31.03.2017			TABLE 8.1: State wise length of lines (OH & UG) 31.03.2017 (ckt kms) (Distribution)	Employees per ckt km
Sl. No	State/UT		Total	Nos
1	Goa		1328	5.377
2	Lakshadweep	337	367	0.918
3	Puduchery	3317	6074	0.546
4	Chandigarh	1127	2221	0.507
5	Meghalaya	5256	18173	0.289
6	Mizoram	4329	35266	0.123
7	Punjab	42311	371660	0.114
8	TN	86997	802411	0.108
9	Kerala	33754	351686	0.096
10	Maharashtra	98699	1054467	0.094
11	Haryana	24301	272773	0.089
12	Telangana	38978	528726	0.074
13	AP	37362	578826	0.065
14	Delhi	2504	44119	0.057
15	Daman & Diu	514	10628	0.048
	Total	386927	4078725	0.095

Data on the following States are only partially available			
16	West Bengal	24429	Only partial data available
17	Rajasthan	42495	Only partial data available
18	MP	36763	Only partial data available
19	Karnataka	32276	Only partial data available
20	Gujarat	24458	Only partial data available
21	Bihar	7561	Only partial data available
22	Uttarakhand	2244	Only partial data available
23	UP	9904	Only partial data available
24	Odisha	5310	Only partial data available
25	Chattisgarh	4411	Only partial data available
26	Assam	1265	Only partial data available
27	Jharkhand	686	Only partial data available

CHAPTER- 6 : SUMMARY OF TRUE-UP AND PRAYER

An item wise comparison of the ARR, ERC and Revenue gap as per ARR and the actual as per the truing up petitions are given in the Table - 6.1 below.

Table - 6.1 : SUMMARY OF TRUE-UP FOR FY 2018-19				
Particulars	Approved	Actual	Trued up	Deviation from approval
Generation Of Power	0.00	3.29	3.29	-3.29
Purchase of power	7850.77	7869.32	7826.86	23.91
Interest & Finance Charges	1805.76	1598.90	2117.13	-311.37
Depreciation	348.84	805.03	404.47	-55.63
Employee Cost (excluding terminal benefits)	2713.46	2892.01	2898.27	-184.81
Repair & Maintenance		303.75		
Administration & General Expenses		598.16		
Other Expenses	0	222.48	345.91	-345.91
Interest on Additional Bond to Trust	200.00	0	200.00	0.00
Over achievement of loss reduction claim			28.59	-28.59
Incentive for transmission availability			8.38	-8.38
Amortization of past gap	400.00			400.00
Net Expenditure (A)	13318.83	14292.94	13806.58	-487.75
Statutory Surplus/ Roe (B)	489.86	0	489.87	0
ARR (C) = (A) + (B)	13808.69	14292.94	14296.45	-487.75
Non-Tariff Income	586.23	481.73	597.37	-11.14
Revenue from Tariff	13190.32	13521.21	12939.20	251.12
Total Income (D)	13776.55	14002.94	13536.57	239.98
Revenue surplus (Gap) (D-C)	32.15	290.00	759.88	-727.73

The Statutory Auditors have audited and certified the accounts for the year 2018-19. This truing up petition is prepared on the basis of the audited accounts. The petitioner is furnishing the details of accounts as per formats given in the Tariff regulation. However, should the Hon Commission requires any further details or information; the petitioner will be furnishing them as and when required.

**MID TERM PERFORMANCE REVIEW OF SBU-G FOR FY-20
& REVISED ESTIMATE FOR FY-21 & FY-22**

CHAPTER – 7 SBU – GENERATION

7.1. INTRODUCTION

7.1.1 The total installed capacity of KSEBL as on 31.03.2019 is **2237.59 MW** of which 92.01 % of the installed capacity is Hydel, 7.15% is Thermal, 0.75 % from solar and rest from the wind. The total installed capacity became 2238.035 MW as on 30.09.2019.

7.1.2. There are altogether 38 **hydroelectric generating stations** owned by KSEBL (as on 30.09.2019) of which 15 are Major Hydel Stations and the rest are Small Hydro Plants. The Major Hydel stations contribute to a total capacity of 1938.75MW whereas the small Hydro stations contribute to 120MW. The lists of all the Hydro stations are shown in **Annexure G1**.

7.1.3. There are two **thermal stations** owned by KSEBL which have a total installed capacity of 159.96MW with a firm annual generation capability of 1035.6 MU. However, due to high variable cost of thermal stations, presently KSEBL is limiting the generation from these liquid fuel stations to the extent essential. The total generation from these stations up to 30.09.2019 in the current FY was 11.87 MU only ie. 11.77 MU from KDPP and that of BDPP was 0.10 MU.

7.1.4. KSEBL presently owns **one wind farm** at Kanjikode which is having an installed capacity of 2.025 MW and an annual generation capability of 4MU. KSEBL has an installed capacity of **16.85 MW** on solar projects as on 31.03.2019. Further, KSEBL has targeted to add around 8.6 MW (excluding soura) during the remaining period of current control period on own land and buildings. The Soura scheme launched by the Government of Kerala aims at developing solar PV roof top/Ground mounted/floating solar plants aggregating to 1000MWp in the state by 2021. The list of solar projects completed and planned on own land and building during the control period is shown in **Annexure G2**.

7.1.5. The gross energy generated from the KSEBL owned stations during the FY 2019-20 up to 30.09.2019 was **3059.09MU**, out of which **3036.97MU** (99.27%) was from own hydro electric stations and the remaining **0.73%** was generated from thermal, wind and solar stations. The source wise capacity and generation details are given in the Table 7.1 below.

Table 7.1 : Source wise Generation				
Source	Installed Capacity (MW)		Generation (MU)	
	As on 31.03.2019	As on 30.09.2019	FY 2018-19	Till 30.09.2019 in FY 2019-20
Hydel	2058.75	2058.75	7602.41	3036.97
Thermal	159.96	159.96	4.089	11.87
Wind	2.03	2.03	1.33	0.75
Solar	16.85	17.295	18.54	9.5
Total	2237.59	2238.035	7626.37	3059.09

7.2 Capital Investment for the control period

7.2.1. As per the MYT Petition, KSEBL has proposed for a capital addition of Rs 2341.67 Cr for SBU-G during the control period. However, the Hon'ble Commission has given provisional approval to projects accounting to Rs 1261.22Cr. It was specifically stated in the order that the GFA addition is provisional and doesn't mean that the Commission has approved the said figures nor has disallowed the balance portion of the GFA proposed by KSEBL. The provisionally approved figure with respect to the proposal given by KSEBL is shown below in Table 7.2.

Table 7. 2 : Proposed/Approved Capital Addition of SBU-G											
No	Particulars	2018-19		2019-20		2020-21		2021-22		Proposed Total	Approved Total
		Proposed	Approved	proposed	Approved	proposed	Approved	proposed	Approved		
1	New Hydel Projects					87.99	53.03	87.23	42.42	175.22	95.45
2	R & M Projects			12.22	12.23	327.20				339.42	12.23
3	Solar New			57.51	57.51					57.51	57.51
4	Ongoing Hydel Projects	99.47	65.79	384.5	354.94	331.41	278.30	578.48	111.34	1393.86	810.37
5	RMU - Ongoing			20.40	20.40	252.26	252.26			272.66	272.66
6	Others –DRIP etc			3	3	100	10			103	13
	Total	99.47	65.79	477.63	448.07	1098.86	593.59	665.71	153.76	2341.67	1261.22

7.2.2 New Hydel Projects

To meet the increasing energy demand of the State, KSEBL has proposed new hydro projects during the control period from 2018-19 to 2021-22. However, due to various reasons explained below the completion date of Pazhassi Sagar and Annakayam projects has been forced to be extended. The Pazhassi Sagar work was re-tendered twice due to lack of participation of suitable qualified bidders whereas the Annakayam work needs to have sanction from the Ministry of Environment, Forest and Climate Change. These factors has affected severely in completing the above projects within the time frame. Further, based on the actual site conditions revision has also been accorded to the above projects by the Board. The details of the new hydel projects with the expected period of completion are shown below.

Table 7.3 : New Hydel Projects for the control period							
No	Name of Scheme	Gen Capacity (MW)	Design Energy (MU)	Project Cost (Cr.)	Expected year of Completion		Status of the Project
					MYT	REVISED	
1	Pazhassi Sagar	7.5	25.8	104.37	2020-21	2021-22	Civil work under progress
2	Peruvanamuzhi	6	24.70	84.11	2021-22	2021-22	Civil work under progress
3	Chinnar	24	76.45	269.87	2022-23	2022-23	Civil work under progress
4	Anakkayam	7.5	22.83	139.64	2022-23	2023-24	Tendering of work in progress

7.2.3 R&M Projects

R&M works have been proposed at Switch Yard of Idukki Power Station and at Kuttiyadi HEP during the control period. The work at Idukki involves renovation & upgradation of switch yard equipments, implementation of Automatic generation control system and automated metering system whereas in Kuttiyadi the work involves enhancing the capacity of 3 units of Kuttiyadi HEP from 25MW to 27.5MW and also laying a separate penstock for the KES unit of 50MW. The works were originally scheduled for completion during the FY 2019-20 and 2020-21 respectively; but in consideration of more time required for dismantling the existing equipments the same has been rescheduled to 2020-21 and 2022-23. The details of the project along with the revised year of completion are shown below.

Table 7.4 : New R&M projects for the Control period							
No	Name of Scheme	Capacity (MW)	Annual Energy (MU)	Project Cost (Rs. Cr.)	Expected year of Completion		Status of the Project
					ARR	REVISED	
1	Idukki 220 kV Yard	--	--	12.23	2019-20	2020-21	Tendering of work in progress
2	Kuttiyadi	3x27.5* 3x50	530.8	377.41	2020-21	2022-23	Work to commence

* Enhanced capacity

Further to the above, 4 new R&M works on Generating station switchyards are proposed and planned to be completed during the control period. The work involves replacing the damaged equipments in the switch yard of Sabarigiri, Lower Periyar, Sengulam and Kakkayam power stations. The details of the works are shown in the table below. All the works are currently under progress and is expected to be completed in the FY 2020-21.

Table 7.5 : New R& M Hydel projects			
No	Name of Scheme	Expected year of Completion	Project cost (Cr.)
1	Switchyard work at Sabarigiri	2020-21	3.19
2	Switchyard work at Lower Periyar	2020-21	5.21
3	Switchyard work at Sengulam	2020-21	1.87
4	Switchyard work at Kakkayam	2020-21	0.40

7.2.4. New Solar Projects

A total No of 4 Solar projects having a total capacity of around 10.1MW was proposed by KSEBL on own land and buildings during the control period 2018-19 to 2021-22. However due to the site conditions and technical constraints, the Brahamapuram project has been revised from 6MWp to 4MWp whereas the Kanjikode project has been revised to 3MWp from 2MWp. Further, new projects are also proposed at Ettumanoor and Mylatty. The details of the new solar projects with the expected date of commissioning are shown in table below.

Table 7.6 : New Major Solar projects for the control period								
No	Name of Scheme	Capacity (MWp)		Annual Energy (MU)	Project Cost (Rs. Cr.)	Expected year of Completion		Status of the project
		ARR	REVISED			ARR	REVISED	
1	Brahmapuram	6.5	4.0	4.9	22.8	2019-20	2020-21	Tendered. Work Order to be issued
2	Kottiyam	0.6	0.6	0.84	3.75	2019-20	2019-20	Work in progress
3	Kanjikode	2	3	3.679	17.10	2019-20	2020-21	Tendered. Work Order to be issued
4	Agali	1	1	1.2	5.70	2019-20	2020-21	Tendered. Work Order to be issued
5	Ettumanoor	-	1	1.4	6.91	-	2022-23	Approval sought of GoK
6	Mylatty	-	1	1.44	5.82	-	2022-23	Work awarded

7.2.5. Ongoing Hydel Projects

Eight ongoing projects have been scheduled for completion during the control period. Due to various reasons specified below, the completion of projects except for Kakkayam has been rescheduled. The Kakkayam project which was planned for commission on October, 2019 has been able to be completed before schedule date ie; on July, 2019. The details of the ongoing projects are furnished in the table 7.7 below:

Table 7.7 : Ongoing Hydel Projects for the control period							
No	Name of Scheme	Gen Capacity (MW)	Design Energy (MU)	Expected year of Completion		Project cost (Cr.)	Remarks on Revision
				MYT petition	REVISED		
1	Kakkayam	3	10.39	2018-19	COD ON 16.07.2018	43.2	Completed earlier than scheduled
2	Boothathenkettu	24	83.5	2019-20	2020-21	231.21	Delayed due to flood and land acquisition issues.
3	Upper Kallar	2	5.14	2019-20	2020-21	28.75	Design revised due to geological factors
4	Porigalkuthu AES	24	45.02	2019-20	2020-21	171.42	Delay in getting the forest land
5	Chathankottunada	6	14.76	2020-21	2021-22	79.00	Delayed due to flood and protest of public against blasting
6	Thottiyar HES	40	99	2020-21	2021-22	283.49	Delayed due to flood
7	Sengulam Aug. Scheme		85	2021-22	2021-22	113.00	Due to problem encountered in tunnelling works
8	Pallivasal Ext Scheme	60	153.9	2021-22	2021-22	550.00	Due to retendering of works

7.2.6. Ongoing RMU Projects

The following RMU works are also undergoing and planned to be completed during the control period. However due to soil conditions /natural calamity excess items of works were necessitated in the project which had incurred additional financial commitment. The details of the projects along with the present status of works are shown below.

Table 7.8 : Ongoing RMU projects				
Sl No	Name of the Scheme	Expected Year of Completion	Project Cost (Cr)	Status of work
1	Sholayar RMU	2020-21	199.58	73% work completed)
2	Sengulam Pump House RMU	2019-20	24.42	77% of Civil works completed
3	Idukki Stage I	2020-21	89.9	60% of Physical work completed

7.2.7 Review of Capital Works (up to 30.09.2019) & Revised projection for 2019-20

Total no. of projects scheduled for completion during 2019-20 was nine, out of which only 2 projects namely; Sengulam PH work (RMU work) and the Kottiyam solar project is currently expected to be completed during the financial year 2019-20. All the remaining projects have been forced to be rescheduled due to various reasons. The main reason for rescheduling the projects are unexpected flood during 2019 & land acquisition problems experienced on acquiring project lands. However, with earnest efforts, KSEBL has been able to commission roof top solar projects 'IPDS South' (23 locations) having a total capacity of 0.445MW on 30.06.2019. The annual design energy expected from the above projects is 0.526MU and the total project cost comes to Rs 3.047Cr. The revised schedule of projects completing during the FY 2019-20 is shown below.

Table 7.9 : Projects scheduled & Revised for completion in the FY 2019-20							
No	Name of Scheme	Proposed completion in 2019-20 as per ARR			Revised Proposal for the FY 2019-20		
		No of Projects	Name of Projects	Capital addition (Cr)	No of Projects	Name of the Project	Capital addition (Cr)
1	New Hydel Projects	-	-	--	-	--	-
2	R & M Projects	1	Idukki 220kV Switch Yard	12.22	--		
3	Solar New	4	Brahamapuram, Kottiyam, Kanjikode & Agali	57.51	2	Kottiyam, Roof top solar	(3.75+ 3.047) 6.797
4	Ongoing Hydel Projects	3	Bhoothathenkettu , Upper Kallar, Poringalkuthu AES	384.5	--		
5	RMU - Ongoing	1	Sengulam PH	20.40	1	Sengulam PH	24.42

7.2.8 Revised projection for 2020-21

As per the earlier schedule 6 projects has been expected to be completed by the FY 2020-21. However, due to various reasons like flood, delay in dismantling the existing equipments etc, the projects scheduled for completion has been forced to be extended. The Ongoing RMU projects at Idukki and sholayar are expected to be completed in the year as planned, whereas the rest of the work has been rescheduled. The 7 projects which were to be completed in the FY 2019-20 have been rescheduled with commission date on 2020-21. New 4 R&M works started is expected to be completed by 2019-20. Accordingly, altogether there are 13 projects expected to be completed in 2020-21. The details of the same are shown in the table below.

Table 7. 10 : Projects scheduled & Revised for completion in the FY 2020-21							
No	Name of Scheme	Proposed completion in 2020-21 as per ARR			Revised Proposal for the FY 2020-21		
		No of Projects	Name of Projects	Capital addition (Cr)	No of Projects	Name of the Project	Capital addition (Cr)
1	New Hydel Projects	1	Pazhassi Sagar	87.99	-	--	-
2	R & M Projects	1	Kuttiyadi	327.20	5	SY work at Idukki, Sabarigiri, Lower Periyar, Sengulam & Kakkayam	22.90
3	Solar New	--	--	--	3	Brahamapuram Kanjikode & Agali --	45.6
4	Ongoing Hydel Projects	2	Chathankottunada, Thottiyar	331.41	3	Bhoothathenkettu, Upper Kallar, Poringalkuthu AES	431.38
5	RMU - Ongoing	2	Idukki Stage 1, Sholayar	252.26	2	Idukki Stage 1, Sholayar	289.48

7.2.9 Revised projection for 2021-22

As per the earlier schedule 3 projects has been expected to be completed by the FY 2021-22. The same is expected to be completed as planned only. Further, the new Pazhassisaragar project and the ongoing Chanthankottunada and Thottiyar project is expected to be completed in the above FY. Accordingly, altogether there are 6 projects expected to be completed in 2021-22. The details of the same are shown in the table below.

Table 7. 11 : Projects scheduled & Revised for completion in the FY 2021-22							
No	Name of Scheme	Proposed completion in 2021-22 as per ARR			Revised Proposal for the FY 2021-22		
		No of Projects	Name of Projects	Capital addition (Cr)	No of Projects	Name of the Project	Capital addition (Cr)
1	New Hydel Projects	1	Peruvanamoozhi	87.23	2	Pazhassi Sagar, Peruvanamoozhi	188.48
2	R & M Projects	--	--	--	--	--	--
3	Solar New	--	--	--	--	--	--
4	Ongoing Hydel Projects	2	Sengulam Aug, Pallivasal Ext.	578.48	4	Chathankottunada, Thottiyar Sengulam Aug, Pallivasal Ext.	1025.49
5	RMU - Ongoing	--	--	--	--	--	--

7.2.10 The Hon'ble Commission in the MYT Order dated 08.07.2019 has only given provisional approval to the projects amounting to Rs 1261.21Cr for the control period. It has been stated in the order that the provisional approval does not mean that the Commission has approved the above GFA addition or dis allowed the balance portion of the GFA addition out of the total GFA addition proposed. The Commission has further stated that they will examine the capital investment separately and after going through public consultation process and prudence check will approve the same. The revised capital addition of SBU-G based on the progress noticed so far is shown in the table below.

Table 7. 12 : Capital Addition of SBU-G							
No	Particulars	2019-20		2020-21		2021-22	
		Proposed in ARR	Revised	Proposed in ARR	Revised	Proposed in ARR	Revised
1	New Hydel Projects			87.99		87.23	188.48
2	R & M Projects	12.22		327.20	22.90		
3	Solar New	57.51	6.797		45.6		
4	Ongoing Hydel Projects	384.5		331.41	431.38	578.48	1025.49
5	RMU - Ongoing	20.4	24.42	252.26	289.48		
6	Others –DRIP etc	3		100			
	Total	477.63	31.217	1098.86	789.36	665.71	1213.97

7.2.11 For the above capital addition, the year wise expenditure outlay expected is shown in the table below.

Table 7.13 Capital Expenditure Outlay of the Projects								
Sl No	Scheme	Total Project cost Cr	expense incurred upto 31.03.2018	2018-19	2019-20	2020-21	2021-22	Expense after 2021-22
	New Projects							
1	Pazhassi Sagar	104.37	0.62	8.11	5.64	30	60	
2	Peruvananmuzhi	84.11	2.51	3.6	10	30	38	
3	Chinnar	269.87	21.74	6.35	20	35	110	76.78
4	Anakkayam	139.64		0.9	2	20	80	36.74
	R&M							
1	Kuttiyadi	377.41			1	35	40	301.41
2	Idukki	12.23			7.07	5.16		
3	Sabarigiri	3.19			2.4	0.79		
4	Lower Periyar	5.21			2.79	2.42		
5	Sengulam	1.87			0.93	0.94		
6	Kakkayam	0.4			0.4			
	Ongoing R&M							
1	Sengulam PH	24.42	0.31	15.07	9.04			
2	Idukki Stage 1	89.9	26.844	35.92	3.762	23.374		
3	Sholayar	199		54.84	6.57	137.59		
	Ongoing Projects							
1	Boothethankettu	231.21	116.66	59.55	30	25		
2	Upper Kallar	28.75	6.18	4.57	11	7		
3	Poringalkuthu AES	171.42	109.49	26.6	24.95	10.38		
4	Chathankottunada	79	5.51	9.49	16	35	13	
5	Thottiyar HES	283.49	98.4114	6.68	30	80	23	45.398
6	Sengulam Aug	113	55.32	2.68	10	25	20	
7	Pallivasal Ext	550	259.34	43.01	90	98	59.65	
	Solar Projects							
1	Brahmapuram	22.8				22.8		
2	Kottiyam	3.75			3.75			
3	Kanjikode	17.1				17.1		
4	Agali	5.7				5.7		
	Total	2817.84	702.9354	277.37	287.302	646.244	443.65	460.328

7.3 Estimation of Hydel Generation for the Control Period

7.3.1 Hydro availability estimation as per MYT order for the Control period

Taking into consideration the anticipated inflow proposed by KSEBL in the MYT petition, the estimated Hydro projection approved by the Hon'ble Commission from FY 2019-20 to FY 2021-22 is shown below in Table 7.14.

Table 7.14. Hydel Generation as per MYT Order						
Particulars	2019-20		2020-21		2021-22	
	Gross gen (MU)	Aux. Consp(MU)	Gross gen (MU)	Aux. Consp(M)	Gross gen (MU)	Aux. Consp(MU)
Existing Large Hydro	6503.17	67.41	6294.28	65.03	6279.15	64.68
Existing Small Hydro	422.76	4.23	382.74	3.83	408.25	4.08
Total Existing	6925.93	71.64	6677.02	68.86	6687.35	68.76
Ongoing and New Hydro						
Kakkayam	10.39	0.10	10.39	0.10	10.39	0.10
Boothathenkettu	48.71	0.49	83.50	0.83	83.50	0.83
Upper Kallar	2.14	0.02	5.14	0.05	5.14	0.05
Poringalkuthu AES	11.25	0.11	45.02	0.45	45.02	0.45
Chathankottunada			11.07	0.11	14.76	0.15
Pazhassi Sagar			9.51	0.10	22.83	0.23
Thottiyar HES			24.75	0.25	99.00	0.99
Peruvanamuzhi					21.48	0.21
Sengulam Aug. Scheme					85.00	0.85
Sub Total New & Ongoing	72.49	0.72	189.38	1.89	387.11	3.87
Gross Generation	6998.42	72.36	6866.40	70.75	7074.51	72.64
Net Generation (less Aux. consumption.)	6926.06		6795.65		7001.88	

7.3.2 Review of Hydro–availability up to 30.09.2019.

The State of Kerala has witnessed heavy deficit in rainfall in the first half of southwest monsoon followed by heavy rainfall during the month of August, 2019. The overall net inflow (excluding spill) up to September, 2019 in the water year (2019-20) was less than the anticipated value projected in the ARR. As per the estimation, expected inflow was 4406.72MU from June to September, 2019 whereas the actual inflow was 3901.58MU only. The actual month wise net inflow of the stations is shown below. It may be noted that water stored in the Pambla dam has to be spilled in order to do maintenance work of the dam. Hence there is negative figure for inflow on Lower Periyar storage in the month of September, 2019.

Table 7.15: Actual inflow from June 2019 to Sep 2019 (MU)					
Sl.no.	Station	Jun-19	Jul-19	Aug-19	Sep-19
1	KUTTIADI	13.09	155.00	210.43	75.07
2	PORINGAL	0.00	24.10	28.71	15.49
3	KUNDALA & MADUPETTY	14.71	33.58	86.20	64.19
4	ANAYIRANKAL & PONMUDI	7.72	22.91	107.02	75.14
5	NERIAMANGALAM	11.62	32.61	50.24	53.48
6	PAMBA & KAKKI	34.39	118.51	405.35	265.30
7	IDUKKI	72.27	254.18	828.97	429.64
8	EDAMALAYAR	5.05	33.53	113.33	60.86
9	LOWER PERIYAR	0.81	14.83	19.09	-27.70
10	SHOLAYAR	5.52	26.53	88.71	71.13
	TOTAL	165.19	715.78	1938.03	1082.58

Considering the net available inflow for generation during the period upto September, 2019 for the water year 2019-20, the power availability from the generating stations for the control period needs to be revised.

7.3.3 Revised projection for 2019-20 from existing projects.

The inflow for the water year 2019-20 with actuals upto October, 2019 was found to be 5969.39MU against the 6487.41MU projected in the ARR. However, due to the floods in the year 2019, Four nos. of major hydro stations and 14 Nos. of SHP's have been badly affected thereby restricting generation from these stations. The stations affected by the flood and the details of restoration are attached as Annexure –G4. The reasons specified above have caused considerable reduction in the power availability from the hydro generating stations for the financial year 2019-20. Hence KSEBL was constrained to revise the hydel generation to 6510.91 against an approved value of 6925.93 MU.

7.3.4 Revised projection for 2020-21 from existing projects.

Due to reduction in net inflow available upto 30.09.2019, in the water year 2019-20, the inflow projected in the MYT petition for the remaining years of the control period needs revision. Taking into account the reduction of actual inflow in the water year 2019 (up to September, 2019), it is found that there will be a slight difference of 63.90 MU(reduction) from the inflow projected for the financial year 2020-21 in the MYT petition. Hence, KSEBL has revised the generation for the financial year 2020-21 to 6614.23MU against the approved 6677.02MU.

7.3.5 Revised projection for 2021-22 from existing projects.

The reduction of average inflow experienced based on the reduction in the inflow for the year 2019-20 has also been taken into account for the financial year 2021-22. Accordingly, the generation has been revised to 6622.09MU against the approved value of 6687.40MU.

7.3.6 The revised inflow estimated based on the actual inflow upto October 2019 and thereafter 20 years average value is shown in Annexure-G3. The comparison statement of Inflow projected in the ARR with revised present projection for the coming years in the control period is shown below in Table 7.16.

Table 7.16. Anticipated/ Revised estimate of Inflow			
Water year	ARR	Revised	Difference
2019-20	6487.41	5969.39	(-)518.02
2020-21	6497.32	6433.42	(-) 63.90
2021-22	6508.72	6441.63	(-) 67.09

7.3.7 In tune to the above, the approved /revised projection of generation from the existing hydro stations is shown below in Table 7.17.

Table 7.17 Comparison of Generation Proposed				
Year	ARR (A)	Approved (B)	Revised (C)	Difference D=C-B
2019-20	6925.90	6925.93	6510.91	(-)415.02
2020-21	6677.02	6677.02	6614.23	(-) 62.79
2021-22	6687.40	6687.40	6622.09	(-) 65.31

7.3.8 However, the actual generation of hydro plants will have to be regulated based on the actual inflow, energy and peak demand, availability of power from CGS, traders, energy exchanges and short term markets etc. Accordingly, there may be changes in the estimated values based on the actual condition. The revised generation projection for the FY 2019-20 to 2021-22 from the generating stations is shown in Annexure – G5 (1) to G5 (3).

7.3.9 . Energy availability from New and Ongoing Hydel Projects

The Hon'ble Commission as per the MYT Order dated 08.07.2019 has provisionally approved generation from the new projects expected to be commissioned during the control period. However, due to uncontrollable events, the completion of certain projects has been rescheduled beyond the original CoD. Hence, the estimated generation proposed from the above stations has changed. Accordingly, the revised generation proposed from the New Hydel projects based on the current status for the coming years of the control period is shown below in Table- 7.18.

Table 2.18.Hydel Generation as per MYT Order			
Ongoing & New Hydro Projects	2019-20	2020-21	2021-22
	Gross gen (MU)	Gross gen (MU)	Gross gen (MU)
Kakkayam	5.612	5.612	5.612
Boothathenkettu		41.7	83.40
Upper Kallar		1.284	2.568
Poringalkuthu AES		45	45
Chathankottunada			7.38
Pazhassi Sagar			49.5
Thottiyar HES			12.6
Sengulam Aug. Scheme			42
Total New & Ongoing	5.612	93.596	248.06

7.3.10 In tune to the above generation proposed from the new Hydel projects, the total estimated hydel generation anticipated for the coming years of the control period will be as shown in table 7.19 below.

Table 7.19: Revised Hydel Generation						
Particulars	2019-20		2020-21		2021-22	
	Gross gen (MU)	Aux. Consp(MU)	Gross gen (MU)	Aux. Consp(M)	Gross gen (MU)	Aux. Consp(MU)
Total Existing	6510.91	67.328	6614.23	68.043	6622.10	68.3194
Ongoing and New Hydro	5.612	0.056	93.60	0.936	248.06	2.4806
Gross Generation	6516.517	67.38426	6707.83	68.97981	6870.16	70.80
Net Generation (less Aux. consp.)	6449.133		6638.85		6799.36	

7.4. Estimation of energy generation from Thermal Stations

7.4.1 As already submitted in MYT petition, because of the high variable cost of power from the two thermal stations, KDPP and BDPP, no generation has been proposed from these thermal generating stations throughout the control period. However, as part of giving quality and reliable power to the consumers and also part of having system stability, in contingency situations, the same had been used in the year 2018-19 and the quantum was 4.089 MU. For 2019-20 up to September, it was 11.87 MU only ie. 11.77 MU from KDPP and that of BDPP was 0.10 MU at a cost of Rs.5.46 Cr. The actual generation for October 2019 was 0.04 MU for KDPP. KSEBL was able to generate power at a rate of Rs.4/ unit from KDPP during 2019-20 using LSHS of BPCL stored in the premise of KDPP at a discounted rate of Rs.17240/MT. It may be noted that the market of LSHS is around Rs. 50,000/- (approx) including GST and transportation.

7.4.2. In future projections of the control period (from October 2019) no generation from the thermal stations has been accounted. Hence in view of actual generation, the revised projection for FY 2019-20 is 11.91 only (KDPP-11.81 and BDPP - 0.1 MU).

7.4.3. The auxiliary consumption for BDPP is fixed at 5% and that of KDPP is 2.5% of gross generation as per the Tariff Regulation. Even though the thermal stations are not scheduled in the proposed generation plan for the control period, the auxiliary consumption needed for the stations are to be accounted as the station needs to be equipped for generation in any contingency situation. As per the past actual, a minimum of 1.5MU is needed annually for maintaining the above 2 stations. Hence, the same is been accounted in the estimation of energy.

7.5. Estimation of energy generation from Solar and Wind sources

7.5.1. Energy generation from solar projects: KSEB Ltd has an installed solar capacity of 16.85 MW as on 31.03.2019 with an annual generation of about 18.54 MU. Further, KSEBL has added 0.445 MWp of solar projects up to 30.09.2019 thus totaling the capacity to 17.295 MW. As on 30.09.2019, the total generation achieved was 9.5 MU from the solar resources. The Kottiyam solar project with an installed capacity of 0.6 MWp is planned to be commission in the FY 2019-20. Accordingly, revised projection for FY 2019-20 is estimated as 22.57 MU. The projected generation for the FY 2020-21 and 2021-22 is same as per the approval of the Hon'ble Commission in MYT order. The solar plants proposed to be commissioned during the control period are shown in **Annexure G2**. The expected generation based on solar projects for the years of the control period is shown in **Annexure G6**.

7.5.2. Energy generation from wind projects: The total wind energy capacity of KSEBL as on 30 .03.2019 is **2.025MW**. At present there is no wind project planned by KSEBL during the control period. The generation received from the wind up to 30.09.2019 was 0.75 MU. Based on the current trends, it is expected to get a lesser generation than the figure approved by the Hon'ble Commission. However, if the approved generation is put for the months from Oct-2019, then also the generation for the FY 2019-20 will be 1.57MU. Since the generation from the wind source is meager and is highly depended on the climatic conditions, no revision from the approved generation is proposed by KSEBL for the FY 2020-21

and 2021-22. The revised solar generation and the generation proposed from the wind is shown in table 7.20 below.

Table 7.20 : Generation Plan of Solar & Wind				
Year	Solar (MU)		Wind (MU)	
	APPROVED	REVISED	APPROVED	REVISED
2019-20	42.61	22.57	2.04	1.57
2020-21	47.60	47.60	2.08	2.08
2021-22	47.60	47.60	2.08	2.08

7.6. Auxiliary consumption of Generating Plants

7.6.1 The permissible auxiliary consumption of existing and new hydroelectric generating stations, as per regulation, ranges between 0.7 % to 1.2 % based on type of plants (Surface/underground) and excitation system. As per the new KSERC (Renewable Energy and Net Metering) Regulations, 2020, the auxiliary consumption of SHEPs is 1% and that of solar PV projects will be 0.25% of the gross generation. Since there has been a revision in the commissioning dates of the projects planned, the auxiliary consumption estimated will also change depending on the same. Accordingly the revised auxiliary consumption of these hydro plants for the control period is given in **Annexure G7**. The actual auxiliary consumption for thermal stations upto 30.09.2019 was 0.985 MU and the revised projection for 2019 -20 is estimated as 1.5 MU and an auxiliary consumption of 1.5 MU is expected for the remaining period also. The auxiliary of solar projects has been calculated as per the norms specified in the Regulation, ie; 0.25% of the gross generation.

7.7. Generation plan for the control period

7.7.1 A consolidated generation schedule of the Hydel stations including proposed projects is shown below. Net generation of KSEBL plants is calculated after deducting the auxiliary consumption from the gross generation.

Table 7.21 : Hydel Generation Plan			
Financial Year	Gross Hydel available(MU)	Aux. Consumption (MU)	Net Hydel Available(MU)
2019-20	6516.517	67.38426	6449.133
2020-21	6707.83	68.97981	6638.85
2021-22	6870.16	70.80	6799.36

7.7.2 Even though, no generation proposed from the thermal stations of KSEBL for 2020-21 and 2021-22, a minimum auxiliary consumption needed for running the station, being 1.5 MU per year, based on past actual is taken into account in calculating energy availability. The auxiliary for the solar stations is taken as per the KSERC (Renewable energy and Net metering) Regulation, 2020.

Table 7.22 : Total Generation Plan						
Financial Year	Net Hydel (MU)	Thermal (MU)	Solar (MU)	Wind (MU)	Aux. Cons Solar +thermal	Generation Available (MU)
2019-20	6449.133	11.91	22.57	1.57	1.5564	6483.6266
2020-21	6638.85	0	47.60	2.08	1.619	6686.911
2021-22	6799.36	0	47.60	2.08	1.619	6847.421

7.7.3 The entire capacity and generation is allocated to the Distribution Business Unit of KSEBL.

7.8 Estimation of ARR of SBU-G for the control period

The estimation of ARR for Generation Business of KSEBL is prepared as per the KSERC (Terms and Conditions for determination of Tariff) Regulations, 2018, especially, Regulation 10 and 44.

7.8.1 Estimation of Operation & Maintenance Expenses

7.8.1.1 Regulation 45 of the tariff regulation specifies that, the generation business of KSEBL is allowed to recover the operation and maintenance expenses of existing stations for each financial year of the control period as per the norms specified in Annexure-VII of the Regulation. Further, annual pension contribution payable to Master Trust as well as expenses for the new generating stations is also allowable. Accordingly, Operation & Maintenance Expenses Claimed and approved for SBU-G of KSEBL for the control period from 2018-19 to 2021-22 given in the table below.

Table 7.23 : O&M cost for SBU-G						
Claimed in ARR						
No	Item	2018-19	2019-20	2020-21	2021-22	Remarks
1	Existing Stations	123.77	129.77	136.05	142.63	
2	New Stations	4.01	22.67	40.54	69.14	
3	Total	127.78	152.44	176.59	211.77	
Approved vide order dated 8-7-2019						
No	Item	2018-19	2019-20	2020-21	2021-22	Remarks
1	Existing Stations	123.77	129.77	136.05	142.63	
2	New Stations	0.38	5.27	17.32	29.38	
3	Total	124.15	135.04	153.37	172.01	

7.8.1.2. KSEB Ltd. has estimated the expense strictly in accordance with the Tariff Regulation , 2018, but Hon'ble Commission vide MYT order dated 08.07.2019 has adopted CERC norms in the absence of State Regulations in the case of Renewable energy projects. Now, as the KSERC (Renewable Energy and Net Metering) Regulations, 2020 has been notified and is in force from 07.02.2020 onwards, the same is taken for calculating the O&M Expense of the renewable energy stations. As per the above regulations, the O&M expense allowed for the SHEPs, wind and solar projects are shown below.

Table 7.24 O&M Expense of new Renewable Sources			
Sl No	Projects		O&M Expense 2019-20 (Cr)/MW
1	Wind		0.08
2	SHEP	Below 5MW	0.3241
		5MW to 25MW	0.2347
3	Solar		0.06

7.8.1.3. The list of new generating stations and units expected to be commissioned during the control period and their O&M Cost calculation are given in the Table below. The O&M has been calculated for new projects (including solar projects) based on the tariff regulation and also based on the KSERC (Renewable energy and Net Metering) Regulations, 2020. An escalation of 5.72% over the previous year is taken as envisaged in the KSERC (Renewable energy and Net Metering) Regulations, 2020.

Table 7.25 : O&M expense for new Generating stations (Rs Cr)							
New Stations	Installed Capacity (MW)	Project cost	Expected completion	O&M Exp Cr/MW	2019-20	2020-21	2021-22
Kakkayam HEP	3	43.2	2018-19	0.3241	0.9723	1.027916	1.086712
Boothathankettu SHEP	24	231.21	2020-21	0.2347		5.954996	6.295622
Uppar Kallar SHEP	2	28.75	2020-21	0.3241		0.685277	0.724475
Porigalkuthu AES	24	171.42	2020-21	0.2347		5.954996	6.295622
Chathankottunada SHEP	6	79	2021-22	0.2347			1.573905
Pazhassisagar SHEP	7.5	104.37	2021-22	0.2347			1.967382
Thottiyar HES	40	283.49	2021-22	4%of PC			11.3396
Shengulam Aug. Scheme	-	113	2021-22				
Peruvanamuzhi SHEP	6	84.11	2021-22	0.2347			1.573905
Pallivasal Extn	60	550	2021-22	4%of PC			22
Solar 2018-19	2.143	14.999	2018-19	0.06	0.12858	0.135935	0.14371
IPDS South RT Projects	0.445	3.047	2019-20	0.06	0.02002	0.028227	0.029842
Kottiyam Solar	0.6	3.75	2019-20	0.06	0.003	0.038059	0.040236
Kanjikode Solar	3	17.1	2020-21	0.06		0.190296	0.201181
Agali Solar	1	5.7	2020-21	0.06		0.063432	0.06706
Brahmapuram Solar	4	22.8	2020-21	0.06		0.253728	0.268241
Soura Phase 1	50	250	2020-21	0.06		3.1716	3.353016
Soura Phase 1	50	125	2021-22	0.06			3.353016
Total O&M Cost		--	--		1.123905	17.50446	60.31353

7.8.1.4. Actuals up to 30.09.2019:

Though the approved O&M cost for the FY 2019- 20 is Rs.135 Cr. the actual O&M expenditure up to 30.09.2019 was Rs.134.83 Cr. It is expected that, based on past actuals, the expense will become Rs.205.15 Cr.

7.8.1.5 Revised projection for 2019-20:

Revised O&M projection for 2019-20 is 130.89 Cr against approved figure of Rs.135.04 Cr. on normative basis. Reduction in O& M cost is due to re-scheduling of new and ongoing hydel/solar projects. It may please be noted that the projected figure based on past actual is Rs.205.15 Cr.

7.8.1.6 Revised projection for 2020-21 :

Revised O&M projection for 2020-21 is 153.55Cr against approved figure of Rs.153.37 Cr. on normative basis. The difference in O& M cost is due to re-scheduling of new and ongoing hydel/solar projects. It may please be noted that the projected figure based on past actual is Rs.221.72 Cr.

7.8.1.7 Revised projection for 2021-22 :

Revised O&M projection for 2021-22 is 202.99 Cr against approved figure of Rs.172.01 Cr. on normative basis. Increase in O& M cost is due to re-scheduling of new and ongoing hydel/solar projects and to the addition of new projects within the control period. It may please be noted that the projected figure based on past actual is Rs.239.31 Cr.

7.8.1.8 Thus, the revised O&M cost as per norms for the control period from 2019-20 to 2021-22 for SBU-G is submitted below:

Table 7.26 Revised O&M claim (Rs Cr)			
Item	2019-20	2020-21	2021-22
Existing Stations	129.77	136.05	142.63
New Stations	1.12	17.50	60.31
Total	130.89	153.55	202.99

7.8.1.9. Pay Revision Expenses

The Regulation 14 (3) provides for admission of expenses relating to pay revision during the control period for the same level of employees as admitted in the truing up of accounts for the year 2016-17. The pay revision of Officers/workmen of KSEBL is due from July / August 2018. The estimation of liability on this count and SBU wise breakup of the anticipated expenses are explained in Chapter 11. Expenses related to SBU-G for the control period are summarized in the table below:

Table 7.28 : Pay revision expenses for SBU G (Rs. Cr)					
Business Unit	Employee cost ratio	2018-19 TU 19	2019-20	2020-21	2021-22
SBU G	5.13	9.03	13.49	14.58	15.73

7.8.1.10. It is respectfully submitted that SBU-G is not including the projection against pay revision expenses of SBU-G for the years 2019-20 onwards. The Hon Commission may allow the said expense as part of truing up process, of respective years. Thus, the total Operation & Maintenance expenses of SBU-G projected for the control period **as per the Regulation** is summarized below:

Table 7.29 : Normative O&M cost (Rs Cr)			
Item	2019-20	2020-21	2021-22
Normative O&M cost	130.89	153.55	202.99
Pay revision expenses	--	--	--
Total O&M Cost	130.89	153.55	202.99

7.8.1.11. Hon'ble Commission may kindly note that actual O&M expenses for 2018-19 has been Rs.197.32 Cr and the same for the half year ended 30.09.2019 amounts to Rs.134.83 Cr. The projection of the O&M expenses of SBU-G for the remaining years of the control period based on the past actuals are higher than the normative claim as shown in the table below.

Table 7.30 : Projection of O&M of SBU (Rs Cr)			
Item	2019-20	2020-21	2021-22
O&M Cost as per estimates	205.15	221.72	239.31
O&M cost as per norms	130.89	153.55	202.99

7.8.1.12. It may kindly be noted that, the O&M expenses as per norms for the control period are below the actual expense projection. This will lead to under recovery of genuine O&M costs. However, KSEBL is taking earnest efforts to control the O&M expenses to the extent possible. If any variation is found beyond its control then it is humbly requested that the same may be allowed at actual during true up.

7.8.2 Depreciation

7.8.2.1. The depreciation claimed by KSEBL for the SBU G in line with Regulation 27 of the Tariff Regulations, 2018 and that approved by the Hon'ble Commission is summarized in Table below.

Table 7.31 Depreciation for control period (Rs Cr)		
Year	As per MYT petition	As per MYT order
2018-19	138.50	130.19.
2019-20	159.32	141.38
2020-21	212.80	174.35
2021-22	235.78	196.26

7.8.2.2. As part of changes noticed in GFA, revised estimation of depreciation has been made for the control period, which is summarized below:

Table 7.32: Computation of Normative depreciation for the remaining years of control period (Rs. Cr)					
SI No	Particulars	TU	Revised estimate		
		2018-19	2019-20	2020-21	2021-22
1	GFA excluding revaluation	4857.26	4904.21	4935.427	5724.787
2	Contribution & grants	75.31	88.66	88.66	135.66
3	GFA net of contribution (1-2)	4781.95	4815.55	4846.767	5589.127
4	Addition during the year	46.95	31.22	789.36	1213.97
5	Contribution & grants	13.35	0.00	47.00	44.50
6	GFA addition net of contribution (4-5)	33.60	31.217	742.36	1169.47
7	Depreciation rate (%) on opening GFA (Actual for 2018-19)		2.86	2.86	2.86
8	Depreciation rate (%) for GFA addition at half the normal rate of 5.14%.		2.57	2.57	2.57
9	Depreciation for Op GFA (3x7)	136.73	137.72	138.62	159.849
10	Depreciation on current year addition (6X8)	0.86	0.80	19.08	30.06
11	Total depreciation for the year (9+10)	137.60	138.53	157.70	189.90

7.8.3 Interest and Finance Charges

7.8.3.1. Interest on Capital Liabilities:

The Interest on Capital liabilities actually incurred as on 30.09.2019 is Rs 43.78 Cr. The revised Interest on Capital liabilities based on the revised GFA for the year 2019-20 and for the subsequent years in the Control period based on the GFA proposed is shown below. Detailed explanation is furnished in Chapter 11.

Table 7.33 Interest on capital liabilities (Rs Cr) for SBU-G										
No	Item	Claimed in ARR 2019-20	Approved for FY 2019-20	2018-19 TU	Actual upto (30.09. 2019)	Revised estimate 2019-20	Appd for the FY 2020-21	Revised estimate 2020-21	Appd for the FY 2021-22	Revised estimate 2021-22
1	Opening Normative loan	1104.44	730.2	889.69	846.98	785.70	1036.89	678.39	1456.13	1263.06
2	GFA addition during the year	457.23	448.07	46.95	---	31.22	593.59	789.36	153.76	1213.97
3	Less: Consumer contribution & Grants			13.34		0.00		47.00		44.50
4	Less: Allowable depreciation/repayment in case of actual	125.01	141.38	137.60	68.1	138.53	174.35	157.70	196.26	189.90
5	Normative loan during the year	332.22	306.69	33.61	-68.1	31.22	419.24	742.36	-42.5	1169.47
6	Closing normative loan	1436.65	1036.89	785.70	778.88	678.39	1456.13	1263.06	1413.64	2242.62
7	Average normative loan	1270.54	883.55	837.69	812.93	732.05	1246.51	970.72	1434.88	1752.84
8	Interest for the year	127.05	82.45	69.88	43.78	61.05	116.32	80.96	133.90	146.19
9	Interest rate (%)	10	9.33	8.34	10.78	8.34	9.33	8.34	9.33	8.34

Note: Closing normative loan as per TU 2019 has been considered as opening normative loan for 2019-20. Actual interest for 2018-19 has been considered for estimating interest for the remaining years of control period.

7.8.3.2. Interest on Security Deposits:

SBU-G does not hold any security deposit and hence no amount is considered on this account.

7.8.3.3 Interest on GPF

The revised interest on GPF is computed in line with the methodology adopted by the Hon'ble Commission in the MYT order dated 08.07.2019 as detailed in Chapter 11. Accordingly, the figures arrived at for the rest of the years of the control period are furnished below:

Table 7.34: Comparison of interest on GPF (Rs Cr)			
	As per MYT Petition	Approved	Revised Projections
Employee cost ratio (2017-18)	5.13	5.13	5.13
2018-19-TU	9.83	9.37	8.92
2019-20	10.48	9.98	9.37
2020-21	11.12	10.6	9.99
2021-22	11.77	11.21	10.60

7.8.3.4. Interest on Master Trust Bonds and additional contribution to Master Trust

Hon'ble Commission was pleased to approve the interest on Master Trust bonds along with additional contribution to Master Trust. No change is proposed in this petition as detailed below. Detailed explanation is furnished in Chapter 11.

Table 7.35 Interest on Master Trust bonds of SBU-G (Rs Cr)						
No	Item	Claimed for the year 2019-20	Approved for FY 2019- 20	Revised estimate for 2019-20	Revised estimate for 2020-21	Revised estimate for 2021-22
1	Existing bond	37.58	37.58	37.58	35.50	33.41
2	Additional contribution to Master Trust	19.12	10.26	10.26	10.26	10.26
	Total	56.70	47.84	47.84	47.84	47.84

7.8.3.5. Interest on Working Capital

The Interest on working capital for SBU-G is computed as per Regulation 32 on a normative basis. One month O&M cost, cost of maintenance spares at 1% historical cost and receivables for one month less security deposit held, if any. The interest rate allowed, as per Regulation 32(2), is 2% higher than the Base rate on First of April of the ARR filing Year. Therefore the Interest on Working Capital in this petition is computed at a rate of 10.95% (8.95% as on 1-4-2019 + 2%). The parameters adopted for computation of Interest on Working capital for the year 2019-20 is given below:

Table 7.36 Parameters for Working Capital for 2019-20 (Rs Cr)	
Item	2019-20
Opening GFA (Rs.Cr.)	4904.21
O&M Cost (Rs.Cr.)	130.89

7.8.3.6 The Interest on Working Capital claimed in ARR for the year 2019-20, approved by Hon'ble Commission, actual for the period up to September 2019 and the revised estimate for the year 2019-20 is given below.

Table 7.37 Interest on Working capital of SBU-G (Rs Cr)

		Claimed in ARR for the year 2019-20	Approved for FY 2019- 20 vide order dtd. 8- 7-2019	Actual up to Sept- 2019	Revised for the year 2019-20	Appd for the FY 2020-21	Revised for the year 2020- 21	Appd for the FY 2021-22	Revised for the year 2021-22
No	Item								
1	O&M Expenses (as per norms)	12.70	11.25	22.78	10.91	12.78	12.80	14.33	16.92
2	Maintenance Spares (as per norms)	45.13	50.17	49.47	49.04	54.65	49.35	60.58	57.25
3	Receivables (as per norms)	0	0	0.84	0.84	0	0	0	0
4	Less Security Deposits	0	0	0	0	0	0	0	0
5	Total working capital	57.83	61.42	73.10	60.79	67.43	62.15	74.92	74.17
6	Interest Rate (as per norms)	10.70%	10.15%	10.15%	10.15%	10.15%	10.15%	10.15%	10.15%
7	Interest on working capital	6.19	6.23	7.42	6.17	6.84	6.31	7.60	7.53

7.8.3.7. The summary of interest and finance charges estimated for SBU-G for the control period is submitted below:

Table 7.38 Summary of Interest & Finance Charges of SBU-G (Rs Cr)

		Claimed in ARR for the year 2019-20	Approved for FY 2019- 20 vide order dtd. 8-7-2019	Actual up to Sept- 2019	Revised for the year 2019-20	Appd for the FY 2020-21	Revised for the year 2020- 21	Appd for the FY 2021-22	Revised for the year 2021-22
No	Item								
1	Interest on Capital Liabilities	127.05	82.45	43.78	61.05	116.32	80.96	133.90	146.19
2	Interest on GPF	10.48	9.98	3.84	9.37	10.60	9.99	11.21	10.60
3	Interest on Master Trust	56.7	47.84	16.53	37.58	45.76	35.50	43.67	33.41
4	Interest on Working Capital	6.19	6.23	7.42	6.17	6.84	6.31	7.60	7.53
5	Total Interest & Finance Charges	200.42	146.50	68.51	114.18	179.53	132.75	196.39	197.73
6	Less: Capitalized			21.02					
7	Net I&FC			47.49					

7.8.4 Return on Equity

7.8.4.1. The ROE for SBU-G was proposed by KSEBL and approved by the Hon'ble Commission at Rs.116.38 Cr. No change is proposed in this filing as submitted below.

Table 7.39 ROE OF SBU-G Return on Equity (Rs.Cr.)							
		Claimed in ARR for the year 2019-20	Approved vide order dtd.8-7- 2019	Actual upto 30-9-2019	Revised estimate for 2019-20	Revised estimate for 2020- 21	Revised estimate for 2021- 22
No	Item						
1	Return on Equity	116.38	116.38	58.19	116.38	116.38	116.38

7.9 Aggregate Revenue Requirement

7.9.1 The SBU-G handles the generation assets of KSEB Ltd and manages bulk generation of power and supply to SBU-D. The revenue requirement of SBU-G is the transfer cost of internal generation to SBU-D. The total Aggregate Revenue Requirement of SBU-G claimed in the original petition, approved, actual upto Sept- 2019 and revised estimate for the future years of the control period is submitted below:

7.9.2 Actuals up to 30.09.2019

Hon'ble Commission has approved aggregate revenue requirement of SBU-G for 2019-20 as 539.31 Cr. But, due to variation in actual O&M cost up to Sep 2019, the actuals up to Sept 2019 became 327.01 Cr. (about 61% of the approved value).

7.9.3 Revised estimate for 2019-20

Though the actual expenses are on the higher side during the 1st half of the year, a projection based on the norms specified in the regulation is taken for revised estimate for 2019-20 and it is estimated as Rs. 515.69 Cr. Reduction in ARR by Rs.23.62 Cr from the approved ARR of Rs.539.31 Cr is due to rescheduling of certain projects proposed in the MYT petition to ensuing financial years.

7.9.4 Revised estimate for 2020-21

Hon'ble Commission has approved aggregate revenue requirement of SBU-G for 2020-21 as 623.62 Cr. But the revised ARR projection is Rs.570.64 Cr. Reduction in ARR by Rs.52.98 Cr is due to lower normative interest.

7.9.5 Revised estimate for 2021-22

Revised estimate for 2021-22 exceeded approval by Rs.36.23 Cr (Rs. 717.26 Cr against approval of Rs.681.03 Cr) mainly because of increase under O&M expenses. A summary of revised estimate for the remaining years of the control period is furnished below:

Table 7.40 Revised ARR of SBU-G (Rs.Cr)									
		Claimed for the year 2019-20	Appvd. For FY 2019-20	Actual up to Sept 2019	Revised estimate for 2019-20	Appd for the FY 2020-21	Revised estimate for 2020-21	Appd for the FY 2021-22	Revised estimate for 2021-22
No	Item								
1	Generation of power			5.46	5.46				
2	Operation & Maintenance Expenses	152.44	135.04	134.83	130.89	153.37	153.55	172.01	202.99
3	Interest on long term loans	127.05	82.45	22.76	61.05	116.32	80.96	133.90	146.19
4	Interest on Master Trust Bonds	56.7	37.58	16.53	37.58	35.50	35.50	33.41	33.41
5	GPF Interest	10.48	9.98	3.84	9.37	10.60	9.99	11.21	10.60
6	Depreciation	125.01	141.38	68.16	138.53	174.35	157.70	196.26	189.90
7	Interest on WC and deposits	6.19	6.23	4.36	6.17	6.84	6.31	7.60	7.53
8	Additional contribution to Master Trust	0	10.26		10.26	10.26	10.26	10.26	10.26
9	Other items			2.02					
10	Total Revenue Expenditure (1 to 9)	477.87	422.93	257.96	399.31	507.24	454.26	564.65	600.88
11	Return on Equity	116.38	116.38	69.05	116.38	116.38	116.38	116.38	116.38
12	Tax on RoE	0	0	0	0	0	0	0	0
13	Aggregate Revenue Requirement (11+12+13)	594.25	539.31	327.01	515.69	623.62	570.64	681.03	717.26

7.10 Non-Tariff Income

The non-tariff income of SBU-G was fully approved by the Hon'ble Commission as projected by KSEBL. Actual income till 30.09.2019 has been Rs. 4.63 Cr. However, revision is not proposed under this head for the remaining control period as submitted below:

Table 7.41 : Non-Tariff Income for SBU-G (Rs Cr)							
		Claimed in ARR for the year 2019-20	Appvd. For FY 2019-20	Actual upto Sept 2019	Revised estimate for 2019-20	Revised estimate for 2020-21	Revised estimate for 2021-22
	Non Tariff income	33.38	33.38	16.69	33.38	37.28	41.17

7.11 Net ARR of SBU-G

The net ARR of SBU-G claimed in the original petition, approved, actual up to Sept- 2019 and revised estimate for the future years of the control period is submitted below:

Table 7.42 Net ARR for SBU-G									
No	Item								
		Claimed in ARR for 2019- 20	Appd for the FY 2019- 20	Actual up to Sept 2019	Revised estimate for 2019-20	Appd for the FY 2020- 21	Revised estimate for 2020-21	Appd for the FY 2021-22	Revised estimate for 2021- 22
1	Aggregate Revenue Requirement	594.25	539.31	327.01	515.69	623.62	570.64	681.03	717.26
2	Less: Other Income	33.38	33.38	4.63	33.38	37.28	37.28	41.17	41.17
3	Net ARR	560.87	505.93	322.37	482.31	586.34	533.36	639.86	676.09

* * *

Annexure G1 - Hydel Power Projects of KSEBL						
No	Name of Station	Installed Capacity			Date of Commissioning	
		No of Machines	Plant Capacity	Design Energy	Original Date	After Renovation
I	Major HEP					
1	Idukki	6 x 130	780	2398	22.03.1986	
2	Sabarigiri	4 x 55 + 2x 60	340	1338	26.11.0967	06.05.2014
3	Idamalayar	2 x 37.5	75	380	03.02.1987	
4	Sholayar	3x18	54	233	14.05.1968	
5	Pallivasal	3 x 5+ 3x7.5	37.5	284	07.03.1951	26.08.2002
6	Kuttiyadi	3x25	75	268	28.11.1972	
7	Kuttiyadi Extension	1x50	50	75	27.01.2001	
8	Kuttiyadi Add Ext	2x50	100	223	11.05.1963	
9	Panniar	2 x 16.2	32.4	158	26.01.1964	01.02.2003
10	Neriamangalam	3 x17.55	52.65	237	11.05.1963	31.11.2005
11	NES	1x25	25	58.27	27.05.2008	
12	Lower Periyar	3 x 60	180	493	28.11.1997	
13	Poringalkuthu	4x9	36	191	06.02.1960	29.05.2015
14	Sengulam	4 x 12.8	51.2	182	05.01.1955	30.11.2002
15	Kakkad	2x25	50	262	13.10.1999	
	Sub Total (HEP)	49 Nos	1938.75	6780.27		
II	Small HEPs					
1	Kallada	2x7.5	15	65	05.09.1994	
2	Peppara	1x3	3	11.5	15.06.1996	
3	Malankara	3x3.5	10.5	44	23.10.2005	
4	Madupatty	1x2	2	6.4	14.01.1998	
5	Malampuzha	1x2.5	2.5	5.6	26.11.2001	
6	Lower Meenmutty	(1x0.5+ 2x1.5)	3.5	7.63	25.03.2006	
7	Chembukadavu - 1	3x0.9	2.7	6.59	19.08.2003	
8	Chembukadavu - 2	3x1.25	3.75	9.03	04.09.2003	
9	Urumi -1	3x1.25	3.75	9.72	25.01.2004	
10	Urumi -2	3x0.8	2.4	6.28	25.01.2004	
11	KTR	3x1.25	3.75	15	23.10.2009	
12	Poozhithode	3 x 1.6	4.8	10.97	25.06.2011	
13	Ranni-Perinadu	2x2	4	16.73	16.02.2012	
14	Peechi	1x1.25	1.25	3.31	07.01.2013	
15	Vilangad	3x2.5	7.5	22.63	19.01.2014	
16	Chimmony	1x2.5	2.5	6.7	22.05.2015	
17	Adyanpara	2x1.5 +0.5	3.5	9.01	09.03.2015	
18	Barapole	3 x 5	15	36	29.02.2016	
20	PLBE	1x16	16	74	20.03.1999	
21	Vellathooval	2 x 1.8	3.6	12.7	08.09.2016	
22	Peruthenaruvi	2 x3	6	25.77	24.10.2017	
23	Kakkayam	2x 1.5	3	10.39	16.07.2018	
	Sub Total (SHEP)	24Nos	120	414.96		
	Total (Hydel)	83 Nos	2058.75	7195.23		

Annexure G.2 Solar Projects commissioned and On-going

Projects Commissioned during 2018-19					
No	Name of the stations	Installed Capacity	Annual Generation (MU)	Date of Commissioning	Project Cost(Cr)
1	Roof Top solar projects Distribution wing (12 Nos)	0.233		02.02.2018	3.82
2	Peerumedu (Idk) GM SPV	0.50		23.04.2018	
3	Roof Top solar projects Transmission wing (27 Nos)	0.91		09.07.2018	7.64
4	Ponnani G. Mounted SPV	0.50	0.77	16.01.2019	3.539
		2.143			14.999

Projects Commissioned /scheduled during 2019-20					
No	Name of the stations	Installed Capacity	Annual Generation (MU)	Date of Commissioning	Project Cost(Cr)
1	Roof top solar projects at Various locations	0.445	0.526	30.06.2019	3.047
2	Kottiyam	0.6	0.84		3.75

Projects scheduled 2020-21				
No	Name of the stations	Installed Capacity	Annual Generation (MU)	Project Cost(Cr)
1	Brahmapuram	4.0	4.9	22.8
2	Kanjikode	3.0	3.679	17.1
3	Agali	1.0	1.2	5.70
	Total	8.0	9.779	45.60

Annexure G3 INFLOW DETAILS FROM 1994-95 ONWARDS (WATER YEAR) (Annexure I)														
SI No.	Year	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
1	1998-99	678.7	476.49 ¹	2357.6	1036.91	1243.8	694.7	457.53	157.27	118	94.11	96.03	421.89	8833.03
2	1999-00	1046.46	1416.49	973.6	441.59	1198.43	451.57	197.19	130.38	148	82.9	104	98.6	6289.21
3	2000-01	835.07	946.1	2199.13	789.14	502.59	227.58	198.97	153.05	80.74	47.5	162.21	127.2	6269.28
4	2001-02	1062.21	1765.9	1079.95	501.1	865.14	712.89	231.18	116.03	86.99	81.26	71.06	161.75	6735.46
5	2002-03	489.76	750.9	1255.86	322.19	585.44	391.14	134.13	78.51	63.04	63.21	52.63	81.22	4268.03
6	2003-04	304.74	748.03	916.01	376.53	983.43	325.98	160	91.92	78.81	39.28	58.56	426.2	4509.49
7	2004-05	1401.61	986.94	1436.86	510.74	716.44	464.39	208.73	155.27	70.42	72.18	109.3	99.29	6232.17
8	2005-06	569.38	2261.04	1252.98	1475.76	715.88	714.76	442.33	217.85	110.07	170.31	154.37	434.29	8519.02
9	2006-07	725.23	1596.83	1117.81	963.41	1009.56	907.56	253.21	164.44	90.93	111.6	123.39	113.14	7177.11
10	2007-08	1002.94	2797.48	1499.21	1700.29	1095.25	596.39	283.09	140.5244	126.85	214.1	180.18	132.23	9768.534
11	2008-09	433.63	1144.88	1358.87	962.98	629.358	297.351	169.3	69.864	44.425	78.414	65.672	115.774	5370.518
12	2009-10	330.869	2023.7	779.469	1147.562	898.7	642.91	242.242	128.347	76.47	81.11	102.159	128.296	6581.834
13	2010-11	800.02	1407.075	1175.575	818.336	921.176	651.47	364.2	167.411	122.624	103.11	208.129	136.99	6876.116
14	2011-12	1236.187	1318.659	1654.185	1192.892	592.55	587.895	262.645	127.97	88.15	90.26	132.78	94.84	7379.013
15	2012-13	340.07	726.86	893.79	744.06	435.67	245.57	102.811	53.308	35.017	76.89	75.527	65.056	3794.629
16	2013-14	1642.94	2392.97	1895.437	1164.5	634.76	441.3921	213.84184	120.2269	68.19692	96.71712	88.4	180.09	8939.472
17	2014-15	583.25	1678.1	1798.89	1034.02	843.43	540.03	273.58	143.588	79.231	113.477	241.44	255.403	7584.439
18	2015-16	1053.950658	1106.8266	829.56	614.38	619.18	605.9906	420.6586	148.6973	92.3638	86.8715	90.83459	107.889449	5777.203
19	2016-17	582.8726738	1105.0913	748.03516	393.7508	267.5849	152.9335	81.911161	57.87296	40.62692	94.89989	70.59566	107.458398	3703.633
20	2017-18	569.72	633.92	1323.47	1269.17	706.25	487.89	326.86	110.03	68.37	113.65	122.90	242.448012	5974.675
21	2018-19G	1569.08	3146.60	4471.27	668.14	-	-	-	-	-	-	-	-	
	2018-19N	1460.22	2461.90	492.56	455.14	599.29	338.19	161.65	87.77	69.70	78.24	85.62	113.40	6403.69
22	2019-20	165.19	715.78	1938.03	1082.58	766.12	489.19	236.43	123.15	82.05	94.80	114.99	161.08	5969.39
23	2020-21	779.49	1428.45	1324.02	875.93	719.39	491.08	238.39	122.79	78.75	95.39	115.54	164.20	6433.423
24	2021-22	776.71	1452.57	1280.27	880.27	730.23	504.25	240.36	121.28	78.65	97.79	113.20	166.05	6441.63
The inflow projected based on 20yrs average value. The Aug-2018 value has been replaced with 20yrs average value for the calculation of subsequent years of the control period.has been taken as 20yrs average for the future														

Annexure-G4						
Details of Generation Restored (Flood 2019)						
Sl.No	Name of Station	Installed Capacity of the plant		Generation Restored in (MW)	Unit #	Date of restoration
		No. of Generators. X Capacity in (MW)	Plant Capacity in (MW)			
<u>HEPs</u>						
1	Idamalayar	2 x 37.5	75	75		19.08.2018
2	Pallivasal	3 x 5+ 3x7.5	37.5	37.5		22.08.2018
3	Lower Periyar	3 x 60	180	180		23.09.2018
4	Poringalkuthu	4x9	36	36		26.12.2018
5	RPanniar	2 x 16.2	32.4	32.4	I	14.01.2019
					II	23.11.2018
<u>Small HEPs</u>						
6	PLBE	1x16	16	16		27.08.2018
7	Malampuzha	1x2.5	2.5	2.5		17.08.2018
8	Urumi -2	3x0.8	2.4	2.4		06.09.2018
9	Poozhithode	3 x 1.6	4.8	4.8		01.09.2018
10	Peechi	1x1.25	1.25	1.25		18.08.2018
11	Vilangad	3x2.5	7.5	7.5		25.08.2018
12	Chimmony	1x2.5	2.5	2.5		24.08.2018
13	Adyanpara	2x1.5+0.5	3.5	3.5	I	10.01.2019
					II	17.01.2019
					III	19.12.2018
14	Madupatty	1x2	2	2		22.02.2019
15	Chembukadavu - 2	3x1.25	3.75			19.06.22019
16	Ranni-Perinadu	2x2	4	2	I	23.01.2019
					II	29.03.2019
17	Barapole	3x5	15			18-06-2019
18	Vellathooval	2x1.8	3.6			
19	Perunthenaruvi	2x3	6	6	I	13.01.2019
					II	27.01.2019
			435.7	411.35		

Annexure G5(1) : Generation 2019-20													
Gen. Stations	Apr'19	May'19	Jun'19	Jul'19	Aug'19	Sep'19	Oct'19	Nov'19	Dec'19	Jan'20	Feb'20	Mar'20	Total
Idukki	276.70	358.39	204.04	99.60	73.98	99.03	93.60	114.81	153.74	183.00	262.77	392.18	2311.84
Sabarigiri	128.03	156.97	71.37	24.47	45.53	92.26	92.90	114.01	142.47	120.05	100.77	158.20	1247.05
Idamalayar	30.59	28.76	10.67	1.57	13.71	29.33	18.50	22.86	37.24	39.75	34.96	41.71	309.65
Sholayar	19.22	16.95	4.49	0.73	9.15	25.01	25.30	20.61	26.82	30.07	24.98	28.01	231.35
Pallivasal	12.73	10.91	10.41	10.48	11.43	12.61	12.87	12.70	12.12	10.88	11.70	14.65	143.49
Kuttiady	47.67	39.34	17.35	60.22	51.66	82.16	67.09	55.69	43.99	43.56	43.28	62.94	614.95
Panniar	13.29	7.71	2.67	1.52	17.40	21.72	22.36	18.80	15.00	12.26	9.35	12.70	154.77
NMGM & NES	19.50	16.18	11.13	20.15	46.59	52.27	48.64	38.30	25.77	15.36	15.12	18.92	327.93
L.Periyar	19.50	16.34	13.52	39.10	103.21	43.79	66.30	53.60	31.66	17.54	15.98	18.49	439.03
Poringal	1.89	2.04	0.13	15.05	20.58	19.64	20.50	16.00	2.48	2.59	3.62	3.42	107.94
PLBE	8.18	0.59	0.10	9.09	11.71	11.60	11.93	10.20	7.94	8.47	8.29	10.96	99.05
Sengulam	11.40	13.57	9.83	10.33	16.33	16.44	12.24	14.99	12.59	11.26	9.96	11.86	150.80
Kakkad	17.62	21.48	11.33	7.27	12.97	17.06	16.36	16.02	18.08	17.44	13.78	17.16	186.58
Kallada	5.39	4.00	2.72	0.76	1.04	0.61	0.68	5.23	6.15	2.61	3.19	5.95	38.33
Peppara	0.37	0.38	0.14	0.29	0.32	1.55	0.76	0.63	0.45	0.32	0.28	0.24	5.73
Madupetty	0.70	0.69	0.00	0.00	0.00	0.00	0.00	0.11	0.20	0.26	0.39	0.54	2.90
Chembukadav	0.00	0.00	0.28	2.53	0.90	1.60	1.38	0.27	0.04	0.00	0.00	0.00	7.00
Malampuzha	0.00	0.00	0.00	0.00	0.00	0.31	0.42	0.41	0.78	0.61	0.12	0.00	2.66
URUMI	0.00	0.00	0.86	2.74	2.53	3.62	2.23	0.16	0.05	0.00	0.00	0.00	12.18
Malankara	3.03	3.92	2.93	2.53	1.96	2.03	1.62	2.26	1.86	2.00	2.08	2.73	28.94
L. Meenmutty	0.04	0.02	0.27	0.43	0.84	1.02	0.96	0.61	0.30	0.08	0.03	0.04	4.65
Ktdy.tail race	0.37	0.20	0.29	0.51	0.76	1.02	0.89	0.32	0.35	0.36	0.35	0.59	6.01
Poozhithode	0.00	0.00	0.62	2.28	0.60	1.49	1.02	0.26	0.10	0.04	0.00	0.00	6.42
Ranni-Perunad	0.60	0.75	0.71	0.46	0.69	0.82	0.69	0.58	0.29	0.13	0.13	0.49	6.34
Peechi	0.16	0.00	0.00	0.00	0.07	0.48	0.33	0.14	0.29	0.17	0.17	0.17	1.97
Vilangad	0.00	0.00	0.24	3.59	3.52	3.69	2.89	0.97	0.52	0.19	0.11	0.34	16.06
Chimmini	0.41	0.17	0.00	0.00	0.03	0.47	0.27	0.91	0.23	0.20	0.64	0.98	4.29
Adiyanpara	0.00	0.01	0.44	1.75	0.19	0.00	0.20	0.17	0.08	0.01	0.00	0.00	2.86
Vellathuval	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.04	0.04	0.15	0.46
Barapole	0.00	0.00	0.06	1.68	1.98	6.65	3.25	3.36	2.72	1.68	1.81	5.77	28.97
Perunthenaruvi	0.03	0.03	1.04	1.27	1.98	2.74	1.10	1.51	0.75	0.11	0.14	0.02	10.73
BDPP	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
KDPP	5.38	6.39	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	11.81
Wind mill	0.06	0.18	0.16	0.13	0.13	0.09	0.30	0.05	0.10	0.10	0.20	0.06	1.37
Ongoing Hydel	0.83	0.77	0.14	0.96	0.35	0.88	0.37	0.22	0.21	0.15	0.25	0.49	5.61
Solar KSEB	3.01	1.90	1.29	1.04	1.53	1.28	1.93	1.76	1.77	2.21	2.17	2.68	22.57
Total	626.70	708.64	379.22	322.62	453.65	553.26	529.70	528.67	547.21	523.55	566.58	812.51	6552.57

	Annexure G5(2) : Generation 2020-21												
Gen. Stations	Apr'20	May'20	Jun'20	Jul'20	Aug'20	Sep'20	Oct'20	Nov'20	Dec'20	Jan'21	Feb'21	Mar'21	Total
Idukki	323.00	319.60	148.51	102.05	93.37	111.16	109.19	111.57	130.80	166.68	227.07	320.17	2163.16
Sabarigiri	143.60	139.60	84.69	62.87	61.20	87.60	97.60	106.30	119.60	101.20	84.60	130.60	1219.46
Idamalayar	33.55	29.60	11.36	22.60	34.60	30.60	31.60	19.60	28.70	31.60	27.79	33.15	334.75
Sholayar	23.60	17.32	4.51	8.10	17.90	25.01	25.30	18.90	22.30	25.00	20.77	23.29	232.00
Pallivasal	12.69	11.20	11.90	12.65	11.43	12.61	12.87	12.40	9.99	9.87	10.61	13.28	141.50
Kuttiady	49.69	44.60	47.69	77.60	83.64	69.60	60.20	36.60	30.60	30.80	30.60	44.50	606.12
Panniar	12.89	9.60	9.50	20.36	20.54	20.89	19.60	18.25	12.80	11.12	8.48	11.52	175.55
NMGM & NES	20.36	17.68	37.60	49.60	47.20	50.68	48.64	37.50	22.96	13.93	13.71	17.16	377.02
L.Periyar	19.50	21.30	52.80	99.80	107.60	61.20	59.60	53.40	26.89	15.90	14.50	16.77	549.25
Poringal	1.89	9.20	14.90	19.80	20.58	19.64	20.50	17.63	2.25	2.35	3.28	3.10	135.13
PLBE	8.18	0.59	10.98	11.20	11.71	10.89	11.93	10.20	7.20	7.68	7.51	9.94	108.01
Sengulam	11.40	13.57	12.98	16.80	16.33	15.89	12.24	12.65	11.41	10.21	9.03	10.76	153.27
Kakkad	23.61	24.30	14.98	15.65	13.01	16.98	16.36	16.98	16.40	15.82	12.50	15.56	202.15
Kallada	5.69	4.38	2.80	4.83	5.80	3.92	3.11	3.67	5.59	2.02	3.13	5.87	50.82
Peppara	0.23	0.11	0.17	0.42	0.43	0.49	0.89	0.76	0.62	0.46	0.40	0.27	5.26
Madupetty	0.60	0.60	0.19	0.00	0.02	0.19	0.11	0.12	0.24	0.27	0.35	0.67	3.37
Chembukadav	0.00	0.00	1.62	2.84	2.04	1.36	1.42	0.65	0.44	0.40	0.40	0.00	11.18
Malampuzha	0.00	0.00	0.00	0.00	0.22	0.10	0.06	0.22	0.57	0.46	0.09	0.00	1.72
URUMI	0.00	0.00	1.79	2.86	2.19	1.32	1.37	0.52	0.48	0.40	0.40	0.00	11.34
Malankara	3.45	3.25	2.78	2.97	2.80	2.48	2.60	2.18	1.83	2.05	2.14	2.95	31.48
L. Meenmutty	0.08	0.35	0.73	0.64	0.52	0.60	0.65	0.69	0.42	0.18	0.14	0.04	5.04
Ktdy.tail race	0.71	0.66	0.67	1.04	0.95	0.75	0.71	0.47	0.52	0.54	0.59	0.75	8.34
Poozhithode	0.01	0.06	1.77	2.83	2.25	1.56	1.44	0.64	0.47	0.42	0.38	0.00	11.84
Ranni-Perunad	0.54	0.64	0.78	0.80	0.60	0.64	0.59	0.46	0.34	0.36	0.34	0.55	6.64
Peechi	0.08	0.00	0.00	0.02	0.14	0.05	0.05	0.11	0.27	0.17	0.24	0.17	1.31
Vilangad	0.06	0.08	1.35	3.30	3.41	2.15	2.02	0.93	0.70	0.56	0.50	0.08	15.15
Chimmini	0.23	0.12	0.57	0.88	0.98	0.72	0.50	0.70	0.56	0.79	0.63	0.51	7.20
Adiyanpara	0.00	0.03	0.24	0.60	0.89	0.64	0.34	0.23	0.11	0.01	0.00	0.00	3.08
Vellathuval	0.71	0.76	1.55	1.32	1.53	1.06	0.95	0.55	0.44	0.25	0.24	0.41	9.76
Barapole	2.67	2.06	1.54	2.75	3.71	4.06	2.72	1.52	1.07	1.97	1.90	1.58	27.55
Perunthenaruvi	0.02	0.57	1.00	1.18	0.71	0.37	0.37	0.74	0.37	0.22	0.23	0.02	5.81
BDPP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KDPP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wind mill	0.09	0.12	0.13	0.17	0.49	0.31	0.31	0.06	0.11	0.10	0.14	0.07	2.08
Ongoing Hydel	4.58	4.52	3.89	4.71	4.10	4.63	11.28	11.13	11.12	11.06	11.16	11.40	93.60
Solar KSEB	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	47.60
Total	707.66	680.44	489.93	557.21	576.86	564.11	561.10	502.30	472.14	468.83	497.82	679.11	6757.51

	Annexure G5(3) : Generation 2021-22												
Gen.Stations	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Oct'21	Nov'21	Dec'21	Jan'22	Feb'22	Mar'22	Total
Idukki	311.60	317.50	142.25	103.16	98.68	111.60	110.53	106.36	127.51	173.22	239.00	360.10	2201.50
Sabarigiri	141.30	137.20	87.13	64.03	63.44	88.84	98.53	106.65	108.97	107.91	97.58	155.76	1257.34
Idamalayar	31.88	27.90	10.65	20.60	35.60	33.50	32.30	18.90	29.80	32.80	26.80	34.50	335.23
Sholayar	23.60	17.32	4.51	8.10	17.90	25.01	25.30	18.90	22.30	25.00	20.77	23.29	232.00
Pallivasal	12.90	12.20	11.90	12.65	11.43	12.61	12.87	12.40	9.99	9.87	10.61	13.28	142.71
Kuttiady	47.65	44.50	39.60	72.30	80.40	66.40	54.40	30.40	28.80	32.20	28.90	43.60	569.15
Panniar	12.00	8.90	9.10	19.80	20.04	19.60	19.60	18.25	12.80	11.12	8.48	11.52	171.21
NMGM & NES	18.80	17.23	36.60	47.60	46.50	48.80	48.64	37.50	22.96	13.93	13.71	17.16	369.43
L.Periyar	20.20	22.40	50.70	92.40	104.50	60.60	56.60	49.90	26.89	15.90	14.50	16.77	531.36
Poringal	1.66	9.01	14.40	17.80	20.01	18.94	19.80	17.63	2.25	2.35	3.28	3.10	130.23
PLBE	7.98	0.56	10.62	10.90	11.01	10.02	11.03	10.20	7.20	7.68	7.51	9.94	104.65
Sengulam	11.01	11.80	12.08	16.20	16.00	15.89	12.24	12.65	11.41	10.21	9.03	10.76	149.28
Kakkad	22.80	23.96	14.04	15.44	12.90	16.98	16.36	16.98	16.40	15.82	12.50	15.56	199.74
Kallada	4.93	3.91	3.02	5.59	6.79	5.07	4.01	4.38	5.18	2.40	3.41	6.02	54.73
Peppara	0.26	0.12	0.22	0.53	0.55	0.63	0.90	0.79	0.63	0.52	0.41	0.26	5.82
Madupetty	0.62	0.63	0.17	0.00	0.03	0.25	0.13	0.10	0.18	0.26	0.31	0.69	3.37
Chembukadav	0.00	0.00	1.80	3.11	2.27	1.38	1.48	0.70	0.54	0.51	0.51	0.00	12.31
Malampuzha	0.00	0.00	0.00	0.00	0.28	0.13	0.08	0.21	0.53	0.44	0.10	0.00	1.77
URUMI	0.00	0.00	1.94	3.12	2.44	1.46	1.45	0.59	0.55	0.51	0.51	0.00	12.57
Malankara	3.29	2.96	2.96	3.08	2.88	2.69	2.92	2.35	2.03	2.19	2.27	3.14	32.76
L. Meenmutty	0.05	0.35	0.81	0.65	0.61	0.60	0.64	0.67	0.43	0.21	0.17	0.05	5.22
Ktdy.tail race	0.74	0.65	0.69	1.09	1.04	0.83	0.79	0.53	0.55	0.59	0.61	0.79	8.90
Poozhithode	0.00	0.05	1.98	3.09	2.47	1.71	1.60	0.69	0.57	0.52	0.49	0.00	13.17
Ranni-Perunad	0.52	0.63	0.78	0.84	0.71	0.64	0.56	0.45	0.30	0.41	0.38	0.61	6.83
Peechi	0.09	0.00	0.00	0.02	0.17	0.07	0.06	0.10	0.29	0.16	0.24	0.16	1.38
Vilangad	0.08	0.10	1.48	3.49	3.63	2.40	2.17	1.07	0.85	0.69	0.63	0.11	16.69
Chimmini	0.29	0.16	0.73	1.13	1.13	0.74	0.55	0.67	0.61	0.79	0.80	0.65	8.25
Adiyanpara	0.00	0.03	0.31	0.76	1.14	0.72	0.23	0.18	0.08	0.01	0.00	0.00	3.48
Vellathuval	0.31	0.33	1.20	0.79	1.10	0.74	0.49	0.22	0.17	0.20	0.19	0.29	6.03
Barapole	2.67	2.06	1.54	2.75	3.71	4.06	2.72	1.52	1.07	1.97	1.90	1.58	27.55
Perunthenaruvi	0.03	0.73	1.28	1.51	0.91	0.48	0.48	0.95	0.47	0.28	0.30	0.03	7.44
BDPP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KDPP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wind mill	0.09	0.18	0.16	0.13	0.13	0.09	0.07	0.06	0.09	0.12	0.11	0.13	1.37
Ongoing Hydel	11.74	11.68	11.05	11.87	11.26	11.79	29.86	29.71	29.70	29.64	29.74	29.98	248.06
Solar KSEB	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	47.60
Total	693.06	678.95	479.63	548.56	585.97	569.43	573.62	506.63	476.09	504.39	539.78	763.71	6919.83

Annexure G6: Generation from ongoing Solar Projects (MU)													
Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
2018-19	0.8308	0.7196	0.3813	0.3695	0.3523	1.0129	1.044491	1.305804	1.333721	2.263952	2.089743	2.786577	14.49069
2019-20	3.01	1.90	1.29	1.04	1.53	1.28	1.93	1.76	1.77	2.21	2.17	2.68	22.57
2020-21	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	47.59508
2021-22	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	3.966257	47.59508

Annexure G7 - Auxiliary Consumption									
Stations	Type of station		2019-20			2020-21		2021-22	
	surface hydro /underground	Excitation system	Aux Consp as per norms (%)	Anticipated energy (MU)	Aux as per norms (MU)	Anticipated energy (MU)	Aux as per norms (MU)	Anticipated energy (MU)	Aux as per norms (MU)
Kuttiady+KES	surface hydro	rotating	0.7	614.949	4.304643	606.12	4.24284	569.15	3.98405
Poringal	surface hydro	brushless	1	107.9417	1.079417	135.1264	1.351264	130.2317	1.302317
PLBE	surface hydro	brushless	1	99.04811	0.990481	108.01	1.0801	104.6503	1.046503
Sholayar	surface hydro	brushless	1	231.3476	2.313476	232.0004	2.320004	232.0004	2.320004
EDMR	surface hydro	static	1	309.6503	3.096503	334.7519	3.347519	335.23	3.3523
Pallivasal	surface hydro	brushless	1	143.4877	1.434877	141.5024	1.415024	142.7124	1.427124
Sengulam	surface hydro	static	1	150.8022	1.508022	153.2735	1.532735	149.2835	1.492835
Panniar	surface hydro	static	1	154.774	1.54774	175.5525	1.755525	171.2125	1.712125
NLM	surface hydro	static	1	327.9263	3.279263	377.0198	3.770198	369.4298	3.694298
LP	surface hydro	static	1	439.0266	4.390266	549.254	5.49254	531.358	5.31358
Idukki	underground	static	1.2	2311.84	27.74208	2163.16	25.95792	2201.5	26.418
Sabarigiri	surface hydro	static	1	1247.05	12.4705	1219.46	12.1946	1257.34	12.5734
Kakkad	surface hydro	rotating	0.7	186.5827	1.306079	202.1512	1.415058	199.7412	1.398188
Kallada	surface hydro	static	1	38.33176	0.383318	50.81681	0.508168	54.72703	0.54727
Peppara	surface hydro	static	1	5.725991	0.05726	5.257831	0.052578	5.817951	0.05818
Madupetty	surface hydro	static	1	2.895619	0.028956	3.366487	0.033665	3.373995	0.03374
Chembukadav	surface hydro	static	1	7.004372	0.070044	11.17883	0.111788	12.30547	0.123055
Malampuzha	surface hydro	static	1	2.655347	0.026553	1.715409	0.017154	1.76599	0.01766
Urumi	surface hydro	static	1	12.18216	0.121822	11.33713	0.113371	12.56937	0.125694
Malankara	surface hydro	static	1	28.93958	0.289396	31.47764	0.314776	32.75803	0.32758
Lower Meenmutty	surface hydro	static	1	4.650462	0.046505	5.04015	0.050402	5.223493	0.052235
Ktdy. tail race	surface hydro	static	1	6.006984	0.06007	8.343492	0.083435	8.902074	0.089021
Poozhithode	surface hydro	static	1	6.415536	0.064155	11.83713	0.118371	13.16543	0.131654
Ranni-Perunadu	surface hydro	static	1	6.338098	0.063381	6.640708	0.066407	6.829647	0.068296
Peechi	surface hydro	static	1	1.970954	0.01971	1.310198	0.013102	1.376721	0.013767
Vilangad	surface hydro	static	1	16.06328	0.160633	15.14513	0.151451	16.69496	0.16695
Chimini	surface hydro	static	1	4.291149	0.042911	7.197399	0.071974	8.249738	0.082497
Adiyanpara	surface hydro	static	1	2.857132	0.028571	3.076822	0.030768	3.481686	0.034817
Vellathuval	surface hydro	static	1	0.45978	0.004598	9.757084	0.097571	6.030102	0.060301
Barapole	surface hydro	static	1	28.96594	0.289659	27.54621	0.275462	27.54621	0.275462
Perunthenaruvi	surface hydro	static	1	10.72507	0.107251	5.807387	0.058074	7.438775	0.074388
Existing HYDRO Total			1	6510.905	67.32814	6614.234	68.04385	6622.096	68.31729
Ongoing Hydro			1	5.612	0.05612	93.596	0.93596	248.06	2.4806
Total Hydro				6516.517	67.38426	6707.83	68.97981	6870.156	70.79789
Net Existing Hydro				6449.133129		6638.850057		6799.358505	

**MID TERM PERFORMANCE REVIEW OF SBU-T FOR
2019-20 & REVISED ESTIMATE FOR 2020-21 & 2021-22**

CHAPTER 8 MID TERM PERFORMANCE REVIEW OF SBU-T FOR THE YEAR 2019-20

8.1 INTRODUCTION

- 8.1.1 The Strategic Business Unit – Transmission of KSEBL performs functions of the State Transmission Utility, to ensure development of an efficient, coordinated and economical system of intra-state transmission lines for smooth flow of electricity from generating station to the load centers. The second transfer scheme entrusts the responsibility on the STU to develop and execute long term plans for evacuation and supply of power at voltages of and above 33KV, in consultation and co-ordination with the other SBUs and under the policy framework developed by KSEBL. SBU-T is also carrying out the functions of State Load Despatch Centre, as provided in Part-II of Schedule-A1 of the second Transfer scheme. The SBU-T handles the total energy sold to consumers and licensees within the state, power drawn by open access consumers and the small quantum of energy sold outside the state.
- 8.1.2 As per the second Transfer Scheme, all assets of voltage level of 66KV and above is assigned to SBU-Transmission. At the same time, SBU-T is entrusted with the construction of 33KV and above system.
- 8.1.3 SBU-T had submitted before Hon'ble Commission a detailed CIP and MYT ARR petition before Hon'ble Commission on October 30th, 2018. As per Regulation 10(2) of the KSERC(Terms and Conditions for determination of Tariff) Regulations, 2018 issued by Hon'ble Commission, every generating business/company or transmission business/licensee or distribution business/licensee or State Load Despatch Centre shall file, on or before the Thirtieth day of November 2019, the Mid-term Performance Review (MPR) which shall comprise the truing up for the financial year upto 2018-19 and midyear performance review for the year 2019-20 and the revised forecast for the year 2020-21 and 2021-22 on account of unexpected variations if any on controllable and uncontrollable parameters.
- 8.1.4 Accordingly the mid year performance review for the year 2019-20 and the revised forecast for the years 2020-21 and 2021-22 of SBU-T are furnished in this chapter.

8.2. Transmission System Statistics

- 8.2.1 The voltage level wise capacity of Transmission system and number of substations and transmission lines as on 31st March, 2019 and the addition to transmission system during the half year period i.e. as on 30-9-2019 in the State is summarized below:

Table 8.1 Transmission System statistics				
No	Item	Unit	As on 31-3-2019	As on 30-9-2019
1	400 kV Lines	Ckt-km	855.96*	947.96**
2	220 kV Lines	Ckt-km	2855.98	2910.98
3	110 kV Lines	Ckt-km	4662.28	4803.28
4	66 kV Lines	Ckt-km	2134.44	2100.64
5	33KV lines	Ckt-km	2006.54	2082.69
6	400 kV Substations	Nos	5* + 1	5* + 1
7	220 kV Substations	Nos	22	22
8	110 kV Substations	Nos	157	162
9	66KV Substations	Nos	74	70
10	33 KV Substations	Nos	153	158
11	Total transmission capacity (MVA)	MVA	20820.90	20933.40
*PGCIL owned **Madakkathara-Malaparambu 400KV line addition				

8.3 Details of Transmission assets added up to September 2019

8.3.1 The details of transmission assets added during the half year of 2019-20 are tabulated below:

Table 8.2 Substations and Lines Commissioned up to 30-9-2019			
Sl. No	Name of Substation	Voltage level (kV)	New / Upgn.
1	Olavakkode	33	New
2	Eramallur	110	New
3	Enathu	66	New
4	Cherai	110	New
5	Vydyuthi Bhavan	33	New
6	Sreekantapuram	110	upgn
7	Kelakom	33	New
8	Kodungallur	110	upgn
9	Vandanmedu	33	New
10	Mala	110	upgn
Lines commissioned			
Sl. No	Name of Line	Voltage level (kV)	
1	Tap line to Cherai	110	
2	Medical College-Vydyuthi Bhavanam UG cable	33	
3	Madakkathara -Malaparamba	400 (92 km)	
4	Madakkathara – Malaparamba	220KV (46km)	
5	Karukadam-Kothamangalam	220KV (9 km)	
6	LILo Kanhirode- Sreekandapuram	110KV (12.5 km)	
7	LILo Aroor- Eramallur	110KV (0.5 km)	
8	Chalakudy-Kodungallur	110KV (43 km)	
9	Parassala-Neyattinkara	110KV (11 km)	
10	Kaniambetta – Kuthumunda	110KV (12.8 km)	
11	Adoor-Enathu	66KV (11.4 km)	
12	Venakkara-Olavakkode	33KV (8 km)	
13	Nedumkandan – Vadunedu	33KV (21 km)	
14	Santhinagar - Pookothupadam	33KV (10 km)	
Capacity Addition			
Sl. No	Name of Substation	Voltage level (kV)	
1	110 kV Substation, Panoor	110/33	
2	33 kV Substation, Melady	33/11	
3	33 kV Substation, Venjarammoodu	33/11	
4	33 kV Substation, Kadakkavoor	33/11	
5	33 kV Substation, Kadakkavoor	33/11	
6	33 kV Substation, Kacheri, Attingal	33/11	
7	33 kV Substation, Poovar	33/11	
8	110 kV Substation, Medical College	110/33	

8.4. Capital expenditure and Capitalization

8.4.1 SBU-T had submitted before Hon'ble Commission a detailed Capital Investment Plan for the control period along with the MYT petition filed on 30th October 2018. The capital addition provisionally approved for the years 2019-20, 2020-21 and 2021-22 vide the order dated 8-7-2019 is submitted below:

Table 8.3 Total GFA addition provisionally approved of SBU-T for 2019-20, 2020-21 & 2021-22 (Rs Cr)							
Name of Work		2019-20		2020-21		2021-22	
		Claimed	Approved	Claimed	Approved	Claimed	Approved
1	Ongoing projects plus new small works	568.73	312.80	196.28	20.00	254.26	0.00
2	New Capital Works above 10Cr	662.59	353.74	421.83	150.92	41.65	141.80
3	Transgrid Works	362.57	362.57	2073.84	1244.84	260.96	260.96
Total		1593.89	1029.11	2691.95	1415.76	556.87	402.76

The status of the above works as on 30-9-2019 along with the physical progress is submitted below.

8.5 Status of Ongoing projects & new projects (w/o DPR)

- 8.5.1 KSEBL in the MYT petition had submitted a list of capital works having project cost less than Rs.10Cr and some new projects for which DPR were under preparation under various Transmission Circles of KSEBL. The status of these works as on 30-9-2019 is enclosed as **Appendix 1**.
- 8.5.2 Many projects planned in 2018-19 could not be completed in 2018-19 due to flood that affected the State during 2018-19. The commissioning of these projects extended to 2019-20 and is expected that these projects will be commissioned in 2019-20. The GFA addition in the year 2018-19 was less compared to that estimated in the ARR. The revised GFA addition for the year 2019-20 is more than that estimated in the ARR due to carry over of commissioning of assets originally planned for 2018-19. The details of works planned under various transmission circles as above for the year 2019-20 and their status as on 30-9-2019 is detailed under Appendix 1. The revised GFA addition on account of ongoing and new small works for the years 2019-20, 2020-21 and 2021-22 are given below.

Table 8.4 GFA addition – Ongoing and New projects less than 10Cr									
	2019-20			2020-21			2021-22		
In Area under	Estimated in ARR (Rs.Cr.)	Provisionally approved (Rs.Cr.)	Revised estimate (Rs.Cr.)	Estimated in ARR (Rs.Cr.)	Provisionally approved (Rs.Cr.)	Revised estimate (Rs.Cr.)	Estimated in ARR (Rs.Cr.)	Provisionally approved (Rs.Cr.)	Revised estimate (Rs.Cr.)
Total Ongoing + New works	568.73	312.80	724.09	196.28	20.00	201.44	254.26	0	77.47

8.6 Status of Normal works (above 10Cr) planned in the control period

- 8.6.1 About 40 new capital works were proposed for the control period exceeding Rs.10 Crore, for which DPR were prepared and submitted before Hon'ble Commission. The project 'Reliable Communication & Data acquisition' submitted in the original CIP under 'SLDC Works' is shifted to works under 'SBU-T' as the asset addition through this project comes under various transmission substations. The status of normal works as on 30-9-2019 is submitted below.

Table 8.5 NORMAL WORKS (STATUS AS ON 30-9-2019)					
	Name of Work	Target CoD	Physical (%)	Revised CoD	Remarks
1	110 KV DC 220 KV S/S, Palakkad-Malampuzha	2019-20	0%	2020-21	Work awarded and agreement executed
2	New 220kV Substation at Kottayi	2021-22			Project dropped due to land availability issues
3	110kV GIS in 110kV Substation, Vennakkara	2019-20	80%	2020-21	80% completed
4	New 110KV S/S Pattambi 110 kV Shornur- Malapparamba D/c feeder	2019-20	0%	2020-21	Land purchased and registration done on 21-3-2019. Site levelling and construction of retaining wall progressing. Line work will be tendered soon.
5	66 kV S/S Chandranagar in 110 kV 110 kV Kanjikode - Chandranagar D/c 110 kV Chandranagar - Vennakkara D/c	2019-20	0%	2020-21	Scheme modified as LILO arrangement from PVKN feeder. (The work is only Rs.4 Cr now and therefore is included in the list of small works less than Rs.10Cr)
6	110 kV Substation, Mannuthy LILO 110 kV Madakkathara - Ollur D/c	2019-20	0%	2020-21	Alterations in the scheme with 2 numbers of 12.5MVA T/F replaced with 1 no. 12.5MVA T/F. Also GIS Substation is replaced with AIS. Revised DPR enclosed.

7	Upgradation 66kV Pudukkad – Kattoor SC & construction 2 Nos. 110kV bays at Pudukkad S/S	2020-21	0%	2020-21	Work tendered. Delay in tendering occurred due to litigation and court cases.
8	Upgradation of Viyyur -Ollur 66kV line	2020-21	0%	2020-21	Pre construction works progressing.
9	Upgradation Pallom - Ettumanoor 66 kV S/c	2020-21	0%	2021-22	Preconstruction works progressing.
	Upgradation 66 kV S/S Gandhinagar to 110 kV		0%		
	Upgradation of 66 kV S/S Kottayam to 110 kV		0%		
10	Upgradation 66 kV Koothattukulam - Kuravilangadu & 66kV Kuravilangad S/S	2019-20	0%	2021-22	Preconstruction works progressing.
11	Upgradation 66 kV Kothamangalam - Koothattukulam S/c to 110 kV D/c.	2019-20	54%	2020-21	54% work completed. Stub setting at 56 locations completed, line survey and tower schedule approval completed, 12 numbers of towers erected.
12	Up-gradation of 66kV S/S Koothattukulam to 110kV-vaikom	2019-20	32%	2020-21	Construction of control room 50% completed, site levelling and construction of retaining wall – 99% completed. Overall 32% work completed.
13	66 kV SC Pala-Ettumanoor to 110 kV DC and construction of feeder bays at 110 kV S/S, Pala	2019-20	12%	2020-21	Overall 12% completed.
14	Upgradation of 66kV S/S Ettumanoor to 110kV	2019-20	6%	2020-21	S/S design changed to GIS and will be executed by TRANSGRID. Scope of this work is limited to installation of Transformers. Work in progress.
15	110 kV S/S, Vazhoor	2020-21	0%	2021-22	Land identified. In contact with Revenue authorities for getting land.
16	110 kV GIS substation, Kowdiar	2019-20	0%	2021-22	Land to be identified.
17	Upgradation of 66 kV S/S Palode to 110 kV	2019-20	0%	2021-22	Pre-construction work in progress
18	Upgradation of TVT No: 1 and 2 feeders.	2020-21	40%	2021-22	First phase Parassala – Neyyattinkara portion work completed.
					Second phase: Thirumala-Neyyattinkara portion work in progress.
					Third phase: Paruthippara-Thirumala portion : Pre-construction work in progress.
19	110 kV switching cum S/S at Panthalacode with 8 feeder bays & 2T/F bays and erecting 2 x 12.5 MVA, 110/11 kV T/F	2020-21	0%	2021-22	Land finalized.
20	110 kV S/S, Chithara LILO of 110 kV Edamon - Paruthippara to 110 kV S/S Chithara	2019-20	0%	2021-22	Land acquisition procedures in progress.
21	110 kV GIS Kollam - Kottiyam (SC, UG cable)	2019-20	0%	2021-22	Pre construction work in progress.
22	66kV S/S Anchal to 110kV with 2 nos, 110/11kV, 12.5MVA T/F and upgradation of 66kV SC Edamon- Ayoor to 110kV DC line	2019-20	60%	2019-20	Work in progress. 60% completed.
23	66kV S/S, Karunagappally to 110kV and upgradation of line from 110kV S/S, Sasthamcotta to 66kV S/S, Karunagapally	2019-20	35%	2020-21	Work in progress. 35% completed.
24	110 kV Kayamkulam -Karunagapally D/c	2021-22	0%	2021-22	Pre-construction work in progress
25	66 kV S/S Kuttanad to 110 Kv, Poopally-Kuttanad portion of 66kV Kuttanad - Alappuzha S/c feeder to 110 kV D/c	2020-21	0%	2021-22	Tendering stage
26	66 kV Punnappa -Alappuzha DC to 110 kV DC	2020-21	0%	2021-22	Pre-construction work in progress
27	110 kV Substation, Seethangoli	2019-20	S/S: 0%	2021-22	Land to be obtained.
	LILO of 110 kV Vidyannagar - Kubanoor to 110 kV S/s Seethangoli		Line : 0%		
28	110 kV GIS Substation, Malappuram	2020-21			Project not to be included in this control period
29	110 kV Chemberi	2019-20	S/S: 30%	2019-20	Substation work 30% completed.
			Line : 43%		Line work : 43% completed
30	Ambalathara Solarpark	2019-20	S/s: 93%	2020-21	Substation work 93% completed.
			Line: 57%		Line work : 57% completed
31	33 kV S/S Thambalamanna to 110 kV	2019-20	65%	2019-20	65% work completed.

	110 kV Agasthiamuzhy -Thambalamanna				
32	66 kV Substation Kuthumunda to 110 kV	2019-20	70%	2019-20	Line upgradation completed.
33	66 kV Substation Mankada to 110 kV	2019-20	10%	2020-21	Work started
	110 kV D/c line Valambur -Elachola, 66 kV Malappuram - Mankada S/c feeder to 110 kV D/c				
34	66 kV Kaniyampetta-Sulthanbattery feeder to 110 kV LILO-ing to 110 kV S/s Ambalavayal	2019-20	63%	2019-20	63% of work completed
35	LILO of 110 kV Nallalam - Kizhissery feeder to proposed 110 kV S/s Pulikkal	2019-20	0%	2021-22	Land identified.
36	110 kV Tirur - Parappanangadi D/c feeder	2020-21	5%	2020-21	Preliminary profile survey 75% completed.
37	110 kV Mylatty -Vidyanagar S/c line to 110/220 kV MCMV line	2019-20	S/S: 0%, Line : 2%	2020-21	Work awarded and in progress
38	Doubling 66 kV Kunnamangalam - Thamarassery in 110 kV parameters	2019-20	0%	2021-22	Alternate scheme evolved with substation also included. Revised DPR included.
39	Methottuthazham - Mankavu portion of 66 kV Nallalam - Kuttikkattoor S/c line to 110 kV D/c	2019-20	30%	2019-20	Work in progress. 30% completed.
40	LILO of 110 kV Tirur- Kuttipuram, Edappal - Kuttipuram & Tirur- Ponnani to 110 kV S/S Vengaloor	2020-21	0%	2020-21	Sanction received from KIIFB. Land acquisition in progress. Line work tendered. Tender evaluation progressing.
41	Reliable Communication & Data Acquisition	2021-22	10%	2021-22	Work under process. Revised DPR attached.

8.6.2 It is humbly submitted that for many works, the progress was not upto the target due to land availability issues and floods that affected the State during 2018-19. Following revisions in the already submitted plan are made:

8.7 Charging of 66 kV Substation Chandranagar in 110 kV, 110 kV Kanjikode - Chandranagar D/c feeder, 110 kV Chandranagar - Vennakkara D/c Feeder

8.7.1 DPR submitted was for the upgradation of Sub Station by constructing 14.5KMS 110 KV DC line from Kanjikode to Vennakkara via Palakkad Medical College 66 KV Sub Station using the ROW of existing decommissioned Palakkad-Madukkara 66kv Single circuit line and Vennakkara - Kozhinjampara decommissioned line. But with the proposed 110KV GIS at Vennakkara, there is no need for this proposal. Hence the DPR is revised with 110KV GIS at Vennakkara with LILO arrangement in PVKN feeder. The estimated cost of the project is Rs 4 Cr and is expected to be commissioned by 2020-21. A comparison of the original proposal and revised proposal is submitted below.

Table 8.6 comparison of the original and revised proposal (Rs.Cr.)					
As per ARR			Revised proposal		
Description of work	CoD	Cost	Description of work	CoD	Cost
Upgrading 66 kV S/S Chandranagar to 110 kV	2019-20	23.10	110KV GIS S/S, Vennakkara	2020-21	4
110 kV Kanjikode - Chandranagar D/c line					
110 kV Chandranagar - Vennakkara D/c line					

8.8 Construction of 110 kV Substation, Mannuthy and LILO of one circuit of 110 kV Madakkathara - Ollur D/c feeder to 110 kV Substation Mannuthy

8.8.1 This proposal is for construction of 110kV AIS substation at Kerala Veterinary and Animal Science University Campus, Mannuthy,Thrissur by installing one No. 110/11kV, 12.5MVA transformers and drawing 0.06km new 110kV DC line from Madakkathara- Kodakara feeder as LILO arrangements. This proposal is a revision of the earlier proposal of providing GIS substation at Mannuthy. GIS substation was proposed earlier anticipating land availability issues. Since

sufficient land is obtained for the project, the proposal is revised with AIS. The estimated cost of the AIS project is Rs 11.60 Cr and is expected to be commissioned by 2020-21.

Table 8.7 Comparison of ARR and revised proposal (Rs.Cr.)					
As per ARR			Revised proposal		
Description of work	CoD	Cost	Description of work	CoD	Cost
110KV GIS Substation at Mannuthy	2019-20	26.30	110KV AIS S/S, Mannuthy	2020-21	11.60

8.9 Upgradation of 66KV S/S, Thamarassery and 66 kV Kunnamangalam - Thamarassery line

- 8.9.1 The original project was only for doubling of 66KV Kunnamangalam-Thamarassery line in 110KV parameters. The project is revised by including upgradation of 66kV Substation, Thamarassery to 110kV.
- 8.9.2 The present installed capacity of Thamarassery substation is 20MVA (Two 66/11kV transformers of capacity 10MVA each). Now the peak load demand of this station comes to nearly 15MVA and hence the upgradation to 110kV substation is proposed. Also this feeder extends another 19.278 km to Kuthumunda 66kV(KU-TM) substation for interconnection. The peak load of this feeder when it feeds Thamarassery Substation alone is 110A , when it extends up to Kuthumunda substation the load will increase to a range of 120-180A . Existing line capacity will not be adequate as far as present load condition and future load growth is considered. Also the replacement of existing conductor with ACSR Wolf will improve the tensile strength of the feeder as well as reduce transmission loss. Moreover, the line passes through residential and hilly areas of Thamarassery, Koduvally and Kunnamangalam villages. Lot of land development / construction works are being carried out in these areas and statutory clearance has been seriously violated in many sites due to earth filling activities. Hence the line has to be raised for obtaining sufficient ground clearance which is very urgent as far as safety aspect is considered.
- 8.9.3 With the commissioning of the upgraded 66 kV Kunnamangalam –Thamarassery feeder , another 110kV connectivity can be materialized for meeting the increased power evacuation requirement and load demand of Thamarassery Substation. The proposed project envisages
1. Constructing new Substation in 110kV standard near the existing 66kV yard in Thamarassery substation and installing 2nos of 12.5MVA transformers and associated equipments and then dismantling the existing 66kV substation and equipments.
 2. Conversion of Existing 66KV SC Kunnamangalam- Thamarassery Feeder (17.7km) to 110KV DC Feeder.
- 8.9.4 The estimated cost of the project is Rs 38.15 Cr and is expected to be commissioned by 2021-22.

Table 8.8 Comparison of ARR and revised proposal (Rs.Cr.)					
As per ARR			Revised proposal		
Description of work	CoD	Cost	Description of work	CoD	Cost
Doubling of 66KV Kunnamangalam-Thamarassery line in 110KV parameters.	2019-20	18.06	Upgradation of 66KV S/S, Thamarassery and 66 kV Kunnamangalam - Thamarassery line	2021-22	38.15

8.10 Reliable Communication and Data Acquisition System.

8.10.1 The proposal was submitted before Hon'ble Commission along with the original CIP submitted on October 30, 2018 along with the DPR. The original estimate was Rs. 212.45 Crore. Now the estimate is revised limiting the expenditure to present requirement and giving price escalation considering present market price of various equipments and for accommodating additional cost for supporting KFON project of Government of Kerala by providing 48 cores instead of 24 core OPGW. AS per the revised estimate the total project cost will be Rs.175.20 Crore of which, 42% of the project cost is available as PSDF grant. The project is expected for commissioning by 2021-22. The project was included under SLDC works in the original ARR CIP. However, the works coming under this scheme belong to Transmission and therefore the work is shifted from SLDC head to Transmission head.

Table 8.9 Comparison of ARR and revised proposal (Rs.Cr.)					
As per ARR			Revised proposal		
Description of work	CoD	Cost	Description of work	CoD	Cost
Reliable Communication and Data Acquisition system (under SLDC Capital works)	2019-20	212.45	Reliable Communication and Data Acquisition system (under SBU-T capital works)	2021-22	175.20

8.11 Up gradation of 66KV substation, Ettumanoor to 110KV

8.11.1 The project was originally estimated at a cost of Rs.20.80 Cr and expected for commissioning by 2019-20. However, a large portion of the work is shifted to Transgrid and therefore the project cost has come down to Rs.6.67 Cr and revised CoD as 2020-21.

Table 8.10 Comparison of ARR and revised proposal (Rs.Cr.)					
As per ARR			Revised proposal		
Description of work	CoD	Cost	Description of work	CoD	Cost
Upgradation of 66KV Substation, Ettumanoor to 110KV	2019-20	20.80	Upgradation of 66KV Substation, Ettumanoor to 110KV	2020-21	6.67

8.12 Renovation & Modernization of 110KV GIS Substation, Malappuram

8.12.1 The project was planned for an amount of Rs. 62.02 Cr as GIS with expected CoD in 2020-21. The GIS Substation was planned due to limitation in land availability in that area. Considering the high cost of GIS, it was decided to explore possibility of AIS using alternate scheme. Therefore, the execution of the project is shifted to next control period.

Table 8.11 Comparison of ARR and revised proposal (Rs.Cr.)				
As per ARR			Revised proposal	
Description of work	CoD	Cost (Rs.Cr.)	Description of work	CoD
Renovation & Modernization of 110KV GIS Substation, Malappuram	2020-21	62.02	Renovation & Modernization of 110KV GIS Substation, Malappuram	Next control period

8.13 Construction of 110KV GIS Substation, Vengaloor

8.13.1 The project was planned for an amount of Rs. 46.39 Cr with expected CoD in 2020-21. The execution of the project is shifted to Transgrid as “Vengallur GIS & TLSP Phase II” Package. The project proposal is revised considering the requirement for 220kV transmission line and 220kV Substation at Vengallur in the Malappuram district.

Table 8.12 Comparison of ARR and revised proposal (Rs.Cr.)				
As per ARR			Revised proposal	
Description of work	CoD	Cost	Description of work	Status
Construction of 110KV GIS S/S, Vengaloor	2020-21	46.39	Construction of 110KV GIS S/S, Vengaloor	Shifted to Transgrid

8.14 220KV Substation, Kottayi

8.14.1 The project was originally envisaged for an amount of Rs.66 Cr with expected CoD in 2020-21. However, this project is dropped due to land availability issues. The scheme has been included in the Transgrid scheme under the project of 220KV S/S Venakkara.

Table 8.13 Comparison of ARR and revised proposal (Rs.Cr)				
As per ARR			Revised proposal	
Description of work	CoD	Cost	Status	
Construction of 220KV S/S, Kottayi	2020-21	66	Dropped	

8.14.2 The details of capital outlay in the 4 years of the control period for the capital works under this head as per the original estimate in the ARR and revised estimate are submitted below. Minor cost variations between that estimated in the ARR and the revised claim for some capital works are due to the change in employee related cost due to re-scheduling of work. The reason for major variations, if any, is mentioned along with each item of work. It is humbly requested that Hon’ble Commission may approve the revised schedule and cost of these capital works.

Table 8.14 Normal works above Rs.10 Cr -Capital Outlay (Amount in Rs. Cr)											
No.	Project	As per ARR					Revised				
		Project cost (Rs.Cr.)	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	Total
1	110kV Kanhangad – Cheruvathuer to 220kV S/s Ambalathara	36.06	30	6.06			2	30.45	5.51		37.96
2	Upgradation of 66kV Palakkad Medical College S/S and line (Revised DPR)	23.1	4	19.1					0		0
3	110 kV GIS Project Vennakkara	44.6	5	39.6				22.3	22.3		44.6
4	Construction of Palakkad-Malampuzha 110kV Line	14.38	4.38	10				4.38	10		14.38
5	110kV Substation Pattambi	25.5	5	20.5			5	10.3	10.2		25.5
6	Mannuthy 110 kV Project (Revised by AIS instead of GIS)	26.3	6.3	20				2.9	8.7		11.6
7	Upgradation 66kV S/S Ettumanoor to 110kV (Large portion of the work shifted to Transgrid)	20.80	8	12.8			0.67	2	4		6.67
8	Upgradation 66kV S/S, Kuravilangadu and Koothattukulam-Kuravilangadu to 110 kV	21.65	6.65	15			0	0	14	7.65	21.65

9	Upgradation 66kV S/S Koothattukulam	15.01	6	9.01			3.4	1.5	8.37		13.27
10	Upgradation of 66kV Kothamangalam- Kothttukulam	14.67	4.67	10			4.15	11	1		16.15
11	Upgradation of 66kV SC Pala-Ettumanoor	15.75	3	12.75			0	10.75	5		15.75
12	Upgradation of 66kV S/S Anchal & 66kV SC Edamon –Anchal-Ayur line (Revised based on amount in LoA)	42.66	29.86	12.8			8.28	20.57			28.85
13	Up gradation of 66kV S/S, Karunagappally & 66kV SC Sasthamcotta-Karunagappally line	18.20	12.74	5.46			1.92	10.51	4.07		16.5
14	Construction of 110kV Substation, Chithara	12.27	3.68	8.59					3.68	8.59	12.27
15	Interlinking 110kV GIS S/S, Kollam & Kottiyam S/S	63.23	12.65	50.58					12.65	50.58	63.23
16	110kV GIS S/S at Kowdiar, Thiruvananthapuram	34.93		34.93						34.93	34.93
17	Upgradation of 66kV Substation Palode to 110kV	18.45		18.45			0	0	9	10.75	19.75
18	66kV S/S, Ambalavayal & 66kV DC line from 66kV Kaniyambetta-Sulthanbathery	13.49	5	8.49			4.585	10.66			15.24
19	110kV Substation, Chemperi and line	27.77	14	13.77			0.73	29.24			29.97
20	Upgradation of Kunnamangalam _ Thamarasserry line to 110kV (Revised)	18.06	8.06	10				10.35	13.9	13.9	38.15
21	Upgradation of Kuthumunda to 110kV GIS	33.98	3.98	30			3.98	31.9			35.88
22	Upgradation of Mankada S/s to 110kV	14.65	4.65	10				5.58	10.16		15.75
23	Upgradation of 66kV S/S, Mankavu to 110kV	13.56	5.56	8			1.8	12.64			14.44
24	Upgradation of 110kV SC/DC line to 220/110kV MC MV line from Mylatty s/s to Vidyanagar	29.43	20	9.43			0	7.99	23.97		31.96
25	110kV Substation, Pulikkal	14.68	1.68	13					1.68	14.96	16.64
26	110kV Substation, Seethangoli	11.59	4.59	7			0	0	3.34	10.07	13.41
27	Upgradation of 33 kV S/S Thambalamanna & 110 kV Agasthamuzhy -Thambalamanna (S/c, UG cable)	39.02	18.02	20			18.02	21.88			39.9
28	220KV Substation Kottayi (dropped)	66	0.5	30.5	35		0	0	0	0	0
29	Upgradation of Pudukkad to Kattoor 66kV SC Line	13.91	1	7	5.91		1	7	5.91		13.91
30	Conversion of Ollur Viyyur feeder to 110 kV	16.72	0.72	7	9		0.72	7	9		16.72
31	Upgradation 66kV Pallom-Ettumanoor feeder & associated S/S to 110kV	69.54	9	35	25.54		0	0	30	31.4	61.4
32	Construction of 110kV substation Vazhoor	14.4	1	8	5.4		0	0	5.3	7	12.3
33	Upgradation of 66kV Substation Kuttanadu	15.16		7.58	7.58		0	0	10	4.2	14.2
34	Upgradation 66kV PUNNAPRA-ALAPPUZHA DC Feeder (Commisng shifted to next control period)	17.54		8.77	8.77		0	0	0	7.25	0
35	110kV Switching Cum S/S at PANTHALACODE	25.16		12.58	12.58		0	4	12	9.16	25.16
36	Upgradation of 66 kV TVT No. I & II feeders	60.03	18	30	12.03		4.24	12	30	13.79	60.03
37	R&M 110kV GIS S/S, Malappuram (shifted to next control period)	62.02	2.02	30	30		0	0	2	36	
38	LIO 110kV Edarikode- Tirur to Parappanangadi S/s	14.96	1.96	10	3		1.96	0.63	14.57		17.16
39	Construction 110kV GIS S/S, Vengaloor (shifted to Transgrid)	46.39	2	19.48	24.91		0	0	0	0	0
40	Construction of new 110kV DC line from Kayamkulam to Karunagappally	41.65		15.3	13.3	13.05	0	0	28.79	17.71	46.5

41	Reliable Communication and DA System						0	21	87	68	176
	Sub Total		263.67	656.33	193.02	13.05	62.46	308.53	406.11	345.94	1077.78
	PSDF funding for Reliable Communication project						0	22.13	44.26	7.38	73.77
	Net capital less PSDF funding (Rs.Cr.)						62.46	286.40	361.85	338.56	1004.01

8.14.4 In addition to the above, SBU-T submits along with this petition additional CIP for approval of Hon'ble Commission, wherein additional 13 works are also proposed for this control period. The details of these capital works are enclosed as **Appendix-2**. The DPRs of these 13 works are enclosed along with this petition. The abstract of these works along with their cash outflow is given below.

Table 8.15 CAPITAL OUTLAY OF ADDITIONAL NORMAL WORKS					
Outlay (Amount in Rs. Crores)					
No.	Project	2019-20	2020-21	2021-22	Total
		Rs.Cr.	Rs.Cr.	Rs.Cr.	Rs.Cr.
1	Construction of 110K/11kv Vengara S/S		18.26	9.98	28.24
2	Construction of 110KV S/s Adivaram	7.821	9.069		16.89
3	Construction 110 kV Substation, Kadampuzha		14.06	9.47	23.53
4	Upgradation of Mavelikara-Pallom 66KV DC	0.1	2.1	39.6	41.8
5	Construction of 110KV DC line from 66KV substation Kattappana to 66KV substation, Peerumedu		25	15.7	40.7
6	Upgradation of 66KV Sasthankotta-Chavara DC Line		10	11.85	21.85
7	Upgradation of 66KV Edappon-Kozhencherry SC line and associated bays	3.1	12.4	5.15	20.65
8	Construction of 110KV Substation, Thiruvalli	6.2	7.21		13.41
9	Construction of Thimiri substation		9	11.87	20.87
10	Construction of Munnar substation and associated lines	1	14	7.13	22.13
11	Kuthunkal-Nedumkandam		11	5	16
12	Aluva-Kothamangalam		20	22.49	42.49
13	110KV Substation Murickasery	0.01	8	3.5	11.6
	Total	18.23	160.10	141.74	320.16

8.14.5 The GFA addition on account of these works for the years 2019-20, 2020-21 and 2021-22 are given below.

Table 8.16 GFA addition-Normal works above Rs.10 Cr				
No.	Project	19-20	20-21	21-22
	GFA addition through works identified in MYT Petition (A)			
1	Linking between 110kv Kanhangad – Cheruvathuer feeder to 220kv S/s Ambalathara		37.96	
2	Upgradation of 66kv Palakkad Medical College Substation and line (Revised DPR)		0	
3	110 kV GIS Project Vennakkara		44.6	
4	Construction of Palakkad- Malampuzha 110kV Line		14.38	
5	110kV Substation Pattambi		25.5	
6	Mannuthy 110 kV Project (Revised)		11.6	
7	Upgradation of 66kv Substation Ettumanoor to 110kv (Large portion of the work shifted to Transgrid)		6.67	
8	Upgradation of 66kv Substation, Kuravilangadu and Koothattukulam-Kuravilangadu to 110 kV			21.65
9	Upgradation of 66kv Substation Koothattukulam to 110 kV		13.27	
10	Upgradation of 66KV Kothamangalam- Kotthttukulam Feeder to 110 KV		16.15	
11	Upgradation of 66kv SC Pala-Ettumanoor feeders to 110kv		15.75	
12	Upgradation of 66kv Substation Anchal to 110kv and Upgradation of 66kv SC Edamon –Anchal-Ayur line to 110kv DC	28.85		
13	Up gradation of 66kv Substation, Karunagappally and 66kv SC Sasthamcotta-Karunagapally line to 110kv DC		16.5	
14	Construction of 110kv Substation, Chithara			12.27

15	Interlinking 110kV GIS Substation, Kollam and 110kV Kottiyam Substation			63.23
16	110kV GIS substation at Kowdiar, Thiruvananthapuram			34.93
17	Upgradation of 66kV Substation Palode to 110kV			19.75
18	66kV Substation, Ambalavayal and 66kV DC line from 66kV Kaniyambetta-Sulthanbathery feeder in 110kV Parameters	15.242		0
19	110kV Substation, Chemperi and line	29.97		
20	Upgradation of Kunnamangalam _ Thamarasserry line to 110kV (Revised)			38.15
21	Upgradation of Kuthumunda to 110kV GIS	35.88		
22	Upgradation of Mankada S/s to 110kV		15.748	
23	Upgradation of 66kV Substation, Mankavu to 110kV	14.44		
24	Upgradation of 110kV SC/DC line to 220/110kV MC MV line from Mylatty s/s to Vidyanagar		31.96	
25	110kV Substation, Pulikkal			16.64
26	110kV Substation, Seethangoli			13.41
27	Upgradation of 33 kV Substation Thambalamanna to 110 kV & 110 kV Agasthiamuzhy -Thambalamanna (S/c, UG cable)	39.9		
28	220KV Substation Kottayi			
29	Upgradation of Pudukkad to Kattoor 66kV SC Line to 110kV DC Line		13.91	
30	Conversion of Ollur Viyyur feeder to 110 kV		16.72	
31	Upgradation of 66kV Pallom-Ettumanoor feeder and associated substations to 110kV			61.4
32	Construction of 110kV substation Vazhoor			12.3
33	Upgradation of 66kV Substation Kuttanadu to 110kV			14.2
34	Upgradation of 66kV PUNNAPRA-ALAPPUZHA DC Feeder to 110 kV (Commissioning shifted to next control period)			0
35	110kV Switching Cum Substation at PANTHALACODE			25.16
36	Upgradation of 66 kV TVT No. I & II feeders			60.03
37	Renovation and modernisation 110kV GIS Substation, Malappuram (shifted to next control period)			0
38	LILO on 110kV Edarikode- Tirur to Parappanangadi S/s		17.16	
39	Construction of 110kV GIS Substation , Vengaloor (shifted to Transgrid)			
40	Construction of new 110kV DC line from Kayamkulam to Karunagapally			46.5
41	Reliable Communication and Data Acquisition System			176
	Sub Total (A)	164.28	297.88	615.62
	PSDF funding for Reliable Communication project			73.77
	Net capital less PSDF funding (Rs.Cr.)	164.28	297.88	541.85
	GFA addition through new works submitted (B)			
1	Construction of 110K/11kv Vengara S/S			28.24
2	Construction of 110KV S/s Adivaram		16.89	
3	Construction 110 kV Substation, Kadampuzha			23.53
4	Upgradation of Mavelikara-Pallom 66KV DC			41.8
5	Construction of 110KV DC line from 66KV substation Kattappana to 66KV substation, Peerumedu			40.7
6	Upgradation of 66KV Sasthankotta-Chavara DC Line			21.85
7	Upgradation of 66KV Edappon-Kozhencherry SC line and associated bays			20.65
8	Construction of 110KV Substation, Thiruvalli		13.41	
9	Construction of Thimiri substation			20.87
10	Construction of Munnar substation and associated lines			22.13
11	Kuthunkal-Nedumkandam			16
12	Aluva-Kothamangalam			42.49
13	110KV Substation Murickasery			11.6
	Total (B)	0	30.3	289.86
	Grand Total (A)+(B)	164.28	328.18	905.48

8.14.6 A summary of the GFA addition for the years 2019-20, 2020-21 and 2021-22 due to normal works above Rs.10Cr under SBU-T are summarized below.

Table 8.17 GFA addition – Normal works above Rs.10Cr (Rs.Cr.)									
	2019-20			2020-21			2021-22		
In Area under	Estimated in ARR	Provisionally approved	Revised estimate	Estimated in ARR	Provisionally approved	Revised estimate	Estimated in ARR	Provisionally approved	Revised estimate
Normal works above Rs.10Cr	662.59	353.74	164.28	421.83	150.92	328.18	41.65	141.80	905.48
Total	662.59	353.74	164.28	421.83	150.92	328.18	41.65	354.25	905.48
Less: PSDF Grant	0	0	0	0	0	0	0	100	73.77
	662.59	353.74	164.28	421.83	150.92	328.18	41.65	254.25	831.71

8.15 STATUS OF TRANSGRID WORKS

8.15.1 SBU-T had submitted 12 numbers of capital works under 'Transgrid 2.0 scheme' proposed for the control period. The physical status as on 30-9-2019 of these works is submitted below.

Table 8.18 TRANSGRID WORKS (Status as on 30-9-2019)				
No	Name of Work	Original Target year	Revised target year	Status as on 30-9-2019
1	Kolathunadu	2021-22	2021-22	Work awarded and is in progress. Foundation 1/279 completed.
2	Chalakkudy	2020-21	2020-21	Chalakkudy 220kV S/S Work in progress. Overall Progress 22.75%. 220kV LILLO line to Chalakkudy – Work awarded & commenced.
3	NRHTLS	2019-20	2019-20	76% of work completed.
4	Thalasseri	2020-21	2021-22	1. 220kV GIS Thalassery S/S Work Awarded and commenced. 2. 220kV Line to Thalassery from Mundayad – Work commenced.
5	Eranad	2019-20	2019-20	Work is in progress. The portion between Madakkathara and Malaparamba charged. Overall progress-68.19%
6	Aluva	2019-20	2020-21	1. 200kV GIS Aluva is in progress. Overall progress – 16% . 2. 220kV Line to ALuva work in progress. Overall progress – 76%.
7	Kaloor	2019-20	2019-20	1. 200kV GIS Kaloor is in progress Overall progress-22%. 2. 220kV Line Kaloor :OH portion 65%. Cable portion – 30%.
8	Kottayam, Thuravur & Ettumanoor	2020-21	2020-21	1. 400kV GIS Kottayam – Tender Evaluation in progress. 2. 220kV Thuravur – Land Acquisition in progress and the project shifted to Phase II 3. 220kV Ettumanoor S/S –Work awarded and the drawing approvals in progress. 3. Lines to Kottayam, Thuravur and Ettumanoor – Work Commenced and is in progress.
9	Kothamangalam & Chithirapuram	2020-21	2020-21	1. Kothamangalam 220kV S/S – Work is in progress. Overall progress-33%. 2. 220kV Line to Kothamangalam – Pallivasal - Kothamangalam 220kV MCMV line- Overall progress- 65%, Karukudam Kothamangalam – 95% 3. Chithirapuram S/S – Work is in progress. Overall progress – 1%.
10	Kunnamangalam	2019-20	2020-21	200kV GIS Kunnamangalam is in progress. Official Date of completion 11/01/2020. Overall progress-9%. 2. 220kV Line to Kunnamangalam, the work awarded and is in progress.
11	Manjeri	2020-21	2019-20	Work is in progress and is expected to be completed by March 2020. Overall progress – 62.18%
12	Kunnamkulam	2020-21	2020-21	1. 220kV GIS S/S Kunnamakulam Work Awarded and commenced. 2. 220kV Line to Kunnamkulam from Wadakkanchery – Work commenced and is in progress.

8.15.2 The revised project cost of the above works and the revised CoD are submitted below.

able 8.19 TRANSGRID WORKS											
		As per ARR				Revised				Revised	
No.	Project	Outlay (Amount in Rs. Crores)				Outlay (Amount in Rs. Crores)				Revised COD	Total
		2018-19	2019-20	2020-21	2021-22	2018-19 Actual	2019-20	2020-21	2021-22		
1	Aluva	127.87	54.8	0		0	128.34	3		2019-20	131.34
2	Kaloor	125.93	53.97	0		0	138.81	0		2019-20	138.81
3	Kothamangalam & Chithirapuram	119.66	219.37	59.83	-	0	309.8	54.67	-	2020-21	364.47
4	Kottayam, Thuravur & Ettumanoor		379.17	162.5	-	0	162.5	379.17	-	2020-21	541.67
5	Chalakudy	7.14	35.71	28.57	-	0	45.53	34.05	-	2020-21	79.58
6	Kunnamkulam	13.03	65.15	52.12	-	0	78.43	55.98	-	2020-21	134.41
7	Manjeri	5.11	25.55	20.44	-	0	38.87	0	-	2019-20	38.87
8	Thalasseri	15.7	78.52	62.81	-	0	110.53	59.94	-	2020-21	170.47
9	Kunnamangalam	9.19	45.95	36.76	-	0	46	31.25	-	2020-21	77.25
10	Eranad	195	295	62		142.37	453.40			2019-20	595.77
11	NRHTLS	23.88	23.88	31.81		20.85	33.95	14.5		2020-21	69.3
12	Kolathunadu	26.1	104.38	78.29	52.19	0	141.83	85.1	60.42	2021-22	287.35
	Subtotal	668.61	1381.45	595.13	52.19	163.22	1687.99	957.92	60.42		2629.29
	PSDF Funding										
	NRHTLS	16.72	16.72	22.27		20.65	46.2	0			66.85
	Eranad	120.57	182.4	30.91		118.59	215.34	0			333.93
	Total outlay for Transgrid works less funding	531.32	1182.33	541.95	52.19	23.98	1426.45	957.92	60.42	0	2228.51

8.15.3 A comparison of the project cost as per the ARR and the revised cost is submitted below. The revised claim is based on the actual awarded project cost, whereas the ARR amount was based on estimates. All the 12 numbers of transgrid works except Kottayam package are awarded.

Table 8.20 Comparison of ARR and revised proposal (Rs.Cr)			
No.	Project	As per ARR	Revised
		Project cost	Project cost
1	Aluva	182.67	131.34
2	Kaloor	179.9	138.81
3	Kothamangalam & Chithirapuram	398.86	364.47
4	Kottayam, Thuravur & Ettumanoor	541.67	541.67
5	Chalakudy	71.42	79.58
6	Kunnamkulam	130.3	134.41
7	Manjeri	51.1	38.87
8	Thalasseri	157.03	170.47
9	Kunnamangalam	91.9	77.25
10	Eranad	552	595.77
11	NRHTLS	79.57	69.3
12	Kolathunadu	260.96	287.35
	Subtotal	2697.38	2629.29
	PSDF Funding	0	
	NRHTLS	55.71	66.85
	Eranad	333.88	333.93
	Total outlay for Transgrid works less funding	2307.78	2228.51

8.15.4 In addition, the following new works are also planned for the control period under Transgrid Phase II, the DPRs of which are enclosed with the Capital Investment plan (**Appendix-2**) submitted along with the instant petition.

Table 8.21 ADDITIONAL TRANSGRID WORKS -CAPITAL OUTLAY (Rs.Cr.)						
	Name of Work	2019-20	2020-21	2021-22	Expected CoD	Total
1	Sabari package		122	126	2021-22	248
2	Vengallur GIS & TLSP Phase II		136.12	68.06	2021-22	204.18
3	Vizhinjam 220/110KV GIS Substation	0.5	26.624	43.84	2021-22	71
	Total	0.5	284.744	229.46		523.18

8.15.5 The GFA addition due to Transgrid works are submitted below.

Table 8.22 TRANSGRID WORKS GFA Addition (Rs. Cr)				
No.	Project	2019-20	2020-21	2021-22
1	Aluva		131.34	
2	Kaloor	138.81		
3	Kothamangalam & Chithirapuram		364.47	
4	Kottayam, Thuravur & Ettumanoor		541.67	
5	Chalakudy		79.58	
6	Kunnamkulam		134.41	
7	Manjeri	38.87		
8	Thalasseri		170.47	
9	Kunnamangalam		77.25	
10	Eranad	595.77		
11	NRHTLS	69.3		
12	Kolathunadu			287.35
	Subtotal	842.75	1499.19	287.35
	PSDF Funding			
	NRHTLS	66.85		
	Eranad	333.93		
	GFA addition less PSDF funding	441.97	1499.19	287.35
	GFA addition new Transgrid works (Phase II)			523.18
	Grand Total (Rs.Cr.)	441.97	1499.19	

8.15.6 The revised GFA addition due to the TRANSGRID works for the years 2019-20, 2020-21 and 2021-22 are submitted below:

Table 8.23 GFA addition – Transgrid works (Rs Cr)									
In Area under	2019-20			2020-21			2021-22		
	Estimated in ARR	Provisionally approved	Revised estimate	Estimated in ARR	Provisionally approved	Revised estimate	Estimated in ARR	Provisionally approved	Revised estimate
Transgrid works	362.57	362.57	842.75	2073.84	1244.84	1499.19	260.96	260.96	810.53
Total	362.57	362.57	842.75	2073.84	1244.84	1499.19	260.96	260.96	810.53
Less: PSDF Grant			400.78	389.58	389.58	0	0	0	0
	362.57	362.57	441.97	1684.26	855.26	1499.19	260.96	260.96	810.53

8.16 SUMMARY OF GFA ADDITION OF SBU-T for 2019-20, 2020-21 & 2021-22

8.16.1 The summary of GFA addition of SBU-T for 2019-20, 2020-21 and 2021-22 are submitted below.

GFA addition of SBU-T									
	2019-20			2020-21			2021-22		
In Area under	Estimated in ARR (Rs.Cr.)	Provisionally approved (Rs.Cr.)	Revised estimate (Rs.Cr.)	Estimated in ARR (Rs.Cr.)	Provisionally approved (Rs.Cr.)	Revised estimate (Rs.Cr.)	Estimated in ARR (Rs.Cr.)	Provisionally approved (Rs.Cr.)	Revised estimate (Rs.Cr.)
Ongoing & new small works	525.04	312.8	724.09	196.28	20	201.44	254.26	0	77.47
Normal Capital Works above 10Cr	662.59	353.74	164.28	421.83	150.92	328.18	41.65	141.8	905.48
Transgrid works	362.57	362.57	842.75	2073.84	1244.84	1499.19	260.96	260.96	810.53
Total	1550.2	1029.11	1731.12	2691.95	1415.76	2028.81	556.87	402.76	1793.48
Less: PSDF Grant			400.78	389.58	389.58	0	0	0	78.53
Net Capital addition			1330.34	2302.37	1026.18	2028.81	556.87	402.76	1714.95

8.17 MID TERM PERFORMANCE REVIEW OF SBU-T FOR 2019-20, 2020-21 & 2021-22

8.17.1 INTEREST & FINANCE CHARGES

CAPITAL EXPENDITURE FOR 2019-20 UPTO SEPTEMBER 2019

8.17.1.1 The capital expenditure incurred by SBU-T up to September 2019 along with the capitalized amount is submitted below.

Table 8.25 Capital outlay and GFA addition till 30.09.2019 (Rs Cr)			
Sl. no.	Brief description of the work	Cost incurred	Capitalized
1	Electrical Transmission schemes	156.12	52.66
2	Power System Development Fund works	50.51	0.20
3	Load Despatch & Communication schemes	1.79	2.41
4	CWIP-General	191.90	
5	TRANSGRID 2.0 project	50.51	
	Total	450.56	55.26

8.17.1.2 The Interest & Finance charges actually incurred by SBU-T and SLDC for the year 2019-20 up to September 2019 are Rs. 50.59 Cr. The Interest & Finance charges approved for the year 2019-20 by Hon'ble Commission vide MYT order dated 8-7-2019, actual incurred upto September 2019 and revised Interest & Finance charges for the years 2019-20, 2020-21 and 2021-22 for SBU-T & SLDC are submitted below. The revised Interest & Finance charges are arrived based on the opening loan, GFA addition during the year and normative repayment for the year, which is detailed under Chapter-11 of this petition.

Table 8.26 Interest on capital liabilities for SBU-T & SLDC (Rs Cr)									
No	Item	Estimated in ARR	Approved vide order dtd.8-7-19 (2019-20)	Actual up to 30-9-19	Revised estimate for 2019-20	Approved for 2020-21	Revised estimate for 2020-21	Approved for 2021-22	Revised estimate for 2021-22
1	Average normative loan	2579.89	1,999.99	1304.19	1,529.39	2849.43	2,984.52	3384.12	4,572.27
2	Interest rate	10%	9.25%	7.76%	9.06%	9.25%	9.06%	9.25%	9.06%
3	Interest for the year	257.99	185.05	50.59	138.56	263.65	270.40	313.12	414.25

8.17.1.3 In the original ARR petition, the Interest and Finance charges of SBU-T and SLDC were clubbed together. As part of segregating the accounts of SLDC, the Interest and Finance charges of SLDC for the years 2019-20 to 2021-22 are worked out by segregating it from the I&F charges of SBU-T based on the GFA ratio of SLDC.

8.17.1.4 The GFA of SLDC for the years 2019-20 to 2021-22 is detailed under **Chapter- 3: Mid Term Performance Review of SLDC**. A comparison of the GFA of SBU-T with the GFA of SLDC for the years 2019-20 to 2021-22 is submitted below.

Table 8.27 GFA segregation (Rs Cr)			
Item	2019-20	2020-21	2021-22
SBU-T			
Opening GFA** (Rs.Cr.)	5094.47	6425.07	8684.75
SLDC			
Opening GFA (Rs.Cr.)	7.63	8.6	17
Ratio of GFA of SLDC to total GFA of SBU-T & SLDC	0.15%	0.14%	0.20%

**incl GFA of SLDC

8.17.1.5 The Interest and Finance charges of SBU-T for the years 2019-20 to 2021-22 after excluding the Interest and Finance Charges of SLDC are submitted below:

Table 8.28 Interest on capital liabilities (Rs Cr) for SBU-T				
No	Item	RE for 2019-20	RE for 2020-21	RE for 2021-22
1	Interest & Finance charges for SBU-T & SLDC	138.56	270.40	414.25
2	GFA ratio of SLDC	0.15%	0.14%	0.20%
3	Interest & Finance charges of SLDC	0.21	0.38	0.84
	Interest & Finance charges for SBU-T	138.35	270.02	413.41

8.17.2 Interest on security deposits

8.17.2.1 SBU-T does not hold any security deposit and hence no amount is assigned on this account.

8.17.3 Interest on GPF

8.17.3.1. The interest on GPF for SBU-T & SLDC for the years 2019-20, 2020-21 and 2021-22 are detailed in chapter 11. A summary is reproduced in the table below:

Table 8.29 SBU-T & SLDC : Interest on provident fund (Rs Cr)									
No	Item	Estimated in ARR	Approved (2019-20)	Actual up to 30-9-19	Revised estimate for 2019-20	Appvd. For 2020-21	Revised estimate for 2020-21	Appvd. For 2021-22	Revised estimate for 2021-22
1	Interest on PF	23.12	22.03	7.58	20.68	23.39	22.04	24.74	23.40

8.17.3.2. The projection of Interest on GPF for SLDC are segregated based on the ratio of employee cost for the year 2018-19 is as submitted below:

Table 8.30 Segregation of Interest on PF for SBUT & SLDC (Rs.Cr.)				
SBU		2019-20	2020-21	2021-22
SBU-T & SLDC	Employee cost ratio for 2018-19	20.68	22.04	23.40
SLDC	1.93%	0.42	0.45	0.47

8.17.3.3. The interest on GPF for SBU-T for the years 2019-20, 2020-21 and 2021-22 after excluding the Interest on GPF of SLDC is submitted below.

Table 8.31 SBU-T : Interest on provident fund (Rs Cr)				
No	Item	Revised estimate for 2019-20	Revised estimate for 2020-21	Revised estimate for 2021-22
1	Interest on Provident fund (SBU-T & SLDC)	20.26	21.59	22.93
2	Interest on Provident fund (SLDC)	0.42	0.45	0.47
3	Interest on Provident fund (SBU-T)	20.68	22.04	23.40

8.17.4 Interest on Master Trust bonds

8.17.4.1 SBU wise interest on Master Trust Bond and interest is calculated in Chapter 11. The interest for SBU-T & SLDC is reproduced in the Table below. This includes the interest contribution of existing bonds as well as the interest on the additional liability to master trust based on actuarial valuation.

Table 8.32 SBU-T & SLDC interest on Master Trust bonds (Rs Cr)									
No	Item	Estimated in ARR	Approved (2019-20)	Actual up to 30-9-19	Revised estimate for 2019-20	Appvd. For 2020-21	Revised estimate for 2020-21	Appvd. For 2021-22	Revised estimate for 2021-22
1	Existing bond	82.95	82.95	36.17	82.95	78.34	78.34	73.73	73.73
2	Additional contribution to Master Trust	42.20	22.64	0	22.64	22.64	22.64	22.64	22.64
	Total	125.15	105.59	36.17	105.59	100.98	100.98	96.37	96.37

8.17.4.2. The projection of Interest on Master Trust Bonds for SLDC are segregated based on the ratio of employee cost for the year 2018-19 is as submitted below:

Table 8.33 Segregation of Interest on PF for SBUT & SLDC (Rs.Cr.)				
SBU		2019-20	2020-21	2021-22
SBU-T & SLDC	Employee cost ratio for 2018-19	105.59	100.98	96.37
SLDC	1.93%	2.04	1.95	1.86

8.17.4.3. The projection of interest on Master Trust Bond for SBU-T for the years 2019-20, 2020-21 and 2021-22 after excluding the Interest on Master Trust Bond of SLDC is submitted below.

Table 8.34 SBU-T : Interest on Master Trust Bond (Rs Cr)				
No	Item	Revised estimate for 2019-20	Revised estimate for 2020-21	Revised estimate for 2021-22
1	Interest on Master Trust Bond (SBU-T & SLDC)	105.59	100.98	96.37
2	Interest on Master Trust Bond (SLDC)	2.04	1.95	1.86
3	Interest on Master Trust Bond (SBU-T)	103.55	99.03	94.51

8.17.5 Interest on Working Capital

8.17.5.1 The working capital for SBU-T comprise of, as per Regulation 32, one month O&M cost, cost of maintenance spares at 1% historical cost and receivables for one month less security deposit held, if any. The interest rate allowed, as per Regulation 32(2), is 2% higher than the Base rate on First of April of the ARR filing Year. Therefore the Interest on Working Capital in this petition is computed at a rate of 10.95% (8.95% as on 1-4-2019 + 2%).

The parameters adopted for computation of Interest on Working capital for the years 2019-20, 2020-21 and 2021-22 are given below:

Table 8.35 Parameters for Working Capital (Rs Cr)			
Item	2019-20	2020-21	2021-22
Opening GFA of SBU-T & SLDC	5094.47	6425.07	8684.75
Normative O&M Cost	390.83	440.48	496.30

8.17.5.2 The Interest on Working Capital estimated in ARR for the year 2019-20, approved by Hon'ble Commission, actual for the period up to September 2019 and the revised estimate for the year 2019-20, 2020-21 and 2021-22 are given below.

Table 8.36 SBU-T& SLDC :Interest on Working capital (Rs Cr)									
No	Item	Estimated in ARR	Approved (2019-20)	Actual up to Sept-19	Revised for the year 19-20	Appvd. For 20-21	Revised for the year 20-21	Appvd. For 21-22	Revised for the year 21-22
1	O&M Expenses	363.23	397.46		390.83	452.88	440.48	491.28	496.30
2	GFA Plants and Equipment		5,637.86		5094.47	6719.97	6425.07	8147.73	8684.75
3	Transmission charges		983.69		934.54	1162.47	1166.68	1283.53	1431.94
4	O&M Expenses for one month	31.52	33.12		32.57	37.74	36.71	40.94	41.36
5	1% of Historical cost of plants & Equipment	61.22	56.38		50.94	67.20	64.25	81.48	86.85
6	Receivables (Transmission charges for one month)	92.18	81.97		77.88	96.87	97.22	106.96	119.33
7	Total requirement of working capital	184.92	171.47		161.39	201.81	198.18	229.38	247.53
8	Rate of interest	10.70%	10.15%		10.95%	10.15%	10.95%	10.15%	10.95%
9	Interest on working capital	19.79	17.40	9.55	21.70	20.48	23.28	23.28	27.10

8.17.5.3 The projection of Interest on Working capital for SLDC for the years 2019-20, 2020-21 and 2021-22 is submitted below.

Table 8.37 SLDC :Interest on Working capital (Rs Cr)				
No	Item	Revised for 2019-20	Revised for 2020-21	Revised for 2021-22
1	Interest on working capital	0.20	0.23	0.27

8.17.5.4 The projection of interest on Working Capital for SBU-T for the years 2019-20, 2020-21 and 2021-22 after excluding the Interest on Working Capital of SLDC is submitted below.

Table 8.38 SBU-T : Revised Interest on Working capital (Rs Cr)				
No	Item	2019-20	2020-21	2021-22
1	Interest on working capital of SBU-T & SLDC	21.70	23.28	27.10
2	Interest on working capital of SLDC	0.20	0.23	0.27
3	Interest on working capital of SBU-T	21.50	23.05	26.83

8.17.6 DEPRECIATION

8.17.6.1. The Depreciation of SBU-T for the year 2019-20 up to September 2019 is Rs. 68.10 Cr as submitted below. The details are furnished under **form-T3**. The methodology for calculation of depreciation is detailed under Chapter-11. The Depreciation approved for the year 2019-20 by Hon'ble Commission vide MYT order dated 8-7-2019, actual incurred up to September 2019 and revised Depreciation for the years 2019-20,2020-21 and 2021-22 are submitted below.

Table 8.39 Depreciation for SBU-T & SLDC (Rs.Cr.)								
Item	Estimated in ARR	Approved (2019-20)	Actual Sept-19	Revised estimate for 19-20	Appvd. For 20-21	Revised estimate for 20-21	Appvd. For 21-22	Revised estimate for 21-22
Depreciation allowable for SBU-T & SLDC	199.58	173.47	68.10	193.78	222.92	255.10	261.09	313.17

8.17.6.2. The segregation of Depreciation for SLDC for the years 2019-20, 2020-21 and 2021-22 is based on GFA ratio of SLDC and an abstract of the same is submitted below.

Table 8.40 SLDC :Depreciation (Rs Cr)				
No	Item	Revised for 2019-20	Revised for 2020-21	Revised for 2021-22
1	Depreciation of SLDC	0.28	0.34	0.60

8.17.6.3 The projection of Depreciation for SBU-T for the years 2019-20, 2020-21 and 2021-22 after excluding Depreciation of SLDC is submitted below.

Table 8.42 SBU-T :Revised Depreciation (Rs Cr)				
No	Item	2019-20	2020-21	2021-22
1	Depreciation of SBU-T & SLDC	193.78	255.10	313.17
2	Depreciation of SLDC	0.28	0.34	0.60
3	Depreciation of SBU-T	193.50	254.76	312.57

8.17.7. O&M EXPENSES

8.17.7.1 The norms for O&M, number of bays and line length in ckt-km for 66KV and above projected for the years 2019-20, 2020-21 and 2021-22 considering the capital addition planned for these years are submitted below.

Table 8.43 Normative O&M norms for SBU-T & SLDC (Rs.Cr.)									
No	Item	Estimated in ARR	Approved (2019-20)	Actual up to 30-9-19	Revised estimate for 19-20	Appvd. For 2020-21	Revised estimate for 20-21	Appvd. For 2021-22	Revised estimate for 21-22
1	O&M cost for Bay (Rslakh/Bay)	11.23	11.23		11.23	11.77	11.77	12.34	12.34
2	O&M cost (Rslakh/circuit km)	0.98	0.98		0.98	1.03	1.03	1.08	1.08
3	Bays (No.) (for Previous year)	2682	2682		2635	2914	2803.5	3007	3008.5
4	Line (Ckt-Km)(for previous year)	9823.195	9823.20		9685.989	10670.15	10728.69	11130.965	11578.95
5	Normative O&M cost (Rs.Cr.)	397.46	397.46	256.40	390.83	452.88	440.48	491.28	496.30

The details are furnished under T-2 of the Transmission tariff forms attached.

8.17.7.2. The projection of O&M expenses for SLDC for the years 2019-20, 2020-21 and 2021-22 is based on the methodology detailed under Chapter-3 (ARR of SLDC) and an abstract of the same is submitted below.

Table 8.44 SLDC : O&M (Rs Cr)				
		Revised for 2019-20	Revised for 2020-21	Revised for 2021-22
No	Item	(Rs.Cr.)	(Rs.Cr.)	(Rs.Cr.)
1	O&M of SLDC	9.96	11.77	12.89

8.17.7.3 The projection of O&M for SBU-T for the years 2019-20, 2020-21 and 2021-22 after excluding O&M of SLDC is submitted below.

Table 8.45 SBU-T :Revised Normative O&M (Rs Cr)				
No	Item	2019-20	2020-21	2021-22
1	O&M of SBU-T & SLDC	390.83	440.48	496.30
2	O&M of SLDC	9.96	11.77	12.89
3	O&M of SBU-T	380.87	428.71	483.41

Pay Revision Expenses

8.17.7.4 SBU-T is not claiming pay revision expenses along with this ARR petition. However, it is requested that pay revision expenses as and when arising in the control period may be allowed over and above the norms in line with Kerala State Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2018. Details are furnished in chapter 11. An estimate of pay revision expenses of SBU-T and SLDC are submitted below.

Table 8.46 Pay revision expenses of SBU-T & SLDC (Rs.Cr.)			
Business Unit	2019-20	2020-21	2021-22
SBU T	29.78	32.18	34.71

- 8.17.7.5 A projection of the O&M expenses of SBU-T based on actual of past years are given in the Table below. The figures shown are excluding the pay revision expenses and contribution to Master Trust. It is seen that the O&M expenses allowed as per norms for the control period are below the actual and may lead to under recovery of cost.

Table 8.47 O&M Projection based on past actuals (Rs Cr)				
O&M Cost	Actual for 2018-19	2019-20	2020-21	2021-22
SBU-T	490.51	524.85	561.58	600.90

The details are included in Form-T2 of the Transmission tariff sheets.

- 8.17.7.6 In the matter of O&M of SBU-T, Hon Commission may please note that the CERC norms (Regulation 35(3) (a) of CERC (T&C of Tariff) Regulations, 2019) for the above drivers are Rs. 17.69Lakh per bay (weighted average of 220KV & 132 KV and below), Rs.0.24125 lakh/MVA(weighted average of 220KV & 132 KV and below), and 0.377 for (Double Circuit single conductor) lines for 2019-20. Applying these norms, the normative O&M cost will be Rs.553.94 Cr for 2019-20, against which the norms this Hon'ble Commission allowed only Rs.397.46 Cr. Therefore, it is submitted that the O&M norms allowed for SBU-T is much lower than CERC allowed benchmark costs. At the same time KSEB Ltd. is taking earnest efforts to control the O&M expenses during the control period and the same will be submitted along with truing up petition. Accordingly, it is requested that since projection based on actual O&M of SBU-T is lower than benchmark CERC norms, actual O&M cost incurred may be allowed during the truing up process if it increases above the norms of this Hon'ble Commission.

8.17.8. RETURN ON EQUITY

- 8.17.8.1. The ROE for SBU-T (including SLDC) claimed, approved and revised estimate for 2019-20, 2020-21 and 2021-22 are submitted below. This ROE is apportioned to SLDC based on GFA ratio as submitted below.

Table 8.48 ROE (Rs.Cr.)									
No	Item	Estimated in ARR	Approved (2019-20)	Actual up to 30-9-19	Revised estimate for 19-20	Appvd. For 20-21	Revised estimate for 20-21	Appvd. For 21-22	Revised estimate for 21-22
1	RoE of SBU-T & SLDC	119.99	119.99	119.99	119.99	119.99	119.99	119.99	119.99
2	RoE of SLDC (based on GFA ratio)				0.18		0.17		0.24
3	RoE of SBU-T				119.81		119.82		119.75

8.18 Aggregate Revenue Requirement of SBU-T & SLDC

- 8.18.1. The SBU-T handles the transmission assets of KSEB Ltd and manages bulk transmission of power within the State for supply to SBU-D. SBU-T as an independent business unit, the cost is recovered as transfer cost from SBU-D as intra-state transmission charges. The total Aggregate Revenue Requirement

of SBU-T and SLDC claimed in the original petition, approved, actual up to Sept- 2019 and revised estimate for the years 2019-20, 2020-21 and 2021-22 are submitted below:

Table 8.49 ARR of SBU-T (Rs.Cr)									
No	Item	Estimated in ARR	Appvd. (2019-20)	Actual upto Sept 2019	Revised estimate for 2019-20	Appvd. For 2020-21	Revised estimate for 2020-21	Appvd. For 2021-22	Revised estimate for 2021-22
1	Operation & Maintenance Expenses	397.46	397.46	256.4	390.83	452.88	440.48	491.28	496.30
2	Interest and finance charges	257.99	185.05	50.59	138.56	263.65	270.40	313.12	414.25
3	Interest on Bonds and additional contribution	125.15	105.59	36.17	105.59	100.98	100.98	96.37	96.37
4	GPF Interest	23.12	22.03	9.55	20.68	23.39	22.04	24.74	23.40
5	Depreciation	199.58	173.47	123.3	193.78	222.92	255.10	261.09	313.17
6	Interest on WC and deposits	20.2	17.4	9.55	21.70	20.48	23.28	23.28	27.10
7	Other items			1.17					
8	Total Revenue Expenditure	1023.5	901	469.6	871.15	1084.30	1112.28	1209.89	1370.59
10	Return on Equity	119.99	119.99	119.99	119.99	119.99	119.99	119.99	119.99
11	Aggregate Revenue Requirement (10+11+12) of SBU-T & SLDC	1143.49	1,020.99	589.59	991.14	1204.29	1232.27	1329.88	1490.58
12	Aggregate requirement of SLDC				13.30		15.28		17.17
13	Aggregate requirement of SBU-T excl SLDC				977.84		1216.99		1473.42

8.19 Non-Tariff Income for SBU-T

8.19.1. The non-tariff income of SBU-T includes income from sale of scrap, interest on advances made to contractors, interest on staff loans and advances, Rent from buildings etc. The projection of Non-Tariff income of SBU-T for the control period is given below.

Table 8.50 Non Tariff Income of SBU-T (Rs.Cr.)									
No	Other Income (Rs.Cr.)	Estimated in ARR	Appd (2019-20)	Actual upto Sept 2019	Revised estimate for 2019-20	Appvd. For 2020-21	Revised estimate for 2020-21	Appvd. For 2021-22	Revised estimate for 2021-22
1	Interest on staff loans and advances	0.02		0.00	0.02	0.02	0.02	0.03	0.03
2	Income from statutory investments	0		0.00	0	0	0	0	0
3	Income from rent of land or buildings	0.5		0.07	0.5	0.52	0.52	0.55	0.55
4	Income from sale of scrap	2.87		7.51	2.87	3.01	3.01	3.17	3.17
5	Income from staff welfare activities	0			0	0	0	0	0
6	Rental from staff quarters	0.12		0.04	0.12	0.12	0.12	0.13	0.13
7	Excess found on physical verification	0.03		0.00	0.03	0.04	0.04	0.04	0.04
8	Interest on investments, fixed and call deposits and bank balances	0.05		0.09	0.05	0.05	0.05	0.05	0.05
9	Interest on advances to suppliers/contractors	0.05		0.12	0.05	0.05	0.05	0.05	0.05
10	Income from hire charges from contractors and others	0		0.00	0	0	0	0	0
11	Income from fibre optic cables/co-axial cables on transmission system	3.9			3.9	4.49	4.49	5.07	5.07
12	Income from advertisements, etc.	0			0	0	0	0	0
13	Miscellaneous receipts	29.76		12.20	29.76	33.52	33.52	37.26	37.26
	Total Other Income (Rs.Cr.)	37.3	37.30	20.02	37.30	41.82	41.82	46.35	46.35

8.20 Net ARR of SBU-T

8.20.1 The net ARR of SBU-T and SLDC for the years 2019-20, 2020-21 and 2021-22 are submitted below.

Table 8.51 Net ARR for SBU-T & SLDC (Rs.Cr.)									
No	Item	Estimated in ARR	Appd (2019-20)	Actual upto Sept 2019	Revised estimate for 2019-20	Appvd. For 2020-21	Revised estimate for 2020-21	Appvd. For 2021-22	Revised estimate for 2021-22
1	Aggregate Revenue Requirement	1143.49	1,020.99	589.59	991.14	1204.29	1232.27	1329.88	1490.58
2	Less: Other Income	37.30	37.30	20.02	37.30	41.82	41.82	46.35	46.35
3	Less: Revenue from Open Access								
4	Less: Income from Other Business								
5	ARR from Transmission Tariff	1106.19	983.69	569.57	953.84	1162.47	1190.45	1283.53	1444.24

8.21 Norms for Operation for the years 2019-20 to 2021-22

Transmission System Availability

8.21.1 The availability of transmission system projected for the years 2019-20 to 2021-22 is 98%. It is humbly requested that relaxation may be allowed to KSEBL from meeting the availability norms during shutdown works carried out at the time of execution of 'TRANSGRID WORKS'.

8.22 Transmission losses

8.22.1. A projection of the transmission loss of SBU-T based on the capital addition for the years 2019-20 to 2021-22 is submitted below.

Table 8.52 Transmission Losses (%)								
		Estimated in ARR for 2019-20	Appvd. For 2019-20	Revised 2019-20	Appvd. For 2020-21	Revised 2020-21	Appvd. For 2021-22	Revised 2021-22
	Transmission loss up to 66KV	3.95	3.95	3.65	3.85	3.55	3.75	3.45

Note: The figures show the losses up to the respective voltage level (%)

8.23 Transmission charges for 2019-20, 2020-21 & 2021-22

8.23.1 SBU-T handles the energy flow to the entire consumers of SBU-D as well as open access consumers. The projection of the energy input to the Transmission network, energy handled, transmission losses and the transmission charges estimated for the years 2020-21 to 2021-22 are submitted below. Transmission charges in Rs/MW/day are calculated assuming a system load factor of 72%.

Table 8.53 Transmission Charges								
		2019-20			2020-21		2021-22	
No	Item	Estimated in ARR	Appvd.	Revised	Estimated in ARR	Revised	Estimated in ARR	Revised
1	Energy injected into the system (MU)	26243.43	26243.43	26135.55	27247.53	26867.86	28295.30	27830.35
2	Percentage of loss (%)	3.95	3.95	3.65	3.85	3.55	3.75	3.45
3	Loss of energy (MU)	1036.62	1036.62	953.95	1049.03	955.81	1061.07	960.15
4	Auxiliary consumption (MU)		16.36	16.92		17.76		18.65
5	Energy handled (MU) (1-3)	25206.81	25190.46	25164.68	26198.50	25896.29	27234.23	26851.55
6	Transmission ARR (Rs.Cr.)	1106.19	983.69	953.84	1394.26	1190.45	1637.13	1444.24
7	Transmission Charges (Rs./unit)	0.44	0.39	0.38	0.53	0.46	0.60	0.54
8	Peak demand projection	4175	4300	4369	4384	4500	4517	4635
9	Transmission Charges STOA (Rs/MW/day)	10082	8705	8281	12102	10063	13791	11902
10	LTA/MTOA Transmission Charges (Rs/MW/month or part thereof)	306662			368095	301890	419489	357060

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Appendix- 1 : Ongoing and New Works less than Rs.10Cr(Status as on 30-9-2019)														
No	As per ARR													
							Acheivement							
	Project	Project Cost *	Commencement	Completion	2018-19		Actual /Revised Project cost	Actual Commencement	Actual/ Revised Completion	Actual achievement in 2018-19		Status up to Sept-2019		
					Physical	Financial				Physical	Financial	Physical	Financial	
		Rs Cr			(%)	Rs Cr	Rs Cr			(%)	Rs Cr	(%)	Rs Cr	
Circle - Kottarakkara														
1	Karunagapalli SS &Sasthamkotta TL Upgrdn to 110	16.5	4/19/2017	2018-19	15	0.57	16.5	19.04.17	30-Apr-20	27	1.92	27	1.92	
2	Anchal 66kV SS of &Ayoor TL Upgdn to 110kV	13	5/15/2017	2018-19	14	0.03	32.2	15.5.17	31-Dec-19	31	7.50	100	32.20	
3	Ayoor 66kV SS Upgradation	7.3	10/11/16	2018-19	24	0.188	7.3	10.11.2016	31-Mar-20	34	0.87	100	7.30	
	SubTotal - Ongoing	36.8												
	SubTotal - New													
Circle - Alappuzha														
1	Eramalloor 110 kV SS & LILO	11.3	Jul-17	2018-19	46	3.81	10.93	17-Jul	19-Jun	98	10.12	100	10.93	
2	Kattanam 33kV SS Upgradation to 66 kV	11.8	1/9/2017	2018-19	SS-19/TL- 1	0.71	11.8	17-Sep	19-Nov	80	5.82	100	11.80	
3	Alappuzha 110 kV SS	30.9	Sept. 2017	2019-20	1	0.27	30.9	17-Sep	20-Dec	0	0.00	0	0.44	
4	Capacity Enhancement of 220 kV SS Punnapra	6	Aug-17	2018-19	85	2.4	4	17-Aug	18-Nov	100	4.00	100	4.00	
5	Kalarcode 33kV Substation &Punnapra TL	5.8	2017-18	2018-19	0.8	4.64	5.8	17-Aug	19-Nov	80	2.01	100	5.80	
6	Mattancherry bay extension work	1	2017-18	2018-19	0.8	0.8	0.24	18-Feb	19-Nov	90	0.03	100	0.24	
7	Edathua 110/33kV 16MVA T/F at 110kV SS.	2	2017-18	2018-19	0.8	1.6	1.43	18-Nov	19-Feb	100	1.43	100	1.43	
8	Edappon 220kV SS-110/33kV 16MVA TF	2.787	2017-18	2018-19	0.8	2.2296	1.67	17-Apr	19-Feb	100	1.67	100	1.67	
9	Vallikunnam 33 kV SS - 33kV bay & 5MVA TF	1	2017-18	2018-19	0.8	0.8	0.83	17-Mar	18-Dec	100	0.83	100	0.83	
10	Aroor 110kV SS- 20MVA TF	2.613	2017-18	2018-19	0.8	2.0904	2.9	18-Feb	18-Sep	100	1.75	100	2.90	

	New work												
11	Upgradation of Edappon - Mavelikkara 66kV DC feeder to 110kV DC					9.34							
	SubTotal - Ongoing	75.2											
	SubTotal - New												
Circle - Poovanthuruthu													
1	Erumely 110 kV SS & DC TL (REC Loan) (TL Comptd)	18.12	2/2/2006	2019-20	SS-99	16.994	18.12	02.02.2006	09.11.2018	100	17.61	100	17.71
2	33 kV SS Manimala& TL to Ranni (REC Loan)	8.75	7/21/2011	5/27/2018	100	6.2488	8.75	21.07.2011	27.05.2017	100	6.28	100	6.29
3	33 kV SS Kallara& Line (SS& TL Commissioned)	5.16	5/20/2013	4/18/2018	100	4.3717	5.16	20.05.2013	18.03.2017	98	5.03	98	5.05
4	Upgradation of 110 kV SS Kanjirappally (2 nd Phase)	8.9	3/25/2015	2019-20	94	8.01	8.9	25.03.2015	15.02.2017	100	8.01	100	8.01
5	Puthupally 110 kV SS & LILO of Pallom – Pampady	8.1	2018-19	2019-20	0	3.02	8.1	19.06.2015	31.03.2022	0	3.02	0	3.27
6	110 kV feeder bay at 220kV S/S, Pallom	2.9	1/3/2017	2019-20	19	0.45	2.9	01.03.2017	29.06.2019	51.98	0.63	100	0.76
7	Mundakkayam 66 KV SS &Kanjirappally TL Upgdn	17.4	7/11/2016	2018-19	75 / 51	1.77	6.3	5.01.2018	08.11.2018	100	2.50	100	2.48
8	Pala 110kV SS - 110kV feeder bay	2.75	2017-18	2019-20	0	0	2.75	26.07.2018	31.03.2020	0	0.00	0	0.00
9	Kanjirappally 110 KV SS – 2 feeder bays	0.39	2017-18	10/31/2018	73	0.3268	0.39	15.02.2017	10.11.2018	100	0.39		
10	Mundakkayam 66kV SS Upgdn to 110kV	11.1	2017-18	2019-20	93	0.3268	11.1	07.11.2016	09.10.2019	99	3.62	99	4.06
11	Pallom 220 kV SS - 1X110kV Feeder Bay	5.8	2017-18	2019-20	23.5	0.3268	2.9	10.01.2014	20.02.2015	100	2.85	100	2.85
12	Construction of 4 nos 110 kV feeder bays at Vaikom substation	5.3	2019-20	2020-21	0	0	5.3	26.06.2019	31.3.2021	0	0.00	0	0.00
	SubTotal -Ongoing	89.37									3.24		
	SubTotal -New												
Circle - Thodupuzha													
1	Kumily 33kV SS and TL fmVandiperiyar DDUGJY	6.5	12/28/2015	2020-21	53	1.63				100	3.00		
2	Muttom 110 kV SS	6	5/23/2016	2018-19	98	3.73				100	2.00		
3	Adimaly 110 kV SS Capacity Enhancement	2	Feb. 2017	2018-19	97	0.16				80	0.50	100	0.80
4	Kulamavu 66 kV SS Renovation	1	8/17/2015	2019-20	30	0.41				100	0.80		
5	Marady 110 kV SS & LILO	12	9/5/2016	2021-22	97	5.67				100	2.00		
6	Odakkali 66 kV SS in 110 kV Std& LILO	10	3/5/2017	2019-20	96	2.15				100	3.00		
7	Rayonpuram 110 kV SS CaptyEnht& 33 kV DC TL	3	1/25/2017	2018-19	100 / 40	1.86				40	0.10	40	0.10
8	Kuruppanpady 110 kV SS Cap Enht,CR& TL DDUGJY	2	6/18/2017	2019-20	40	0.02				100	1.60		
9	Koovappady 33kV SS - CR Ext & feeders (DDUGJY)	1	9/27/2016	2018-19	70	0.27				100	0.80		
10	Mazhuvannoor 33kV SS – CR EXT &feedersDDUGJY	1	9/27/2016	2018-19	50	0.27				100	0.80		
11	Vandanmedu 33kV SS & SC TL to – Vandanmed	6	6/5/2017	2019-20	10	0.35				60	1.00	90	2.00
12	Pallivasal Extension HEP - 220 kV SC line	1	2018-19	2019-20	0.01	0.01				1	0.00	1	0.02
13	Kothamangalam – B'kettu 66 kV TL Upgrdn	10	5/30/2017	2019-20	79	0.87				100	3.00		
	SubTotal - Ongoing	61.5									17.00		
1	33 kV Substation Vandanmedu and &33 kV SC line Nedumkandom to Vandanmedu	6	05.06.2017	2020-21	100	4.9				60	1.00	90	2.00
2	110 kV Substation Murickassery and 110 kV Neriya MangalamKuthunkal feeder	9	04.06.2018	2021-22	4	0.05				1	0.01	5	0.03

	Sub-Total New	15											
Circle - Thrissur													
1	Madakathara SS - 200 kV Bus Enhancement PSDF	2.9	8/11/2016	29.9.2018	100	2.24				100	2.90		
2	Madakathara 400 kV SS - 200 MVA, Transformer	12.1	02.10.2016	17.01.2019	Completed	8.16				100	12.10		
3	Madakathara 400 kV SS - Setting up of 220kV feeder bay (Malapparambu 1&2)						1.62	26.2.2019	25.08.2019			Completed	0.17
4	Madakathara 400 kV SS - Providing spare arrangement to 3rd bank						1.4	06.03.2019	31.12.2019			22	0.11
5	Replacement of 220kV high impedance bus bar protection with low impedance bus bar protection.						1.2	06.08.2019	05.02.2020			-	-
6	Chalkdy - Kodungallur DC to 110 kV Upgrdn-IPDS	6.5			45	2.925	6.5	27.3.18	31.08.2019	86	3.92	100	4.64
7	Chalakkudy - Kodungallur TL to 110 kV DC & Bays	1.9			SS-78	0.994	1.9	03.7.2018	20.8.2019	91	1.69	100	1.74
8	Mala 66 KV SS - Upgdn to 110 kV	5.25	2017-18	2018-19	48	2.52	5.25	17.10.2017	29.2.2020	55	1.35	98	2.81
9	Malayattoor SS – Bays & 110kV SC TL to DC	21.3	2015-16		13	2.1	21.3	Line-06.5.2017 & SS-22.3.18	SS-18.7.2019 & Line-30.4.2020	ss-79 & Line-23	ss-1.43, Line-1.31 & 87	ss-100, Line-42	ss - 1.738 2 & Line - 3.17
10	Karukutty 66kV SS - CB, C&R Panels, Etc& LILO	1.86		2019-20			1.86	10.6.2019	29.2.2019	Nil	0.00	16	0.00
11	Koratty 33kV SS - control room	0.5		2019-20			0.5	18.12.2017	31.8.19	26	0.21	100	0.00
12	Chalakkudy 110KV SS - DP shifting (A)	0.084	2017-18	2018-19	50	0.042	0.084	14.11.2018	15.6.2019	50	0.00	100	0.08
	Chalakkudy 110KV SS - Shifting of 33,11and LT lines (B)	0.34	2017-18	2018-19	50	0.170	0.15	1.10.2018	31.1.2019	50	0.00	100	0.15
	Chalakkudy 110 SS – 110 kV Cable Laying (C)	3.8	2017-18	2018-19	50	1.900	3.8	16.4.2018	15.7.2019	95	0.00	100	3.70
	Chalakkudy 110Kv Ss Rearranging water line (D)	0.012	2017-18	2018-19	50	0.006	0.0064	11.12.2018	17.12.2018	100	0.01		
13	Valapad – Kandassankadavu 110 kV DC Line	4.1	6/24/2016	8/31/2017	100	4.1			Work completed on 14.06.2018	100	4.10		
14	Kodungallur 66 KV SS Upgdn to 110 kV						9.5	17.10.2018	SS UPGRDRD to 24.08.2019	20	3.00	80	6.00
15	Irinjalakuda 110kV SS - Cap Enhnt	3.5	2017-18	2018-19	50	1.75			Trfr 1 charged on 12.12.2018	100	3.50		
16	Valapad 110 kV SS– Capacity enhancement	1.62	9/30/2017	2018-19	99	1.6038							
17	Pudukkad - Kattoor TL upgr to 110kV (HC Case)	11.2		2020-21									
18	Blangad&Punna (Chavkd) 33kV SS– Blangad TL	7.04	9/30/2017	2018-19	80	5.632	7.04	30.09.2017	22.02.2019	95	5.63	96	5.71
19	Athani 110 kV SS – Capacity enhancement	2.6	3/10/2017	2018-19	88	2.189	2.6	14.07.2017	Trsrcom misioned on 24.5.2019	88	2.19	100	2.49
20	Mundur 33 kV SS – Cap Enhnt& 33kV Vyr – ParprTL	1.84	2017-18	2018-19	20	0.368	1.1	10.04.2018	Trfrerener gised on 8-3-2019	CapEnh-50%	0.60	Cap Enh-98%	1.09
					0	0	0.74	23.10.2018	Not complet	Vyr-ppr TL	0.00		

									ed	- Not award ed			
22	Interlinking between parappur and Mullassery 33kV substations						1.92	21.02.2019	31.5.2019			88	1.69
	Subtotal -Ongoing										22.61		
Circle - Kalamassery													
1	Thammanam 33kV SS & UGC (APDRP) (SS energized)	10	29/11/2016	2018-19	95	7.58			22.02.2019	100%	7.98		
4	Brahmapuram 220 kV SS – Connecty to DLF (DW)	4	04/15	2018-19	90	4.21	4.681	4/1/2015	3/1/2020	90	4.21	90	4.21
5	Cherai 110 kV SS & Mannam line (REC, SS Compl0212)	15	2010	2018-19	95.2	22.497	30.47		30.06.2019	20%	24.62	100%	24.62
7	Thrikkakkara 66 kV SS– Capacity Enht (IPDS)	2	01/01/2017	2018-19	6.5	0.21	3.25	1/1/2017	6/25/2019	70	1.30	100	3.25
8	Perumanoor 66 kV SS – Capacity enht (IPDS)	2	03/06/2017	2018-19	0.31	0.01			30.09.2019	50	1.32	50	1.32
9	Kizhakkambalam 110 kV SS– Capacity Enht (Tx Compl0	1.5	30/11/2017	2018-19		0.5			14.05.2018	100%	0.14		
10	Thrikkakkara 66 kV SS – Providing Earth Mat (IPDS)	0.17	2017-18	2018-19	20	0.05	0.1855	11/30/2017	4/5/2018	100	0.19		
11	Kalamassery 220kV SS - BB protn§ionalizer	3.2		2019-20			3.2	15.07.2019	31.03.2020				
12	SAS - Automation of 7, 110 kV feeders- (PSDF)	2.21		2018-19			2.498	23.03.2018	20.07.2019			100%	2.49
13	Automation 4, 110 kV feeders : (Part DW)	1.28		2018-19			1.427	08.03.2018	01.11.2018	100%	1.42		
16	Enhancing the 220kV main bus	3	2017-18	2018-19	50	1.85	0.0838	27.11.2018	31.03.2020	95%	0.61	95%	0.61
17	Kalamassery -Earth mat @ 66kV yard	1.07	2017-18	2018-19	50	0.535	0.6365	11.06.2018	25.05.2019	80%	0.24	100%	0.45
18	Feeder bays for 110kV KLPM feeder	2.985		2019-20			1.003	06.08.2019	31.03.2020	0	0.00	35%	0.00
19	Kalamassery -Earth mat @ 110kV yard	2.31	08.09.2017	07.03.2018	100	1.691	2.31	08.09.2017	29.06.2018	100%	1.69		
20	Kalamassery 220 kV SS - LT panel	0.62	2017-18	30.11.2018	50	0.31		12.07.2017	30.04.2019	70%	0.41	100%	0.77
21	Renovation of Auxiliary No.2	0.1	2017-18	31.10.2018	50	0.05		14.02.2018	18.09.2018	100%	0.04		
22	Erection and commissioning of DCDB panels	0.25	2017-18	15.12.2018	50	0.125		19.10.2018	30.04.2019	85%	0.17	100%	0.19
25	Remetalling of yard	0.215	2017-18	31.01.2019	50	0.1075	0.169	24.08.2019	30.11.2019	0	0.00	30	0.04
26	Providing LAs for 110/66kV Transformers.	0.035	2017-18	30.10.2018	50	0.0175		03.04.2019	06.07.2019	0	0.00	100	0.02
27	Bushings replacement of 63 MVA Transformers	0.134	2017-18	31.12.2018	50	0.067	0.127	7.3.2019	14.3.2019	100	0.07		
28	Vyttila UG cable feeder Eqpt& bus coupler bay	0.62	2017-18	31.12.2018	50	0.31		01.06.2018		0	0.00	50	0.31
29	Construction of new control room	3	2017-18	31.12.2018	50	1.635	3.27	28.01.2019	14.07.2019	0	0.00	100	2.39
31	Capacity Enht -1x 10MVA transformer	1.75	2017-18	28.02.2019	50	0.875	1.72	10.08.2018	28.06.2019	70	1.20	100	1.65
34	Kurumassery 110kV SS - 5MVA Transformer	1.45	2017-18	2018-19	50	0.75				50	0.25	100%	1.45
35	Thammanam 33kV GIS – SCADA	0.224	2017-18	2018-19	50	0.112			22.02..2019	50	0.11	100%	0.22
36	Mattancherry 110kV SS - Capacity Enht	1.62	2017-18	2018-19	50	0.81	2.1			0	0.00	0	0.00
37	NParavur 110 kV SS - 12.5MVA TF	2	2017-18	2018-19	50	1.175	2.35	31.03.2020	1/0/1900	0			
38	KLSY 220 - Repl cross bus and CTs of 6 bays (IPDS)	0.05	2017-18	2018-19	50	0.025		05.02.2019	18.02.2019	100%	0.01		
39	KLSY-Vyttila 66kV TL Reconductoring (IPDS)	4	2017-18	2018-19	50	2.15		28.11.2018	28.12.2018	100%	3.42		
40	Edayar SS Solar plant : SCADA & CCTV (IPDS)	0.08	2017-18	2018-19	50	0.04		23.03.2018	28.03.2018	100%	0.01		
41	Vyttila-P'Cruz 66 kV TL - UG OFC	0.2	2017-18	2018-	50	0.1		03.12.20	29.12.20	100%	0.20		

	& OPGW-IPDS			19				18	18				
42	Solar panel 25kWp (IPDS)	0.175	2017-18	2018-19	50	0.0875	0.1712	24.05.2018	01.06.2019			100	0.17
43	Solar panel 25kWp (IPDS)	0.175	2017-18	2018-19	50	0.0875	0.171	5/25/2018	7/3/2019	90	0.05	100	0.17
44	Independent control to 66kV supply IPDS	1.18	2017-18	2018-19	50	0.59	1.026	10/6/2018	8/31/2019	0.623	0.87	100	1.03
46	Tripunithura 66kV GIS IPDS	20	2017-18	2018-19	50	10.875	25	10.08.2018	1.08.2019	100	15.00	100	19.00
48	Njarakkal 66 kV SS Cap Enht - 16MVA -IPDS	1.69	2017-18	2018-19	50	1	1.88			50	1.69	100	1.88
49	Varapuzha 33 kV SS – R&M (DDUGJY)	1.01	2017-18	2018-19	50	1	1.01		28.03.2019	50	1.01	100	1.01
50	Alangad 33kV S/S – R&M DDUGJY	1	2017-18	2018-19	50	1			22.07.2019	50	1.00	100	1.00
51	Kurumassery 33 kV SS – R&M – DDUGJY	1.03	2017-18	2018-19	50	1			1.08.2019	50	1.03	100	1.03
52	Puthenvelikkara 33kV SS - R&M - DDUGJY	1	2017-18	2018-19	50	1			12.08.2019	50	1.00	100	1.00
66	Kochi Metro Supply from 110kV New Vyttila (DW)	1	2017-18	2018-19	50	0.771	1.542	8/6/2016	8/14/2019	90	0.78	100	0.92
	SubTotal -Ongoing										15.15		
	SubTotal -New												
	Division - Pathanamthitta												
1	Pandalam 33KV S/S & SC TL to Edappon IPDS	5.16	17-3-2015	31-03-2019	SS68/T L17	Substation commissioned on 28.3.2019 & line commissioned on 15.3.2019					4.30		
2	Enathu 66KV SS (110KV Std) & TL to Adoor	18.38	5/4/2016	31-03-2019	SS46/T L29				30.6.2019				Substation - 99% Trans Line - 100% (Substation & feeder commissioned on 26.6.2019)
	New work												
3	Upgradation of 66KV substation Adoor to 110KV standard-Bay upgradation	9.95	15-10-2018	15.1.2019					2021-22				
	SubTotal -Ongoing										4.30		
	SubTotal -New												
	Circle - Kannur												
1	Rajapuram 33kV Indoor SS	6	7/1/2016	2019-20	27	0.6906	6.48	10.02.2017	31.10.2019	50	3.24	90	5.83
2	Kelakam 33kV Indoor SS	10	22/08/2017	2019-20	60	6.14	10	42969	43679	60	6.14	100	9.05
3	Nedumpoyil 66 KV SS Upgdn to 110 kV & DC Line	12	15/12/2015	2019-20	90	6.574	13.55	15/12/2015	27/05/19	90	6.57	98	9.85
4	Sreekandapuram 66 KV SS Upgr to 110 kV & TL	9.95	26/04/2017	2019-20	65	5.35	9.95	26/04/2017	43776	65	5.35	80	8.53
5	Valiyavelicham 110 kV SS – (KSIDC DW)	11.85	10/1/2016	43251	Completed	5.38		42644	27/3/18	99	9.70	100	10.73
6	Tholambra 33KV SS - Conversion to indoor	0.63	2017-18	2018-19	completed	0.315	0.63	42826	22/3/19	100	0.40	100	0.61
7	Pinarayi 110KV SS - Capacity Enht	2		2019-20			3.37	17/1/17		35	0.11	50	0.65
8	Dharmadam 33 kV SS - Conversion to indoor	0.9		2019-20			0.9	23/11/18		40	0.00	70	0.21
9	Kodiyeri 33 kV SS -Conversion to indoor	0.9	2017-18	2018-19	50	0.485	0.9	27/7/18				70	0.31
10	Panoor 110kV SS - Cap enht -1 x 16MVA TF & bay	2	2017-18	2018-19	50	1.3	2.6	19/7/18	28/6/19	50	1.20	100	2.10
11	Puthur 33kV SS - Conversion to indoor	0.92		2019-20				13/12/18		30	0.00	65	0.00
12	220kV SS, Kanhirode - capacity enhancement by installing 2X12.5MVA transformer	2.5	2020-21	2020-21									
13	Kannur Sports Council -shifting of 110 kV line (DW)	1	2017-18	2018-19	completed	0.625		2018-19	2018-19	100	1.00		

14	33 kV Payyannur Town-11kV Indoor 8 Panel set Conversion	0.76	2017-18	2018-19	50	0.38			2020-21			50	0.17
15	33kV Alakkode-New 11kV Outlet	0.07	2017-18	2018-19	completed	0.07		2018-19	2018-19	100	0.07		
16	220kV SS Taliparamba-Erection of 220 kV bus isolators	0.09	2017-18	2018-19	completed	0.09		2018-19	2018-19	100	0.09		
17	220kV SS Taliparamba-Yard metalling	0.04	2017-18	2018-19	completed	0.04		2018-19	2018-19	100	0.04		
18	220kV SS Taliparamba-Renovation of 220kV Isolators	0.05	2017-18	2018-19	completed	0.05		2018-19	2018-19	100	0.05		
19	Puthiyatheru 33 kV SS - 11kV panel to indoor Conv	0.9	2017-18	2018-19	50	0.45			2020-21	50		50	0.19
20	110 kV SS Mangad-Providing chain link fencing	0.08	2017-18	2018-19	completed	0.08		2018-19	2018-19	100	0.08		
21	110kV SS Mangad-Leak proofing of control room	0.09	2017-18	2018-19	completed	0.09		2018-19	2018-19	100	0.09		
22	110kV SS Mangad-Renovation of store compund	0.18	2017-18	2018-19	Completed	0.18		2018-19	2018-19	100	0.18		
23	110kV SS Mundayad-Second 16MVA Transformer	2	2017-18	2018-19	completed	1.25		2018-19	2018-19	100	2.00		
24	110kV SS Mundayad-Water connection to yard	0.02	2017-18	2018-19	50	0.01		2018-19	2018-19	100	0.02		
25	Mylatty 220kV SS - Nitrogen drying and Overhauling of TF	0.2	2017-18	2018-19	25	0.06		2018-19	2019-20	25	0.06	25	0.06
26	Mylatty 220kV SS - Replacing 220kV TF CB & BC	0.0215	2017-18	2018-19	50	0.01075		2017-18	2018-19	50	0.01	100	0.02
27	Mylatty 220 kV SS - Quarters Renewal	0.1495	2017-18	43447	40	0.11	0.46	2018-19	2019-20	40	0.11	40	0.11
28	Mylatty 220kV SS- Switch Yard Renweal	0.0465	2017-18	43495	50	0.02325		25.03.2019	03.06.2019	50	0.02	100	0.05
29	Mylatti 220kV SS -Video conference hall	0.5	2019-20	43831		0						10	0.00
30	220 kV Substation, Mylatty - Bay extension for upgradation of Mylatty-Thoudugoli line	0.2	2019-20	2020-21	0	0				0	0.00	0	0.00
31	220 kV Substation, Mylatty - Bay extension for proposed 110 kV Substation at Kuttikkol	0.5	2019-20	2020-21	0	0				0	0.00	0	0.00
32	Mulleria 110kV SS - TF Bay Extn - 16 MVA TF	2	2017-18	31.12.2018	50	1.15		2018-19	2018-19	100	2.00		
33	Badiadka - 33 KV Substation - Conversion to indoor	0.25	2017-18	31.03.2019	50	0.125		2018-19	2019-20	50		50	0.13
34	Perla 33 KV SS - Control room extension and cable trench	0.17	2017-18	31.03.2019	50	0.085		2018-19	2018-19	100	0.17		
35	Perla 33 KV SS - Store shed	0.0451	2017-18	2018-19	50	0.02255		2018-19	2018-19	100	0.05		
36	West Eleri 33 kV SS - Capacity addition by installation of 5 MVA transformer	0.7	2017-18	2019-20	50	0.35	0.4						
37	Cheruvathur 110 kV SS - Cap Enh 2X10 MVA TF	1.99	2017-18	2019-20	50	0.995	1.99	13.03.2019		50	1.00	75	1.00
38	Thrikkaripur - 33 KV SS - Conversion indoor	0.88	2017-18	2019-20	50	0.44	0.15	06.03.2019	27.01.2019	5	0.00	5	0.00
39	Belur 33 KV SS - Conversion to indoor	0.99	2017-18	2019-20	50	0.495	0.255	13.08.2018	10.04.2019	70	0.14	100	1.00
40	110KV SS Mulleria - Earthmat	0.23	2019-20	2019-20			0.23	2019-20	2019-20			25	0.06
41	110KV SS Kasaragod - Installation of new capacitor bank	0.15	2019-20	2019-20			0.15	2019-20	2019-20			90	0.10
42	33KV SS Kasaragod town - Capacity enhancement from 2 x 5MVA to 2 X 8MVA	0.92	2019-20	2019-20			0.92	2019-20	2019-20			100	0.92
43	110KV SS Manjeshwar - Earthmat	0.3	2019-20	2019-20			0.3	2019-20	2019-20			25	0.08
44	33kV SS Alakkode-11kV outdoor to indoor conversion	0.76	2019-20	2020-21								50	0.18
	Subtotal -Ongoing										5.84		
	Subtotal-New												

	Circle - Malappuram												
1	Perinthalmanna SS Upgdn to 110 kV & DC LILO	16.7	4/5/2015	3/31/2017	Commissioned	8.5593	16.7	13/02/2015	1/1/2020	99	8.56	99.5	8.56
2	33 kV SS Pothukallu & connected lines	5.72	1/11/2012	2018-19	47	1.93	9.6	30/09/2011	12/19	47	1.93	89	3.10
3	Malaparamba to Ramapuram DC Line to MC	3.44	4/29/2013	4/29/2018	Commissioned	1.98	3.44	4/29/2013	25/10/2019	99	1.98	99	3.16
4	Kalpachanchery & Edarikode 33kV SS – SC Tap Line	3.45	4/4/2016	6/4/2017	Commissioned	2.883	3.45	4/4/2016	6/4/2017	Commissioned	2.88		
5	Malappuram – Tirur 110 kV Line Doubling (Ph1&2)	1.55	09/16	2018-19	100 / 89	2.038	2.43	14/09/2016	31/07/2019	100 / 89	2.04		
6	Manjeri SS Upgdn to 110 kV with 2 No 110kV feeder bay	8.21	1/11/2012	2018-19	100 / 23	2.83	8.21	1/4/2016	12/19	90/86	2.83	90/86	2.83
7	Tirur Traction SS supply with UGC (DW)	9.08		2018-19	93 / 100	2.61	9.08	4/3/2016	07.09.2018	100/100	2.61		
8	Kizhissery – Edavanna 33kV Line	4.07	9/30/2017	2018-19	33	0.03175	4.07	30/09/2017	12/19	33	0.71	95	1.09
9	Ramapuram – Melattur 110 kV TL & Melattur Bays	2.95	6/6/2016	2018-19	TL-100	2.9	2.95	6/6/2016	2016-17	100	2.90		
10	Nilambur & Edakkara SS Upgdn to 110 kV & TL	13.21	02/18	2018-19	TL-15	0.021	13.21	11/2/2016	03/21	TL-100,	0.02	TL-100, SS-15%	0.43
11	Shanthinagar – Pokkottumpadam 33kV Line	2.85	12/16	2018-19	TL-100	0.2687	2.85	22/02/2017	03/18	100	1.18	100	1.26
12	Installation of 2nd 12.5 MVA Transformer at 110kV SS Melattur	2.92	09/18	2018-19	95	0	2.92	09/18	02.05.2019	95	0.00	98	0.05
13	Installation of 2nd 16 MVA Transformer at 110kV SS Melattur	3.04	03/19	2019-20	0	1.28384	3.04	03/19	02/20	0	1.28	20	1.28
14	Capacity Enhancement by replacing 2x12.5MVA with 2X20MVA at 110kV SS, Kizhissery	4.57	12/18	2019-20	50	1.19027	4.57	12/18	2020-21	50	1.19	70	1.19
15	Installation of 2nd 5MVA Transformer at 33kV SS Kalikavu	1.03	12/19	2019-20	0	0	1.03	12/19	03/20	0	0.00	0	0.00
16	Replacing existing 2X5MVA Transformers with 2X8MVA, at 33kV SS Makkaraparamba	2.56	04/19	03/20	0	0	2.56	04/19	03/20	0	0.00	85	1.39
17	Replacing 2x12.5MVA Transformers with 2x20MVA at 110kV Substation, Tirur	4.76	3/1/2017	2018-19	100%	4.76	4.76	3/1/2017	2020-21	98%	4.60	98%	4.60
18	Enhancement of 220kV Malaparamba Substation Capacity to 400MVA	15.85	8/8/2019	2020-21	NIL	NIL	15.85	10/8/2019	2020-21	0%	NIL	5%	7.86
19	Extension of Control room and 10 panel set at 33kV Kooriyadsubstn	1.5	01/19	2020-21	NIL	NIL	1.5	17/01/2019	2020-21	0%	NIL	2%	0.07
20	Renovation of 110kV Bus bar at 220kV Substation, Malaparamba	4.5	03/20	03/21	NIL	NIL	4.5	03/20	03/21	0%	NIL	0%	NIL
21	Replacing 2x16MVA Transformer with 2x25MVA Transformer at 110kV Substation, Edarikode	4.9	05/20	03/21	NIL	NIL	4.9	05/20	03/21	0%	NIL	0%	NIL
22	Construction of 2 Nos 110kV Bays at 110kV Substation, Edarikode	1.1	01/19	08/19	NIL	NIL	1.10	01/19	03/21	60%	0.00	60%	0.85
23	Providing 1x16MVA Transformer at Edappal	3.47	06/20	10/20	NIL	NIL	3.47	06/20	10/20	0%	NIL	0%	NIL
24	25MVAR Capacitor bank at 110kV Substation, Edappal	0.26	01/20	03/20	NIL	NIL	0.26	01/20	03/20	0%	NIL	0%	NIL
25	Capacity enhancement work at 110kV Substation, Kuttippuram	7.3	11/19	10/20	NIL	NIL	7.3	11/19	10/20	0%	NIL	0%	NIL
26	Upgradation of 66kV Substation, Mankada to 110kV	4.34	06/20	12/21	NIL	NIL	4.34	06/20	12/21	0%	NIL	0%	NIL
27	Upgradation of 66kV line to Mankada substation	2.65	08/19	05/20	NIL	NIL	2.65	08/19	05/20	0%	NIL	10%	0.85
28	Control room extn and 10 Panel set at 33kV Substation, Othukkungal	1.5	05/20	01/21	NIL	NIL	1.5	05/20	01/21	0%	NIL	0%	NIL

29	Providing 2x8MVA Transformers at 33kV Substation, Othukkungal	1.2	06/20	10/20	NIL	NIL	1.2	06/20	10/20	0%	NIL	0%	NIL
30	Providing 1x5MVA Transformer at 33kV Substation, Tavanur	1	01/19	06/20	NIL	NIL	1.00	01/19	03/20	0%	NIL	0%	NIL
31	33kV Chelari - Kooriyad line	4.2	02/20	03/21	NIL	NIL	4.2	02/20	03/21	0%	NIL	0%	NIL
32	33kV Substation, Changaramkulam	5.82	05/20	03/21	NIL	NIL	5.82	05/20	03/21	0%	NIL	0%	NIL
33	33kV Edappal - Changarmkulam line	2.91	06/20	02/21	NIL	NIL	2.91	06/20	02/21	0%	NIL	0%	NIL
34	Construction of new control room at 110kV Ponnani Substation	0.45	04/20	03/21	NIL	NIL	0.45	04/19	03/21	0%	NIL	0%	NIL
35	New 110kV Feeder bay at 110kV Substation, Ponnani	0.6	2021-22	2021-22	NIL	NIL	0.6	05/21	09/21	0%	NIL	0%	NIL
36	Construction of balance compound wall for 110kV Substation, Parappanangadi	0.2	08/20	01/21	NIL	NIL	0.2	08/20	01/21	0%	NIL	0%	NIL
	Sub Total -ongoing works										10.43		
	Circle - Palakkad												
1	Kollengode – Vadakkenchery 110 kV DC TL	15	18/03/2017	2018-19	30	2	2.8	2017	2020	30	0.30	60	0.30
3	Agali 33 kV SS - 5 MVA TF - DDUGJY	0.91	21/10/2017	2018-19	75	0.72				70	0.70	100	0.29
4	Kollengode 110 kV SS - Replacing 33 kV TF	3	21/11/2017	2019-20	15	0.3	1	2018	2021	30	0.21	45	0.23
5	Palakkad 220 kV SS - 160 MVA TF	5	2017-18	2018-19	20	0.27			2019-20	100		100	3.76
6	Palakkad-Medical College S/s upgradation	4	2017-18	2018-19	50	5	10		2019-20	80		100	0.24
7	Bay Extension for 110kV DC Line to Malampuzha	0.8	2017-18	2018-19	50	2.75			2020-21			50	0.26
8	Replacing Faulty Spare Unit 53.33 MVA TFR	0.25	2017-18	2018-19	50	0.4			2019-20			90	0.15
9	Control Room Window for Leak Proofing of AC	0.005	2017-18	2018-19	50	0.125						0	
10	Construction of Bike shed in front of control room	0.0125	2017-18	2018-19	50	0.0025	0.01		2018-19	100	0.01		
11	Compound wall & tiles	0.0558	2017-18	2018-19	50	0.00625	0.058		2019-20			0	0.00
12	Concrete interlocking tiles at courtyard	0.034	2017-18	2018-19	50	0.0279	0.034		2019-20			0	0.00
14	Replacing 2x220kV CB of Transformer Bank	0.26	2017-18	2018-19	50	0.02065	0.172		2019-20			75	0.24
15	Yard concreting & spreading Metal (6th Phase)	0.3	2017-18	2018-19	50	0.13	0.44		2019-20			90	0.00
16	Providing security camera in 220/11kV Yard	0.03	2017-18	2018-19	50	0.15	0.28		2019-20			80	0.02
17	Capacity enhancement - 2x200MVA transformers	10	2017-18	2018-19	50	6	6	2018-19	2018-19	50	6.00	-	-
18	Second 110V 400 AH battery with charger	0.135	2017-18	2018-19	100	0.135	0.135	2017-18	2018-19	100	0.14	-	-
19	New Yard and road	0.13	2017-18	2018-19	50	0.0675	0.1428	2019-20	2019-20	50	0.07	100	0.14
20	220 kV yard metalling	0.39	2017-18	2018-19	50	0.065	0.39	2019-20	2019-20	50	0.63	100	0.39
21	Yard Security Camera (220/11kV Yard)	0.03		2019-20	-	-	0.164	2019-20	2019-20	-	-	100	0.16
22	Tiles in 11kV control room	0.06		2019-20	-	-	0.154	2019-20	2019-20	-	-	100	0.15
26	Renovation of 3 Quarters	0.08		2019-20	-	-	0.452	2019-20	2019-20	-	-	100	0.45
29	Renovation of control room & office	0.095	2019-20	2019-20	-	-	0.925	2019-20	2019-20	-	-	100	0.93
40	Construction of Bell mouth and Providing drainage						0.283	2019-20	2019-20	-	-	100	0.28
42	Providing new pipe connection inside the yard	0.0078	2017-18	2018-19	50	0.005				100	0.01		
43	Nalleppilli DP Structure - 11kV AB	0.0025	2017-18	2018-	50	0.0039				100	0.00		

	switch			19									
48	Construction of vehicle shed	0.01		2019-20				4/17/2018	6/14/2018	100	0.02		
49	Metaling of 11kV DP structure area	0.01		2019-20				5/5/2016	12/29/2018	100	0.03		
50	Strengthening of earthing system	0.2		2019-20						100	0.05		
51	Flooring of Tiles and Repair	0.02		2019-20						100	0.03		
53	Replacing 11kV VCB panel (12panel set)	0.4		2019-20						100	0.40		
54	Construction of firewall	0.12	2018-19	2018-19	100%	0.055	0.1275			100%	0.06		
56	Providing earthmat in existing yard	0.3		2019-20			0.22					8%	0.00
57	Feeder Bay extension - for Vennakkara GIS TL	0.25		2020-21									
58	Instruments, tools and safety equipments	0.003		2019-20								100%	0.00
59	Mac road up to transformer and fencing	0.05		2019-20			0.068			100%	0.05		
60	Instruments, tools and safety equipments	0.005		2019-20								100%	0.01
61	Tower Insertion - Sreekrishnapuram and Kongad 33 kV	0.1		2018-19			0.74			100%	0.74		
63	Yard metalling, Earthing (11 KV) etc	1	2017-18	2018-19	50	6.15	0.0081			100%	0.01		
65	Mat Earthing	0.15	2017-18	2018-19	50	0.55	0.1471	2018-19	2018-19	100	0.15	-	-
66	Transformer (110 kV)CB Replacment	0.09	2017-18	2018-19	50	0.075				100	0.08		
70	Palakkad &Malampuzha SS Interlinking – 2 TLs	1.2	2017-18	2018-19	50	0.275				100	1.20		
71	Malampuzha 110kV SS – 1x 10MVA TF & Bay	1.5	2017-18	2018-19	50	0.6						65	0.10
74	Replacement of 110kV CT &OTCR	0.09	2019-20	2019-20									
75	Construction of Pillars for Gate in front of Yard	0.002	2017-18	2018-19	50	0.045	0.002	2018-19	2018-19	100	0.00	-	-
76	Replacement of old Battery Charger 30A	0.009	2017-18	2018-19	50	0.001	0.009	2018-19	2018-19	100	0.01	-	-
77	Installation of 110kV Bus Coupler (Gas Insulated)	0.47	2019-20	2019-20	50	0.0045	-	-	-	-	-	-	-
78	Providing 1 No 11 kV feeder outlet (pengattiri)	0.0025	2018-19	2018-19	-	-	0.028	2018-19	2018-19	100	0.03	-	-
79	Construction of vehicle shed	0.001	2019-20	2019-20	-	-	-	-	-	-	-	-	-
80	Replacement of Station Battery 200AH	0.031		2019-20	100	0.0252	0.0252	2018-19	2018-19	100	0.03	-	-
81	Construction of vehicle shed	0.001	2019-20	2019-20	-	-	-	-	-	-	-	-	-
83	Splitting of 110 KV Bus by providing Bus Isolator	0.06	2019-20	2020-21	-	-	-	-	-	-	-	-	-
84	110 KV Bus PT- 3 Nos	0.04	2020-21	2020-21	-	-	-	-	-	-	-	-	-
85	Koottanad 110kV SS - 16 MVA TF	2.2	2019-20	2019-20	-	-	-	-	-	-	-	25	1.19
86	Compound wall 110 Kv yard	0.02		2019-20	-	-	-	-	-	-	-	-	-
87	Replacing 11 kV AB switch	0.014	2018-19	2018-19			0.006	2018-19	2018-19	100	0.01	-	-
89	Providing 110KV Bus splitting isolator	5	2019-20	2020-21			-	-	-	-	-	-	-
90	Yard fencing infront of Control room.	1	2020-21	2020-21			-	-	-	-	-	-	-
93	KollengodeVadakkenchery 110kV Line	24		2019-20			24	04/03/2017	31/12/2019	20	1.22	75	6.71
106	Yard light - LED lamp	0.05	2017-18	2018-	50	0.01	0.0042	2018-19	2018-19	100	0.00	-	-

				19			5						
109	Kothachira& NH Feeders - AutoreclosureReplcmt	0.06	2018-19	2018-19	100	0.0744	0.0744	2018-19	2018-19	100	0.07	-	-
110	New Control Room Civil works	0.1	2018-19	2018-19	100	0.0941	0.0941	2018-19	2018-19	100	0.09	-	-
112	New prefab Control room with 11 kV indoor panel	0.75	2019-20	2019-20	-	-	-	-	-	-	-	50	0.19
113	Thiruvegapura 33 SS -Cap Enh - - 1x 5 MVA TF	0.4	2017-18	2018-19	50	0.375	-	-	-	-	-	-	-
114	Construction of 110 kV substation Pattambi	8	2019-20	2020-21			-	-	-	-	-	-	-
115	Construction 110 kV line		2020-21	2020-21			-	-	-	-	-	-	-
116	Installation of 5MVAR capacitor bank	0.15		2019-20									
121	Construction of compound wall	0.01	2017-18	2018-19	50	0.075				100	0.08		
132	Palakkad - Malampuzha 110kV DC line	5.5		2020-21			3.55					15%	0.00
133	Olavakkode Substation civil work including filling	0.4	2018-19	2019-20	100%	0.32	0.28						
134	Olavakkode Substation drawing 33kV ABC	0.16	2017-18	2018-19	100%	0.65	0.53			100	0.36		
136	Olavakkode Substation Equipment & Erection	1.2	2018-19	2019-20	50%	0						100%	1.10
137	Olavakkode Substation containerised substation	2.5	2018-19	2019-20	50%	0						100%	2.20
	Sub Total Ongoing works										3.58		
	Circle -Thiruvananthapuram												
1	Kattakkada 220 kV SS & TL to Pothencode	112.15	9/23/2009	2018-19	Completed	104.26				100	104.26		
4	Aryanad 33 kV SS Upgradation of & SC TL	8.41	9/7/2014	2018-19	completed	8.3289				100	8.33		
5	Vilakulam 33 kV SS Upgdn& SC TL (RAPDRP)(Name of Work: Construction of 33 kV Substation,Vilakkulam and 33kV SC Line and constructionof 33 kV feeder bay at 110 kV Substation,Varkala).	8.3	3/16/2016	2018-19	30 / 50	3.05		01.10.2016		82	4.70	85	4.70
6	Kacheri 33 kV SS Upgdn& UGC (RAPDRP)(Name of Work: Construction of 33 kV Substation, Kachery and laying of 33 kV UG cable from 110 kV Substation ,Attinga to 33 kV Substation, Kachery)	6.6	9/21/2016	2018-19	95 / 100	4.6967		27.02.2017		95	0.00	99	5.43
8	VydyuthiBhavanam 33 kV SS & UGC (IPDS)	7.43	2/15/2018	2018-19	2	0.02	5.9	8.11.2018	7.9.2019	43	0.36	100	7.00
9	Neyyattinkara SS Upgdn 110 kV	8.37	1/12/2017	2018-19	2	0.38	8.37	22.1.2018	5.7.2019	50	4.24	100	7.69
	Subtotal -Ongoing	165.2											
	Sub Total -ongoing works										112.59		
	Circle - Kozhikode												
1	Kinaloor 110 kV SS & LILO	9.5	11/19/2015	42777	Commissioned	6.0501				100	9.50		
2	Cyber Park 66 kV SS & LILO (Part DW) (TL- Compltd)	9	4/22/2016	2018-19	SS- 97	5.2002	5.2352	4/22/2016	28-05-2019	97	5.20	100	5.24
3	Gandhi Road- Chevayur 110 kV UG Cable	23	1/23/2017	2018-19	65	14.3862	23	2016-2017	4/1/2019	0.95	12.00	1	12.00
4	Mankavu 66kV SS Upgration to 110kV	11.86	2017-18	43497	75	8.895	11.86	7/10/1905	2020-2021	30	1.80	75	0.90
5	Kunnamangalam- Kuttikkattor Line to 110 KV	5	2017-18	43497	75	3.75		2018-19	2019-20	40	2.53	45	0.70
6	Gandhi Road – Chevayur 110 kV UGC & bays	23	2017-18	43525	75	17.25		16.03.2018	25.03.2019	100	23.00		
7	Nallalam 220kV SS Cap Enh - Power transformers	17.21		43586	35	6.12		18-19	20-21	35	6.12	40	6.19

8	Kuttikkattur SS Upgradation to 110kV	8	july2018	2019-20	0.05	0.3		7/1/2018		5	0.30	20	0.30
9	Ramanattukara 33kV SS – 5MVA TF (DDUGJY)	0.66	2017-18	2018-19	75	0.495	1.4535	2018-19	15-03-2019	100	1.45		
10	Nallalam 220kV SS - Downstream works	3.5		43891	50	1.2		18-19	20-21	50	1.20	10	2.00
11	Ambalavayal 66 kV SS and TLs	12.56	2017-18	2018-19	70	8.792	12.56	2017-18	2019-20	27	1.01	63	2.59
12	Kaniyambetta - Kuthumunda 66kV SC to DC TL	12.37	2017-18	2018-19	70	8.659	12.37	31-1-2017	15-5-2019	60	8.52	100	10.50
13	Kalpetta 33kV - Cap Enht - 8 MVA TF (IPDS)	0.53	2017-18	2018-19	70	0.371	0.743	3/3/2019	3/31/2019	100	0.74		
14	Reconductoring of KuthumundaUppatty DC line	0.972	2019-20	2019-20	Nil	Nil	0.16	10-10-2019		Nil	Nil	Nil	Nil
15	Nallalam 220kV SS Cap Enht - Power transformers	17.21		5/1/2019	35	6.12		18-19	20-21	35	6.12	40	6.19
16	Kuttikkattur SS Upgradation to 110kV	8		6/1/2019	0.05	0.3		7/1/2018		5	0.30	20	0.30
17	Nallalam 220kV SS - Downstream works	3.5		3/1/2020	50	1.2		18-19	20-21	50	1.20		
18	Meppayur 110kV SS Cap Enht - 2x12.5MVA TF	2.67	2017-18	2019-20			2.9				0.46	0.57	0.47
19	33KV Substation Melady – Replacement of 33/11KV 5MVA TF with 8MVA TF	0.093	2018-19	22/8/2019	Commi sioned	0.09						1	0.07
20	33KV Substation Balussery – Replacement of 33/11KV 5MVA TF with 8MVA TF	0.093	2018-19	23/9/2019	Commi sioned	0.09						1	0.07
	New works												
1	New 11kV outlet from Ambalaparamba substation	0.11		2019-20									
2	Alternate feeding arrangement to Vellannur 33kV S/s from Kunnamangalam S/s	6.21		2019-20									
	Sub Total -Ongoing works										12.90		
	Sub Total -New works												
	System Operation												
1	DPLCC, Prot Coupler Etc - MDA – PKD & KKM-KHD	0.4773	2017-18	2018-19	75	0.4655	0.4773	2017-18	2019-20	0	0.00	100	0.01
2	SDH for FOC - (OPGW-DWSM) Etc	0.8919	2017-18	2018-19	75	0	0.8919	2017-18	2019-20	50	0.00		0.89
3	Kattakada Substation – GPS System	0.02	2017-18	2018-19	75	0.015	0.0283	2017-18	2019-20	100	0.01		
4	OFC & OPGW - Mylatty, Talipba and Nileswar SS	3.77	2017-18	2018-19	75	2.8275	3.77	2017-18	2018-19	100	0.94		
5	Mini RTU for Small Hydro Electric Power Stations	0.2704	2017-18	2018-19	50	0.2328	0.2704	2017-18	2019-20	50	0.23	100	0.04
6	PDH Equipments	2.31	2017-18	2018-19	75	1.7325	1.33	2017-18	2019-20		0.00	100	1.33
7	Power Quality Analyser for Kannur & Kalamassery						0.1055	2018-19	2019-20			100	0.11
8	SLM for SOCs (Kannur, T'puram and Klsy)	0.3452	2017-18	2018-19	75	0.2589	0.3357	18.05.2019	2019-20		0.00	100	0.35
9	OFC (ADSS) etc -Sholayar and Poringal	1.124	2017-18	2018-19	75	0.843	1.124					85	0.00
10	Dam Level Monitoring System 7 locations	0.185	2017-18	2018-19	0	0	0.185	2015-16	2019-20	0	0.00	80	0.00
11	Digital ProtCoupler& PLCC – K'KulamSch& 3 SS	1.035	2017-18	2018-19	75	0.77625	0.7599	2018-19	2019-20	75	0.00	100	0.76
12	ADMS for 322 Substations - PSDF Scheme.						5.1389	2018-19	2019-20			10	0.37
13	Kalamassery SLDC building Lift replacement	0.1834	2017-18	2018-19	75	0.13755	0.165	2018-19	2019-20	0	0.00	50	0.00
14	Edappon Com SbDvn - 2nos of O4LC card	0.010486	2017-18	2018-19	75	0.007864	0.010486	2017-18	2018-19	100	0.00		
15	Kannur SOC Purchase of 6 DCDB Panel	0.04	2017-18	2018-19	75	0.03	0.04	2017-18	2018-19	100	0.01		
16	Purchase of Battery	0.125	2017-18	2018-	75	0.0937	0.125	2017-18	2018-19	100	0.03		

	48V,100Ah/200Ah			19		5							
17	Purchase of Battery 48V,50A	0.1155	2017-18	2018-19	75	0.0866 25	0.1155	2017-18	2018-19	0	0.03		
18	RTU Ambalathara work Part(M/s spectron)						0.2229	20.12.20 17	2019-20	75	0.00	100	0.22
19	DPC work Part Knhrd,Ampl, Mylty(M/s ZIV)						0.0118	2018-19	2019-20	0	0.00	100	0.01
20	DPC AKD, SRR(M/s ZIV)						0.0509	7.03.201 9	2019-20			100	0.05
21	Waves charger spares(M/s Waves)						0.0223	2018-19	2019-20			100	0.02
22	Video conference facility at GISS Gandhi Road(M/s Twisted pair)						0.0035	2018-19	2019-20			100	0.00
23	6 Nos. AC(M/s Nikshan)						0.0182	2018-19	2019-20			100	0.02
24	GPRS modem						0.0072	2018-19	2019-20			100	0.01
25	Supply of battery sets						0.1	2018-19	2019-20	0	0.00	100	0.10
26	Battery chargers(M/s waves)						0.13	2018-19	2019-20	0	0.00	100	0.13
27	Installation, Testing and Commissioning of Digital Protection Coupler and PLCC with PC for Pallom and Kayamkulam						0.0572	2017-18	2019-20	40	0.00	100	0.06
28	TOD Meter(Klsy and Knr)						0.0638	2018-19	2019-20			100	0.06
29	Spare Protection Coupler Cards (GE Alstom make)						0.0537	2018-19	2019-20			100	0.05
30	Purchase of 48V,100Ah/200Ah Battery						0.084	2018-19	2019-20			100	0.08
31	Battery Charger 48V,50 Amp						0.0995	2018-19	2019-20			100	0.10
32	Replacement of VRLA Battery - SCADA SD TVM						0.0135	2018-19	2019-20			100	0.01
33	Purchase of spare card for DPC For EMPC feeder						0.0414	2018-19	2019-20			100	0.04
34	Suplyinstallation,testing and commissioning of Digital protection couplers and PLCC with PC Kayamkulam Transmission Scheme						0.7599	12.06.20 18	2019-20		0.00	100	0.76
35	Purchase of Portable SLM-cum-Oscillator at Moozhiyar						0.1119	2018-19	2019-20			100	0.11
36	Purchase of fixed wireless phones						0.0066	2018-19	2019-20			100	0.01
37	Purchase of spare cards for the Digital PLCC panel (ABB ETL 42) installed at 220kV Pothencode and Kattakada substations of the Pothencode-Kattakada 220kV feeder- Rs.670000						0.067	2018-19	2019-20			100	0.07
38	Purchase of Single Phase Relay test kit						1.03	11.10.20 19	10.01.20 20			0	0.00
39	CB Timing Kit PET TVM						0.1145	13.05.19	2019-20			0	0.00
40	3 Phase Relay Test Kit						0.3538	30.01.20 19	2019-20			100	0.35
41	Purchase of measuring equipments						0.0027	2019-20	2019-20			100	0.00
42	HV cable for IR tester						0.0043	2019-20	2019-20			100	0.00
43	CB Timing Kit PET Kannur						0.0156	2019-20	2019-20			0	0.00
44	GPS						0.0346	2019-20	2019-20			100	0.03
45	Frequency protection Relays						0.0058	2019-20	2019-20			100	0.01
46	Clamp Meter						0.0355	2019-20	2019-20			100	0.04
47	Micro Ohm Meter PET Kannur						0.0924	2019-20	2019-20			100	0.09
48	Multi Meter						0.002	2018-19	2019-20			100	0.00
49	Subtotal -Ongoing										1.03		
50	New Works												
51	Purchase of LMU-LMDU and Co-axial cable(22sets LMU-LMDU and 1950 mtr cable)						0.5805		2020-21	0	0.00	0	0.00
52	Analog PLCC Panel						0.26		2020-21	0	0.00	0	0.00
53	Purchase of two number of PLCC Panels with two channel						0.115		2020-21	0	0.00	0	0.00

	protection coupler for 220kV Sabarigiri-Theni feeder and Idulli-Udumal												
54	Implementation of Integrated Communication Management System with work flow automation						0.15		2020-21	0	0.00	0	0.00
55	Other Purchase/works from SOC						0.81825		2020-21	0	0.00	0	0.00
56	Purchase of Differential & Distance Relay for Relay Divisions(122 Distance and 84 differential)						0.7923		2020-21	0	0.00	0	0.00
57	Purchase of High voltage DC test kit						0.6		2020-21	0	0.00	0	0.00
58	Line Differential protection Relays For PCOD(PGCIL 1,2,3,4)						0.22		2020-21	0	0.00	0	0.00
59	Conversion of Edamon 110kV bay to Digital						1.25		2020-21	0	0.00	0	0.00
60	Implementation of Integrated Protection Management System with work flow Automation						0.15		2020-21	0	0.00	0	0.00
61	Line impedance measurement unit						0.1357	20.09.19	2020-21	0	0.00	0	0.00
62	Megger make Digital insulation tester(buy back scheme						0.05		2020-21	0	0.00	0	0.00
63	Other Purchase/works from SOC						0.3395		2020-21	0	0.00	0	0.00
64	Renovation of Office of CE(SO)						0.1		2020-21	0	0.00	0	0.00
65	Other SOC & TNMS works						0.4822		2020-21	0	0.00	0	0.00
66	Upgradtion of SCADA beyond 2011 Works under the scope of M/s PGCIL KLSY & KSEBL						0.0864		2020-21	0	0.00	0	0.00
67	Modernisation of MT & SOC office						0.0503		2020-21	0	0.00	0	0.00
68	Procurement of SLM and Osilloscope						0.668		2020-21	0	0.00	0	0.00
69	Procurement of Protection coupler panel for Chalakudy-MDKA and CHKY- LP link,Aluva-Pallikkara and BRPM-Kaloor link						0.24		2020-21	0	0.00	0	0.00
70	Digital Protection Coupler for 220kV Pothencode - Kattakada # 1, 2 220kV Kattakada- Vizhinjam # 1, 2						0.1536		2020-21	0	0.00	0	0.00
71	Digital Protection Coupler for Trivandrum PGCIL - Pothencode 220kV(8 Nos) and CSD Arekode(2 Nos)						0.276		2020-21	0	0.00	0	0.00
72	OPGW Laying work Moozhiyar, Kochupamba -Thriveni (27 km)						1.2		2020-21	0	0.00	0	0.00
73	Procurement of 48V 200AH Plante type Battery Set						0.07		2020-21	0	0.00	0	0.00
74	Procurement of 48V 400AH VRLA type Battery Set						0.1		2020-21	0	0.00	0	0.00
75	Procurement of 48V, 100A SMPS Battery Charger						0.13		2020-21	0	0.00	0	0.00
76	Procurement of Power Quality Analyzer for transducers(Communication)						0.085		2020-21	0	0.00	0	0.00
77	Procurement of IP Phones						0.072		2020-21	0	0.00	0	0.00
78	Purchase of spare cards for the Digital PLCC panel (ABB ETL 600) installed at 220kV Kundara and 110kV Parippally substations of the Kundara - Parippally 110kV feeder						0.061		2020-21	0	0.00	0	0.00
79	Firewall and License						0.06		2020-21	0	0.00	0	0.00
80	Povision for spare cards for RTUs,						0.15		2020-21	0	0.00	0	0.00

	Battery Chargers												
81	Purchase of 48V, 50A SMPS Battery Charger for Transgrid Project						0.1		2020-21	0	0.00	0	0.00
82	Procurement of ETL 42 Spare cards of ABB Panel						0.1		2020-21	0	0.00	0	0.00
83	Procurement of Protection coupler panel for Idukki-Kothamangalam link						0.06		2020-21	0	0.00	0	0.00
84	PLCC Panel, Wave Trap, Coupling capacitor, LMU and LMDU for Kothamangalam end of Bhoothathankettu SHEP						0.115		2020-21	0	0.00	0	0.00
85	Primary Current Injection kit						1.05		2020-21	0	0.00	0	0.00
86	Multifunction Commissioning Kit with Primary Injection facility						0.53		2020-21	0	0.00	0	0.00
87	Purchase of Spare relays						0.65		2020-21	0	0.00	0	0.00
88	Procurement of 15 kV Digital insulation tester with digital and Analog display						0.26		2020-21	0	0.00	0	0.00
89	Single phase Rlay test kit, RSD,PKD and RSD MDKTRA ,RSD Pallom						0.613		2020-21	0	0.00	0	0.00
90	GPS MODULE for existing OMICRON Kit						0.12		2020-21	0	0.00	0	0.00
91	Purchase of Energymeter testing & calibrating kit (with Phantom loading facility)						1.1		2020-21	0	0.00	0	0.00
92	Three phase relay test kit with provision for digital substation teting						1.76		2020-21	0	0.00	0	0.00
93	CT Analyser						0.93		2020-21	0	0.00	0	0.00
94	Three phase DCRM test kit(CB Analyser)						0.75		2020-21	0	0.00	0	0.00
95	160kVAC Hi-pot test kit						0.35		2020-21	0	0.00	0	0.00
96	Testing solution for IEC 61850 SAS						0.3		2020-21	0	0.00	0	0.00
97	Transformer Turns Ratio and Winding Resistance Measurement kit						0.9		2020-21	0	0.00	0	0.00
98	Procurement of new spare Tan delta measurement kit for use under SOC Kannur, TVM						1.4		2020-21	0	0.00	0	0.00
	Subtotal-New												

Appendix 2: ADDITIONAL CAPITAL INVESTMENT PLAN OF SBU-TRANSMISSION FOR THE REMAINING YEARS OF THE CONTROL PERIOD

Kerala State Electricity Board Limited (KSEBL), is an integrated State Public Sector power utility in the State of Kerala, performing the three functions of Electricity Generation, Transmission, and Distribution through three Strategic Business Units (SBUs) with SBU-T carrying out the function of State Load Dispatch Centre also.

As per the second transfer scheme, it is the function of the State Transmission Utility to ensure development of an efficient, co-ordinated and economical system of intra-state transmission lines for smooth flow of electricity from a generating station to the load centres. Further, the second transfer scheme entrusts the responsibility on the STU to develop and execute long term plans for evacuation and supply of power at voltages of and above 33KV, in consultation and co-ordination with the other SBUs and under the policy framework developed by KSEB Ltd. so as to satisfy the present and future needs to the generation and distribution SBUs. The SBU-T handles the total energy sold to consumers and licensees within the state, power drawn by open access consumers and the small quantum of energy sold outside the state.

Transmission system is the backbone of the power system. The growth of transmission system should match with the growth of generation capacity in the State and ideally it must be ahead of generation both in time and capacity to avoid congestion or bottling up of power. Efficient operation of transmission system in terms of providing reliability, avoidance of disturbance, maintaining voltage level and reducing transmission losses requires continuous strengthening of transmission system.

The transmission planning by KSEBL is done for achieving the above objective and also to provide 24 x 7 power supply to all consumers with n-1 and n-1-1 and n-2 reliability as per CEA Transmission planning criteria and CEA (Grid Standards) Regulations, 2010 as amended from time to time. Further, the transmission planning inside the State has to move ahead synchronously with generation addition and development of regional and inter regional transmission planning. Development of transmission system must match with generating capacity on one side and growing demand on the other side. With Open Access in transmission, the role of transmission has changed from a mere infrastructure to an enabler in operation of a competitive power market.

Investments in transmission are made with prudence and benefits are socialized. In addition to the financial benefit as evaluated through IRR computation, there are other intangible benefits on account of realization of the planned elements including the benefits on account of better capacity utilization and consequently higher energy yield from generating stations, opportunity financial gains on account of transmitting additional power through the strengthened network to meet additional loads etc. which cannot be quantified.

Thus, for transmission projects, though the initial investment cost appears to be high and financial benefit lower, the benefit due to the project available in the long run including intangible benefits is manifold which spans for more than 35 years from the date of commissioning.

Limitations of the present Intra state transmission network

The presently available intra-state transmission system in the State is analyzed to be insufficient for catering to the current demand in an unconstrained manner. There were very little additions in the state in 220 and 400kV level since 1992 and the infrastructure created is not sufficient to meet the increasing load growth. With the projected load in the coming years and the existing transmission network, there can be serious consequences as submitted below:

- Absence of additional capacity will lead to extreme low voltage pockets and chances of system collapse. Analysis carried out indicate that the voltage profile in Malabar area is even below the statutory requirement under the present loading conditions and is observed to reach an extreme low value under the horizon scenario studied with a projected demand of 4800MW.
- Under utilization of assets due to de-rating resulting in financial loss.
- The peak load system loss will increase heavily causing huge financial loss.

The planning criteria mandated by the Central Electricity Authority requires that the transmission network should not be subjected to any constraints like overloading or under voltage consequent to an [n-1] condition like the loss of any one circuit of a double circuit feeder or one transformer of a multi transformer installation. It also states that the transmission system shall meet 'N-1-1' criteria also, wherein after suffering single contingency (N-1), grid is still vulnerable to experience second contingency, though less probable ('N-1-1'), wherein some of the equipment's may be loaded up to their emergency limits. The present day transmission system in KSEBL is found to be not fully complying with these criteria and is analyzed to be deficient in meeting the current demand in a secure and reliable manner as well as extremely inadequate to meet the projected future demand.

Consequent to the formation of S3region for Kerala control area, the import capability (ATC) of the state will be assessed periodically based on which sanction for Long Term and Medium Term Open Access will be granted for the import of power from outside the State. The ATC in-turn depends on the transmission capability of the intra-state network to transmit the power in an unconstrained manner satisfying all the statutory planning and operational criteria as laid out in Central Electricity Authority's planning criteria and Grid code respectively. Any constraints like low voltages or security issues violating the contingency criteria consequent to the absence of a strong and stable transmission network inside the state will lead to the reduction of the import capability. Therefore the augmentation of intra state transmission network is essential.

To achieve the above objective, SBU-T has evolved a multiyear capital expenditure plan which is grouped as follows:

- A. **Ongoing projects & New projects costing less than Rs.10Cr**
- B. **Normal capital works (above 10Cr) proposed in the control period 2018-19 to 2021-22**
- C. **Transgrid works.**
- D. **SLDC related capital works.**

The Multiyear capital expenditure plan for the period 2018-19 to 2021-22 was submitted before Hon'ble Commission along with the Multiyear ARR petition on October 30, 2018.

In addition to the capital investment already submitted before Hon'ble Commission, following new works are planned for the control period, the details of which are submitted below. The DPR of these works are submitted along with this petition. The following works are categorized under Normal works above Rs.10Cr.

1. Construction of 110/11kV Substation at Vengara

KSEBL, is considering Capacity Enhancement, Upgradation, Renovation and Modernization (R&M), and new proposals for elements in the Transmission system. The present project is aimed for improving the transmission system in and around Kadampuzha and nearby areas

"110kV Substation, Vengara " project envisages construction of 110/11kV substation with 2 x 12.5 MVA transformers and the construction of 8 km 110 kV LIL line from Kizhissery-Malappuram 110 kV line (1KIML1) to the proposed Vengara substation site.

The project is expected to facilitate the industrial and commercial development of Vengara and Oorakam grama panchayaths and nearby areas and to meet future demand, improve the quality and reliability of supply to about 3.5 Lakh people.

The estimated cost of the project is Rs 24 Cr and is expected to be commissioned by 2021-22.

2. Construction of 110KV S/S at Adivaram

At present the Electrical section Puthuppady is fed from 66 kV substation Thamarassery through 11 kV Puthuppadi feeder, 11 kV Kuppayakode feeder and 11 kV Adivaram feeder. 11 kV Puthuppadi feeder feed Poolode, Kakkavayal, Kannappankundu and Valliyad area and 11 kV Kuppayakode feeder caters the load of Kalappuram, kannoth area and Adivaram feeder feed Eangapuzha town, Kaithapoyil area, Adivaram town, chippilithode and Nooramthode area. During shut down of Adivaram 11kV feeder, Engapuzha town area is back fed via 11kV Kuppayakode feeder through Kalapuram AB. Presently in this area there are about 8000 consumers and 19 transformers (100kVA transformers- 13no, 160kVA transformer- 1no, 250kVA transformer- 1Nos and 25kVA transformer-4Nos) of Puthuppadi section area. Also the Kuppayakode feeder feed 42 transformers (160 kVA transformers- 2 Nos, 100 kVA transformers-33 Nos, and 25 kVA transformers 7 Nos) under Electrical Section, Kodenchery before reaching Kalappuram area, this feeder covers about 24 kms of thickly vegetated and hilly areas under Kodenchery section before reaching Kalappuram and hence break down of feeder and supply interruption is more in this area. As there is no substation in that area, the back feeding of this feeder is not possible during shut down of 66 kV Substation Thamarassery. A new 110kV substation in Adivaram

envisages an integral development of the transmission & distribution system in this area. The scope of work includes the following:

Construction 110kV substation at Adivaram with

- two Nos of 110 kV feeder bays
- 1x12.5 MVA 110/11 kV Transformers and 0.5 km 110 kV DC line.

The estimated cost of the project is Rs 11.50 Cr and is expected to be commissioned by 2020-21.

3. Construction 110 kV Substation, Kadampuzha

The project “110kV substation, KADAMPUZHA ” contains construction of 110/11kV substation with 2 x 12.5 MVA transformers and the construction of 4.5 km 110 kV LILO line from Malaparamba - Kuttippuram 110 kV line to the proposed Kadampuzha substation site..

The project is expected to facilitate the industrial and commercial development of Kottakkal Municipality and nearby areas Marakkara and Edayur grama panchayath and to meet future demand, improve the quality and reliability of supply to about 3.75 Lakh customers

The growth of Load in Kottakkal, Edayur, Puthanathani and Kadampuzha towns and surrounding areas are expected to increase rapidly in the coming years due to commercial establishments and residential loads.

These areas are now fed by six 11kV feeders, viz. 11kV Puthanathani feeder, 11kV Kadampuzha feeder, 11 kV Edayur from 110kV Substation, Kuttippuram, 11kV Chenakkal feeder and 11 kV Parappur feeder from 110 kV Substation, Edarikode, 11kV Vattalloor feeder from 33kV Substation, Makkarapparamba. Since all the above feeders are over loaded, interruption due to routine maintenance and feeder faults will affect a large number of consumers for long time. This situation can be avoided by constructing the proposed substation.

The estimated cost of the project is Rs 19.80 Cr and is expected to be commissioned by 2021-22.

4. Up gradation of Mavelikkara - Pallom 66kV DC

The work involves upgrading 41km of existing 66kV Pallom Mavelikara DC line and Changanassery 66kV substations to 110kV standards with corresponding bay upgradation at Pallom and Mavelikara Substations.

Currently the station load at 66kV side of Thiruvalla, Chumatra and Changanasery is 108A,80A and 145A respectively. Hence the total load on the feeders is around 333A which implies a corresponding MVA rating of 38.45MVA. On upgrading to 110kV standard, the 333A at 66kV level will correspondingly reduce to 200A. With this, we can arrive that the power loss at 66kV level is around 2.7 times that at 110kV.

The scope of work includes bay upgradation of 66KV substation, Changanachery, upgradation of 66KV system to 110KV at 220KV Substation, Pallom, upgradation of 66KV – 6TVMV#1 and 6TVMV#2 bays to 110KV bays at 110KV substation, Mavelikara, upgradation of 19.74 km Pallom-Mavelikara 66KV DC line to 110KV , upgradation of 21.26KM Pallom-Mavelikara 66KV DC line to 110KV.

The estimated cost of the project is Rs.68.35 Crore and is expected for commissioning by 2021-22.

5. Construction of 110KV DC line Kattappana - Peerumedu

The work involves construction of two 110 KV feeder bays each at Kattappana and Peerumedu substations for terminating the line. The line part involves construction of 36 KM 110 KV DC line from Kattappana substation to Peerumedu substation. With this the excess power available at existing and upcoming Muthirapuzha group generating stations during wet seasons can be evacuated to Peerumedu, Vandiperiyar and the nearby substations in Pallom – Peerumedu line. Power evacuation of existing wind project and upcoming wind – solar hybrid projects at Ramakalmedu and nearby areas can also be done with this interlinking. Also the proposed 220 kV Kuyilimala substation can be fully utilized by loading to peerumedu area. Feeding of Kuyilimala substation is proposed from the Idukki – Udumulpet 220 kV line. This line will become power rich after commissioning of PES and Upper Sengulam projects. Hence its evacuation will be easier with Kuyilimala substation and Kattappana – Peerumedu line. Thus this proposed line is an interlinking between major source point and major load point. Also with this line back feeding facility will be available from Peerumedu side to Vazhathoppu, Nedumkandam and Kattappana substations and vice versa. With this it will be very easier to maintain uninterruptable power supply at Pallom – Peerumedu – Moozhiyar belt during overload at Sabarimala festival season. The line is proposed to be constructed as 110 KV DC line after converting all associated substations to 110 KV. The estimated project cost is Rs. 40.7 Cr and the project is expected for CoD by 2021-22.

6. Up gradation of 66KV Sasthankotta-Chavara DC line to 110KV

At present, the 110kV Substation Chavara is fed from 220kV substation Kundara and from 110kV substations Sasthamcotta through KMML, an EHT consumer. The 110kV Kavanad Substation is fed from 110kV Chavara substation. There is no direct feeding to 110kV Chavara Substation from 110kV Sasthamcotta substation. If any fault occurs at 220kV Substation kundara, the Chavara, KMML and Kavanadu 110 KV Substations has to be fed from Sasthamcotta Substation. By the up gradation of this proposed line, we can provide 2 Nos. feeders extra to Chavara Substation and hence the supply at the Chavara Substation will become more stable which in turn benefit KMML and Kavanadu Substation. More over the proposed site for the 110 KV Substation, Thevalakkara is very near to this proposed Sasthamcotta - Chavara line and can be tapped very easily. This will improve the voltage profile and load restrictions in Thevalakkara and near by areas. There will be a load growth in near future in kollam, kavanad area due to the development of Kollam- Kavanad bypass and by the up gradation of this line, Chavara, Kavanad substations will become more stable to meet the load requirement. Also this will benefits for the new proposal for interlinking of 110kV Kavanad Substation and 110kV Perinad substations. Also a 50MW solar project is proposed at west kallada by NHPC. This power is proposed to be evacuated through the 110kV Kundara – Chavara KMML feeder Hence to improve the stability and reliability of Sasthamcotta, Chavara, KMML, Kavanad Substations, this upgradation is essential. The estimated project cost is Rs.21.85 Cr and the anticipated CoD is 2020-21.

7. Up gradation of 66KV Edappon-Kozhencherry SC line to 110KV DC

This project comes under the downstream work of Transgrid project. The downstream work is the up-gradation of existing 66kV D/C Edappon-Kozhencherry feeder to 110kV D/C. The 66kV Edappon-Kozhencherry D/C line is lying idle and disconnected from both Edappon and Kozhencherry substations for

more than 8 years, with the gantry arrangements of feeders at both stations decommissioned; consequent upon the upgradation of Kozhenchery and Ranni Substations to 110kV voltage level. Kozhenchery and Ranni Substations are now fed from Pathanamthitta Substation through Pathanamthitta – Kozhenchery - Ranni Double Circuit lines. Kakkad power house and other small hydel stations in the Pamba basin are also connected to the 110kV Bus of Pathanamthitta Substation. This work also includes the construction of two numbers 110kV feeder bays at Edappon and Kozhenchery Substations after dismantling the existing isolated 66kV bay. The estimated project cost is Rs.18.35 Cr and the project is expected for CoD by 2020-21.

8. Construction of 110KV Substation, Thiruvally

The scope of the project includes

- Construction of 2 Nos 110kV Feeder Bays, 2Nos Transformer Bays,
- installation of 2Nos 12.5MVA 110/11kV Transformers.
- LILoing Elamkur-Nilambur 110kV line

For providing alternate 11kV feeders to the scheme area and for providing back up support to 110kV network of 220kV Substation, Elamkur, construction of 110kV Substation, Thiruvally is essential and it is proposed to construct 110kV Substation, Thiruvally by LILoing Elamkur-Nilambur 110kV line by installing 2x12.5 MVA transformers, considering the reduction in Peak Load System loss, additional load expected in the area and the relief in the loading of transmission elements in the vicinity. The estimated project cost is Rs.12.50 Cr and the anticipated CoD is 2020-21.

9. Construction of 110KV Substation, Thimiri

The scope of work includes

- Construction of 110kV Substation, Thimiri by constructing
- 5.5km of 110kV DC LILo line from 110kV Payyannur – Cherupuzha 110kV feeder 1 (1PYCP-1) at Thattummal to Thimiri using Panther
- Construction of 2Nos. of 110kV Feeder bays,
- 2Nos. of Transformer Bays
- 1No. of 110kV Bus coupler bay
- 6 Nos. of 11kV Outgoing feeders

The project is expected to facilitate the industrial development and meet future demand in Alakode, Mathamangalam, Nadukani etc. area and improve the quality and reliability of supply to about 2.5 Lakh customers in the Town and 1.5 Lakh consumers in Alakode and Nadukani substation supply area. Since the population growth in this region is increasing day by day, construction of new 110kV Substation is inevitable to avoid future load problems and interruptions.

The estimated cost of the project is Rs.20.87 Cr and is expected to be commissioned by 2021-22.

10. Construction of 66kV Substation at Munnar, 33kV Substation Marayoor and associated lines

The scope of work includes construction of 66KV Substation, construction of 66KV substation, Munnar & associated 66KV DC line, 33KV substation, Marayoor and associated 33KV DC line. The estimated cost of the project is Rs.15.79 Cr and expected to be commissioned by 2021-22.

11. Kuthunkal Nedumkandam 110 kV DC line Project

The proposal envisages linking Kuthunkal – Neriya Mangalam 110 kV line to 66 kV Nedumkandam substation by construction of 17 km 110 kV DC line and installation of 40 MVA 110/66 kV transformers at Nedumkandam substation in Idukki district under Transmission circle Thodupuzha. At present 66 KV supply to Vazhathoppu, Nedumkandam and Kattappana substations is feeding from the 50 year old Sengulam – Moolamattom 66 KV SC feeder and its tap line to Kattappana. In the line at Kuyilimala there is a switching station from which either Sengulam or Moolamattom supply is feeding to the three substations. The total peak load of the three substations is more than 240 A and conductor snapping was frequent since the line is constructed using ACSR MINK conductor of capacity 167 A. Due to this the Sengulam – Kuyilimala portion of the line re-conductoring work with ACSR DOG is completed. Moolamattom - Kuyilimala portion re-conductoring cannot be easily done since the tower is not strong. Even after re-conductoring, the problem is not fully solved since the DOG conductor also is fully loaded. Considering a load growth of 10% in the area the problem will re-strike during the coming years. Since the present source points (Moolamattom & Sengulam) are far away from the load center (about 70 KM) low voltage complaints are frequent. This project will help in resolving these issues. The estimated cost of the project is Rs.25.55 Cr and the anticipated CoD is in 2019-20.

12. Aluva-Kothamangalam

The scope of work includes up-gradation of the existing 66 kV Kothamangalam –Aluva DC feeder to 110 kV standard by replacing the towers, & existing copper conductors with ACSR wolf. This is an important tie feeder between 66kV Kothamangalam Substation and Aluva Substation. It is this feeder and the 66kV Pallivasal -Aluva feeder; through which the generation of the Pallivasal Station (37.5MW) is being evacuated to Aluva side. The 66kV Pallivasal- Aluva feeder is already being upgraded to 220/110 kV multi-circuit, by the Transgrid. The 66kV Kothamangalam S/S is also being upgraded to 220 kV, and the work has started. Also since the new Boothathankettu SHEP is upcoming, the evacuation from this Station also is to be considered. The Boothathankettu SHEP (24MW) is targeted to complete by 2020. As per the Boards approved long term plan, for evacuation of power above 12 MVA, the voltage level of feeders need to be 66 kV or above. The estimated cost of the project is Rs. 39.60 Crores and expected to commission in 2020-21.

13. Construction of 110kV Substation at Murickasery and associated 8KM 110kV line.

The scope of work includes construction of 110KV substation at Murickasery and associated 8KM 110KV line. The estimated cost of the project is Rs.11.6 Cr and the project is expected to commission in 2021-22.

A summary of the additional normal capital works planned for the control period and the proposed outlay are submitted below:

Table CAPITAL OUTLAY OF ADDITIONAL NORMAL WORKS					
Outlay (Amount in Rs. Crores)					
No.	Project	2019-20	2020-21	2021-22	Total
		Rs.Cr.	Rs.Cr.	Rs.Cr.	Rs.Cr.
1	Construction of 110K/11kv Vengara S/S		18.26	9.98	28.24
2	Construction of 110KV S/s Adivaram	7.821	9.069		16.89
3	Construction 110 kV Substation, Kadampuzha		14.06	9.47	23.53
4	Upgradation of Mavelikara-Pallom 66KV DC	0.1	2.1	39.6	41.8
5	Construction of 110KV DC line from 66KV substation Kattappana to 66KV substation, Peerumedu		25	15.7	40.7
6	Upgradation of 66KV Sasthankotta-Chavara DC Line		10	11.85	21.85
7	Upgradation of 66KV Edappon-Kozhencherry SC line and associated bays	3.1	12.4	5.15	20.65
8	Construction of 110KV Substation, Thiruvalli	6.2	7.21		13.41
9	Construction of Thimiri substation		9	11.87	20.87
10	Construction of Munnar substation and associated lines	1	14	7.13	22.13
11	Kuthunkal-Nedumkandam		11	5	16
12	Aluva-Kothamangalam		20	22.49	42.49
13	110KV Substation Murickasery	0.01	8	3.5	11.6
	Total	18.23	160.10	141.74	320.16

A summary of GFA addition due to the additional works is submitted below:

Table GFA Addition				
No.	Project	2019-20	2020-21	2021-22
		Rs.Cr.	Rs.Cr.	Rs.Cr.
1	Construction of 110K/11kv Vengara S/S			28.24
2	Construction of 110KV S/s Adivaram		16.89	
3	Construction 110 kV Substation, Kadampuzha			23.53
4	Upgradation of Mavelikara-Pallom 66KV DC			41.8
5	Construction of 110KV DC line from 66KV substation Kattappana to 66KV substation, Peerumedu			40.7
6	Upgradation of 66KV Sasthankotta-Chavara DC Line			21.85
7	Upgradation of 66KV Edappon-Kozhencherry SC line and associated bays			20.65
8	Construction of 110KV Substation, Thiruvalli		13.41	
9	Construction of Thimiri substation			20.87
10	Construction of Munnar substation and associated lines			22.13
11	Kuthunkal-Nedumkandam			16
12	Aluva-Kothamangalam			42.49
13	110KV Substation Murickasery			11.6
	Total	0	30.3	289.86

TRANSGRID WORKS

SBU-T had submitted 12 numbers of Transgrid works for approval of Hon'ble Commission in the Capital Investment Plan submitted during October 2018. In addition to this, following new works are also planned for this control period, the details of which are submitted.

Sabari Lines and Substation package

The project involves a comprehensive Sabari Lines and Substations package with a 220kV SCADA enabled GIS substation at Pathanamthitta which would receive power at 220kV level from both 220kV Edappon substation and Sabarigiri – Edamon (SBEM) 220kV lines, each through double circuit feeders. The lines for

this substation from Edappon are planned by constructing 16km of MCMV lines through the right of way of Edappon-Adoor 66 kV line and 12.7km of MCMV lines through the right of way of Adoor-Pathanamthitta 66 kV line. The lines from SBEM are LILoed from Padom as 8.2km of new 220kV DC lines with new RoW and 3.42km MCMV line through the RoW of Punaloor-Koodal 110kV line and as 14.5km new MCMV line through the RoW of Koodal-Pathanamthitta 66kV line. The substation planned at Pathanamthitta will have four 220kV feeders, one 100MVA 220/110kV transformer and 110kV cable connectivity to the 110kV yard of Pathanamthitta AIS. The lines portion is estimated at Rs. 141.2 Crore and the substation part is estimated at Rs. 54.1 Crore.

The second part of the project involves construction of a 220kV/110kV SCADA enabled GIS substation at Kakkad with 220kV feeders LILoed from Sabarigiri-Ambalamugal (SBAM) line at Valupara. The line proposed is 220kV SC line of 1.66km through new RoW from Valupara to Kakkad. The GIS substation at Kakkad will have two 220 kV feeders, one 100 MVA 220/110kV transformer and two 110kV feeders one of which providing cable connectivity to the 110kV substation yard at the Kakkad power house. The lines portion is estimated at Rs.6.3 Crore and the substation part is estimated at Rs. 42.4 Crore.

The estimated cost of the project is Rs 244 Cr and is expected to be commissioned by 2021-22.

220/110kV GIS & 220/110kV GIS, Vengallur & Thrissivaperur Line Strengthening Package - Phase II (Kunnamkulam to Vengallur 220/110kV MCMV line)

The project “Vengallur GIS & TLSP Phase II” as mentioned above forms a part of the TransGrid 2.0 Project and consists of following new substations and transmission line project.

1. Project A : 110/11kV GIS Vengallur (Execution Phase 1)
Construction of 110/11kV GIS at Vengallur, Malappuram district with station capacity of 2x12.5MVA transformer, 6x110kV Feeders with Double Busbar arrangement and 11kV 10 panel set
2. Project B : 220/110kV MCMV line from Kunnamkulam to Vengallur (Execution Phase 2A)
TLSP Phase II - Construction of 42km 220/110kV MCMV transmission line from Kunnamkulam Substation in Thrissur district to Vengallur in Malappuram district using existing/new RoW
3. Project C : 220/110kV GIS Vengallur (Execution Phase 2B)
Construction of 220/110kV GIS at Vengallur, Malappuram district with station capacity of 2x100MVA transformers, 2x220kV Feeders and Double Busbar arrangement (upgradation of the 110/11kV GIS constructed under Project A) will be implemented in Phase 2

The estimated cost of the project is Rs 204.15 Cr and is expected to be commissioned by 2021-22.

Vizhinjam 220/110KV GIS Substation

This project is for the upgradation of the existing 66kV, Vizhinjam substation to a 220kV GIS substation. 220kV GIS is planned at the existing Vizhinjam substation premises with a capacity of 2x100MVA. This project is intended to meet the future power requirement in the southern part and the coastal area of Thiruvananthapuram District. The development of Vizhinjam area with the completion of the International seaport will make the power demand to increase very high. This station will ensure a secure and reliable network satisfying N-1 criteria in this area and there will be a good relief in the loading of the existing feeders.

The southern side and the coastal belt of the Thiruvananthapuram District like Veli, Vizhinjam, Balaramapuram, Neyyattinkara, Muttathara areas will get the feeding from both the 220kV substations Kattakada (existing) & Vizhinjam (proposed). This will mitigate total supply failure in the event of tripping

of one circuit of the Pothencode - Paruthippara 110kV DC line. There will be a good relief in the loading of the existing feeders. Moreover considerable increase in the voltage profile can be expected. The proposed 220kV Vizhinjam substation is the only solution for the supply reliability in these areas. The Substation proposed is to achieve the above and the cost is estimated as Rs. 75.00Cr. The project is expected to commission by 2021-22. A summary of the additional TRANSGRID works planned for the control period and the proposed outlay are submitted below:

Table ADDITIONAL TRANSGRID WORKS						
CAPITAL OUTLAY (Rs.Cr.)						
	Name of Work	2019-20	2020-21	2021-22	Expected CoD	Total
1	Sabari package		122	126	2021-22	248
2	Vengallur GIS & TLSP Phase II		136.12	68.06	2021-22	204.18
3	Vizhinjam 220/110KV GIS Substation	0.5	26.624	43.84	2021-22	71
	Total	0.5	284.744	229.46		523.18

Table ADDITIONAL TRANSGRID WORKS					
GFA ADDITION (Rs.Cr.)					
	Name of Work	2019-20	2020-21	2021-22	Expected CoD
1	Sabari package			248	2021-22
2	Vengallur GIS & TLSP Phase II			204.18	2021-22
3	Vizhinjam 220/110KV GIS Substation			71	2021-22
	Total			523.18	

The remaining projects are in proposal/design/ approval/ stages, their details can be provided to the Commission as and when the projects are ready for implementation. SBU-T humbly request Hon'ble Commission permission to submit the details of these projects in future.

Hon Commission may please condone any inadvertent error/omission that may have crept in this petition. The petitioner may be given an opportunity to rectify the same detected subsequently. The petitioner may also be allowed to the petitioner to make further submission, addition and alteration to this petition as may be necessary from time to time.

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CHAPTER 9: MID YEAR PERFORMANCE REVIEW OF SLDC FOR THE YEAR 2019-20& REVISED ESTIMATE FOR 2020-21 & 2021-22

- 9.1. As per Regulation 66(2), the State Load Despatch Centre shall submit separate audited accounts of its business. The Regulation 66 (2) further states that in case separate accounts are not available, the Commission may approve as the Aggregate Revenue Requirement of State Load Despatch Centre, a portion of the approved Aggregate Revenue Requirement of the transmission business of KSEB Limited, based on the proposal submitted by it only for the first year of the

Control Period. In compliance with the same, KSEBL evolved a procedure for segregation of accounts of SLDC. The accounts of SLDC submitted in this petition are based on this procedure.

- 9.2. KSEBL had provisionally segregated the accounts of SLDC in the MYT ARR submitted before Hon'ble Commission on October 31, 2018. In the instant petition, the midyear performance of SLDC for the year 2019-20, revised ARR of SLDC for 2019-20 and revised estimate for the years 2020-21 and 2021-22 are submitted below.

Gross Fixed Asset of SLDC

- 9.3. The details of GFA addition originally claimed and approved by Hon'ble Commission for SLDC for the years 2019-20 to 2021-22 are submitted below.

Table 9.1 GFA addition estimated in ARR and provisionally approved (Rs Cr)										
No.	Name of Work	Estimated in ARR			Approved			Revised		
		2019-20	2020-21	2021-22	2019-20	2020-21	2021-22	2019-20	2020-21	2021-22
1	Ongoing projects plus new small works	7.14	0	0				0.97	8.40	0
2	New projects	53	12	212.45	53.00	12.00	212.45	0	0	53
	Total	60.14	12	212.45	53.00	12.00	212.45	0.97	8.40	53

- 9.4 SLDC had submitted before Hon'ble Commission a detailed Capital Investment Plan of SLDC for the control period along with the MYT petition filed on 30th October 2018. The CIP of SLDC miscellaneous small purchases/works in addition to few major works. The changes made in the major works and the reasons for the same are submitted below:

- ADMS Work:** The project was planned for an amount of Rs. 7.14 Cr with expected completion in 2019-20. The completion of the project is shifted to the year 2020-21 due to non availability of supplies and contractors.
- SAMAST:** The DPR of SAMAST work has been prepared and is submitted for PSDF grant. The completion schedule of SAMAST amounting to Rs.53 Cr is shifted to 2021-22.
- Reliable Communication & Data Acquisition:** The project 'Reliable Communication & Data acquisition' amounting to Rs.212.45 Cr is shifted to the CAPEX of SBU-T and accounted under SBU-T GFA. Therefore the same is removed from the CIP of SLDC.
- Miscellaneous works:** An amount of Rs.12 Cr was included in the CIP of SLDC towards purchase of tools and plants of Relay and communication. Since Relay and Communication wings come under SBU-T, these works are shifted to CIP of SBU-T.

- 9.5 The GFA of SLDC for each year of the control period is computed based on the asset addition projected for the respective year as per the Capital Investment Plan for SLDC submitted along with the Mid Term Review petition. The revised GFA of SLDC projected for the year 2019-22 is as submitted below.

Table 9.2 Opening GFA of SLDC for the control period (Rs.Cr.)					
	Asset group	2018-19 (Actual)	2019-20	2020-21	2021-22
1	Land & Land rights	0	0	0	0
2	Building and Civil Works	0.28	0.29	0.39	0.79
3	Hydraulic Works	0.00	0	0	0
4	Other Civil Works	0.00	0	0	0
5	Plant & Machinery	0.29	0.48	1.24	9.22
6	Lines Cable Network etc.	0.00	0	0	0
7	Vehicles	0.00	0	0	0
8	Furniture & fixtures	0.06	0.08	0.08	0.08
9	Office Equipment's	0.03	0.07	0.10	0.10
10	Communication equipment	0.00	0	0	0
11	SCADA and IT system	6.31	6.31	6.39	6.40
12	Other equipment	0.40	0.40	0.40	0.40
	Total	7.37	7.63	8.60	17

9.6 A comparison of the GFA of SBU-T with the GFA of SLDC for the years 2019-20 to 2021-22 is submitted below.

Table 9.3 GFA segregation(Rs Cr)			
Item	2019-20	2020-21	2021-22
SBU-T			
Opening GFA** (Rs.Cr.)	5094.47	6425.07	8684.75
SLDC			
Opening GFA (Rs.Cr.)	7.63	8.6	17
Ratio of GFA of SLDC to total GFA of SBU-T & SLDC	0.15%	0.14%	0.20%

**incl GFA of SLDC

Operation and Maintenance Expenses of SLDC

9.7 Expenditure incurred for the following offices are considered as SLDC expenditure for segregation and for assessing the O&M expenses of SLDC, the details corresponding to the following offices are extracted from SARAS software.

- Main LD station at Kalamassery and Sub LD at Thiruvananthapuram
- SCADA Sub division, Kalamassery and Thiruvananthapuram
- TNMS, Kalamassery
- Office of Chief Engineer, Transmission – System Operation, Kalamassery.
- In the case of repairs and maintenance expenditure, additional amount of Rs. 14 lakhs per year is also included considering the high AMC charges for SCADA equipments and based on past actual.

9.8 Based on the above methodology adopted for segregation of accounts of SLDC, the O&M expenses of SLDC projected for the control period are given below.

Table 9.4 O&M expenses of SLDC (Rs Cr)							
As per ARR				Revised			
Item	2019-20	2020-21	2021-22	Actual upto Sept-19	2019-20	2020-21	2021-22
Employee cost	17.24	18.97	20.86	4.24	8.18	9.84	10.82
R&M Expenses	0.62	0.69	0.75	0.32	0.65	0.71	0.75
A&G Expenses	1.35	1.63	1.93	0.31	1.14	1.21	1.32
O&M expenses	19.22	21.28	23.55	4.87	9.96	11.77	12.89

The details are furnished under S-2 of the SLDC ARR forms.

Pay Revision Expenses

- 9.9 SLDC is not claiming pay revision expenses along with this ARR petition. However, it is requested that pay revision expenses as and when arising in the control period may be allowed over and above the norms in line with CERC norms and Kerala State Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2018. An estimate of pay revision expenses of SLDC is submitted below. The estimate is same as that submitted in the original ARR petition. The projection of Pay Revision expenses for SLDC segregated based on the ratio of employee cost for the year 2018-19 is as submitted below:

Table 9.5 Projection of Pay revision expenses (Rs.Cr.) for SLDC				
SBU		2019-20	2020-21	2021-22
SBU-T & SLDC		29.78	32.18	34.71
SLDC	Employee cost ratio for 2018-19 : 1.93%	0.57	0.62	0.67

Depreciation of SLDC

- 9.10 In the original ARR petition, the depreciation claim of SBU-T and SLDC were clubbed together. As part of segregating the accounts of SLDC, the depreciation of SLDC for the years 2019-20 to 2021-22 are worked out by segregating from the Depreciation of SBU-T based on the GFA ratio of SLDC. The Depreciation of SLDC is submitted below.

Table 9.6 Segregation of Depreciation of SLDC (Rs Cr)			
Item	2019-20	2020-21	2021-22
Depreciation of SBU-T	193.78	255.10	313.17
GFA ratio	0.15%	0.14%	0.20%
Depreciation of SLDC	0.28	0.34	0.60

Return on Equity

- 9.11 The ROE for SBU-T (including SLDC) is Rs. 119.99 Cr each year during the Control Period. This ROE is apportioned to SLDC based on GFA ratio as submitted below. The RoE of SLDC is submitted below.

Table 9.7 Segregation of RoE of SLDC (Rs Cr)			
Item	2019-20	2020-21	2021-22
RoE of SBU-T	119.99	119.99	119.99
GFA ratio	0.15%	0.14%	0.20%
RoE of SLDC	0.18	0.17	0.24

Interest on Working Capital

9.12 As per Regulation 32(f) of KSERC (Terms and conditions for determination of Tariff) Regulations, 2018, the working capital of SLDC shall comprise of,-

- (i) operation and maintenance expenses for one month; plus
 - (ii) cost of maintenance spares at one per cent of the historical cost of plant and equipments; plus
 - (iii) receivables equivalent to State Load Despatch Centre charges for one month.
- (2) Interest on normative level of working capital as per this Regulation shall be allowed at a rate equal to two percent higher than the base rate as on the First day of April of the financial year in respect of which the petition for approval of Aggregate Revenue Requirement and determination of tariff is filed.

Table SLDC : Interest on Working capital (Rs Cr)				
No	Item	2019-20	2020-21	2021-22
1	O&M expenses (as per norms)	0.83	0.98	1.07
2	Maintenance Spares (as per norms)	0.08	0.09	0.17
3	Receivables (as per norms)	0.90	1.08	1.24
4	Total Working Capital	1.81	2.14	2.48
5	Interest Rate (as per norms) (2% + base rate as on 1-4-2019)	10.95%	10.95%	10.95%
6	Interest on Working Capital	0.20	0.23	0.27

Interest and Finance charges

9.13 In the original ARR petition, the Interest and Finance charges of SBU-T and SLDC were clubbed together. As part of segregating the accounts of SLDC, the Interest and Finance charges of SLDC for the years 2019-20 to 2021-22 is worked out by segregating from the I&F charges of SBU-T based on the GFA ratio of SLDC. The I&F charges of SLDC is submitted below.

Table 9.8 Segregation of I&F charges of SLDC (Rs Cr)			
Item	2019-20	2020-21	2021-22
Interest & Finance charges of SBU-T	138.56	270.40	414.25
GFA ratio	0.15%	0.14%	0.20%
Interest & Finance charges of SLDC	0.21	0.38	0.84

Interest on GPF

9.14 The interest on GPF for SLDC for the years 2019-20, 2020-21 and 2021-22 is reproduced in the table below:

Table 9.9 Segregation of Interest on PF (Rs.Cr.) for SBUT & SLDC				
SBU		2019-20	2020-21	2021-22
SBU-T & SLDC	Employee cost ratio for 2018-19	20.68	22.04	23.40
SLDC	1.93%	0.42	0.45	0.47

Interest on Master Trust bonds

- 9.15 The projection of Interest on Master Trust Bonds for SLDC are segregated based on the ratio of employee cost for the year 2018-19 is as submitted below:

Table 9.10 Segregation of Interest on Master Trust for SBUT & SLDC (Rs. Cr.)				
SBU		2019-20	2020-21	2021-22
SBU-T & SLDC		105.59	100.98	96.37
SLDC	Employee cost ratio for 2018-19 : 1.93%	2.04	1.95	1.86

Aggregate Revenue Requirement of SLDC

- 9.16 The total Aggregate Revenue Requirement of SLDC for the years 2019-20 to 2021-22 is submitted below:

Table 9.11 ARR of SLDC (Rs.Cr.)				
	Particulars	2019-20	2020-21	2021-22
1	Expenses			
a)	Operating Expenses			
i)	Employee expenses	8.18	9.84	10.82
ii)	Administrative and General Expenses	0.65	0.71	0.75
iii)	Repair and Maintenance Expenses	1.14	1.21	1.32
iv)	Interest on Working Capital	0.20	0.23	0.27
v)	RLDC Fee and Charges (*)			
b)	Capital expense components			
i)	Depreciation	0.28	0.34	0.60
ii)	Interest and finance charges on term loan	0.21	0.38	0.84
	Interest on GPF	0.42	0.45	0.47
	Interest on Master Trust Bond	2.04	1.95	1.86
iii)	Return on equity	0.18	0.17	0.24
iv)	Income Tax provision			
2	Total Revenue Expenditure (a+b+c)	13.30	15.28	17.17
3	Less: Non Tariff income			
4	Less: Income from other business			
5	Aggregate Revenue Requirement	13.30	15.28	17.17

- Claimed in SBU-D ARR

Table 9.12 SLDC Charges for 2019-20, 2020-21 & 2021-22							
No	Item	2019-20		2020-21		2021-22	
		Estimated in ARR	Revised	Estimated in ARR	Revised	Estimated in ARR	Revised
1	Peak demand projection	4175	4369	4384	4500	4517	4635
2	SLDC ARR (Rs.Cr.)	19.77	13.30	21.93	15.28	24.26	17.17
3	SLDC charges for LTA (Rs/MW/month)	5482	3523	5791	3930	6216	4288
4	SLDC charges for STOA (Rs/MW/day)	180	116	190	129	204	141

Transmission & SLDC Tariff forms

Form-T1: Summary of ARR of SBU-T (Rs.Cr)									
No	Item	Estimated in ARR	Appvd. Vide order dtd. 8-7-2019 (2019-20)	Actual upto Sept 2019	Revised estimate for 2019-20	Appvd. For 2020-21	Revised estimate for 2020-21	Appvd. For 2021-22	Revised estimate for 2021-22
1	Operation & Maintenance Expenses	397.46	397.46	256.4	390.83	452.88	440.48	491.28	496.3
2	Interest and finance charges	257.99	185.05	50.59	138.56	263.65	270.44	313.12	417.04
3	Interest on Bonds and additional contribution	125.15	105.59	36.17	105.59	100.98	100.98	96.37	96.37
4	GPF Interest	23.12	22.03	9.55	20.68	23.39	22.04	24.74	23.40
5	Depreciation	199.58	173.47	123.3	193.78	222.92	255.10	261.09	313.17
6	Interest on WC and deposits	20.2	17.4	9.55	21.70	20.48	23.28	23.28	27.10
7	Adjustment of Controllable/uncontrollable factors	0	0	0					
8	Other items			1.17					
10	Total Revenue Expenditure	1023.5	901	469.6	871.14	1084.30	1112.28	1209.89	1376.16
11	Return on Equity	119.99	119.99	119.99	119.99	119.99	119.99	119.99	119.99
12	Tax on RoE	0	0	0	0		0		0
13	Aggregate Revenue Requirement (10+11+12) of SBU-T & SLDC	1143.49	1,020.99	589.59	991.14	1204.29	1231.86	1329.88	1490.58
14	Aggregate requirement of SLDC				13.30		15.28		17.17
15	Aggregate requirement of SBU-T excl SLDC				977.83		1216.99		1473.42
16	Less: Other Income	37.3	37.30	20.02	37.30	41.82	41.82	46.35	46.35
17	Less: Revenue from Open Access								
18	Less: Income from Other Business								
19	ARR from Transmission Tariff	1106.19	983.69	569.57	953.84	1162.47	1190.45	1283.53	1444.24

Form-T2: O&M Expenses							
S. No.	Particular	2019-20				2020-21	2021-22
		Apr-Sep (Actual)	Estimated for the year	Approved by the Commission	Revised estimate for 2019-20	Projected	Projected
1	Bay Basis						
a	Op. Balance of no. of Bays		2682	2682	2635	2803.5	3008.5
b	Addition of no. of Bays during year				205		
c	Deletion of no. of Bay during year						
d	Cl. Balance of no. of Bays		2682	2682	2840		
e	Average no. of Bays during Year						
f	Applicable O&M cost Norm for Bay :- Rs _____Lakh/Bay		11.23	11.23	11.23	11.77	12.34
A	O&M Expense per Bay, Rs L						
2	ckt-km Basis						
a	Op. Balance of ckt-km		9823.2	9823.2	9686	10728.69	11578.95
b	Addition of ckt-km during year				850.3		
c	Deletion of ckt-km during year						
d	Cl. Balance of ckt-km		9823.2	9823.2	10536.3		
e	Average ckt-km during Year						
f	Applicable O&M cost Norm - Rs _____Lakh / ckt-km		0.98	0.98	0.98	1.03	1.08
B	O&M Expense Rs. Lakh	256.4	397.46	397.46	390.83	440.48	496.3
	Pay revision expenses						
3	Total O&M Expenses (as per norms) (A+B)						
4	Total O&M Expenses (actual)				524.85	561.58	600.9

Form T 2(a) : Employee expenses Rs. Crore							
S. No.	Particulars	2019-20			2020-21	2021-22	Remarks
		Apr-Sep (Actual)	Estimated for the year	Approved by the Commission	Projected	Projected	
1	2	7	8	9	10	11	13
1	Basic Salary	146.21	324.41		347.11	371.41	
2	Dearness Allowance (DA)	38.94	74.77		80.01	85.61	
3	House Rent Allowance	2.57	5.80		6.20	6.64	
4	Conveyance Allowance	0.00	0.00		0.00	0.00	
5	Leave Travel Allowance	0.01	0.02		0.02	0.03	
6	Earned Leave Encashment	16.66	22.70		24.29	25.99	
7	Other Allowances	0.92	2.09		2.24	2.39	
8	Medical Reimbursement	0.67	1.91		2.04	2.19	
9	Overtime Payment	0.00	0.00		0.00	0.00	
10	Bonus/Ex-Gratia Payments	0.98	1.03		1.11	1.18	
11	Interim Relief / Wage Revision	0.00	0.00		0.00	0.00	
12	Staff welfare expenses	0.17	0.18		0.19	0.21	
13	Net Employee Costs	207.14	432.91		463.21	495.64	
14	Terminal Benefits	0.00	0.00		0.00	0.00	
15	Provident Fund Contribution	0.00	0.00		0.00	0.00	
16	Provision for PF Fund	0.00	0.00		0.00	0.00	
17	Pension Payments	0.00	0.00		0.00	0.00	
18	Gratuity Payment	0.00	0.00		0.00	0.00	
19	Annual Contribution for Terminal Liabilities based on actuarial valuation	0.00	0.00		0.00	0.00	
20	Contribution of KSEB Ltd towards National Pension Scheme	0.98	0.00		0.00	0.00	
21	Others	0.00	0.04		0.04	0.05	
22	Gross Employee Expenses	208.13	432.95		463.26	495.69	
23	Less: Expenses Capitalized	22.60	69.64		74.52	79.74	
24	Net Employee Expenses	185.53	363.31		388.74	415.95	

Form T 2(b) : Administrative & General Expenses Rs. Crore							
S. No.	Particulars	Current Year (n)			Ensuing Year (n+1)	Year (n+2)	Remarks
		Apr-Sep (Actual)	Estimated for the year	Approved	Projected	Projected	
1	2	7	8	9	10	11	13
1	Rent Rates & Taxes	0.21	0.7		0.74	0.79	
2	Insurance	0	0.38		0.41	0.43	
3	Telephone & Postage, etc.	0.83	2.74		2.9	3.09	
4	Legal charges	0.2	0.59		0.63	0.67	
5	Audit Fees	0	-0.03		-0.03	-0.03	
6	Consultancy charges	0	0.02		0.02	0.02	
7	Other Professional charges	0.39	0.9		0.96	1.02	
8	Conveyance	3.31	7.31		7.75	8.25	
9	Vehicle Running Expenses Truck / Delivery Van	0.08	0.2		0.21	0.22	
10	Vehicle Hiring Expenses Truck / Delivery Van	0.1	0.29		0.31	0.33	
11	Electricity charges	0.02	0.07		0.07	0.07	
12	Water charges	0.08	0.17		0.18	0.19	
13	Entertainment	0.1	0.23		0.24	0.26	
14	Fees & subscription	0.18	0.54		0.57	0.61	
15	Printing & Stationery	0.44	1.05		1.11	1.18	
16	Advertisements, exhibition publicity	0.01	0.3		0.31	0.33	
17	Contribution/Donations	0.22	0.45		0.48	0.51	
18	Training expenses	0.01	0.07		0.08	0.08	
19	Miscellaneous Expenses	0.25	0.62		0.66	0.7	
20	SRPC expenses	0.24	0.24		0.25	0.27	
21	Sports and related activities	0.01	0.09		0.09	0.1	
22	Freight	0.52	0.95		1.01	1.07	
23	Purchase Related Advertisement Expenses	0.3	0.84		0.89	0.95	
24	Office Expenses	38.17	77.81		82.48	87.84	
25	License Fee and other related fee	1.31	4.19		4.44	4.73	
26	V-sat, Internet and related charges	0.05	0.03		0.03	0.03	
27	Books & periodicals	0	0.01		0.02	0.02	
28	Others	0.4	12.98		13.76	14.66	
29	Others- Other Purchase related Expenses	2.66	1.09		1.15	1.23	
30	Gross A&G Expenses	50.07	114.88		121.77	129.68	
31	Net A&G Expenses	50.07	114.88		121.77	129.68	

Form T 2(c) : Repair & Maintenance Expenses Rs. Crore								
S. No.	Particulars	Current Year (n)				Ensuing Year (n+1)	Year (n+2)	Remarks
		Apr-Sep (Actual)	flood	Estimated for the year	Approved by the Commission	Projected	Projected	
1	2	7		8	9	10	11	13
1	Plant & Machinery	12.49	0.01	29.66899901		31.74582894	33.96803697	
2	Buildings	1.06	0.00	2.666559233		2.853218379	3.052943666	
3	Civil Works	2.81	0.00	5.359245423		5.734392603	6.135800085	
4	Hydraulic Works	0.04	0.00	0.087929816		0.094084903	0.100670846	
5	Lines & Cable Networks	3.76	0.00	8.35817303		8.943245142	9.569272302	
6	Vehicles	0.39		0.890687961		0.953036118	1.019748647	
7	Furniture & Fixtures	0.05		0.118843704		0.127162764	0.136064157	
8	Office Equipment	0.18		0.474525611		0.507742404	0.543284372	
9	Gross R&M Expenses	20.79	0.01	47.62496379		50.95871125	54.52582104	
10	Less: Expenses Capitalised			0		0	0	
11	Net R&M Expenses	20.79	0.01	47.62496379		50.95871125	54.52582104	

Form-T3: Depreciation for SBU-T & SLDC (Rs.Cr.)								
	Estimated in ARR	Approved vide order dtd. 8-7-2019 (2019-20)	Actual upto Sept-2019	Revised estimate for 2019-20	Appvd. For 2020-21	Revised estimate for 2020-21	Appvd. For 2021-22	Revised estimate for 2021-22
Item								
Net depreciation allowable for SBU-T & SLDC	199.58	173.47	68.10	193.78	222.92	255.13	261.09	314.78

Form-T4: Interest on capital liabilities (Rs Cr) for SBU-T & SLDC									
No	Item	Estimated in ARR	Approved vide order dtd.8-7-19 (2019-20)	Actual up to 30-9-19	Revised estimate for 2019-20	Approved for 2020-21	Revised estimate for 2020-21	Approved for 2021-22	Revised estimate for 2021-22
1	Average normative loan	2579.89	1,999.99	1304.19	1,529.39	2849.43	2,985.00	3384.12	4,603.11
2	Interest rate	10%	9.25%	7.76%	9.06%	9.25%	9.06%	9.25%	9.06%
3	Interest for the year*	257.99	185.05	50.59	138.56	263.65	270.44	313.12	417.04

Form T4C: SBU-T & SLDC interest on Master Trust bonds (Rs Cr)										
No	Item	Estimated in ARR	Approved vide order dtd.8-7-19 (2019-20)	Actual upto 30-9-19	Revised estimate for 2019-20	Appvd. For 2020-21	Revised estimate for 2020-21	Appvd. For 2021-22	Revised estimate for 2021-22	
1	Existing bond	82.95	82.95	36.17	82.95	78.34	78.34	73.73	73.73	
2	Additional contribution to Master Trust	42.20	22.64	0	22.64	22.64	22.64	22.64	22.64	
	Total	125.15	105.59	36.17	105.59	100.98	100.98	96.37	96.37	

Form-T5: SBU-T& SLDC :Interest on Working capital (Rs Cr)									
		Estimated in ARR	Approved vide order dtd. 8-7- 2019 (2019-20)	Actual upto Sept- 2019	Revised for the year 2019-20	Appvd. For 2020- 21	Revised for the year 2020- 21	Appvd. For 2021-22	Revised for the year 2021- 22
No	Item								
1	O&M Expenses	363.23	397.46		390.83	452.88	440.48	491.28	496.30
2	GFA Plants and Equipment		5,637.86		5094.47	6719.97	6425.07	8147.73	8684.75
3	Transmission charges		983.69		934.54	1162.47	1166.68	1283.53	1431.94
4	O&M Expenses for one month	31.52	33.12		32.57	37.74	36.71	40.94	41.36
5	1% of Historical cost of plants & Equipment	61.22	56.38		50.94	67.20	64.25	81.48	86.85
6	Receivables (Transmission charges for one month)	92.18	81.97		77.88	96.87	97.22	106.96	119.33
7	Total requirement of working capital	184.92	171.47		161.39	201.81	198.18	229.38	247.53
8	Rate of interest	10.70%	10.15%		10.95%	10.15%	10.95%	10.15%	10.95%
9	Interest on working capital	19.79	17.40	9.55	21.70	20.48	23.28	23.28	27.10

Form-T7: ROE (Rs.Cr.)									
No	Item	Estimated in ARR	Approved vide order dtd.8-7- 2019 (2019-20)	Actual upto 30- 9-2019	Revised estimate for 2019- 20	Appvd. For 2020- 21	Revised estimate for 2020- 21	Appvd. For 2021- 22	Revised estimate for 2021- 22
1	RoE of SBU-T & SLDC	119.99	119.99	119.99	119.99	119.99	119.99	119.99	119.99
2	RoE of SLDC (Segregated based on GFA ratio)				0.18		0.17		0.24
3	RoE of SBU-T				119.81		119.82		119.75

Form-T10: Non Tariff Income of SBU-T (Rs.Cr.)									
No	Other Income (Rs.Cr.)	Estimated in ARR	Appd vide order dtd.8-7-2019 (2019-20)	Actual upto Sept 2019	Revised estimate for 2019-20	Appvd. For 2020-21	Revised estimate for 2020-21	Appvd. For 2021-22	Revised estimate for 2021-22
1	Interest on staff loans and advances	0.02		0.00	0.02	0.02	0.02	0.03	0.03
2	Income from statutory investments	0		0.00	0	0	0	0	0
3	Income from rent of land or buildings	0.5		0.07	0.5	0.52	0.52	0.55	0.55
4	Income from sale of scrap	2.87		7.51	2.87	3.01	3.01	3.17	3.17
5	Income from staff welfare activities	0			0	0	0	0	0
6	Rental from staff quarters	0.12		0.04	0.12	0.12	0.12	0.13	0.13
7	Excess found on physical verification	0.03		0.00	0.03	0.04	0.04	0.04	0.04
8	Interest on investments, fixed and call deposits and bank balances	0.05		0.09	0.05	0.05	0.05	0.05	0.05
9	Interest on advances to suppliers/contractors	0.05		0.12	0.05	0.05	0.05	0.05	0.05
10	Income from hire charges from contractors and others	0		0.00	0	0	0	0	0
11	Income from fibre optic cables/co-axial cables on transmission system	3.9			3.9	4.49	4.49	5.07	5.07
12	Income from advertisements, etc.	0			0	0	0	0	0
13	Miscellaneous receipts	29.76		12.20	29.76	33.52	33.52	37.26	37.26
	Total Other Income (Rs.Cr.)	37.3	37.30	20.02	37.30	41.82	41.82	46.35	46.35

Form-S1: ARR of SLDC (Rs.Cr.)				
	Particulars	2019-20	2020-21	2021-22
1	Expenses			
a)	Operating Expenses			
i)	Employee expenses	8.18	9.84	10.82
ii)	Administrative and General Expenses	0.65	0.71	0.75
iii)	Repair and Maintenance Expenses	1.14	1.21	1.32
iv)	Interest on Working Capital	0.20	0.23	0.27
v)	RLDC Fee and Charges (*)			
b)	Capital expense components			
i)	Depreciation	0.28	0.34	0.60
ii)	Interest and finance charges on term loan	0.21	0.38	0.83
	Interest on GPF	0.42	0.45	0.47
	Interest on Master Trust Bond	2.04	1.95	1.86
iii)	Return on equity	0.18	0.17	0.24
iv)	Income Tax provision			
2	Total Revenue Expenditure (a+b+c)	10.82	12.91	14.86
3	Less: Non Tariff income			
4	Less: Income from other business			
5	Aggregate Revenue Requirement	13.30	15.28	17.17

Form S2: O&M expenses of SLDC (Rs Cr)							
As per ARR				Revised			
Item	2019-20	2020-21	2021-22	Actual upto Sept-19	2019-20	2020-21	2021-22
Employee cost	17.24	18.97	20.86	4.24	8.18	9.84	10.82
R&M Expenses	0.62	0.69	0.75	0.32	0.65	0.71	0.75
A&G Expenses	1.35	1.63	1.93	0.31	1.14	1.21	1.32
O&M expenses	19.22	21.28	23.55	4.87	9.96	11.77	12.89

Form S 2.1 :Employee expenses (Rs.Lakhs)						
S. No.	Particulars	Current Year (2019-20)			Ensuing Year (2020-21)	Year (2021-22)
		Approved	Apr-Sep(Actual)	Estimated	Projected	Projected
		6	7	8	9	10
I	Employee's Cost (Other Than Covered In 'III'&'IV')					
1	Basic Salary		282.45	595.69	655.25	720.78
2	Additional Pay		0.05	0.12	0.13	0.14
3	D.A.		95.88	202.20	222.42	244.66
4	House Rent Allowance		5.19	11.01	12.11	11.84
5	Other Allowances & Relief		2.81	5.00	5.50	6.05
6	Sub-Total: (1 to 5)	0.00	386.38	737.25	895.41	983.47
7	Medical Expenses Reimbursement		0.55	1.16	1.27	1.40
8	Travelling Allowance(Conveyance Allowance)		0.00	0.00	0.00	0.00
9	Leave Travel Assistance		0.00	0.30	0.50	0.60
10	Honorarium/Overtime		0.00	0.00	0.00	0.00
11	Load Despatch Allowance		0.00	0.00	0.00	0.00
12	Earned Leave Encashment		37.47	78.99	86.89	95.58
13	Payment Under Workman's Compensation		0.00	0.00	0.00	0.00
14	Any Other Item		0.00	0.00	0.00	0.00
15	Arrears to Wage Revision		0.00	0.00	0.00	0.00
16	Sub-Total (7 to 15)	0.00	38.02	80.45	88.66	97.58
17	Staff Welfare Expenses		0.00	0.10	0.15	0.20
II	Apprentice And Other Training Expenses		0.00	0.00	0.00	0.00
III	Payment/Contribution To PF Staff Pension And Gratuity		0.00	0.00	0.00	0.00
1	Terminal Benefits		0.00	0.00	0.00	0.00
a.	Provident Fund Contribution		0.00	0.00	0.00	0.00
b.	Provision for PF Fund		0.00	0.00	0.00	0.00
c.	Pension Payments		0.00	0.00	0.00	0.00
d.	Gratuity Payment on super annuation		0.00	0.00	0.00	0.00
e.	SuperAnnuation Fund, If any		0.00	0.00	0.00	0.00
f.	Any other terminal benefit(Encashment)		0.00	0.00	0.00	0.00
2	Any Other Items		0.00	0.00	0.00	0.00
	Total III	0.00	0.00	0.00	0.00	0.00
IV	Grand Total [I.6 + I.16 + I.17 + II + III]	0.00	424.40	817.80	984.22	1081.25
V	Incentive Payment		0.00	0.00	0.00	0.00
VI	Grand Total	0.00	424.40	817.80	984.22	1081.25
VII	Less Expenses Capitalised		0.00	0.00		
	Net Employee expenses	0.00	424.40	817.80	984.22	1081.25

Form S 2.2 : Administrative and General Expenses (Rs.Lakhs)							
S. No.	Particulars	Current Year (2019-20)			Ensuing Year (2020-21)	Year (2021-22)	Remarks
		Approved	Apr- Sep(Actual)	Estimated	Projected	Projected	
1	2	6	7	8	9	10	13
A)	Administration Expenses						
	Rent rates and taxes						
i)	Rent		0.00	0.00	0.00	0.00	
ii)	Rates & Taxes		1.18	2.50	2.80	3.10	
	Sub - total of Rent rates and taxes	0.00	1.18	2.50	2.80	3.10	
iii)	Insurance		0.05	1.80	2.00	2.20	
iv)	Revenue Stamp Expenses,Telephone,P&T & Telex Charges		5.30	7.45	8.20	8.76	
v)	Legal Charges		0.01	0.10	0.10	0.10	
vi)	Audit Fees		0.00	0.00	0.00	0.00	
vii)	Technical Fees, Consultancy and Other Professional Charges		0.24	0.50	0.60	0.70	
viii)	Conveyance and Travel		3.70	7.50	8.00	8.50	
ix)	Electricity charges		0.00	0.00	.	0.00	
x)	Vehicle Running & Hiring Expenses		1.39	4.79	5.30	5.80	
xi)	Vehicles Running Expenses Petrol And Oil		0.27	0.60	0.70	0.80	
xii)	Security / Service Charges Paid To Outside Agencies		11.16	25.50	28.10	28.50	
	Sub-Total of Administrative Expenses	0.00	23.30	50.74	55.80	58.46	
B)	Other Charges						
i)	Fee And Subscriptions Books And Periodicals		0.00	0.01	0.00	0.00	
ii)	Printing And Stationery		0.78	1.66	1.87	2.07	
iii)	Advertisement Expenses (Including Purchase Related) Exhibition & Demo.		0.00	0.10	0.10	0.15	
iv)	Water Charges		0.00	0.00	0.00	0.00	
v)	Bank Charges		0.00	0.00	0.05	0.05	
vi)	Miscellaneous Expenses		6.47	10.03	11.04	12.04	
vii)	Office Expenses		0.96	2.00	2.20	2.50	
	Sub-Total of other charges	0.00	8.21	13.80	15.26	16.81	
C)	Material Related Expenses		0.00	0.00	0.00	0.00	
i)	Incidental Stores Expenses		0.00	0.00	0.00	0.00	
	Sub Total of Material related expenses	0.00	0.00	0.00	0.00	0.00	
D)	Total A&G expenses	0.00	31.51	64.54	71.06	75.27	

Form S 2.3 : Repair and Maintenance expenses (Rs.Lakhs)							Remarks
S. No.	Particulars	Current Year			Ensuing Year	Year	
		(2019-20)			(2020-21)	(2021-22)	
		Approved	Apr-Sep(Actual)	Estimated	Projected	Projected	
1	2	6	7	8	9	10	13
1	Plant & Machinery		18.29	66.42	73.46	80.51	
2	Building		5.19	24.40	23.78	25.00	
3	Civil Works		6.71	20.00	22.02	24.00	
4	Lines, Cables, Networks, etc.		-	0.40	0.20	0.20	
5	Vehicle		0.15	0.10	0.44	0.50	
6	Furniture & Fixtures		0.04	1.00	0.11	0.12	
7	Office Equipment		0.66	1.29	1.42	1.66	
8	Station Supplies		-				
9	Miscellaneous		-				
A	Total R&M Expenses	-	31.04	113.61	121.43	131.99	
B	less: Expenses Capitalized	-	-	-	-	-	
C	Total R&M Expenses chargeable to Revenue Expenses	-	31.04	113.61	121.43	131.99	
	Total						

Form-S3: SLDC : Interest on Working capital (Rs Cr)				
No	Item	2019-20	2020-21	2021-22
1	O&M expenses (as per norms)	0.83	0.98	1.07
2	Maintenance Spares (as per norms)	0.08	0.09	0.17
3	Receivables (as per norms)	0.90	1.08	1.24
4	Total Working Capital	1.81	2.14	2.48
5	Interest Rate (as per norms) (2% + base rate as on 1-4-2019)	10.95%	10.95%	10.95%
6	Interest on Working Capital	0.20	0.23	0.27

Form-S5 : Fixed Assets (2019-20)							
S.No.	Assets Group (as per notification in respect of depreciation)	Rate of depreciat ion	Gross fixed assets				Remar ks
			At the beginning of the year	Additions during the year	Adjustment & deductions	At the end of the year	
1	2	3	4	5	6	7	
1	Land & Land rights		0	0	0	0	
2	Building and Civil Works		28.89	10.00	0.00	38.89	
3	Hydraulic Works		0	0.00	0.00	0	
4	Other Civil Works		0	0.00	0.00	0	
5	Plant & Machinery@		47.97	75.72	0.00	123.69	
6	Lines Cable Network etc.		0	0.00	0.00	0	
7	Vehicles		0	0.00	0.00	0	
8	Furniture & fixtures		8.27	0.00	0.00	8.27	
9	Office Equipment's		6.76	2.79	0.00	9.55	
10	Communication equipment		0	0.00	0.00	0	
11	SCADA and IT system*		630.61	8.64	0.00	639.25	
12	Other equipment		40.10	0.00	0.00	40.1	
	Total (1) to (12)		762.60	97.15	0.00	859.75	

Form-S5 : Fixed A Form-S5 : Fixed Assets (2019-20)

	Land & Land rights		0	0	0	0	
	Building and Civil Works		38.89	40.00	0.00	78.89	
	Hydraulic Works		0	0.00	0.00	0	
4	Other Civil Works		0	0.00	0.00	0	
	Plant & Machinery		123.69	798.75	0.00	922.44	Includes Rs. 698 lakhs

							for ADMS (PSDF grant Sanctioned is Rs.477 lakhs)
	Lines Cable Network etc.		0	0.00	0.00	0	
	Vehicles		0	0.00	0.00	0	
	Furniture & fixtures		8.27	0.00	0.00	8.27	
	Office Equipment's		9.55	0.00	0.00	9.55	
	Communication equipment		0	0.00	0.00	0	
	SCADA and IT system*		639.25	1.01	0.00	640.26	
	Other equipment		40.1	0.00	0.00	40.1	
	Total		859.75	839.76	0.00	1699.51	

S.No.	Assets Group (as per notification in respect of depreciation)	Rate of depreciation	Gross fixed assets (2021-22)					Remarks
			At the beginning of the year	Additions during the year	Adjustment & deductions	At the end of the year	Cumulative upto the beginning of year	
1	2	3	4	5	6	7	8	14
1	Land & Land rights		0	0	0	0		
2	Building and Civil Works		78.89	0.00	0.00	78.89		
3	Hydraulic Works		0	0.00	0.00	0		
4	Other Civil Works		0	0.00	0.00	0		
5	Plant & Machinery		922.44	17600.00	0.00	18522.44		•
6	Lines Cable Network etc.		0	0.00	0.00	0		
7	Vehicles		0	0.00	0.00	0		
8	Furniture & fixtures		8.27	0.00	0.00	8.27		
9	Office Equipment's		9.55	0.00	0.00	9.55		
10	Communication equipment		0	0.00	0.00	0		
11	SCADA and IT system*		640.26	5300.00	0.00	5940.26		**
12	Other equipment		40.1	0.00	0.00	40.1		
	Total (1) to (12)		1699.51	22900.00	0.00	24599.51	0.00	

- *Includes Rs.17600 lakhs for Reliable Communication Project (PSDF grant sanctioned is Rs.7376 lakhs). It may please be noted that this asset shall form part of the capital asset of Transmission Circles

****Rs.5300 lakhs represents the project cost of SAMAST for which DPR already been submitted before PSDF Authorities for availing Grant**

**MID TERM PERFORMANCE REVIEW OF SBU-D FOR
FY-20 & REVISED ESTIMATE FOR FY-21 &FY-22**

CHAPTER 10: MID TERM PERFORMANCE REVIEW OF SBU-D FOR FY-20 & REVISED ESTIMATE FOR FY-21 & FY-22

1. Introduction

- 10.1 Kerala State Electricity Board Limited supplies electricity to the entire population of about 3.47 Cr covering 14 districts in Kerala. SBU-D of KSEB Ltd directly supplies electricity to about 97 Lakh domestic consumers, 21.97 Lakh commercial/general consumers, 1.41 Lakh industrial consumers, 4.71 Lakh agricultural consumers. The key statistics of distribution network is given below

Table-10.1 Key Statistics of KSEBL Distribution Network as on 30.09.2019	
Particulars	Statistics
Area Sq.km.	38863 km ²
Districts No's	14
Electrical Circle Offices	25
Consumers (Nos)	12686120
Distribution transformers (Nos)	80699
HT lines (Ckt. Kms)	65370.02
LT lines (Kms)	291461

2. Capital Expenditure

- 10.2.1 The gross fixed addition proposed by KSEB Ltd in the ARR petition for Capital Investment Plan under Distribution SBU is given below:

Table :10.2- GFA addition proposed by KSEB Ltd in the ARR petition for Capital Investment Plan						
No.	Particulars	FY-19	FY-20	FY-21	FY-22	Total
1	Normal woks -Dhyuthi 2021	808.64	1300.55	1139.26	787.86	4036.31
2	Estimated & other funded Works	199.7	201.69	203.71	205.74	810.84
3	System strengthening & IT works	1593.91				1593.91
4	IT related works (CAP)				258.14	258.14
5	Safety	18	19.5	20	18.5	76
	Total	2620.25	1521.74	1362.97	1270.24	6775.2

- 10.2.2 GFA addition provisionally approved by the Commission is given below:

Table : 10.3- GFA addition provisionally approved by the Commission for Capital Investment Plan						
No	Particulars	FY-19	FY-20	FY-21	FY-22	Total
1	Normal woks -Dhyuthi 2021	312.23	691.67	607.98	403.37	2015.25
2	Estimated & other funded Works	199.70	201.69	203.71	205.74	810.84
3	System strengthening & IT works	1243.77	329.31			1573.08
4	IT related works (CAP)				258.14	258.14
5	Safety	18.00	19.50	20.00	18.50	76.00
	Total	1773.70	1242.17	831.69	627.61	4475.17

10.2.3 After detailed performance evaluation of the plan proposal under ARR petition and reviewing the achievement for the FY- 2019, the petitioner is submitting herewith the revised GFA addition proposal based on the capital investment under Distribution SBU. Detailed performance review report follows:

Table : 10.4- Revised GFA addition plan for Capital Investment Plan under SBU-D				
No	Particulars	2019-20	2020-21	2021-22
1	Normal woks -Dhyuthi 2021	847.63	1250.93	1563.88
2	Estimated & other funded Works	191.65	301.1	205.74
3	Flood related work	10	10	
4	System strengthening Central aided Projects	1077.44		
5	IT related works (CAP)	61.86	42.64	202.69
6	Safety	21.5	19	20.5
	Total	2210.08	1623.67	1992.81

Annual performance review of works under SBU-D upto Sept 2019

Physical progress of works

10.2.4 The Physical achievement of the Distribution work which includes Normal Dhyuthi works /estimated cost/ other funded works such as deposit work MP, MLA funded works and Central aidedproject works such as DDUGJY, IPDS, R APDRP is given below.

Table : 10.5- Physical achievement of distribution works			
SINo:	Particulars	FY -2019	FY -2020 (up to Sept.2019)
1	Service connections (No:s)	368673	176769
2	Construction of 11kV lines(ckt km)	1773	802
3	Construction of LT lines(ckt km)	3401	1657
4	Single phase to three phase conversion -(km)	1292	721
5	Installation of distribution transformers (No:s)	2410	823
6	Enhancement of distribution transformers (No:s)	517	148
7	Transformer faulty replacement	1660	865
8	Faulty meters replacement -Electronic (No:s)	837858	378372
9	Faulty meters replacement -mechanical (No:s)		
10	Mechanical meter replacement (No:)		
11	LT Reconductoring (ckt. km)	8355	5356
12	HT Reconductoring ckt. km)	840	317

Financial progress of works under Distribution - SBU

10.2.5 As per annual audited accounts for capital expenditure under Distribution SBU, the cost incurred during the FY-2019 amounts to Rs.1434.67 Cr., and the capitalized cost during the year is Rs.1203.72 Cr. and also capital work in progress amounts to Rs. 1108.24 Cr.

Dhyuthi Works

Progress of works under Dhyuthi– Works for 2018-19 and up to 30.09.2019 in FY 20

10.2.6 The Dhyuthi project is monitored using PROMOS software. The financial progress of completed works as per PROMOS software is given in table below.

Table 10.6: Progress of Normal works planned under Dhyuthi(Rs. in Cr.)			
No	Particulars	FY -2019	FY -2020 (up to Sept.2019)
1	Dhyuthi 2018-19 control period work	43.48	124.64
2	Dhyuthi 2019-20 control period work		3.30
	Total	43.48	127.94

10.2.7 The capital investment proposed under Dhyuthi scheme for FY-2019 was **Rs 808.64Cr.** As per PROMOS software, works amounting to **Rs 43.48Cr** was completed during 2018-19. In addition to this, works amounting to **Rs 552.22Cr.** was under implementation stage as on 31.03.2019. The completion date for the same was extended up to January 2020. The completed works amounts to **Rs 470.93 Cr.** and the works under implementation stage amountsto **Rs. 244.96 Cr** as on 11.03.2019. Thus out of 808.17 Cr proposed for the FY-2019, works amounting to **Rs.715.88Cr.** is already under implementation and completion stage as on 11.03.2020. The scheduling of remaining works is under progress. 90 % of the works proposed under Dhyuthi for FY-19 is expected to be completed during the year 2019-20.

10.2.8 The detailed physical and financial progress report of Dhyuthi is attached herewith as **Annexures I to III**

Reason for delay in executing Dhyuthi work

10.2.9 Hon'ble Commission may please note that the execution of Dhyuthi works during FY-2019 and first two quarters of the FY-2020 were delayed due to allocation of entire resources for the execution of huge quantum of funded works like DDUGJY/IPDS works, Deposit works and unprecedented floods during August 2018 and August 2019. Now the Centrally Aided projects are completed and the focus is to execute Dhyuthi works.

As the works were not executed due to the reasons mentioned above, KSEBL rescheduled the works as detailed below:

Revised capital expenditure plan of capital works under Distribution SBU for the years2019-20, 2020-21 & 2021-22

10.2.10 The petitioner revised the schedule of works under distribution SBU based on revised annual plan 2019-20, and 2020-21 plan period. The plan work for the year 2021-22 is same as that included under Dhyuthi work. Hence the revised plan under Dhyuthi, other funded and flood resilient work is as detailed below:

Table 10.7 :Revised plan for FY-20 to FY-22 vis a vis provisionally approved ARR									
	2019-20			2020-21			2021-22		
Particulars	ARR petition	Prov. approved	Revised plan	ARR petition	Prov. approved	Revised plan	ARR petition	Prov. approved	Revised plan
Dhyuthi	1300.55	691.7	847.63	1139.26	607.98	1250.90	787.86	403.37	1563.88
Other funded works incl ECSC	201.69	201.69	191.65	203.71	203.71	301.10	205.75	205.74	205.74
Flood resilient works			10			10			
Total	1502.24	893.39	1049.3	1342.97	811.69	1562.00	993.61	609.11	1769.62

10.2.11 In addition to the normal Development under Dhyuthi, the petitioner has to undertake and complete the Centrally Aided projects (ongoing works for system strengthening and IT related works) in a time bound manner. Safety plan is also included under capital investment plan under Distribution SBU.

System strengthening & IT works - Central aided projects

10.2.12 The status of Central aided projects for System strengthening works as on 30th September 2019 is detailed below:

Completed works during the FY2019

10.2.13 Central aided projects, ongoing RAPDRP Part B amounting to Rs 1115.18 Cr with 60 % grant completed during the FY-2019. Also RAPDRP Part A- IT works amounting to Rs 175.23 Cr with 100 % grant were completed during the FY-2019

Status of ongoing Central aided projects as on 30th September 2019

10.2.14 The central aided project Deena Dayal Upadhyaya Grama JyothiYojana (DDUGJY) is expected to be completed during the FY-2020. The project cost for DDUGJY amounts to Rs.485.37 Cr. Overall Financial Progress as per physical achievement as on 30.09-2019 is 99.5%. It is expected to submit the closure proposal by 31-03-2020. 60% is the Grant portion for the project.

10.2.15 The central aided project or IPDS work- Sanctioned Project cost is Rs.592.07Cr.Overall Financial Progress as per Physical Achievement : Rs. 489.23 Cr – 82.63%. This project is also declared to be completed during the FY-2020. 60% is the Grant portion for the project.

10.2.16 The detailed project status and the physical and financial progress of DDUGJY and IPDS works as on 31st March 2019 and 30th Sept 2019 is attached as **Annexure IV**

Status of IT related new works proposed under Capital investment plan

10.2.17 RAPDRP Part A- SCADA work amounting to Rs. 61.86 Cr is expected to be completed during the FY-2020. It is 100 % grant project.

10.2.18 Capital Investment Plan of new IT related works (CAP)-under Distribution SBU for the control period was submitted under ARR petition. The Commission provisionally

approved the capital investment plan with a GFA addition of Rs.258.14Cr for the FY-2022. The status of IT related works is attached as **Annexure V**

10.2.19 The revised forecast of IT projects with GFA addition plan follows:

Table 10.8: Revised GFA addition plan for IT related works					
No.	Particulars	FY-20	FY-21	FY-22	Grant
	New works				
1	IPDS- Phase II Incr IT			22.86	13.72
2	IPDS--ERP		42.64		22.58
3	IPDS-Smart Metering - Kesevadasapuram			19.525	
4	IPDS-Smart metering- UDAY			64.36	38.62
5	Smart Grid			90.7	11.715
6	RT-DAS			5.25	3.15
7	Cyber security				
	Ongoing projects				
8	Part A RAPDRP SCADA	61.86			61.86
	Sub Total	61.86	42.64	202.695	151.645

Safety Plan

10.2.20 The major proposals for improving the safety culture of employees and adopting new technologies for reducing the number of accidents from KSEBL installations are listed below.

- Providing safety kit to all line staff in Distribution wing
- Procurement of Vehicle with Ariel lift for electrical section offices
- Procurement of Modern Safety Equipment's in Transmission wing and Generation wing.
- Safety training to employees and contract workers in distribution5. Public awareness activities.

10.2.21The petitioner filed capital investment plan for Rs. 76 Cr. in the ARR petition for the Control period Honorable Commission provisionally approved the safety plan as such.

Achievement in safety Activities

10.2.22 The petitioner expended around **Rs. 15 Cr during 2018- 19** for providing 9253 nos. safety kit to line staff under Distribution SBU. The amount expended for safety equipment during 2019-20 control period till 30th September2019 comes to Rs.1.49Cr.

10.2.23 Revised forecast of Safety activities for the control period 2018-19, 2019-20 & 2021-22

Table 10.9: Rescheduled Capital investment plan for Safety (Rs Cr)					
No	Particulars	FY-20	FY-21	FY-22	Total
1	Providing safety kit to line staff	4	4	5	13
2	Aerial lift for SBU-D	14	12	13	39
3	Safety Equipment SBU-T&G wing	3.5	3	2.5	9
	Total	21.50	19	20.5	61

10.2.24 Based on the actual progress of the work under Distribution SBU and the revised capital outlay, the revised GFA addition plan for the rest of the control period is submitting for approval.

EV Policy – Initiatives

10.2.25 Following initiatives have been taken by KSEB so far, towards adoption of EV policy in the State of Kerala, which has notified KSEBL as the nodal agency for setting up EV charging stations across the State.

1. Implementation of Pilot Projects

- KSEB has now invited tender for the installation of Charging Stations in Board's own land along the National Highway in six Corporation areas viz. Thiruvananthapuram, Kollam, Kochi, Thrissur, Kozhikode & Kannur, as a Pilot Project. The PAC of the project is Rs. 1.41 Crore. The work shall include setting up one charging station with multiple charging points along with the required canopy. The work is expected to be completed within two months' from the date of award of work.
- Installation of EVCS in 32 locations in Thiruvananthapuram District at an amount of Rs. 8.2 Crore, using e-mobility promotion fund of Government of Kerala. The work is expected to be commenced by May, 2020 and completed by September, 2020.

2. Utilisation of FAME-II incentives:

The Department of Heavy Industries, Government of India has invited applications for availing incentives for the deployment of charging infrastructure in the cities. The incentives ranges from 50% of the capital cost to 100% capital cost depending on the category, specifically defined in this respect in the EOI. With Kerala having seven cities coming under the category of cities with population above one million, KSEB has applied under the scheme for seven million plus cities, where funds are being offered for setting up 25 charging stations having 7 or 8 chargers each under each city. Accordingly, 131 EV charging stations were approved in four cities as phase I, remaining will be approved in phase II.

10.2.26 KSEB has already rolled out an EOI for short listing firms for setting up PCS in Kerala. On completion of tendering process, it is planned to set up the PCS across the four cities through the selected agencies. The work is expected to be awarded by June 2020 and completed by March 2021.

10.2.27 Detailed write up on EV charging infrastructure proposal and the mode of implementation by KSEBL is attached as Annexure VI.

Table : 10.10 Revised GFA addition plan for Capital Investment Plan under SBU-D				
No	Particulars	2019-20	2020-21	2021-22
1	Normal woks -Dhyuthi 2021	847.63	1250.93	1563.88
2	Estimated & other funded Works	191.65	301.1	205.74
3	Flood related work	10	10	
4	System strengthening Central aided Projects	1077.44		
5	IT related works (CAP)	61.86	42.64	202.69
6	Safety	21.5	19	20.5
	Total	2210.08	1623.67	1992.81

10.3 Energy Sales forecast

10.3.1 KSEB Ltd vide MYT petition for the control period from 2018-19 to 2021-22 has projected the energy sales for the control period as follows

Table 10.11 Energy projected in the MYT petition (MU)					
Category	Control period				
	2017-18	2018-19	2019-20	2020-21	2021-22
LT I Domestic	10,569.99	10,856.52	11,439.87	11,901.30	12,381.33
LT VI&VII Commercial	3,063.48	3,168.22	3,448.97	3,660.73	3,885.49
LT IV Industrial	1112.33	1,100.98	1,134.68	1,146.03	1,157.49
LT V Agricultural	346.03	350.02	368.65	377.80	387.19
LT VIII Street Lights	373.48	380.84	404.36	420.75	437.81
LT II Colonies	4.85	4.90	5.05	5.10	5.15
LT IX Adv. Hoardings		2.01	2.12	2.18	2.25
LT Total	15,470.16	15,863.49	16,803.70	17,513.89	18,256.71
HT I Industrial	2062.99	2,137.66	2,280.91	2,385.08	2,494.01
HT II General	761.64	797.91	864.87	918.70	975.88
HTIII Agricultural	9.61	9.69	10.17	10.46	10.76
HT IV Commercial	644.82	671.26	727.59	772.88	820.98
HT V Domestic	14.97	15.41	16.51	17.33	18.20
EHT I 66kV Industrial	247.34	355.56	369.22	375.75	382.38
EHT II 110kV industrial	631.13	748.67	778.40	793.12	808.12
EHT III 220kV Industrial	77.99	94.83	101.61	106.69	112.02
EHT Non industrial	70.14	70.48	73.75	75.62	77.54
Railway Traction	265.80	273.51	293.05	307.70	323.09
KMRL	15.35	15.79	16.92	17.77	18.66
HT & EHT Total	4801.78	5,190.77	5,533.00	5,781.10	6,041.64
Bulk	608.77	593.03	632.99	662.29	693.10
Total	20,880.71	21,647.29	22,969.69	23,957.28	24,991.45
Growth (%)		2.35	6.10	4.30	4.32

10.3.2 Honorable Commission has approved the same vide order dated 08.07.2019. It may please be noted that the energy sales projected for 2018-19 was 21647.29 MU which is inclusive of energy availed through open access. The actual energy sales for 2018-19 was 21536.77 MU and energy availed through openaccess were 205.44 MU. The details are given in chapter 4 of this petition

Revised Energy sale forecast for the current control period

10.3.3 The revised energy sales of each consumer category was estimated based on the past actual data such as (i) category wise consumer strength, (ii) category wise consumption, (iii) Compound Annual Growth Rate (CAGR) taking the data of 2018-19, (iv) actual consumption during the year 2019-20 till September-2019, (v) new service connections proposed during the ensuing years, (vi) DSM initiatives taken by the Board and impact of wheeled energy, etc. The energy consumption forecast has also considered the economic growth, regional characteristics of consumers, seasonal variations, change in consumer habits, cumulative average growth rate during the previous years etc. Now, the CAGR of sales upto 2018-19 is given in the table below:

Table 10.12 : Historical trends in CAGR								
Category	10 year CAGR	7 year CAGR	6 year CAGR	5year CAGR	4year CAGR	3 year CAGR	2 year CAGR	YOY increase
Domestic	6.24	5.05	4.58	4.47	3.78	3.01	2.81	2.74
Commercial	7.93	6.00	6.36	7.65	7.45	5.60	4.36	5.16
Industrial	0.91	0.19	0.15	0.27	0.33	0.25	-0.90	-0.06
Agricultural	4.13	2.39	1.65	1.71	3.75	6.51	2.40	-2.42
Street Lights	2.53	3.63	3.17	3.31	2.19	1.00	0.27	1.15
LT II		-16.85	-17.93	-17.53	-10.25	-15.85	-15.29	-10.78
LT Advt and Hoardings		0.00	0.00	0.00	-7.79	6.41	6.64	1.49
Total	5.90	4.72	4.44	4.62	4.16	3.32	2.76	2.86
HT I	5.04	4.47	4.31	4.13	4.15	5.27	4.75	3.92
HT II	22.09	31.58	35.91	43.07	9.39	5.25	4.62	3.13
HTIII	0.18	1.37	1.11	3.37	6.76	9.40	-1.63	-7.14
HT IV	1.87	-3.08	-3.66	-4.61	4.73	6.02	7.36	8.00
HT V	0.00	0.00	0.00	0.00	18.87	19.50	9.24	8.95
EHT-1	1.86	-1.03	-0.08	-0.12	-0.21	5.16	-3.61	-5.92
EHT-II	0.42	-2.95	-2.55	-1.37	0.25	0.09	-0.73	-4.54
EHT-III	0.00	0.00	17.12	7.86	22.88	50.78	32.42	25.52
EHT General	0.00	0.00	0.00	1.91	0.57	-0.90	1.39	-5.13
Railway Traction	7.87	10.11	9.73	8.60	10.23	12.51	14.91	14.04
Bulk	6.54	3.43	3.00	2.71	1.92	1.13	-1.16	-1.77
HT&EHT Total	4.65	3.91	4.10	4.14	4.38	5.02	4.05	2.62
Total	5.76	4.50	4.35	4.49	4.22	3.77	3.10	2.80

10.3.4 The energy consumption for various customer categories are estimated primarily based on the CAGR trends during past years. Wherever it is observed that the trend is unreasonable or unsustainable, the growth factors have been corrected to arrive at more realistic projections based on experience.

10.3.5 In the case of year 2019-20, the energy demand for the first half of the financial year showed a considerable increase during the period April-July. The energy demand for the first six months from April-August of the financial year 2017-18 , 2018-19 and 2019-20 is given in table below.

Table 10.13 : Energy Demand in the first half of FY-20					
Month	2017-18	2018-19	2019-20	Growth (FY-18 to FY-19) (%)	Growth (FY-19 to FY-20) (%)
April	2233.75	2240.75	2429.556	0.31	8.43
May	2174.14	2154.72	2559.158	-0.89	18.77
June	1889.13	1932.05	2176.4	2.27	12.65
July	1940.58	1894.86	2092.4	-2.36	10.43
August	2009.53	1791.12	1915.51	-10.87	6.94
September	1909.66	2017.95	1993.817	5.67	-1.20
Total	12156.79	12031.45	13166.84	-1.03	9.44

10.3.6 It can be seen from the above table the energy sales during the first quarter of FY-20 show an abnormal increase owing to delay in onset of monsoon and excess heat during summer. Thus the energy sales of 2019-20 is projected considering the actual energy consumption for the period from April-November and that of the remaining period is estimated by applying a reasonable growth rate based on previous trends from the energy sales of corresponding period of FY-19. The energy sales projections for the remaining part of control period is estimated by considering the data of FY-19 as base year; as the first quarter of FY-20 shows an abnormal increase in demand.

10.3.7 For the remaining control period, compound annual growth rate as described below is taken.

- *For domestic category, the growth rate of domestic consumption shows a steady decreasing trend during last three years. Since the factors contributing reduction in consumption (Saturation, LED DSM impact, Solar penetration etc) are applicable to last four years, CAGR of 4 years seems to be appropriate for domestic category. As the first quarter of 2019-20 shows an abnormal increase in demand, the same is not used for projecting the next year data. The estimate is arrived by applying CAGR on the data of FY-19. The An allowance of 0.15% reduction is allowed for DSM activities savings and solar penetration for the year 2020-21 and 0.30 % is given for 2021-22 in anticipation of energy savings due to LED distribution. The 3 year CAGR is used for energy sales projection of LT Commercial considering the trends, and 4 year CAGR for LT Agriculture and Public lighting category.*
- *As for LT Industrial category, the consumption shows a small negative growth rate CAGR for last 2 years and YOY change from 2017-18 is negative. Hence 1 % growth is considered for projection.*
- *Impact of project SOURA and future solar installations by consumers in future years not considered for projection because of difficulty in exact prediction of consumer behaviour.*
- *In the case of HT & EHT category, it is not possible to predict the quantum of energy purchase by open access consumers because they resort to short term power purchase and have not furnished any definite proposals for the future. Hence energy sales including energy wheeled by embedded open access consumers is also considered for future projections. Energy consumed from captive generation is not considered for future energy sales projection.*
- *The 4 year CAGR is used for energy sales projection of HT Industrial, Commercial & General combined, HT Agriculture category. HT domestic is relatively a new category formed in FY-15 and CAGR is on the higher side. Hence a growth of 5 % growth is considered.*
- *In the case of EHT categories, 2.5% is taken for EHT 66 KV, 110 KV and EHT non-industrial category as the CAGR taken with respect to 2018-19 shows abnormal values. In the case of EHT 220 KV, being a captive generator, there is a wide variation in their consumption; hence projection based on their previous trends cannot be relied and hence 3% increase is taken for projection.*
- *In addition to the sale to its own consumers, KSEBL has been providing electricity to other licensees at the BST approved by the Hon Commission. In the case of licensees, 4 year CAGR is taken for energy sales projection.*
- *Considering the present trends, 45 MU was considered towards electric vehicle charging stations for FY-21 and 90 MU was estimated for FY-22.*
- *The estimated energy consumption of the Bulk Consumers for the next control period based on 4 year CAGR*

- Thus the energy sales forecast for the control period, estimated as described in preceding paragraphs, is given in table below.

Table 10.14 :Revised Category wise sales projection (MU)			
Category	2019-20	2020-21	2021-22
Domestic	11584.02	11680.62	12087.61
Commercial	3466.51	3590.28	3791.44
Industrial	1131.11	1134.01	1145.35
Agricultural	364.46	363.45	377.08
Street Lights	383.85	394.50	403.13
LT II	4.11	4.23	4.27
LT IX	2.06	2.15	2.21
LT X	0.62	0.66	0.70
LT Total	16936.75	17169.90	17811.80
HT I	2205.50	2351.57	2449.18
HT II	843.61	881.59	931.01
HTIII	9.58	10.17	10.86
HT IV	751.66	776.65	820.19
HT V	17.50	17.98	18.88
EHT I	341.62	352.38	361.19
EHT II	719.76	751.99	770.79
EHT III	119.74	122.73	126.41
EHT General	72.03	70.59	72.71
Railway Traction	304.21	334.20	350.91
Bulk	628.35	644.88	668.66
KMRL	15.81	15.82	16.29
HT VI	0.00	45.00	90.00
HT & EHT Total	6029.36	6375.55	6687.07
Total	22966.11	23545.45	24498.87

- 10.3.8 Based on the above projection, the forecast of each tariff Category for the next control period is made and provided in table below.

Table 10.15 : Sales Projection for LT Category (MU)				
No	Category	2019-20	2020-21	2021-22
1	LT I Domestic	11584.02	11680.62	12087.61
2	LT II Colony	4.11	4.23	4.27
3	LT IV A Industrial	1120.23	1123.10	1134.33
4	LT IV B Industrial	10.88	10.91	11.02
5	LT V A Agriculture	301.34	300.51	311.78
6	LT V B Agriculture	63.12	62.94	65.30
7	LT VI A General	225.38	222.66	235.13
8	LT VI B General	128.40	129.39	136.64
9	LT VI C General	250.92	259.87	274.44
10	LT VI D General	22.50	23.31	24.61
11	LT VI E General	3.01	3.12	3.30
12	LT VI F General	945.89	979.66	1034.55
13	LT VI G General	78.25	81.05	85.59
14	LT VII A Commercial	1596.37	1678.50	1772.55
15	LT VII B Commercial	192.23	188.33	198.88
16	LT VII C Commercial	23.55	24.39	25.76
17	LT VIII A Public Lighting	281.71	289.53	295.86
18	LT VIII B Public Lighting	102.14	104.97	107.27
19	LT IX Advertisements and Hoardings	2.06	2.15	2.21
20	LT X Electric vehicle charging stations	0.62	0.66	0.70
	LT Subtotal	16936.75	17169.90	17811.80

10.3.9 The Projection for HT and EHT consumer categories are given below:

Table 10.16 : Sales Projection for HT & EHT Category (MU)				
HT category				
No	Category	2019-20	2020-21	2021-22
1	HT I A Industrial	2191.21	2336.33	2433.30
2	HT I B Industrial	14.29	15.24	15.87
3	HT II A General	201.46	210.53	222.33
4	HT II B General	642.15	671.05	708.67
5	HT III A Agriculture	7.31	7.76	8.28
6	HT III B Agriculture	2.27	2.41	2.58
7	HT IV A Commercial	453.98	340.87	359.98
8	HT IV B Commercial	297.68	435.78	460.21
9	HT V Domestic	17.50	17.98	18.88
10	HT VI Electric charging vehicles	0.00	45.00	90.00
	HT Sub Total	3827.84	4082.96	4320.11
EHT Category				
No	Category	2019-20	2020-21	2021-22
1	EHT 66 KV Industrial	341.62	352.38	361.19
2	EHT 110KV Industrial	719.76	751.99	770.79
3	EHT 220 KV Industrial	119.74	122.73	126.41
4	EHT General A	15.93	15.61	16.08
5	EHT General B	56.10	54.99	56.64
6	EHT Railway Traction	304.21	334.20	350.91
7	KMRL	15.81	15.82	16.29
8	EHT Sub Total	1573.17	1647.71	1698.30

10.3.10 Similarly, the projection for Licensees and others are given below:

Table 10.17 : Sales Projection for Licensees and others (MU)				
No	Category	2019-20	2020-21	2021-22
1	KPUPL	95.44	96.65	101.22
2	CSEZ	58.63	59.03	59.46
3	RPL	31.97	35.17	37.43
4	Technopark	93.90	99.31	104.74
5	Cochin Port trust	36.77	36.99	37.80
6	Thrissur Corporation	163.06	165.28	169.82
7	KDHPCL	61.25	64.04	67.88
8	MES	71.74	72.07	73.18
9	Karnataka	0.79	0.80	0.82
10	Infopark	10.51	11.04	11.59
11	Smart City	4.29	4.50	4.73
	Subtotal	628.35	644.88	668.66
	Grand Total	22966.11	23545.45	24498.87

10.4 Aggregate Technical and Commercial Losses

T& D losses

10.4.1 The T&D loss proposed by KSEBL and approved by Honorable Commission for the control period is given in table below.

Table 10.18 T&D losses									
No	Particulars	Estimated				Approved			
		FY-19	FY-20	FY-21	FY-22	FY-19	FY-20	FY-21	FY-22
1	T&D loss reduction	0.25%	0.40%	0.40%	0.40%	0.25%	0.40%	0.40%	0.40%
2	T & D loss	12.82%	12.42%	12.02%	11.62%	12.82%	12.42%	12.02%	11.62%
3	Transmission Losses	4.05%	3.95%	3.85%	3.75%	4.05%	3.95%	3.85%	3.75%

10.4.2 Against the estimated and approved T&D loss of 12.82% KSEBL has achieved 12.47% for the year 2018-19. KSEBL is considering the approved loss reduction targets for FY-20 to FY-22 for estimation.

Table 10.19 : Revised claim of T&D loss during the control period					
No	Particulars	FY 19	FY-20	FY-21	FY-22
		Actual	Estimated		
1	T&D loss reduction	0.60%	0.40%	0.40%	0.40%
2	T & D loss	12.47%	12.07%	11.67%	11.27%
3	Transmission Losses	3.74%	3.65%	3.55%	3.45%

Energy Requirement

10.4.3 Based on the revised energy sales and revised T&D losses the revised energy requirement is given in table below.

Table 10.20 Energy sales and energy requirement for the control period					
Estimate vide MYT petition dated 31.10.2018					
Particulars	Unit	2018-19	2019-20	2020-22	2021-22
Energy Sales	MU	21,647.29	22,969.69	23,957.28	24,991.45
T&D Loss	%	12.82%	12.42%	12.02%	11.62%
Substation auxiliary consumption	MU	15.58	16.36	17.18	18.04
Energy Requirement	MU	24,846.15	26,243.46	27,247.55	28,295.31
Approved vide MYT order dated 08.07.2019					
Particulars	Unit	2018-19	2019-20	2020-22	2021-22
Energy Sales	MU	21,647.29	22,969.69	23,957.28	24,991.45
T&D Loss	%	12.82%	12.42%	12.02%	11.62%
Substation auxiliary consumption	MU	15.58	16.36	17.18	18.04
Energy Requirement	MU	24,846.15	26,243.46	27,247.55	28,295.31
Revised Estimate					
Particulars	Unit	2018-19	2019-20	2020-22	2021-22
Energy Sales		21,536.7	22,966.1	23,545.4	24,498.8
Energy Sales inside the State	MU	7	1	5	7
T&D Loss*	%	12.47%	12.07%	11.67%	11.27%
Substation auxiliary consumption	MU	16.11	16.92	17.76	18.65
Energy Requirement	MU	24,646.8	26,135.5	26,673.9	27,629.2
		9	5	9	4

* For the year 2018-19, T&D loss is calculated considering actual open access transportation also

10.4.4 Based on the above, the distribution loss and AT&C loss estimates are revised as follows:

Table 10. 21 Revised estimate of AT&C losses and collection efficiency				
Estimate				
A	Particulars	2019-20	2020-21	2021-22
	Distribution losses (%)	10	9.92	9.86
	Collection efficiency (%)	98	98	98
Approved				
B	Particulars	2019-20	2020-21	2021-22
	Collection efficiency (%)	98	99	99
	AT &C losses	10.7	9.47	9.15
Revised Estimate				
C	Particulars	2019-20	2020-21	2021-22
	Energy Requirement (MU)	26,135.55	26,673.99	27,629.24
	Transmission loss (MU)	953.95	946.93	953.21
	Auxiliary consumption	16.92	17.76	18.65
	Net Energy input (MU) (A-B)	25,164.68	25,709.30	26,657.38
	Energy Sold (MU)	22,966.11	23,545.45	24,498.87
	Distribution loss(MU)	2,198.57	2,163.85	2,158.51
	Distribution loss (%)	8.74	8.42	8.10
	Collection efficiency	98	98	98
	Units realised	22,506.79	23,074.54	24,008.89
	Units unrealised (MU)	2,657.89	2,634.76	2,648.49
	AT&C loss (%)	10.6	10.2	9.9

Revised Forecast of Energy for the control period

10.4.5 The consolidated sales projections for the control period from FY 20 to FY 22 are as shown below; It is proposed to reduce the T&D loss by a factor @0.4% for FY-20 to FY-22. The transmission loss is 3.65% and 3.55% and 3.45% for FY-20, FY-21 and FY-22 respectively.

10.4.6 Accordingly, the energy requirement at the generation points is computed. The average and peak load requirement is computed. Peak load requirement for the remaining control period is estimated based on past trends by taking 4 year CAGR after taking suitable correction factors.

Table 10.22 : Forecast of Energy requirement and Peak Demand					
No	Particulars	FY-19*	FY-20	FY-21	FY-22
1	Total energy sales projected	21750.25	22,966.11	23,545.45	24,498.87
2	T&D Loss In %	12.47%	12.07%	11.67%	11.27%
3	Energy at IF Points in MU	24849.15	26118.63	26656.23	27610.59
4	Substation auxiliary Consumption	16.11	16.9155	17.76128	18.64934
5	Energy at Gen. Points in MU	24865.25	26135.5473	26673.99	27629.24
6	Average MW Requirement	2838.50	2983.51	3044.98	3154.02
7	Peak MW requirement @.668% LF	4242	4482.34	4597.02	4761.65
	Peak demand expected	4242	4400	4500.34	4635.35

10.5 Norms for Operation for the control period 2018-19 to 2021-22

Supply Availability

10.5.1 KSEBL has taken earnest efforts to ensure supply availability at 100% as detailed in Format D.6.1. The supply availability for the next control period is given in table below.

Table 10.23 : Supply Availability			
Particulars	2019-20	2020-21	2021-22
Supply availability	100%	100%	100%

10.6 Revised estimate for Aggregate Revenue Requirement of SBU-D for the control period 2018-19 to 2021-22

10.6.1 As per Regulation 75 of the KERC (Terms and Conditions for Determination of Tariff) Regulations, 2018, the Aggregate Revenue Requirement shall comprise of the following items of expenditure:-

- (i) Cost of own power Generation
- (ii) Cost of Power Purchase
- (iii) Transmission charges
- (iv) NLDC/RLDC/SLDC charges if any
- (v) Operation and maintenance expenses;
- (vi) Interest and finance-charges;
- (vii) Depreciation;
- (viii) Interest on working capital and on security deposits and deposits from users of the distribution system;
- (ix) Contribution to contingency reserves; and
- (x) actual write off, if any approved by the Commission;
- (xi) Return on Equity
- (xii) Revenue surplus or revenue gap on account of truing up of accounts for previous years and carrying costs if any approved by the Honorable Commission

Following items, if any, shall be deducted from the gross amount of Aggregate Revenue Requirement computed as specified above:-

- (i) Non-tariff income;
- (ii) Other income
- (iii) Income from wheeling charges recovered from open access consumers;
- (iv) Income from other business, to the extent specified in these Regulations.
- (v) Receipts on account of cross subsidy surcharge on wheeling charges from open access consumers; and
- (vi) Receipts on account of additional surcharge on wheeling charges from open access consumers

Based on the above Principles, the estimation of cost are made as under:

10.7 Cost of Internal Generation

10.7.1 The total energy required for meeting the electricity demand for the control period and corresponding T&D losses and auxiliary consumption is given in table below. The month wise peak demand is estimated based on 4 year CAGR. The revised energy

requirement and peak demand requirement for the next control period is given in table below:

Table 10. 24 : Energy Requirement for FY 2019-22				
Particulars	2018-19	2019-20	2020-21	2021-22
Energy sales(MU)	21750.25	22,966.11	23,545.45	24,498.87
T&D loss in %	12.47%	12.07%	11.67%	11.27%
Substation auxiliary Consumption(MU)	24849.15	26118.6318	26656.23	27610.59
Energy requirement (MU)	24865.25	26135.5473	26673.99	27629.24
Peak Demand Requirement (MW)	4242	4400	4500.34	4635.35

10.7.2 The above requirement will be met through own generation plants by SBU-G and purchase of power from various sources. The details of revised energy generation and cost of generation is given in **Chapter 2** of the petition. The source-wise details of own generation are given in table below.

Table 10. 25 : Net Generation from own Stations (MU) and Cost (Rs Cr)				
Source	2018-19	2019-20	2020-21	2021-22
Hydel(net)	7570.6	6449.13	6638.85	6799.36
Thermal	2.66	11.91		
Solar	18.54	22.57	47.60	47.60
Wind		1.33	1.37	1.37
Aux cons of thermal and wind	1.33	1.56	1.62	1.62
Total	7593.12	6483.38	6686.20	6846.71
Cost (Rs Cr)		486.37	542.98	671.82

10.7.3 As indicated in the chapter 7 there was generation of 2.66 MU during 2018-19 and 11.91 MU during 2019-20 from thermal power plants in order to meet the demand. It is expected that no energy from thermal stations will need to be used for the remaining part of control period. Thermal stations will be reserved for use only during extreme exigencies.

10.8 Cost of power purchase

10.7.4 The entire energy requirement of the state cannot be met from own generation alone. Balance requirement is met by purchasing power from different sources such as Central Generating Stations (CGS), Independent power producers (IPP) within as well as outside the State, traders and power exchanges. KSEBL has entered into several long term agreements which have been approved by the Hon Commission. The revised forecast or projection is made based on the following factors and assumptions:

- Forecast of purchase of power from different sources and cost are based on contracts and Merit Order Dispatch Principle except renewable energy purchase.
- The transmission charges payable to the ISTS operator PGCIL are only considered for cost forecast, in addition to fixed and variable charges payable to CGS/ IPPs /

Traders. Other supplementary claims will be claimed during the time of truing up based on actual figures.

- The revised forecast for FY 2020 was estimated based on the actual quantum and cost for the first half of FY 2020 and based on the actual outage schedule for 2019-20 and terms of contract.
- The fixed charges of FY 2019-20 are taken considering the actual of first half of FY-2020. Honorable CERC is yet to approve the tariff of central generating stations based on the tariff regulation for the control period 2019-2024. The fixed charges for FY 2019-20 are estimated at the annual fixed charges approved by Honorable CERC for the year 2018-19. Hence KSEBL humbly requests the variation in fixed charges at the time of truing up regarding tariff revision based on new Tariff Regulations.
- In the MYT petition fixed charges has been estimated by considering 2 % reduction of fixed charges from FY 2018 expecting that fixed charges will be reduced on account of the reduction in return on equity specified in Draft Tariff Regulations 2019. Honorable CERC has not reduced rate of return on equity as specified in Draft Regulations. Hence 4 % increase is considered from FY 2018-19 for estimating the fixed charges of FY-21.
- The Government of India, Ministry of Environment, Forest & Climate Change (MOEFCC) vide its Notification No. S.O. 3305(E) dated 7.12.2015 notified the Environment (Protection) Amendment Rules, 2015 (hereinafter called „the MOEFCC Notification“) amending/introducing the standards for emission of environmental pollutants to be followed by all existing as well as future thermal power plants. By the said Notification, all thermal power plants are mandatorily required to comply with the revised norms within the period of two years from the date of the said Notification. By the said amendment, MOEFCC has revised the norms as detailed hereunder:
 - (a) Revised the emission parameters for Particulate Matter for thermal power plants;
 - (b) Introduced additional parameters/ limits for thermal power plants -
 - (i) Emission norms for Sulphur dioxide (SO), Oxides of Nitrogen(NO)& Mercury(Hg),
 - ii) Amount of cooling water to be used per unit
 - (ii) Directed all thermal plants with Once-Through Cooling (OTC) to install Cooling Tower(CT)
- In order to comply with the revised norms the thermal power plants is required to install ECS, which will result in-
 - (a) Additional Capital expenditure because of installation of Emission Control system (ECS) required meeting the revised norms
 - (b) Increase in O & M expenses of the power station on account of installation of ECS to meet the revised norms
 - (c) Increase in auxiliary consumption of the power station due to installation of ECS
 - (d) Disruption in power generation during the installation phase of the above equipment

(e) Issue of fixed cost recovery for shut down period

- The implementation of Flue Gas Desulphurisation (FGD) in the existing and upcoming thermal power plants to curb SO_x emissions is expected to complete by FY 2021-22. The cost of FGDD is estimated to be 0.4 to 0.5 Cr per MW. The fixed charges are likely to increase by about 30 paise due to the above notification. Central Electricity Authority has published a schedule for phasing of FGD which is enclosed as **Annexure-VII**. As per the phasing of FGD, one unit of NLC Tuticorin Expansion may complete the implementation by June 2020. Hence additional fixed charge of 30 paise per unit for the energy purchase from corresponding unit is estimated in the year 2021-22. The remaining stations are implementing during the year 2021-22 and 2022-23. Honorable Commission may kindly approve the same at the time of truing up for the year FY 22.
- The variable charges for first half of FY-20 is taken as such and the average of variable charges of first half is of FY-20 is taken for the estimation of variable charges for the remaining period of FY-20. The variable charges of subsequent years are estimated by giving 3% increase on the rate of FY-2020. Transmission charges are arrived based on the average of actual PoC charges from April to September 2019. Transmission losses and transmission charges for subsequent years are taken at the same rate. Honorable Commission may please note that Honorable CERC issued Draft Central Electricity Regulatory Commission (Sharing of Inter State Transmission charges and Losses Regulations), 2019 in which the mechanism of point of Connection charges is significantly modified wherein major component of transmission charges are derived based on the total quantum of long term contracts and medium term contracts at national level. It is estimated that there will be an increase of about 50 % in transmission charges for Kerala as per the methodology in draft regulations. As the regulation is yet to be notified, KSEBL humbly request before the Honorable Commission to consider the changes in transmission charges on account of change in Regulations at the time of truing up.

Power from Central Generating Stations

10.7.5 While estimating power from Central Generating Stations, the total allocated share of power from CGS for the State is 1677.92 MW as on Oct-19 and while estimation it was expected that about **35.92 MW** of power, that is 4.49 % of 1 x 800 MW, would be additionally available from **NTPC Kudgi III unit** from January 2019 onwards, 43 MW of the power from Bhavini Nuclear Power Plant, (43 MW = 8.6 % of 1 x 500 MW) would be available from June 2019 onwards. The total capacity available from CGS projected vide MYT petition for the control period is given in table below and the same is approved by Honorable Commission.

Table 10. 26 : Capacity allocation from CGS (proposed and approved)

No	Station	Installed Capacity (MW)	Allocation (%)	2018-19	2019-20	2020-21	2021-22
1	RSPTS Stage I & II	2100	11.67%	245.07	245.07	245.07	245.07
2	RSTPS Stage III	500	12.20%	61.00	61.00	61.00	61.00
3	TALCHER - Stage II	2000	21.35%	427.00	427.00	427.00	427.00
4	SimhadriExp	1000	8.29%	82.90	82.90	82.90	82.90
5	NLC-II- Stage-1	630	10.00%	63.00	63.00	63.00	63.00
6	NLC-II- Stage-2	840	10.71%	89.96	89.96	89.96	89.96
7	NLC- Exp- Stage-1	420	15.93%	66.91	66.91	66.91	66.91
8	NLC - II Exp	500	15.93%	79.65	79.65	79.65	79.65
9	MAPS	440	5.23%	23.01	23.01	23.01	23.01
10	KAIGA Stg I	440	8.64%	38.02	38.02	38.02	38.02
11	KAIGA Stg II	440	7.96%	35.02	35.02	35.02	35.02
12	Kudamkulam Unit I	1000	13.91%	139.10	139.10	139.10	139.10
13	Kudamkulam unit II	1000	13.30%	133.00	133.00	133.00	133.00
14	Vallur JV with	1500	3.33%	49.95	49.95	49.95	49.95
15	NTPL(Tuticorin JV)	1000	7.25%	72.50	72.50	72.50	72.50
16	Kudgi Unit I	800	4.49%	35.92	35.92	35.92	35.92
17	Kudgi Unit II	800	4.49%	35.92	35.92	35.92	35.92
18	Kudgi Unit III	800	4.49%	35.92	35.92	35.92	35.92
19	Bhavini	800	8.60%		43.00	43.00	43.00
	Total			1,713.85	1,756.85	1,756.85	1,756.85

10.7.6 However, 43 MW from Bhavini nuclear power plant was not available from June 2019. Power from Bhavini nuclear power plant is expected to be available from April 2020 onwards. In addition to the above, Unit-I of New Neyveli Thermal Power Plant (NNTPP) commissioned during December 2019 for which KSEBL share of allocation is 16.2 MW. Unit-II of NNTPP is expected to be available from April 2020 which enhances the availability by another 16.2 MW.

10.7.7 As per tariff regulations for the control period from FY 2019-2024 issued Hon'ble CERC, the normative plant load factor, plant availability factor, auxiliary consumption and gross station heat rate of certain Central Generating Stations are revised and the details are given in table below

Table-10.27 Revised capacity allocation from CGS								
No.	Station			Allocated Capacity to KSEBL (MW)			Aux Consum ption (%)	Target PLF
		IC	Allocation	2019-20	2020-21	2021-22		
		MW	%	MW	MW	MW		
1	RSPTS Stage I & II	2100	11.67%	245.07	245.07	245.07	7.04%	85.00%
2	RSTPS Stage III	500	12.20%	61.00	61.00	61.00	6.25%	85.00%
3	TALCHER - Stage II	2000	21.35%	427.00	427.00	427.00	6.25%	85.00%
4	Simhadri Exp	1000	8.56%	85.55	85.55	85.55	5.75%	85.00%
5	NLC-II- Stage-1	630	10.00%	63.00	63.00	63.00	10.00%	85.00%
6	NLC-II- Stage-2	840	10.72%	90.02	90.02	90.02	10.00%	85.00%
7	NLC- Exp- Stage-1	420	16.25%	68.24	68.24	68.24	8.50%	85.00%
8	NLC - II Exp	500	16.25%	81.23	81.23	81.23	10.00%	75.00%
9	MAPS	440	5.23%	23.01	23.01	23.01	10.50%	68.50%
10	KAIGA Stg I	440	8.64%	38.01	38.01	38.01	10.50%	
11	KAIGA Stg II	440	7.95%	34.98	34.98	34.98	10.50%	
12	Kudamkulam Unit I	1000	14.01%	140.10	140.10	140.10	7.80%	
13	Kudamkulam unit II	1000	13.30%	133.00	133.00	133.00	7.80%	
14	Vallur STPS	1500	3.33%	49.95	49.95	49.95	7.19%	85.00%
15	NTPL(Tuticorin JV)	1000	7.25%	72.50	72.50	72.50	6.25%	85.00%
16	Kudgi Unit I,II & III	2400	4.66%	111.72	111.72	111.72	6.25%	85.00%
17	Bhavini	500	8.60%		43.00	43.00	10.00%	85.00%
18	NNTPP	1000	3.24%	16.2	32.4	32.4	6.25%	
	Total			1740.58	1799.62	1799.62		

10.7.8 The actual energy received from Central Generating Stations for the year 2018-19 is given in table below:

Table-10.28 Energy purchased from CGS in MU during 2018-19				
SI No	Stations	Energy at exbus	External loss	Energy at Kerala periphery
1	NTPC RSPTS Stage I&II	1608.17	66.88	1541.29
2	NTPC RSPTS StageIII	400.76	16.56	384.20
3	Talcher II	2889.61	121.02	2768.59
4	Simhadri STPS Stg IIUnit I	541.92	22.39	519.53
5	NTPC KUDGI	458.51	19.04	439.47
6	NLC II stage I	396.01	16.54	379.46
7	NLC II stage II	586.18	24.46	561.72
8	NLC I Expansion	429.78	17.76	412.02
9	NLC II Expansion	281.08	11.58	269.50
10	Vallur STPS	267.73	11.13	256.60
11	NTPL	420.25	17.32	402.93
12	MAPS	60.72	2.52	58.20
13	Kaiga Stage I&II	541.76	22.64	519.12
14	Kudankulam	759.53	31.07	728.46
	Sub Total	9642.01	400.92	9241.09

10.7.9 The revised energy availability for the year 2019-20 was estimated by taking the actual of first half of FY 2019-20 and considering the outages anticipated during second half of FY-2020 and considering the actual PLF during FY-19.

10.7.10 The revised energy availability from CGS was estimated for the rest of the control period after making judicious assumptions for actual PLF during 2018-19, and revised auxiliary consumption considering the operational Norms specified in CERC (Terms and Conditions of Tariff) Regulations, 2019 and actual outage schedule.

10.7.11 The revised energy availability for the remaining part of control period is given in table below:

Table 10.29 Energy procurement from CGS for FY 20 to FY 22										
No	Station	Allocation (MW)	Aux Consumption (%)	Expected PLF	Exbus energy (MU)	FY 20		FY 21 & FY 22		
						ISTS losses (MU)	Energy at KSEB periphery (MU)	Energy at exbus (MU)	ISTS losses (MU)	Energy at KSEB periphery (MU)
1	RSPTS I & II	245.07	7.04%	85%	1768.46	66.83	1701.63	1696.33	66.50	1629.83
2	RSTPS Stg III	61	6.25%	85%	485.54	18.41	467.13	425.82	16.69	409.13
3	TALCHER - Stg II	427	6.25%	85%	2854.92	113.48	2741.44	2980.73	124.30	2856.43
4	SimhadriExp	85.55	5.75%	80%	600.88	22.03	578.85	565.06	20.74	544.32
5	NLC-II- Stg-1	63	10.00%	85%	434.94	16.41	418.53	422.19	16.55	405.64
6	NLC-II- Stg-2	90.02	10.00%	85%	620.15	23.56	596.59	603.26	23.65	579.61
7	NLC- Exp- Stg-1	68.24	8.50%	85%	511.29	19.21	492.08	464.90	18.22	446.67
8	NLC- II ExpStg II	81.23	10.00%	70%	369.17	14.02	355.14	480.33	18.83	461.50
9	MAPS	23.012	10.50%	70%	79.29	2.89	76.40	126.29	4.63	121.65
10	KAIGA Stg I& II	72.99	10.50%	70%	530.64	22.49	508.14	400.58	19.71	380.87
11	Kudamkulam I& II	273.1	7.80%	70%	1325.29	51.37	1273.92	1544.02	64.39	1479.64
12	Vallur JV with	49.95	7.19%	70%	320.61	11.01	309.60	345.19	10.94	334.25
13	NTPL(Tuticorin JV)	72.5	6.25%	70%	435.47	17.83	417.64	506.10	22.37	483.73
14	Kudgi Unit I II & III	111.72	6.25%	85%	580.44	23.75	556.69	779.88	32.52	747.36
15	Bhavini	43	10.00%	75%	0	0.00	0	237.31	8.71	228.60
16	NNTPP	32.4	6.25%	75%	24.42	0.96	23.46	226.17	8.87	217.31
	Total				10941.50	424.26	10517.24	11804.16	477.61	11326.55

10.7.12 As shown in table above the net energy availability for the year 2019-20 was projected at 10517.24 MU and for FY 2020-21 and FY 2021-22 at 11326.55 MU at Kerala periphery against the approved quantum of 11241.94 MU and 11274.76 MU respectively.

10.7.13 On analyzing the variable charges of first half of FY 2020 it is seen that the variable charges has increased considerably from that of FY-19. The details are given below.

Table 10. 30 Variable cost of CGS April to September 2019								
Source	Approved for FY 2020	April	May	June	July	August	September	Average
		Rs/kWh	Rs/kWh	Rs/kWh	Rs/kWh	Rs/kWh	Rs/kWh	Rs/kWh
RSTPS I & II	2.49	2.73	2.55	2.62	2.73	2.62	2.61	2.64
RSTPS III	2.45	2.68	2.50	2.50	2.66	2.66	2.73	2.62
Talcher Stage-II	1.73	1.85	2.00	1.92	1.84	2.19	2.29	1.98
Simhadri TPS Stage II	2.89	3.37	3.22	3.20	3.18	3.12	3.36	3.24
NLC Stage-I	2.64	2.64	2.64	2.64	2.66	2.64	2.64	2.64
NLC Stage-II	2.64	2.64	2.64	2.64	2.66	2.64	2.64	2.64
NLC 1 Expansion	2.44	2.42	2.43	2.41	2.42	2.42	2.43	2.42
NLC II Expansion	2.44	2.48	2.48	2.48	2.48	2.48	2.48	2.48
Vallur STPS	3.07	3.81	3.77	4.04	3.94	3.65	3.78	3.86
MAPS	2.78	2.74	2.74	2.74	2.74	2.74	2.74	2.74
KAIGA	3.71	3.64	3.64	3.65	3.65	3.65	3.65	3.65
Kudankulam	4.19	4.11	4.11	4.10	4.10	4.12	4.11	4.11
NTPL	3.13	3.44	3.55	3.55	3.07	2.80	3.10	3.21
Kudgi	3.91	3.83	3.70	3.80	3.90	4.07	4.11	3.83

10.7.14 The variable cost increase of first half of FY 20 is more than 5 % from that of FY-19 in most of Central Generating stations except MAPS, KAIGA and Kudamkulam and NLC Stations. The main reasons for the increase in variable charges compared to approved value is due to following reasons. There was revision in normative station heat rate and auxiliary consumption for all Central Generating Stations and stations whose tariff is determined by CERC, through notification of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 dated 07.03.2019, with effect from 01.04.2019, due to which energy charges increased considerably compared to last quarter of previous year. The energy charge rate calculated as per Tariff regulations is based on the following formula.

$$\text{Energy charge rate} = \{(GHR - SFC * CVSF) * LPPF / CVPF + (SFC * LPSFi) + (LC * LPL) * 100 / (100 - Aux)\}$$

Where, GHR is Gross station heat rate in Kcal per kWh and Aux=Normative auxiliary energy consumption in %. Thus, increase of normative auxiliary consumption and station heat rate results in increase of the rate of energy charge.

10.7.15 The variation of energy charges also depends on the price notified for each mine which are different from mine to mine, grade of coal, blending ratio of imported coal and domestic coal, distance from source (Coal mines), mode of transport etc. During coal shortage periods the Generating Companies resorted to imported coal and mines other than that of linkage mines which resulted in increase in variable cost.

10.7.16 The variable cost of FY 20 for CGS other than NLC stations is estimated by taking actual variable charges for first half of FY 2019-20 and considering the same average cost for estimating the variable charges of second half of FY 2020. NLC India Limited issued revised Lignite transfer price guidelines 2019-24 dated 17.09.2019 wef October

2019 and as a result there is an increase in energy charges from October 2019 by about 5 %. Hence the average of the variable charges for the period October to December 2019 is taken for estimating the variable charges of second half of FY 2020.

10.7.17 The variable cost of CGS for FY 21 and FY-22 is estimated by considering an escalation of 3% in the variable cost of FY 20 on YoY basis as the variable cost increase of first half of FY 20 is more than 5 % from that of FY-19 in most of Central Generating stations owing to the shortage of coal. Hence considering the trend, an escalation of 3 % is uniformly considered for estimating the variable cost of power purchase for the remaining control period. The variable charges of NLC stations for the period October to December 2019 is given in table below.

10.7.18 The additional fixed charges due to implementation of FGD for NTPL Tuticorin described in para 11.7.4 is given in table below

Table 10. 31 Additional fixed charges due to implementation of FGD							
Station	Unit capacity	Allocation	Allocated capacity	Ex bus	Addition to fixed charges due to FGD	Fixed charges estimated at 2 % increase	Total fixed charges
	MW	%	MW	MU	Rs Cr	Rs Cr	Rs Cr
NTPL	1000	7.25	72.5	506.10	15.18	83.87	99.06

10.7.19 Based on the above the variable and fixed charges are shown in below.

Table 10. 32 Average variable cost and fixed cost for the control period								
Station	Average Variable cost (Rs./Unit)				Fixed cost (Rs. Cr)			
	Actual	Estimated						
	2018-19	Oct-Mar 2019	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
RSPTS Stage I & II	2.53	2.64	2.72	2.80	123.66	124.67	129.70	132.30
RSTPS Stage III	2.47	2.62	2.70	2.78	33.76	33.24	34.58	35.27
TALCHER - Stage II	1.73	1.98	2.04	2.10	214.87	216.19	224.92	229.42
Simhadri Exp	2.90	3.24	3.34	3.44	103.23	92.54	96.28	98.20
NLC-II- Stage-1	2.58	2.78	2.86	2.95	31.00	29.98	31.19	31.82
NLC-II- Stage-2	2.59	2.78	2.86	2.95	46.21	44.40	46.19	47.12
NLC- Exp- Stage-1	2.40	2.55	2.63	2.71	45.60	44.87	46.68	47.62
NLC - II Exp	2.38	2.60	2.68	2.76	66.64	74.70	77.71	79.27
MAPS	2.64	2.74	2.83	2.91		0.00		
KAIGA Stg I & II	3.64	3.65	3.76	3.87		0.00	0.00	
Kudamkulam Unit I & II	4.05	4.11	4.23	4.36		0.00	0.00	
Vallur JV	3.01	3.86	3.97	4.09	64.49	61.90	64.40	65.69
NTPL(Tuticorin JV)	3.17	3.21	3.30	3.40	74.20	79.04	82.23	99.06
Kudgi Unit I,II & III	3.84	3.83	3.95	4.07	100.02	121.67	126.58	129.11
Bhavni			4.23	4.36		0.00		0.00
NNTPP		2.39	2.46	2.54		4.84	40.81	41.63
Nuclear power stations are having single part tariff, for the purpose of estimating the power purchase cost, 3% escalation year on year is allowed								

10.7.20 The revised power purchase cost for the remaining control period from Central Generating Stations is given in table below

No.	Station	Allocation (MW)	Aux Consumption (%)	Energy at exbus (MU)	ISTS losses (MU)	Net Energy at KSEB periphery (MU)	Fixed Charges(Rs Cr)	Variable Charges(Rs Cr)	Total(Rs Cr)
1	RSPTS Stage I & II	245.07	6.25%	1768.46	66.83	1701.63	124.67	467.09	591.76
2	RSTPS Stage III	61.00	6.25%	485.54	18.41	467.13	33.24	127.13	160.37
3	TALCHER - Stage II	427.00	5.75%	2854.92	113.48	2741.43	216.19	564.91	781.10
4	SimhadriExp	85.55	10.00%	600.88	22.03	578.85	92.54	194.68	287.22
5	NLC-II- Stage-1	63.00	10.00%	434.94	16.41	418.53	29.98	117.83	147.81
6	NLC-II- Stage-2	90.02	8.50%	620.15	23.56	596.59	44.40	168.51	212.91
7	NLC- Exp- Stage-1	68.24	10.00%	511.29	19.21	492.08	44.87	127.13	172.00
8	NLC - II Exp	81.23	10.50%	369.17	14.02	355.14	74.70	94.58	169.28
9	MAPS	23.01	10.50%	79.29	2.89	76.40	0.00	21.75	21.75
10	KAIGA Stg I& II	72.99	7.80%	530.64	22.49	508.14	0.00	193.52	193.52
11	Kudamkulam Unit I& II	273.10	7.80%	1325.29	51.37	1273.92	0.00	544.64	544.64
12	Vallur JV with	49.95	6.25%	320.61	11.01	309.60	61.90	123.67	185.58
13	NTPL(Tuticorin JV)	72.50	6.25%	435.47	17.83	417.64	79.04	139.60	218.63
14	Kudgi Unit I II & III	111.72	10.00%	580.44	23.75	556.69	121.67	222.60	344.26
15	Bhavini		6.25%	0.00	0.00	0.00	0.00	0.00	0.00
16	NNTPP	16.20	0.00%	24.42	0.96	23.46	4.84	5.84	10.68
	Total	1740.38		10941.50	424.26	10517.24	928.03	3113.49	4041.51

No.	Station	Allocation (MW)	Aux Consumption (%)	Energy at exbus (MU)	ISTS losses (MU)	Net Energy at KSEB periphery (MU)	Fixed Charges(Rs Cr)	Variable Charges(Rs Cr)	Total(Rs Cr)
1	RSPTS Stage I & II	245.07	6.25%	1696.33	66.50	1629.83	129.70	461.48	591.19
2	RSTPS Stage III	61.00	6.25%	425.82	16.69	409.13	34.58	114.84	149.42
3	TALCHER - Stage II	427.00	5.75%	2980.73	124.30	2856.43	224.92	607.50	832.42
4	SimhadriExp	85.55	10.00%	565.06	20.74	544.32	96.28	188.56	284.84
5	NLC-II- Stage-1	63.00	10.00%	422.19	16.55	405.64	31.19	120.89	152.08
6	NLC-II- Stage-2	90.02	8.50%	603.26	23.65	579.61	46.19	172.74	218.93
7	NLC- Exp- Stage-1	68.24	10.00%	464.90	18.22	446.67	46.68	122.10	168.79
8	NLC - II Exp	81.23	10.50%	480.33	18.83	461.50	77.71	128.63	206.35
9	MAPS	23.01	10.50%	126.29	4.63	121.65	0.00	35.68	35.68
10	KAIGA Stg I& II	72.99	7.80%	400.58	19.71	380.87	0.00	150.47	150.47
11	Kudamkulam U I& II	273.10	7.80%	1544.02	64.39	1479.64	0.00	653.56	653.56
12	Vallur JV with	49.95	6.25%	345.19	10.94	334.25	64.40	137.15	201.55
13	NTPL(Tuticorin JV)	72.50	6.25%	506.10	22.37	483.73	82.23	167.11	249.34
14	Kudgi Unit I II & III	111.72	10.00%	779.88	32.52	747.36	126.58	308.06	434.64
15	Bhavini	43.00	6.25%	237.31	8.71	228.60	0.00	100.45	100.45
16	NNTPP	32.40	6.25%	226.17	8.87	217.31	40.81	55.70	96.51
	Total	1799.78		11804.16	477.61	11326.55	1001.29	3524.92	4526.22

Table 10.35 Energy procurement from CGS for FY-22									
No.	Station	Allocation (MW)	Aux Consumption (%)	Energy at exbus (MU)	ISTS losses (MU)	Energy at KSEB periphery (MU)	Fixed Charges(Rs Cr)	Variable Charges(Rs Cr)	Total(Rs Cr)
1	RSPTS Stage I & II	245.07	6.25%	1696.33	66.50	1629.83	132.30	475.33	607.63
2	RSTPS Stage III	61	6.25%	425.82	16.69	409.13	35.27	118.28	153.55
3	TALCHER - Stage II	427	5.75%	2980.73	124.30	2856.43	229.42	625.72	855.14
4	SimhadriExp	85.55	10.00%	565.06	20.74	544.32	98.20	194.22	292.42
5	NLC-II- Stage-1	63	10.00%	422.19	16.55	405.64	31.82	124.52	156.33
6	NLC-II- Stage-2	90.02	8.50%	603.26	23.65	579.61	47.12	177.92	225.03
7	NLC- Exp- Stage-1	68.24	10.00%	464.90	18.22	446.67	47.62	125.77	173.38
8	NLC - II Exp	81.23	10.50%	480.33	18.83	461.50	79.27	132.49	211.76
9	MAPS	23.012	10.50%	126.29	4.63	121.65	0.00	36.75	36.75
10	KAIGA Stg I & II	72.99	7.80%	400.58	19.71	380.87	0.00	154.98	154.98
11	Kudamkulam U I & II	273.1	7.80%	1544.02	64.39	1479.64	0.00	673.17	673.17
12	Vallur JV with	49.95	6.25%	345.19	10.94	334.25	65.69	141.26	206.96
13	NTPL(Tuticorin JV)	72.5	6.25%	506.10	22.37	483.73	99.06	172.12	271.18
14	Kudgi Unit I II & III	111.72	10.00%	779.88	32.52	747.36	129.11	317.30	446.41
15	Bhavini	43	6.25%	237.31	8.71	228.60	0.00	103.46	103.46
16	NNTPP	32.40	6.25%	226.17	8.87	217.31	41.63	57.37	99.00
	Total	1799.78		11804.16	477.61	11326.55	1036.50	3630.67	4667.17

10.7.21 In addition to the fixed cost and variable energy charges the beneficiary utilities are liable to pay incentive, income tax, water cess, foreign exchange rate variation etc. However these expenses are not taken into the present forecast and the same may be allowed at the time of truing up. The revised power purchase cost from central Generating Stations for the remaining part of control period is given in table below.

Table 10. 36 Total revised Power Purchase cost for CGS for the control period (Rs Cr)					
Station	2018-19	April to Sept 2019	2019-20	2020-21	2021-22
RSPTS Stage I & II	530.31	312.00	591.76	591.19	607.63
RSTPS Stage III	132.78	81.98	160.37	149.42	153.55
TALCHER - Stage II	715.24	342.25	781.10	832.42	855.14
Simhadri Exp	260.58	153.76	287.22	284.84	292.42
NLC-II- Stage-1	127.61	74.84	147.81	152.08	156.33
NLC-II- Stage-2	189.00	96.61	212.91	218.93	225.03
NLC- Exp- Stage-1	151.66	83.55	172.00	168.79	173.38
NLC - II Exp	133.64	56.33	169.28	206.35	211.76
MAPS	16.63	10.09	21.75	35.68	36.75
KAIGA Stg I & II	201.73	98.86	193.52	150.47	154.98
Kudamkulam Unit I&II	330.14	288.79	544.64	653.56	673.17
Vallur JV with	145.30	85.49	185.58	201.55	206.96
NTPL(Tuticorin JV)	207.58	88.49	218.63	249.34	271.18
Kudgi Unit I,II,III	275.99	117.30	344.26	434.64	446.41
Bhavini		0.00	0.00	100.45	103.46
NNTPP		0.00	10.68	96.51	99.00
Total	3,418.19	1,890.34	4,041.51	4,526.22	4,667.17

10.7.22 The summary of revised power purchase cost for Central Generating Station is given in table below.

Table 10. 37 Summary of Power Purchase cost from CGS for the control period								
	Allocation (MW)	Ex-bus Energy (MU)	ISTS losses (MU)	Net Energy (MU)	Fixed Cost (Rs. Crore)	Variable cost (Rs. Crore)	Total cost (Rs. Crore)	Avg.Rate (Rs/Unit)
Approved by the Commission								
2019-20	1,756.95	11,672.89	430.94	11,241.96	892.01	3,227.96	4,135.05	3.54
2020-21	1,756.95	11,706.79	432.02	11,274.77	874.17	3,307.00	4,196.25	3.58
2021-22	1,756.95	11,706.79	432.02	11,274.77	856.69	3,373.14	4,244.91	3.63
As per Revised Estimate								
2019-20	1756.76	10941.50	424.26	10517.24	928.03	3113.49	4041.51	3.69
2020-21	1799.76	11804.16	477.6103	11326.55	1001.29	3463.27	4,526.22	3.83
2021-22	1799.76	11804.16	477.6103	11326.55	1036.50	3567.17	4,667.17	3.95

Purchase through Long Term agreements

10.7.23 KSEB Ltd entered contracts with power producers for meeting the power requirements for the next 25 years for 450 MW at CERC approved rates with the approval of the Commission and another 865MW on DBFOO basis. Out of the 865MW, 100MW from M/s East Cost Energy Limited has not materialized.

10.7.24 Honorable Commission vide MYT order dated 08.07.2019 approved the power purchase through long term contracts as given in table below.

Table 10. 38 Power Purchase through long term contracts approved by the Hon Commission							
Trader/Source	contracte d capacity (MW)	Aux. consum ption (%)	Actual PLF	2018-19		2019-20 to 2021-22	
				Ex-bus Energy (MU)	Energy at KSEB peripher y (MU)	Ex-bus Energy (MU)	Energy at KSEB peripher y (MU)
Maithon power limited	150	6.5	90%	991.63	960.83	1,105.73	1,070.92
Maithon power limited	150	6.5	90%	991.63	960.83	1,105.73	1,070.92
DVC-Mejia TPS	100	5.25	85%	686.96	666.03	705.5	683.99
DVC-Reghunathpur TPS	50	6.5	85%	244.94	237.45	348.1	337.49
Jindal Power Limited	200	5	90%	1,486.29	1,420.67	1,497.96	1,431.81
Jindal Power Limited	150	5	90%	1,117.19	1,067.86	1,123.47	1,073.86
Jindal India Thermal Ltd	100	5	90%	695.25	669.93	748.98	721.9
Jhabua Power Limited	115	5	90%	733.26	700.19	861.33	822.57
Jhabua Power Limited	100	5	90%	625.27	597.06	748.98	715.28
BALCO	100	5	90%	748.98	718.46	748.98	718.32
TOTAL	1215			8,321.40	7,999.32	8,994.76	8,647.06

10.7.25 The power purchase cost approved by the Honorable Commission for long term contracts is given in table below

Table 10. 39 Power Purchase through long term contracts approved by the Hon Commission

Trader/Source	contracted capacity (MW)	Aux. consumption (%)	PLF	Ex-bus Energy (MU)	Energy at KSEB periphery (MU)	Ex-bus Energy (MU)	Energy at KSEB periphery (MU)	Total Power Purchase cost(Rs Cr)			
				2018-19	2019-20	2021-22		FY-19	FY-20	FY -21	FY- 22
Maithon power limited	150	6.5	90%	991.63	960.83	1,105.73	1,070.92	387.03	415.79	418.03	420.43
Maithon power limited	150	6.5	90%	991.63	960.83	1,105.73	1,070.92	387.03	415.79	418.03	420.43
DVC-Mejia TPS	100	5.25	85%	686.96	666.03	705.5	683.99	267.44	273.27	274.74	276.32
DVC-Reghunathpur TPS	50	6.5	85%	244.94	237.45	348.1	337.49	113.29	136.92	137.38	137.89
Jindal Power Limited	200	5	90%	1,486.29	1,420.67	1,497.96	1,431.81	554.67	555.28	551.58	548.13
Jindal Power Limited	150	5	90%	1,117.19	1,067.86	1,123.47	1,073.86	466.45	466.17	462.05	458.33
Jindal India Thermal Ltd	100	5	90%	695.25	669.93	748.98	721.9	290.28	310.78	308.03	305.56
Jhabua Power Limited	115	5	90%	733.26	700.19	861.33	822.57	279.67	332.47	332.22	332.31
Jhabua Power Limited	100	5	90%	625.27	597.06	748.98	715.28	261.06	310.78	308.03	305.56
BALCO	100	5	90%	748.98	718.46	748.98	718.32	312.72	310.78	308.03	305.56
TOTAL	1215			8,321.40	7,999.32	8,994.76	8,647.06	3319.64	3528.03	3518.12	3510.52

10.7.26 Due to coal shortage and variation in outage schedule there was a reduction in energy availability for the first half of the FY-19. Further the actual availability of DVC Mejia Station for the year 2018-19 and 2019-20 was only around 71 % and for RTPS it is only around 30 %. The revised energy availability for the year 2019-20 was estimated by taking the actual of first half of FY 2019-20 and considering the outages expected to occur during second half of FY-2020 and considering the actual PLF during FY-19 and the normative factors. The revised forecast of FY 21 is estimated based on the revised PLF and normative auxiliary consumption. The parameters taken for revised forecast is given in table below.

Table 10. 40 Revised forecast of FY 21

Sl.no	Trader/Source	contracted capacity MW	Auxillary consumption %	Normative PLF	Expected PLF
1	Maithon Power limited	150	6.25	85%	90%
2	Maithon Power limited	150	6.25	85%	90%
3	DVC-Mejia TPS	100	5.75	85%	85%
4	DVC-Reghunathpur TPS	50	5.75	85%	85%
5	Jindal Power Limited	200	5	90%	90%
6	Jindal Power Limited	150	5	90%	90%
7	Jindal Thermal limited	100	5	90%	90%
8	Jhabua Power Limited	115	5	90%	90%
9	Jhabua Power Limited	100	5	90%	90%
10	BALCO	100	5	90%	90%
	TOTAL				

10.7.27 The revised forecast of energy availability for the remaining part of control period is given below.

Table 10. 41 Energy availability through long Term contracts-revised forecast

Sl.no	Trader/Source	Energy at exbus (MU)				Energy at Kerala periphery (MU)			
		First half of FY-20	FY-20	FY -21	FY-22	First half of FY-20	FY-20	FY -21	FY-22
1	Maithon Power limited	491.61	1,047.47	1,108.69	1,108.69	536.96	1,006.81	1,070.99	1,070.99
2	Maithon Power limited	491.59	1,047.45	1,108.69	1,108.69	536.96	1,006.81	1,070.99	1,070.99
3	DVC-Mejia TPS	288.39	579.69	701.79	701.79	282.12	562.03	679.68	679.68
4	DVC-Reghunathpur TPS	120.43	264.16	350.89	350.89	139.20	255.90	339.84	339.84
5	Jindal Power Limited	718.33	1,469.36	1,497.96	1,497.96	717.69	1,404.70	1,431.45	1,431.45
6	Jindal Power Limited	539.10	1,102.38	1,123.47	1,123.47	538.26	1,053.73	1,073.59	1,073.59
7	Jindal Thermal limited	376.96	752.47	748.98	748.98	362.75	727.07	723.51	723.51
8	Jhabua Power Limited	328.16	760.01	861.33	861.33	413.75	728.23	825.24	825.24
9	Jhabua Power Limited	285.36	660.87	748.98	748.98	359.78	633.24	717.60	717.60
10	BALCO	390.45	765.97	748.98	748.98	358.84	732.54	715.73	715.73
	TOTAL	4,030.38	8,449.83	8,999.75	8,999.75	4,246.32	8,111.05	8,648.62	8,648.62

Cost of Purchase of power from projects for which tariff is determined by CERC

10.7.28 Among the purchase of Power through long term contracts, the projects for which tariff is determined by Honorable CERC are Maithon Power Ltd, DVC MTPS and DVC RTPS. Honorable CERC is yet to approve the fixed charges of the above stations for the control period FY-2020 to FY-2024 as per Tariff Regulations 2019. The fixed charges for FY 2019-20 are estimated at the annual fixed charges approved by Honorable CERC for the year 2018-19. KSEBL humbly requests before the Honorable Commission to allow the variation in fixed charges for the control period at the time of truing up.

10.7.29 In the MYT petition in the case of Maithon Power Ltd and DVC stations, fixed charges has been estimated by considering 2 % reduction of fixed charges from FY 2018 expecting that fixed charges will be reduced on account of the reduction in return on equity proposed in Draft Tariff Regulations 2019. However, Honorable CERC has not reduced rate of return on equity as proposed in Draft Regulations. Hence 4 % increase is considered from FY 2018-19 for estimating the fixed charges of FY 2020-21 and 2 % increase is considered for FY 2021-22. The actual variable charges of first half of financial year increased considerably and the monthwise details of actual variable cost are given in table below.

Table 10. 42 Variable cost of Long Term contracts April to September 2019 (Rs/kWh)									
	Source	Approved for FY 2020	April	May	June	July	August	Sep	Average
1	Maithon power limited	2.39	2.69	2.68	2.73	2.73	2.68	2.71	2.70
2	Maithon power limited	2.39	2.69	2.68	2.73	2.73	2.68	2.71	2.70
3	DVC-Mejia TPS	2.46	2.789	2.718	2.720	2.851	2.992	2.885	2.80
4	DVC-Reghunathpur TPS	2.30	2.71	2.80	2.74	2.93	3.02	3.09	2.88

10.7.30 The variable cost of FY 19 is estimated by taking actual variable charges for first half of FY 2019-20 and by estimating the variable charges of second half of FY 2020@

average variable cost of first half of FY-20. The variable cost of FY 21 and FY-22 is estimated by considering an escalation of 3% in the variable cost of FY 20.

10.7.31 The estimated fixed cost and variable cost for purchase of power from projects for which tariff is determined by CERC is given below

Table 10. 43 Average variable cost and fixed cost approved for the control period								
Station	Average Variable cost (Rs./Unit)				Fixed cost (Rs. Cr)			
	Estimated							
	April-Sept2019	2019-20	2020-21	2021-22	April-Sept 2019	2019-20	2020-21	2021-22
Maithon power limited	2.70	2.70	2.78	2.87	75.36	154.85	165.41	168.65
Maithon power limited	2.70	2.70	2.78	2.87	75.36	154.85	165.41	168.65
DVC-Mejia TPS	2.80	2.80	2.88	2.97	43.57	83.93	87.33	90.82
DVC-Reghunathpur TPS	2.88	2.88	2.96	3.05	21.04	47.89	49.82	51.81

10.7.32 The revised power purchase cost from the above stations based on above parameters is as follows

Table 10. 44 Power Purchase cost-Revised claim (Rs Cr)							
Sl No	Station	April-September 2019			2019-20		
		Fixed Charges	Variable charges	Total	Fixed Charges	Variable charges	Total
1	Maithon power limited	75.36	132.74	208.10	154.85	282.99	437.84
2	Maithon power limited	75.36	132.74	208.09	154.85	282.99	437.84
3	DVC-Mejia TPS	43.57	80.84	124.41	83.93	162.40	246.33
4	DVC-Reghunathpur TPS	21.04	34.67	55.71	47.89	76.03	123.92
	Total	215.33	380.98	596.31	441.52	804.40	1245.93
Sl No	Station	2020-21			2021-22		
		Fixed Charges	Variable charges	Total	Fixed Charges	Variable charges	Total
		Rs Cr			Rs Cr		
1	Maithon power limited	165.41	308.67	474.07	168.65	317.93	486.58
2	Maithon power limited	165.41	308.67	474.07	168.65	317.93	486.58
3	DVC-Mejia TPS	87.33	202.39	289.72	90.82	208.47	299.29
4	DVC-Reghunathpur TPS	49.82	104.02	153.84	51.81	107.14	158.95
	Total	467.96	923.75	1391.71	479.93	951.46	1431.39

Cost of Purchase of power from projects through DBFOO

10.7.33 Honorable Commission approved purchase of power from projects through DBFOO as shown in table D 38. In the MYT order dated 08.07.2019 , Honorable Commission allowed scheduling of power from 350 MW of power from DBFOO contracts, of M/s Jindal Power Limited 150 MW, M/s Jhabua Power Limited -100 MW and M/s Jindal India Thermal Power Ltd -100 MW, under bid II, for which rates are yet to be adopted, at the rate equivalent to the cost of power from M/s BALCO which is the L1 of Bid II. It may kindly be noted DBFOO framework allows pass through of actual fuel cost based on predetermined Station Heat Rate, which shall not exceed 2350 kCal/kWh, subject to parameters specified to arrive at the variable charge as on bid date. Further, the Station Heat Rate has to be certified by the generators by following tests prescribed in the PSA prior to date of commissioning. The Station Heat rates duly

certified by generators under Bid 2 viz; M/s Jindal PowerLtd (150 MW), M/s Jhabua Power Ltd (100 MW) , M/s Jindal India Thermal Power Ltd (100 MW) and M/s BALCO (100 MW) are 2327 kCal/kWh, 2347.9kCal/kWh, 2350 kCal/kWh and 2350 kCal/kWh respectively. Further, the delivered cost of coal to each generator would depend on the grade of coal supplied by Coal India Ltd or its subsidiaries, the notified price of coal of the respective mine from which coal is supplied and the cost of transportation which again depends on the mode of transportation and distance from mine. At the same time, the ratio of the notified price of coal and transportation with the quoted fuel price and transportation cost is not allowed to change for the benefit of the generator. In view of the above framework prescribed in DBFOO model as notified by MoP,Gol, it is respectfully submitted that the rate applicable for BALCO cannot be used for estimating the power fpurchase cost of other stations, eventhough the rates were matched as on date of biddig.

10.7.34 The applicable fixed charges for each year for the power from projects through DBFOO contracts is determined as per the clause 21.2, 21.3 and 21.4 of power supply agreement entered as per DBFOO contracts.The variable charges for FY 2019-20 is estimated @ average variable cost of first half of FY 20 and the variable cost for the rest of control period is estimated by considering an escalation of 3 % over FY-2020.The actual variable cost for first half of financial year is given in table below.

Table 10. 45 Variable cost of Power purchase from projects through DBFOO contracts for the period April to September 2019									
	Source	Approved for FY 2020	April Rs/kWh	May Rs/kWh	June Rs/kWh	July Rs/kWh	August Rs/kWh	September Rs/kWh	Average Rs/kWh
1	Jindal Power Ltd-Bid I	1.29	1.31	1.31	1.31	1.31	1.27	1.29	1.3
2	Jindal Power Ltd-Bid II		1.30	1.30	1.30	1.30	1.26	1.29	1.29
3	Jindal India Thermal Llttd		1.14	1.14	1.14	1.14	1.14	1.14	1.14
4	Jhabua Power Ltd-Bid I	1.91	1.95	1.95	1.95	1.95	1.95	1.95	1.95
5	Jhabua Power Ltd-Bid II		1.87	1.87	1.87	1.87	1.87	1.87	1.87
6	BALCO	1.19	1.15	1.15	1.15	1.15	1.15	1.15	1.15

10.7.35 The revised estimate for fixed charges and variable charges for the control period is given in table below

Table 10. 46 Average variable cost and fixed cost approved for the control period								
Station	Average Variable cost (Rs./Unit)				Fixed cost (Rs per unit)			
	April-Sep2019	2019-20	20-21	21-22	April-Sep 2019	19-20	20-21	21-22
Jindal Power Ltd-Bid I	1.30	1.30	1.34	1.38	2.61	2.61	2.56	2.51
Jindal Power Ltd-Bid II	1.29	1.29	1.33	1.37	3.33	3.33	3.27	3.2
Jindal India Thermal Llttd	1.14	1.14	1.17	1.21	3.43	3.44	3.37	3.3
Jhabua Power Ltd-Bid I	1.95	1.95	2.01	2.07	2.05	2.05	2.01	1.97
Jhabua Power Ltd-Bid II	1.87	1.87	1.93	1.98	2.89	2.89	2.83	2.77
BALCO	1.15	1.15	1.18	1.22	3.06	3.16	3.1	3.03

10.7.36 The revised cost of purchase of power through DBFOO contracts is given in table below

Table 10. 47 Power purchase cost –Revised claim								
Station	April-September 2019				2019-20			
	Fixed Charges	Variable charges	Other charges*	Total	Fixed Charges	Variable charges	Other charges*	Total
	Rs Cr				Rs Cr			
Jindal Power Ltd-Bid I	187.51	93.37	-14.88	265.99	383.56	190.98	-29.38	545.16
Jindal Power Ltd-Bid II	179.55	69.62	-15.47	233.70	367.14	142.36	-30.57	478.93
Jindal India Thermal Ltd	129.33	42.97	-8.91	163.40	258.51	85.78	-17.51	326.78
Jhabua Power Ltd-Bid I	67.27	64.06	-6.04	125.29	155.80	148.36	-14.51	289.64
Jhabua Power Ltd-Bid II	82.47	53.36	-6.86	128.97	190.99	123.58	-16.11	298.46
BALCO	119.55	44.90	-9.93	154.52	238.21	88.09	-19.00	307.30
Total	765.68	368.28	-62.09	1071.87	1594.22	779.15	-127.09	2246.28
Station	2020-21				2021-22			
	Fixed Charges	Variable charges	Other charges*	Total	Fixed Charges	Variable charges	Other charges*	Total
	Rs Cr				Rs Cr			
Jindal Power Ltd-Bid I	383.48	200.54	-28.88	555.13	375.99	206.56	-28.83	553.71
Jindal Power Ltd-Bid II	367.37	149.43	-30.03	486.77	359.51	153.92	-29.88	483.55
Jindal India Thermal Ltd	252.41	87.95	-17.08	323.27	247.16	90.58	-16.98	320.77
Jhabua Power Ltd-Bid I	173.13	173.18	-13.03	333.27	169.68	178.37	-13.09	334.96
Jhabua Power Ltd-Bid II	211.96	144.26	-15.03	341.19	207.47	148.59	-15.02	341.04
BALCO	232.18	88.72	-14.61	306.29	226.94	91.38	-14.50	303.82
Total	1620.53	844.07	-118.66	2345.95	1586.75	869.40	-118.30	2337.84

*Other charges comprises of the transmission charges, compensation of transmission losses upto Kerala periphery borne by the Generator as per PSA

Summary of powerpurchase from LTA

10.7.37 The summary of the power purchase cost from LTA is as shown below:

Table 10. 48 Summary of Power purchase cost from LTA				
Approved by Honorable Commission				
Financial Year	Capacity	Ex-bus energy	Energy at periphery	Total charges
	MW	MU	MU	Rs. Crore
2019-20	1,215.00	8,994.76	8,647.06	3,528.02
2020-21	1,215.00	8,994.76	8,647.06	3,518.11
2021-22	1,215.00	8,994.76	8,647.07	3,510.51
Revised Estimate				
April-September 2019(Actual)	1,215.00	2,872.70	2,751.07	1668.18
2019-20 (Estimate)	1,215.00	8,449.83	8,111.05	3,492.20
2020-21 (Estimate)	1,215.00	8,999.75	8648.62	3,737.65
2021-22 (Estimate)	1,215.00	8,999.75	8648.62	3,769.23

Energy procurement from liquid fuel stations

10.7.38 The capacity and energy availability from, RGCCPP, Kayamkulam is given below. Due to high fuel cost and consequent power cost, no power is proposed to be used from this plant. This plant will be used only during extreme exigencies. However, there is a fixed charge obligation of Rs 200 Cr per year. Honorable Commission approved Rs 200 Cr. for FY-19 and directed to renegotiate the annual fixed charges of RGCCPP as there was a provision of review.

10.7.39 Even after several round of discussions with NTPC, they were not willing to reduce the fixed charges from Rs 200 Cr. Hence KSEBL provisionally admitted an annual fixed charges of Rs 62.3544 Cr. from April 2019 onwards eventhough the same was not agreeable to NTPC. Hence for the time being, KSEBL humbly requests before the Honorable Commission to allow 62.3544 Cr. from 2019-20 onwards and requests to allow the variations if any, that materializes on future dates, at the time of truing up.

Table 10. 49 Energy availability from liquid fuel stations				
Station	Capacity (MW)	Capacity Available (MW)	Energy availability (MU/day)	
RGCCPP	360	320	7.45	
Fixed charges (Rs Cr)				
	April-September 2020	2019-20	2020-21	2021-22
Approved by Honorable Commission		0	0	0
Revised Estimate	31.18	62.35	62.35	62.35

Interstate transmission charges

10.7.40 The transmission charges to be paid for ISTS for 2019-20 are estimated by taking the actual transmission charges for the first half of FY 20 and the transmission charges for second half and remaining part of control period is estimated on the basis of averagePoC charges for the period from April to September 2019 approved by CERC vide order dated 02.05.2019 and 10.10.2019. The transmission charges approved for the two quarters of FY 20 and the projection of transmission charges are given in Table below.

Table 10. 50 Interstate transmission charges claimed and approved vide MYT order					
Quarter	CERC order date	PoC charges	Reliability support charges	HVDC charges	Total
		Rs/MW			
Apri-June	02.05.2019	170715	31315	17858	219888
July to September	10.10.2019	124104	31725	17886	173715
Average		147409.5	31520	17872	196801.5
POC charges taken for contoll period					
2019-20		147409.5	31520	17872	196801.5
2020-21		147409.5	31520	17872	196801.5
2021-22		147409.5	31520	17872	196801.5

10.7.41 Based on above PoC charges the interstate transmission is estimated as follows.

Table 10. 51 Interstate transmission charges (Rs Cr)					
Source	Allocated capacity (MW)	Apr to Sep 2019	2019-20	2020-21	2021-22
			Rs Cr	Rs Cr	Rs Cr
RSPTS Stage I & II	245.07	24.89	57.88	57.88	57.88
RSTPS Stage III	61	6.18	14.41	14.41	14.41
TALCHER - Stage II	427	42.93	100.84	100.84	100.84
Simhadri Exp	85.55	9.10	20.20	20.20	20.20
NLC-II- Stage-1	63	6.02	14.88	14.88	14.88
NLC-II- Stage-2	90.02	8.55	21.26	21.26	21.26
NLC- Exp- Stage-1	68.24	6.59	16.11	16.11	16.11
NLC - II Exp	81.23	7.70	19.18	19.18	19.18
MAPS	23.01	2.17	5.43	5.43	5.43
KAIGA Stg I& II	38.01	6.88	8.98	8.98	8.98
KAIGA Stg II	34.98		8.26	8.26	8.26
Kudamkulam Unit I	140.1	26.51	33.09	33.09	33.09
Kudamkulam unit II	133		31.41	31.41	31.41
Vallur JV with	49.95	5.20	11.80	11.80	11.80
NTPL(Tuticorin JV)	72.5	7.71	17.12	17.12	17.12
Kudgi Unit I	111.72	11.31	26.38	26.38	26.38
20 Bhavini	43		0.00	10.15	10.15
NNLTPS	32.4		1.28	7.65	7.65
Sub Total	1799.78	171.73	408.51	425.04	425.04
Long Term Agreements					
Maithon power	150	14.86	35	35.42	35.42
Maithon power	150	14.86	35	35.42	35.42
DVC-Mejia TPS	100	9.98	24	23.62	23.62
DVC-R'pur	50	4.92	12	11.81	11.81
Sub Total	450	44.62	106.27	106.27	106.27
RGCCPP	359	4.20	8.16	8.16	8.16
Total	2608.78	220.55	522.94	539.47	539.47

Power procurement from IPPs

10.7.42 Honorable Commission approved the power procurement from IPPs within the State for the control period as follows.

Table 10. 52 Purchase of power from IPPs for the control period				
Small Hydel	Capacity (MW)	Annual Energy availability (MU)	Per unit cost (Rs/unit)	Total cost (Rs.Cr.)
Ullumkal	7	17.79	2.44	4.34
Iruttukanam I & II	4.5	24.69	2.70	6.67
Karikkayam	10.5	37.56	4.16	15.62
Meenvallom	3	8.44	4.88	4.12
Pambumkayam	0.11	0.09	4.88	0.04
Kallar	0.05	0.08	5.47	0.04
SHP Total	25.16	88.65	3.48	30.84
Agali	13.8	29.72	3.14	9.33
Koundikkal	4.8	12.56	3.14	3.94
Ramakkalmedu	14.25	27.87	3.14	8.75
Ahalya	8.4	20.98	5.23	10.97
INOX	16	30.84	4.09	12.61
Wind Total	57.25	121.97	3.74	45.61
Kasargod solar Park	50	70.08	3.90	27.33
Sub Total	50	70.08	3.90	27.33
Grand Total	132.41	280.70	3.70	103.78

10.7.43 The revised forecast is done considering the following

- Actual of first half of financial year 2019-20
- Honorable Commission vide order dated 6.2.2019 approved the levelised tariff for

the electricity generated from the 50 MW SolarPV project at Kasargode as @Rs 3.83/unit.

- iii. Due to flood there is no energy availability from Mankulam Grama Panchayath and Western Kallar
- iv. Honorable Commission has not considered power from wind power project of M/s Kosamattom Finance Ltd in the MYT order. M/s Kosamattom Finance Ltd was connected to grid on 20.03.2018 and injected 1.13 MU during FY 2018-19 at a total power purchase cost of Rs 0.06 Cr. It may please be noted that KSEBL initialled draft PPA with M/s Kosamattom Pvt Ltd on 27.10.2018 @ interim tariff of Rs 3.07 per unit and submitted before Honorable Commission for approval. Honorable Commission approved the tariff for the project at Rs 4.23 per unit without accelerated depreciation and at Rs 3.93 per unit with accelerated depreciation benefit. Hence the energy availability from Kosamattom is also considered in this projection @ Rs 3.93 per unit taking into account of accelerated depreciation benefit.

10.7.44 The revised forecast for the remaining part of control period is as follows:

Table 10. 53 Power purchase cost from IPPs

Small Hydel	Capacity (MW)	Per unit cost (Rs/unit)	Energy in MU				Cost of Power Purchase (Rs Cr.)			
			April-September	2019-20	2020-21	2021-22	April-September	2019-20	2020-21	2021-22
Ullumkal	7	2.44	10.17	17.98	17.79	17.79	2.48	4.39	4.34	4.34
Iruttukanam I & II	4.5	2.7	9.84	19.42	24.69	24.69	2.66	5.24	6.67	6.67
Karikkayam	10.5	4.16	23.45	38.17	37.56	37.56	8.62	15.88	15.62	15.62
Meenvallom	3	4.88	4.18	7.30	8.44	8.44	2.04	3.56	4.12	4.12
Pambumkayam	0.11	4.88	0.00	0.00	0	0.00	0.00		0.00	0.00
Kallar	0.05	5.47	0.00	0.00	0	0.00	0.00		0.00	0.00
Pathamkayam	8	5.47	0.00	0.00	0	0.00	0.00		0.00	0.00
SHP Total	33.16		47.63	82.87	88.48	88.48	15.79	29.07	30.75	30.75
Agali	13.8	3.14	23.84	27.04	29.72	29.72	7.49	8.49	9.33	9.33
Koundikkal	4.8	3.14	8.76	12.34	12.56	12.56	2.75	3.87	3.94	3.94
Ramakkalmedu	14.25	3.14	14.67	21.54	27.87	27.87	4.60	6.76	8.75	8.75
Ahalya	8.4	5.23	12.39	19.47	20.98	20.98	6.48	10.18	10.97	10.97
INOX	16	4.09	23.54	36.90	38.90	38.90	9.63	15.09	15.91	15.91
Kosamattom	1	3.93	1.14	1.22	2.10	2.10	0.35	0.48	0.83	0.83
Wind Total	57.25	3.74	84.35	118.52	132.14	132.14	31.30	44.89	49.74	49.74
Kasargod solar Park	50	3.83	33.85	77.17	70.08	70.08	12.96	29.56	26.84	26.84
Kuzhalmannam	2	3.14	1.19	2.63	2.54	2.54	0	0.82	0.80	0.80
Sub Total	50		35.05	79.79	72.62	72.62	12.96	30.38	27.64	27.64
Grand Total	132.41	3.7	167.03	281.18	293.23	293.23	60.06	104.34	108.13	108.13

Power procurement from renewable energy sources

10.7.45 Honorable Commission approved RPO targets and the required renewable energy as follows

Table 10. 54 RPO Targets and additional Renewable energy approved by Hon'ble Commission				
	2018-19	2019-20	2020-21	2021-22
Sales Excluding Bulk supply (MU)	21054.25	22336.68	23294.98	24298.35
Net Hydro excluding SHP (MU)	7,458.23	6,435.76	6,229.25	6,214.47
Energy for RPO (MU)	13,596	15,901	17,066	18,084
Non-Solar Obligation (%)	7.00%	8.00%	9.00%	10.25%
Non-Solar Obligation (MU)	951.72	1,272.07	1,535.91	1,853.60
Existing banking arrangement (MU)	65.8	65.8	65.8	65.8
Net internal Small Hydro (MU)	349.2	490.3	566.4	787.41
IPPs-SHP Total (Existing) (MU)	88.65	88.65	88.65	88.65
Wind (internal) (MU)	1.77	2.02	2.06	2.06
Wind IPPs (Existing) (MU)	121.97	121.97	121.97	121.97
Total Non-Solar available (MU)	627.38	768.73	844.87	1,065.88
Balance requirement of Non-Solar energy (MU)	324.34	503.35	691.04	787.71
Solar Obligation (%)	2.75%	4.00%	5.25%	6.75%
Solar Obligation (MU)	373.89	636.03	895.96	1,220.67
Solar (internal) (MU)	14.81	42.18	47.12	47.12
Banking arrangement & GBI (MU)	38.26	38.26	38.26	38.26
Solar (Existing IPPs) (MU)	70.08	70.08	70.08	70.08
Total Solar Energy available (MU)	123.15	150.52	155.46	155.46
Balance Requirement Solar Energy (MU)	250.74	485.51	740.5	1,065.21

10.7.46 Based on the revised energy sales and energy generation the renewable purchase obligation to be met as per the KSERC (Renewable Energy) Regulations, 2020 is as follows

Table 10. 55 : Revised RPO Targets for next control period			
Particulars	Quantum in MU		
	2019-20	2020-21	2021-22
Energy sales excl bulk licensees	22337.76	22900.56	23830.22
Hydro	6079.86	6122.07	6179.86
Net Energy sales	16257.90	16778.49	17650.36
Non-Solar Obligation (%)	8.00%	9.00%	10.25%
Non Solar RPO Targets as per RE regulations	1,300.63	1,510.06	1,809.16
Solar Obligation (%)	4.00%	5.25%	6.75%
Solar RPO Targets as per RE regulations	650.32	880.87	1191.40

10.7.47 The petitioner has been earnestly attempting to meet the RPO through own generation as well as through procurement. The Renewable energy generation of KSEB Ltd for the control period FY 20 to FY-22 is given in table below.

Table 10. 56 Renewable Energy Generation from own SHEPs				
Sl No	Particulars	Energy availability in MU		
		FY-20	FY-21	FY-22
1	Existing SHEP	436.66	497.78	502.45
2	Bhothathan kettu		41.7	83.4
3	Upper Kallar		1.284	2.568
4	Poringal AES		45	45

5	Chathankottunada			7.38
6	Pazhassisagar			49.5
	Sub Total	436.66	585.76	690.30
Renewable Energy Generation from own wind projects				
		Energy availability in MU		
Sl No	Particulars	FY-20	FY-21	FY-22
	Wind Kanjikkode	2.04	2.08	2.08
Renewable Energy Generation from own solar projects				
		Energy availability in MU		
Sl No	Particulars	FY-20	FY-21	FY-22
	Existing and new	22.57	47.60	47.60

10.7.48 The RE procurement arrangement from existing SHP, Wind and Solar sources as described in para 10.7.44 is reproduced below

Table 10. 57 Power purchase cost from IPPs						
Small Hydel	Capacity (MW)	Per unit cost (Rs/unit)	Energy in MU			
			April-September	2019-20	2020-21	2021-22
Ullumkal	7	2.44	10.17	17.98	17.79	17.79
Iruttukanam I & II	4.5	2.7	9.84	19.42	24.69	24.69
Karikkayam	10.5	4.16	23.45	38.17	37.56	37.56
Meenvallom	3	4.88	4.18	7.30	8.44	8.44
Pambumkayam	0.11	4.88	0.00	0.00	0	0.00
Kallar	0.05	5.47	0.00	0.00	0	0.00
Pathamkayam	8	5.47	0.00	0.00	0	0.00
SHP Total	33.16		47.63	82.87	88.48	88.48
Agali	13.8	3.14	23.84	27.04	29.72	29.72
Koundikkal	4.8	3.14	8.76	12.34	12.56	12.56
Ramakkalmedu	14.25	3.14	14.67	21.54	27.87	27.87
Ahalya	8.4	5.23	12.39	19.47	20.98	20.98
INOX	16	4.09	23.54	36.90	38.90	38.90
Kosamattom	1	3.93	1.14	1.22	2.10	2.10
Wind Total	57.25	3.74	84.35	118.52	132.14	132.14
Kasargod solar Park	50	3.83	33.85	77.17	70.08	70.08
Kuzhalmannam	2	3.14	1.19	2.63	2.54	2.54
Sub Total	50		35.05	79.79	72.62	72.62
Grand Total	132.41	3.7	167.03	281.18	293.23	293.23

10.7.49 In order to meet the RPO obligation KSEBL has entered into new Power Purchase Agreements/Power Sale agreements during 2019-20 period for the purchase of renewable power, the details of which are enumerated below:

Table 10. 58 Details of contracts entered for purchase during the second control period					
Sl.No	Name of Station	Date of PPA	Capacity MW	Tariff, Rs./kWh	Expected date of power purchase
Solar Projects					
1	NTPC Floating Solar Project at Kayamkulam	28.08.2019	92	3.16	Dec-20
2	Solar Ground mounted THDCIL, Paivalike	16-01-2019	50	3.10	Mar-20
3	Floating Solar project of NHPC at West Kallada.	31.08.2019	10	3.43	Aug-20
4	Solar project of THDCIL at Nellithadam,	25.09.2019	5	3.10	Mar-20

	Kasargod	(initialled)			
Non solar projects					
5	PSA with SECI for purchase of Wind Power	14-06-2019	200	2.83+trading margin 0.07	Jan-21
6	PSA with SECI for purchase of Wind Power	06.09.2019	100	2.81+trading margin 0.07	Jul-21

Further, discussions are going on for procuring 40 MW from NHPC at West Kallada and expected COD is September 2020 @ Rs 3.43 per unit

10.7.50 In addition to the above the following floating solar projects on various dam sites are under pipeline.

Table 10. 59 Details of contracts entered for purchase during the second control period

Location	Details of water body	Capacity in MW	Project executing Agency	Present status	Role of KSEBL
<u>Idukki</u>					
1)Cheruthoni	Idukki reservoir of Idukki 780MW HEP	50	NTPC	Agency identified for conducting bathymetric and topographic survey by NTPC.	Development of transmission system for evacuation of power to Vazhathope substation proposed to be upgraded to 110KV and to procure power generated from the project.
2) Anchuruli	-do-	250	NTPC	To be done as 2 nd phase by NTPC.	Development of transmission system for evacuation of power to Kattappana substation proposed to be upgraded to 110KV, development of 220kV Kuyilimala substation and to procure power from the project.
3) Kulamavu	Idukki reservoir of Idukki 780MW HEP	100	SECI	Initial surveying carried out and power evacuation proposal finalised	Development of transmission system for evacuation of power to Kulamavu substation proposed to be upgraded to 110KV and to procure power generated from the project.
Banasurasagar	Banasurasagar reservoir of Kuttiyadi 225MW HEP	100	SECI	-do-	Development of transmission system for evacuation of power to Padinjarathara substation proposed to be upgraded to 220KV and to procure power from the project.

10.7.51 Among the above projects 50 MW of Cheruthoni is expected to complete by March 2021, 100 MW of Anchuruli is expected to complete during September 2021, 100 MW of Kulamavu expected to be completed by September 2021, 100 MW Banasurasagar expected to complete by September 2021. As PPA is yet to be executed power purchase cost is provisionally estimated @ Rs 3.16 per unit (Rate proposed for NTPC floating solar project at Kayamkulam).

10.7.52 In addition to the above under Saura scheme, 250 MW of roof top solar are expected to complete during the year 2020-21 and 250 MW of roof top solar is expected to complete during 2021-22. Since the RESCO bid under rooftop solar is to be retendered and in respect of other modes no power procurement is involved, the cost of power procurement is not estimated under this instant petition. The same is considered hereunder for the limited purpose of meeting the RPO.

10.7.53 Further, Ministry of New and Renewable Energy (MNRE) has launched the Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) Scheme for farmers for installation of solar pumps and grid connected solar and other renewable power plants in the country. The scheme aims to add solar and other renewable capacity of 25,750 MW by 2022 with total central financial support of Rs. 34,422

Crore including service charges to the implementing agencies. The target allocation for KSEBL is 10 MW and the expected rate is Rs 3.50 per unit.

10.7.54 The revised estimate for renewable energy procurement from other sources is provided in the table below.

Table 10. 60 Renewable energy expected during the control period								
Solar Projects	Capacity	CUF	Expected date of completion	Energy availability		Rate	Power Purchase cost (Rs Cr)	
	MW	%		MU		Rs/unit	FY-21	FY-22
				FY-21	FY-22			
NTPC Floating Solar Project at Kayamkulam	92	0.22	Dec-20	58.78	177.30	3.16	18.57	56.03
Ground mounted THDCIL, Paivalike	50	0.19	Mar-20	83.22	83.22	3.10	25.80	25.80
Floating Solar project of NHPC at West Kallada.	10	0.22	Sep-20	12.23	24.53	3.43	4.20	8.41
Solar project of THDCIL at Nellithadam, Kasargod	5	0.19	Mar-20	8.32	8.32	3.10	2.58	2.58
Floating Solar Project at Idukki reservoir(Cheruthoni)	50	0.22	Mar-21		96.36	3.16		30.45
Floating Solar project of NHPC at West Kallada.	40	0.22	Sep-20	38.44	77.09	3.43	13.18	26.44
Floating Solar Project at Kulamavu	100	0.22	Sep-21	0.00	96.10	3.16	0.00	30.37
Floating Solar Project at Anchuruli	100	0.22	Sep-21		96.10	3.16	0.00	30.37
Floating Solar Project at Banasurasagar	100	0.22	Sep-21		96.10	3.16	0.00	30.37
Power procurement through reverse bid process	200	0.19	Dec-21	0.00	82.08	3.00	0.00	24.62
Roof Top Solar -Saura-250 MW	250	0.17	Oct-20	154.02	372.30			
Roof Top Solar -Saura-250 MW	250	0.17	Oct-21	0.00	154.02			
PM KUSUM	10	0.19	Dec-21	8.30	16.64			
Sub Total	1257			362.27	1374.90	31.86	63.98	263.63
Non solar projects								
PSA with SECI for purchase of Wind Power	200	0.35	Sept-20	136.38	613.16	2.90	39.55	177.82
PSA with SECI for purchase of Wind Power	100	0.35	Jul-21	0.00	192.18	2.88	0.00	55.35
Sub Total	300.00			136.38	805.34		39.55	233.16
Total	1557.00			498.65	2180.23		103.52	496.79

10.7.55 Further KSEBL has made banking arrangements with the following prosumers for which RPO can be claimed. The actual details and the estimate for the remaining part of control period is given in table below.

Table 10. 61 Banking Arrangements with prosumers for which RPO can be claimed				
Particulars	Energy in MU			
Banking arrangements	As on 31.12.2019	FY-20	FY-21	FY-22
Small Hydro Electric Project				
Maniyar	23.36	25.21	25.21	25.21
Kuthungal	40.34	48.82	48.82	48.82
Wind Projects				
Malayala Manorama Ltd	18.83	26.28	26.28	26.28
Subtotal nonsolar	82.53	100.31	100.31	100.31
Solar				
CIAL	33.31	44.48	44.48	44.48
Other solar prosumers (grid connected) (LT & HT)	34.285	89.53	91.32	93.15
Off grid consumes availing GBI	2.67	2.67	2.72	2.78
Subtotal Solar	70.27	136.68	138.53	140.41

10.7.56 Additional energy requirement for meeting RPO is estimated in table below

Table 10. 62 Balance energy requirement for meeting RPO				
Sl No	Particulars	2019-20	2020-21	2021-22
1	Sales Excluding Bulk supply (MU)	22337.76	22900.56	23830.22
2	Net Hydro excluding SHP (MU)	6079.86	6122.07	6179.86
3	Energy for RPO (MU)	16257.90	16778.49	17650.36
4	Non-Solar Obligation (%)	0.08	0.09	0.10
5	Non-Solar Obligation (MU)	1300.63	1510.06	1809.16
6	Existing banking arrangement (MU)	100.31	100.31	100.31
7	Net internal Small Hydro (MU) Existing	436.66	585.76	690.30
8	IPPs-SHP Total (Existing) (MU)	82.87	88.48	88.48
9	Wind (internal) (MU)	2.04	2.08	2.08
10	Wind IPPs (Existing) (MU)	118.52	132.14	132.14
11	Wind new purchase expected		136.38	805.34
12	Total Non-Solar available (MU)	740.39	1045.14	1818.64
13	Balance requirement of Non-Solar energy (MU)	560.25	464.92	-9.48
14	Solar Obligation (%)	0.04	0.05	0.07
15	Solar Obligation (MU)	650.32	880.87	1191.40
16	Solar (internal) (MU)	22.57	47.60	47.60
17	Roof Top under Saura scheme		185.64	526.32
18	PM KUSUM scheme		8.30	16.64
19	Banking arrangement & GBI (MU)	136.68	138.53	140.41
20	Solar (Existing IPPs) (MU)	79.79	72.62	72.62
21	Solar new purchase expected		199.95	831.93
22	Total Solar Energy available (MU)	239.04	652.63	1635.51
23	Balance Requirement Solar Energy (MU)	411.27	228.24	-444.11

10.7.57 M/s IEX, as per submission before CERC in Petition No.25/MP/2019 dated 26th November 2018, is preparing to launch Green Term-Ahead Market (Renewable Energy) Contracts at Indian Energy Exchange Ltd for transactions of renewable energy power. KSEBL is planning to procure the balance requirement through the green energy exchange as it materializes or through contracts at the ceiling rate of Rs 3.5 per unit for solar energy and Rs 3 per unit for non solar energy for FY-21. The total cost of renewable power is given in table below:

Table 10. 63 Power Purchase Cost for renewable Energy procurement approved by the Honorable Commission									
Source	2019-20			2020-21			2021-22		
	Annual energy availability	Avg. Unit Cost	Total amount	Annual energy availability	Avg Unit Cost	Total amount	Annual energy availability	Avg. Unit Cost	Total amount
	MU	Rs/unit	Rs Cr.	MU	Rs/unit	Rs Cr.	MU	Rs/unit	Rs Cr.
SHP Total	88.65	3.48	30.84	88.65	3.48	30.84	88.65	3.48	30.84
Wind Total	121.97	3.74	45.61	121.97	3.74	45.61	121.97	3.74	45.61
Solar Total	70.08	3.9	27.33	70.08	3.9	27.33	70.08	3.9	27.33
Additional Non-solar power procurement	503.35	2.9	145.97	691.04	2.9	200.4	787.71	2.9	228.44
Additional solar power (procurement)	485.51	3	145.65	740.5	3	222.15	1,065.21	3	319.56
Total	1,269.55	3.11	395.4	1,688.64	3.12	526.33	2,179.04	2.99	651.78

Revised Estimate									
Existing SHEP	82.87	3.51	29.07	88.48	3.48	30.75	88.48	3.48	30.75
Existing Wind	118.52	3.79	44.89	132.14	3.76	49.74	132.14	3.76	49.74
Existing Solar	79.79	3.81	30.38	72.62	3.81	27.64	72.62	3.81	27.64
NTPC Floating Solar Project at Kayamkulam				58.78	3.16	18.57	177.30	3.16	56.03
Ground mounted THDCIL, Paivalike				83.22	3.10	25.80	83.22	3.10	25.80
Floating Solar project of NHPC at West Kallada.-10MW				11.19	3.43	3.84	19.27	3.43	6.61
Floating Solar project of NHPC at West Kallada-40 MW.				38.44	3.43	13.18	77.09	3.43	26.44
Solar project of THDCIL at Nellithadam, Kasargod				8.32	3.10	2.58	8.32	3.10	2.58
Floating solar at Cheruthoni							96.36	3.16	30.45
Floating solar at Anchuruli				0.00	3.16	0.00	96.10	3.16	30.37
Floating solar at Kulamavu				0.00	3.16	0.00	96.10	3.16	30.37
Floating solar at Banasurasagar				0.00	3.16	0.00	96.10	3.16	30.37
PM KUSUM				8.30	3.50	2.90	16.64	3.50	5.83
Power procurement through reverse bid process				0.00	3.00	0.00	82.08	3.00	24.62
PSA with SECI for purchase of Wind Power				136.38	2.90	39.55	613.16	2.90	177.82
PSA with SECI for purchase of Wind Power				0.00	0.00	0.00	192.18	2.88	55.35
Additional non solar power procurement				464.92	2.90	134.83			
Additional solar power procurement				228.24	3.00	68.47			
Total	281.18	3.71	104.34	1331.03	3.14	417.86	1947.15	3.14	610.74

10.7.58 Sourcewise energy availability for 3 years

Table 10. 64 Summary of energy availailty for remaining control period										
Financial Year	Generation(MU)					Power Purchase(MU)				Total Availabilit y (MU)
	Hydro	Thermal	Wind	Solar	Sub Total	Small IPPs (existing)	CGS	IPPs outside the State	RE contracted /roof top solar	
2019-20	6449.13	11.92	1.33	22.57	6484.95	281.18	10517.24	8111.05	0.00	25023.37
2020-21	6638.85		2.08	47.6	6688.53	293.23	11326.55	8648.62	498.65	27455.58
2021-22	6799.36		2.08	47.6	6849.04	293.23	11326.55	8648.62	2180.23	29297.67
Above availability is exclusive of RE energy through banking										

Summary of monthwise energy availability

10.7.59 Based on the above the summary of the month-wise energy balance statement for the remaining part of FY-20, is as shown below

Table 10. 65 : Summary of the total energy availability for remaining period of FY 2019-20										
Month	Demand	Generation (MU)			Power Purchase MU)			Credible outage on LTA and CGS	Total availability	Surplus/ Deficit
		Hydro	Wind	Solar	IPPS	CGS	LTA(net)			
	MU	MU	MU	MU	MU	MU	MU	MU	MU	MU
Oct-19	2043.00	501.45	0.07	1.93	25.75	874.57	719.32	79.69	2043.39	0.39
Nov-19	2080.00	479.92	0.06	1.76	19.24	966.01	696.12	83.11	2080.00	0.00
Dec-19	2157.00	570.70	0.09	1.77	17.08	930.53	719.32	82.49	2157.00	0.00
Jan-20	2119.53	474.60	0.12	2.21	16.67	992.20	719.32	85.58	2119.54	0.00
Feb-20	2154.70	555.19	0.11	2.17	15.45	905.70	672.91	78.93	2072.60	-82.10
Mar-20	2555.95	834.65	0.13	2.68	19.97	912.83	719.32	81.61	2407.98	-147.96
Total	13110.18	3416.51	0.58	12.51	114.15	5581.84	4246.32	491.41	12880.51	

10.7.60 The month wise peak demand for the second half of FY 20 is given below.

Table 10. 66 : Summary of Peak time availability										
Month	Demand (MW)	Hydro (MW)	Outage s (MW)	Small IPPs (MW)	CGS (MW)	LTA (MW)	UI (MW)	Total (MW)	Deficit(-)/Surplus(+) (MW)	
Oct-19	3582	1448	-100	60	1160.00	1000	50	3618.00	36	
Nov-19	3800	1448	-100	60	1166.00	1000	50	3624.00	-176	
Dec-19	3850	1389	-100	60	1186.00	1000	50	3585.00	-265	
Jan-20	3900	1489	-100	60	1176.00	1000	50	3675.00	-225	
Feb-20	4000	1480	-100	50	1184.00	1000	50	3664.00	-336	
Mar-20	4400	1743	-100	30	1184.00	1000	50	3907.00	-493	

10.7.61 The month wise energy requirement and availability estimated for FY 21 is given below.

Table 10. 67 : Summary of the total energy availability for FY 2020-21										
Month	Demand	Hydro	Wind	Solar incl Soura	Total Generation	Renewable energy existing & contracted	CGS	IPPs	Total availability	Deficit(-)/Surplus(+)
April	2502.44	696.14	0.09	3.97	700.20	27.90	847.95	776.01	2352.06	-150.38
May	2635.93	669.16	0.12	3.97	673.24	32.76	892.60	801.88	2400.48	-235.45
June	2018.00	480.87	0.13	3.97	484.96	42.35	838.94	679.96	2046.20	28.21
July	2023.29	547.62	0.17	3.97	551.76	41.70	963.30	736.81	2293.56	270.27
August	1930.99	566.78	0.49	3.97	571.24	43.61	982.89	625.51	2223.26	292.27
September	2056.24	504.28	0.31	3.97	508.55	41.43	978.24	672.18	2200.41	144.17
October	2188.86	501.27	0.31	5.38	506.95	72.42	935.86	679.03	2194.26	5.40
November	2194.82	493.23	0.06	35.93	529.23	64.43	937.10	704.63	2235.38	40.56
December	2174.02	423.27	0.11	37.00	460.38	78.88	992.03	743.84	2275.12	101.10
January	2181.16	459.92	0.10	37.00	497.02	62.17	961.12	702.62	2222.93	41.77
February	2165.64	588.45	0.14	33.80	622.39	56.57	932.00	724.28	2335.24	169.60
March	2602.62	707.87	0.07	37.00	744.93	65.34	1064.53	801.88	2676.68	74.06
Total	26673.99	6638.85	2.08	209.91	6850.85	629.56	11326.55	8648.62	27455.58	781.59

10.7.62 The monthwise peak demand estimated for FY 21 is given below.

Table 10. 68 : Summary of the peakdemand balance statement for FY 2020-21								
2020-21	Demand expected MW	Availability(MW)						Shortage MW
		Hydro MW	Small IPPs MW	CGS MW	LTA MW	Unforeseen outages MW	Total MW	
April	4445	1692	35	1403	1,103	125	4,108	-338
May	4346	1661	35	1332	1,103	122	4,009	-336
June	3925	1593	40	1288	968	113	3,776	-149
July	3916	1548	50	1461	1,013	124	3,948	32
August	3812	1530	50	1486	862	117	3,810	-2
September	3852	1548	50	1431	955	119	3,865	13
October	3836	1548	50	1403	933	117	3,817	-20
November	3863	1498	50	1439	1,001	122	3,866	3
December	3916	1615	50	1497	1,024	126	4,059	143
January	3915	1596	115	1413	968	119	3,973	58
February	4007	1593	115	1384	1,103	124	4,071	64
March	4551	1694	105	1434	1,103	127	4,209	-342

10.7.63 The month wise energy requirement and availability estimated for FY 22 is given below

Table-10.69 Summary of energy availability for the year 2021-22									
2021-22	Demand	Hydro	Wind	Solar*	Small IPPs/ RE purchase contracted	CGS	LTA	Total availability	Deficit (-) /Surplus(+)
	MU								
April	2589.98	681.71	0.09	35.93	132.91	847.95	776.01	2474.60	-115.38
May	2717.89	707.69	0.12	37.00	157.93	892.60	801.88	2597.21	-120.67
June	2085.49	470.66	0.13	35.93	163.48	838.94	679.96	2189.10	103.61
July	2092.57	499.04	0.17	37.00	217.76	963.30	736.81	2454.07	361.50
August	1982.23	515.79	0.49	37.00	219.67	982.89	625.51	2381.36	399.13
September	2115.12	499.53	0.31	35.93	116.92	978.24	672.18	2303.11	188.00
October	2274.13	538.64	0.31	37.00	161.73	935.86	679.03	2352.56	78.44
November	2261.98	556.51	0.06	66.53	150.86	937.10	704.63	2415.68	153.70
December	2246.01	483.18	0.11	68.62	153.13	992.03	743.84	2440.90	194.89
January	2242.40	500.11	0.10	68.62	155.87	961.12	702.62	2388.44	146.04
February	2290.05	569.97	0.14	62.36	141.21	932.00	724.28	2429.95	139.90
March	2731.42	776.54	0.07	68.62	159.04	1064.53	801.88	2870.68	139.26
Total	27629.24	6799.36	2.08	590.56	1930.50	11326.55	8648.62	29297.67	1668.43
* Solar incl rooftop under Saura scheme and PM KUSUM scheme									

10.7.61 The month wise peakdemand for FY22 is given below.

Table 10.70 Summary of peak demand balance statement for for 2021-22									
2021-22	Demand expected(MW)	Availability(MW)							Shortage
		Hydro	Small IPPs/RE purchase*	Proposed wind and solar	CGS	LTA	Unforeseen outages	Total	
	MW	MW	MW	MW	MW	MW	MW	MW	MW
April	4579	1646	105	35	1403	1,103	125.31	4131.89	-446.95
May	4476	1631	105	35	1332	1,103	121.75	4049.17	-426.76
June	4079	1500	120	105	1288	968	112.80	3763.29	-315.81
July	4032	1500	165	105	1461	1,013	123.68	4014.96	-17.52
August	3926	1530	165	105	1486	862	117.38	3925.19	-1.20
September	3956	1548	165	105	1431	955	119.30	3979.79	24.02
October	3928	1548	165	105	1403	933	116.77	3931.56	3.58
November	3952	1498	165	105	1439	1,001	122.02	3981.34	29.25
December	4008	1615	165	105	1497	1,024	126.01	4174.13	166.44
January	4005	1596	160	105	1413	968	119.05	4017.92	13.29
February	4091	1593	160	105	1384	1,103	124.39	4116.34	25.03
March	4714	1694	150	105	1434	1,103	126.86	4254.25	-459.75

Purchase from Short term market-Purchase for FY-20

10.7.62 The summary of energy balance statement for the first half of financial year is as follows.

Table 10. 71 Energy Balance Statement during first half of FY-20			
Particulars	Approved	Actual	Deviation
Hydro	4036.74	3002.50	-1034.24
Generation from other sources	19.71	17.05	-2.66
Small IPP	140.73	172.18	31.44
Additional RE approved for meeting RPO(proportionate)	275.18	0.00	-275.18
CGS(exbus)	5729.70	5123.23	-606.47
IPPs outside State*(ex bus)	4405.05	4030.38	-374.67
Demand	12718.00	12928.08	210.08

10.7.62 It can be seen that during the first half of financial year, a reduction of 1034 MU in hydro, reduction of power purchase of 606.17 MU from CGS, reduction of 374 MU from LTA causes the reduction in availability by 2261 MU. Further the demand during April reaches 4316 MW and daily demand during April touches 88 MU.It may please be noted that the average daily consumption during April was 81 MU.There is an increase of 210 MU in enery demand during the first half of FY-2020.In order to meet the demand and to compensate the deficit KSEBLtd purchased 1225.27 MU through short term markets partially to meet the deficit in summer months of FY 2020, for a total cost of Rs 369.37Cr.

10.7.64 KSEBL has already filed a petition before the Honorable Commission to enter into banking arrangement with M/s PTC India Ltd and M/s BSES Yamuna Power Ltd, with delivery point as Regional Periphery of Exporting Utility as well as return period as given in Table below

Table 10.72 Details of banking arrangements made for FY 20						
Supply thru PTC from TPDDL to KSEB			Return from KSEBL to PTC-TPDDL			
Supply Period	Quantum(MW)	Duration(Hrs)	Return Period	Duration (Hrs)	Return (%)	Trading Margin(Ps/kWh)
01.02.20 to 29.02.20	50	RTC	16.06.2020 to 30.09.2020	0-4 & 17-18.30 & 22.30 to 24.00 (uniformly distributed)	102%	2.98
	50	0-6				
	100	20-24				
01.03.2020 to 31.03.2020	50	RTC				
	100	0-6				
	50	18-20				
	100	20-24				
01.04.2020 to 30.04.2020	50	RTC				
	100	0-6				
	25	18-23				
Supply from BYPL to KSEBL			Return from KSEBL to BYPL			
Supply Period	Quantum (MW)	Duration (Hrs)	Return period	Duration (Hrs)	Return (%)	Trading Margin(Ps/kWh)
16.02.20 to 29.02.20	75	RTC	16.06.2020 to 30.09.20	0-3 & 13-17 & 22-24.00(unifomly distributed)	103%	NIL
01.03.20 to 31.03.20	75	RTC				

10.7.65 The quantum of power to be supplied to KSEBL as well as returned by KSEBL is given in table below:

Table 10. 73 Quantum of power transactions thru banking				
Source	Supply		Return	
PTC-TPDDL	Month	MU	Month	MU
	Feb-20	55.1	Jun-20	26.33
	Mar-20	71.3	Jul-20	54.42
	Apr-20	57.75	Aug-20	54.42
			Sep-20	52.66
BYPL	Feb-20	27.00	Jun-20	11.96
	Mar-20	55.80	Jul-20	24.71
			Aug-20	24.71
			Sep-20	23.91

After considering the power through banking arrangements, there is a deficit of 20.86 MU. KSEBL is estimating power procurement of 20.86 MU @ Rs 4.24 per unit (Realised price of DB Power through DEEP portal) from day ahead market. KSEBL returned 286.78 MU through various banking arrangements approved by Honorable Commission and sold 55.93 MU for the first half of FY 20. The details are given in table below:

Table 10. 74 Short term procurement for FY 2020										
Month	Peak demand			Energy availability			Short term	Power expected thru PTC_TPDDL & BYPL thru banking	External sale	Swap return
	Demand	Peak Availability	Surplus(+)/Deficit(-)	Demand	Availability after credible outages	Surplus(+)/Deficit(-)				
	MW	MW	MW	MU	MU	MU				
April -Sept				13025.36	12,142.86	-882.50	1,225.27		55.93	286.84
Oct-19	3582	3618.00	36.34	2,043.00	2,043.39	0.39			0.39	
Nov-19	3800	3624.00	-176.00	2,080.00	2,080.00	0.00				
Dec-19	3850	3585.00	-265.00	2,157.00	2,157.00	0.00				
Jan-20	3900	3675.00	-225.00	2,119.53	2,119.54	0.00				
Feb-20	4000	3664.00	-336.00	2,154.70	2,072.60	-82.10		82.1		
Mar-20	4400	3907.00	-493.00	2,555.95	2,407.98	-147.96	20.86	127.1		
Total				26,135.54	25,023.37	-1112.17	1,246.13		56.32	286.84
Remaining power purchase through short term needed for period from October to March 2020							20.86			
External sale expected for period from October to March 2020							0.39			

10.7.66 Thus the total power purchase through short term markets during FY 2020 quantifies to 1287.65 MU for a total amount of Rs 378.23 Cr.

Table 10. 75 : Purchase from short term market			
No	Particulars Purchase	Energy at Kerala periphery (MU)	Amount (Rs Cr.)
1	During first part of financial year	1,225.27	369.38
2	Remaining part of financial year	20.86	8.85
	Total	1,246.13	378.23

Short term/Medium Term Purchase for FY-21

10.7.68 The energy availability statement and the short term procurement for the year FY -21 is given in Table 10.67 above. It is seen that there is a shortage of about 600 MW during April and May 2020 and March 2021. As stated in para above, KSEBL arranged 57.75 MU during the month of April 2020 through banking arrangements with PTC-TPDDL.

10.7.69 Considering the energy surplus during monsoon months KSEBL is planning to make similar banking arrangements done in FY 20, for the period from February to April 2021 also to the extent possible. It may be noted that surplus energy for return of banked energy is available mostly during off peak hours in monsoon months. Thus the surplus will be materializing only in case monsoon strengthens during this period. Also, there is only limited number of utilities in need of power during this period. Even these utilities are looking for RTC power, which may not be feasible for KSEBL due to inadequate availability during peak period.

10.7.70 Further in order to meet the energy deficit during April and May 2020, KSEBL has already taken steps to avoid power crisis and to avoid scheduling of high cost internal thermal generating stations. KSEBL issued letter of award to M/s Adani enterprises and M/s DB Power Ltd purchase RTC and peak power from 01-04-2020 to 30.04.2020 from Adani Enterprises Ltd on firm and short term basis through DEEP portal as per the prices discovered as shown in table below.

Table 10. 76 Details of power contracted through DEEP portal				
Generator	Adani Enterprises Ltd			
Period	Duration	Quantum(MW) on firm basis	Rate at delivery point ie; at Kerala periphery(Rs/unit)	Source of power
01.04 to 30.04.2020	00.00 to 24.00	100	3.72	Raipur Energen Ltd
01.05. to 31.05.2020	00.00 to 24.00	150	3.76	
01.05. to 31.05.2020	19.00 to 23.00	50	4.25	
Generator	DB Power Ltd(DBPL)			
Period	Duration	Quantum(MW) on firm basis	Rate at delivery point ie; at Kerala periphery(Rs /unit)	Source of power
01.04. to 30.04.2020	19.00 to 23.00	50	4.24	DB Power Ltd
01.05 to 31.05.2020	19.00 to 23.00	50	4.24	

10.7.71. The energy expected from the above purchase arrangements already done is given in table below

Table 10.77 Banking arrangements already done for FY 20-21				
Source	Supply to KSEBL		Return by KSEBL	
	Month	MU	Month	MU
PTC-TPDDL			Jun-20	26.33
			Jul-20	54.42
	Apr-20	57.75	Aug-20	54.42
			Sep-20	52.66
BYPL			Jun-20	11.96
			Jul-20	24.71
			Aug-20	24.71
			Sep-20	23.91
	Month	MU		
Adani Enterprises Ltd	Apr-20	72		
	May-20	117.8		
DB Power Ltd	Apr-20	6		
	May-20	6.2		
			Aug-21	24.71
			Sep-21	23.91

10.7.72 The energy balance statement of FY 21 is given in table below

Table 10. 78 Energy balance statement for FY-21											
2020-21 Month	Demand expected MW	Availability MW	Deficit(-) / Surplus(+) MW	Energy demand MU	Energy availability MU	Energy Deficit/s urplus MU	Power availe d throug h banki ng arrang ement MU	Power purcha se throug h contrac ts MU	Swap return MU	Total availabilit y MU	Energy Deficit/s urplus MU
April	4445	4,108	-338	2502.44	2352.06	-150.38	57.75	78.00		2487.81	-14.63
May	4400	4,009	-336	2635.93	2400.48	-235.45		124.00		2524.48	-111.45
June	3925	3,776	-149	2018.00	2046.20	28.21			-38.29	2007.91	-10.08
July	3916	3,948	32	2023.29	2293.56	270.27			-79.13	2214.43	191.14
August	3812	3,810	-2	1930.99	2223.26	292.27			-79.13	2144.13	213.14
Sept	3852	3,865	13	2056.24	2200.41	144.17			-76.57	2123.84	67.60
Oct	3836	3,817	-20	2188.86	2194.26	5.40				2194.26	5.40
Nov	3863	3,866	3	2194.82	2235.38	40.56				2235.38	40.56
Dec	3916	4,059	143	2174.02	2275.12	101.10				2275.12	101.10
Jan	3915	3,973	58	2181.16	2222.93	41.77				2222.93	41.77
Feb	4007	4,071	64	2165.64	2335.24	169.60				2335.24	169.60
March	4551	4,209	-342	2602.62	2676.68	74.06				2676.68	74.06
				26673.99	27455.58	781.59	57.75	202.00	-273.12	27442.21	768.22

10.7.73 It can be seen that there is a peak deficit during summer months even after the above arrangements and hence KSEBL is planning to meet this requirement through short term or medium term contracts. As the deficit during the period other than summer months is negligible, in this instant petition KSEBL is estimating the cost of the power purchase arrangements for summer months only. In order to meet the peak deficit and energy shortage KSEBL is planning to procure 250 MW for 18.00 to 24.00 hours during March 2021 (46.5 MU) and the corresponding power purchase cost is estimated @ clearing price of DB power Ltd ie Rs 4.24 per unit and to meet the energy deficit during April-June through short term/medium term contracts quantifying (14.63+111.45+10.08 MU=136.17 MU) @average rate of Rs 4.24/unit. Thus the energy procurement through short term/medium term contracts for the year FY 2020-21 is 384.67 MU (46.5 MU +136.17 MU+ 202 MU). The figures might change during course of time based on progress of monsoon, actual unit availability from various sources, demand variations etc. The corresponding power purchase cost amounts to Rs 154.01 Cr. The details are given in table below

Table 10.79 Energy procurement through short term/medium term contracts for the year FY 2020-21						
Source	Month	Duration	Quantum (MW) on firm basis	Rate at Kerala periphery (Rs/unit)	Quantum (MU)	Power Purchase cost(Rs Cr)
Adani enterprises Ltd	Apr-20	00.00 to 24.00	100	3.72	72	26.78
	May-20	00.00 to 24.00	150	3.76	111.6	41.96
	May-20	19.00 to 23.00	50	4.25	6.2	2.64
DB Power Ltd	Apr-20	19.00 to 23.00	50	4.24	6	2.54
	May-20	19.00 to 23.00	50	4.24	6.2	2.63
Short term/ Medium Term	April-June			4.24	136.17	57.74
	Mar-21	18.00 to 24.00	250	4.24	46.5	19.72
Sub total					384.67	154.01

10.7.74 It can be seen from the above table that there is a surplus energy availability of 1644.05 MU during the year 2020-21 as shown in table below. KSEBL is planning to sell the surplus energy only if the rate is more than the marginal cost of high cost generating stations such as Kudgi, NTPL, NTECL Vallur etc. In case such opportunistic sale does not materializes in real time power from these stations with high variable cost will be surrendered which will reduce the power purchase cost. For estimation purpose this surplus energy is shown as sale at a rate of Rs 4/unit is considered through short term market. The corresponding expected revenue is Rs 657.62Cr.

Table 10. 80 Surplus energy							
2020-21	Energy demand	Availability	Renewable energy proposed to procure through short term markets for meeting RPO	Swap /Short term/ medium term contracted/ proposed	Swap return	Total availability	Surplus sale
Month	MU	MU	MU	MU	MU	MU	MU
April	2502.44	2352.06					
May	2635.93	2400.48					
June	2018.00	2046.20					
July	2023.29	2293.56					
August	1930.99	2223.26					
September	2056.24	2200.41					
October	2188.86	2194.26					
November	2194.82	2235.38					
December	2174.02	2275.12					
January	2181.16	2222.93					
February	2165.64	2335.24					
March	2602.62	2676.68					
Total	26673.99	27455.58	693.17	442.42	-273.12	28318.043	1644.05

Short term/Medium Term Purchase for FY-22

10.7.75 The energy availability statement and the short term procurement for the year FY -22 is given in Table 10.67 above. It is seen that there is a deficit of 300 to 600 MW during summer months

10.7.76 Considering the energy surplus during monsoon months KSEBL will explore the possibilities of banking arrangements as done in FY 20, for the period from February 2021 to April 2022 also to the extent possible. It may be noted that surplus energy for return of banked energy is available mostly during off peak hours in monsoon months. Thus the surplus will be materializing only in case monsoon strengthens during this period. Also, there is only limited number of utilities in need of power during this period. Even these utilities are looking for RTC power, which may not be feasible for KSEBL due to inadequate availability during peak period. The energy balance statement for the year FY 22 is given in table below.

Table 10. 81 Energy balance statement for FY -22						
2021-22	Demand expected	Availability	Deficit(-)/ Surplus(+)	Energy demand	Energy availability	Deficit(-)/ Surplus(+)
Month	MW	MW	MW	MU	MU	MU
April	4579	4131.89	-446.95	2589.98	2,474.60	-115.38
May	4476	4049.17	-426.76	2717.89	2,577.21	-140.67
June	4079	3763.29	-315.81	2085.49	2,189.10	103.61
July	4032	4014.96	-17.52	2092.57	2,474.07	381.50
August	3926	3925.19	-1.20	1982.23	2,441.36	459.13
September	3956	3979.79	24.02	2115.12	2,303.11	188.00
October	3928	3931.56	3.58	2274.13	2,377.56	103.44
November	3952	3981.34	29.25	2261.98	2,415.68	153.70
December	4008	4174.13	166.44	2246.01	2,425.90	179.89
January	4005	4017.92	13.29	2242.40	2,383.44	141.04
February	4091	4116.34	25.03	2290.05	2,389.95	99.90
March	4714	4254.25	-459.75	2731.42	2,845.68	114.26
				27629.24	29297.67	1,668.43

10.7.77 It can be seen that there is a peak deficit during summer months and apart from banking KSEBL is planning to meet this requirement through short term or medium term contracts. As the deficit during the period other than summer months is negligible, in this instant petition KSEBL is estimating the cost of the power purchase arrangements for summer months only. In order to meet the peak deficit and energy shortage KSEBL is planning to procure 400 MW for for April-June 2021 and March 2022 from 18.00 to 24.00 hours amounting to 292.80 MU and the corresponding power purchase cost is estimated @ clearing price of DB power Ltd for FY-20 ie Rs 4.24 per unit amounting to Rs 124.15 Cr. The remaining energy deficit (109.65 MU) will be met through swap arrangements or dayahead markets and for estimation

purpose it is shown as a short term purchase at Rs 4.24 per unit. These figures are highly susceptible to monsoon pattern, unit availability at different generating stations and actual demand etc. Thus the energy procurement through short term/medium term contracts for the year FY 2021-22 is 402.45 MUas shown in table below and the corresponding power purchase cost amounts to Rs 170.64 Cr.

Table 10. 82 Short term procurement for FY-22									
2021-22	Demand expected	Availability	Deficit(-)/ Surplus(+)	Energy demand	Energy availability	Deficit(-)/ Surplus(+)	Short term 400 MW	Remaining deficit through short term/swap	Surplus energy
Month	MW	MW	MW	MU	MU	MU	MU	MU	MU
April	4579	4131.89	-446.95	2589.98	2,474.60	-115.38	72	43.38	0
May	4476	4049.17	-426.76	2717.89	2,577.21	-140.67	74.4	66.27	0
June	4079	3763.29	-315.81	2085.49	2,189.10	103.61	72		175.61
July	4032	4014.96	-17.52	2092.57	2,474.07	381.50			381.50
August	3926	3925.19	-1.20	1982.23	2,441.36	459.13			459.13
September	3956	3979.79	24.02	2115.12	2,303.11	188.00			188.00
October	3928	3931.56	3.58	2274.13	2,377.56	103.44			103.44
November	3952	3981.34	29.25	2261.98	2,415.68	153.70			153.70
December	4008	4174.13	166.44	2246.01	2,425.90	179.89			179.89
January	4005	4017.92	13.29	2242.40	2,383.44	141.04			141.04
February	4091	4116.34	25.03	2290.05	2,389.95	99.90			99.90
March	4714	4254.25	-459.75	2731.42	2,845.68	114.26	74.4		188.66
				27629.24	29297.67	1,668.43	292.8	109.65	2070.88
400 MW from 18.00 to 24.00 during April ,May ,June 2021 and d March 2022									

10.7.78 It can be seen from the above table that there is a surplus energy of 2070.88 MU during the year 2021-22. KSEBL decided that the sale of surplus energy will be done only if the rate is more than the marginal cost of high cost generating stations such as Kudgi, NTPL, NLC II expansion etc. In case such opportunistic sale does not materializes in real time, power from these stations with high variable cost will be surrendered which will reduce the power purchase cost. For estimation purpose this surplus energy is shown as sale at a rate of Rs 4/unit through short term market. The corresponding expected revenue is Rs 828.35 Cr.

10.7.79 Surplus Energy Sale: The surplus energy sale approved by the Honorable Commission for the control period is given in table below.

Table 10. 83 Surplus Energy Sales for the control period					
Approved by the Honorable Commission					
Particulars	Unit	2018-19	2019-20	2020-21	2021-22
Surplus energy for external sales	MU	1,513.27	1,885.40	1,231.36	811.21
Rate	Rs./kWh	5	5	5	5
Total Revenue expected	Rs.Crore	756.64	942.7	615.68	405.61

10.7.80 Based on the availability and demand there is a surplus energy as explained above. KSEBL has been taking earnest efforts to sell the excess power whenever opportunity is available. The details of proposed energy sale is given in the table below

Table 10. 84 Surplus Energy Sales for the control period						
Approved by the Honorable Commission						
Particulars	Unit	2018-19	2019-20		2020-21	2021-22
Energy for external sales	MU	1,513.27	1,885.40		1,231.36	811.21
Rate	Rs./kWh	5	5		5	5
Total Revenue expected	Rs.Crore	756.64	942.7		615.68	405.61
Revised Estimate						
Particulars	Unit	FY-19	April-Sept 2019	2019-20	2020-21	2021-22
		Actuals		Estimate		
Energy for external sales	MU	824.78	55.93	56.32	1644.05	2,070.88
Rate	Rs./kWh	4.11	3.12	3.12	4.00	4.00
Total Revenue expected	Rs.Crore	339.34	17.45	17.56	657.62	828.35

Summary of cost of generation and power purchase for the control period

10.7.81 Approved power purchase cost for the control period is extracted below:

Table 10. 85 Summary of Power Purchase cost for the control period								
Approved by Honorable Commission								
	ENERGY at KSEB end (MU)				COST (Rs.Crore)			
	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
CGS	10,255.41	11,241.96	11,274.77	11,274.77	3,684.51	4,135.05	4,196.25	4,244.91
LTA	7,999.31	8,647.06	8,647.06	8,647.07	3,319.64	3,528.02	3,518.11	3,510.51
IPPs	280.7	280.7	280.7	280.7	103.78	103.78	103.78	103.78
Additional RPO purchase -Non Solar	-	503.35	691.04	787.71	-	145.97	200.4	228.44
Additional RPO purchase -Solar	-	485.51	740.5	1,065.21	-	145.65	222.15	319.56
RGCCPP					200			
Transmission charges								
CGS					419.72	435.34	437.12	437.12
LTA					111.96	111.96	111.96	111.96
RGCCPP					8.16	8.16	8.16	8.16
Total	18,535.42	21,158.58	21,634.07	22,055.46	7,847.77	8619.08	8747.85	9265.79

10.7.82 The revised estimate of power purchase cost for control period is given in table below:

Table 10. 86 Summary of Power purchase Cost for the control period

Source	Energy (MU)					Power Purchase cost(Rs Cr)				
	FY -19	April-Sept 2019	FY -20	FY -21	FY -22	FY -19	April-Sept 2019	FY -20	FY -21	FY -22
CGS*	9241.09	4935.40	10517.24	11326.55	11326.55	3418.17	1890.34	4041.51	4526.22	4667.17
LTA	7652.05	4,246.32	8,111.05	8,648.62	8,648.62	3314.19	1668.18	3492.20	3737.65	3769.23
IPPs inside the State	268.48	167.03	281.18	293.23	293.23	101.08	60.06	104.34	108.13	108.13
RE energy contracted for control period				498.65	2180.23				103.52	496.79
Additional RPO purchase -Non Solar				464.92	0.00				134.83	0.00
Additional RPO purchase -Solar				228.24	0.00				68.47	
RGCCPP						204.13	31.18	62.35	62.35	62.35
Short term	872.21	1225.27	1246.13	384.6692	402.45	235.84	369.38	379.81	154.01	170.64
Transmission charges										
CGS							171.73	408.51	425.04	425.04
LTA							44.62	106.27	106.27	106.27
RGCCPP							4.20	8.16	8.16	8.16
Subtotal						513.24	220.55	522.94	539.47	539.47
Other charges						40.033				
Total	18033.83	10574.02	20155.60	21844.88	22851.08	7826.68	4239.68	8603.15	9434.65	9813.79

10.7.83 Thus the revised generation and power purchase cost of SBU D for FY 20, FY-21 and FY-22 is given below

Table 10. 87 Total Generation and Power Purchase-Revised estimate

Financial Year	Net Generation	Cost of Generation	Quantum at KSEB end	Cost of Power Purchase	Total	
	MU	Rs Cr	MU	Rs.Cr.	MU	Rs. Cr.
2018-19	7593.12	510.36	18046.53	7826.68	25639.65	8337.04
April-Sept 2019	3901.58	322.34	10574.02	4386.83	14475.6	4709.17
2019-20	6471.48	480.25	20155.60	8603.15	26627.081	9083.40
2020-21	6688.53	534.47	21844.88	9434.65	28533.413	9969.12
2021-22	6849.04	659.44	22851.08	9813.79	29700.121	10473.23

10.8 Intra State Transmission Charges

10.8.1 The details of Intra State Transmission Charges are explained in Chapter 3 of this petition. A summary of revised estimate of intrastate transmission charges for next control period is given in table below:

Table 10. 88 Intra State Transmission Charges					
No	Item	2018-19	2019-20	2020-21	2021-22
1	Energy injected into the system (MU)	24897.52	26135.55	26673.99	27629.24
2	Percentage of loss (%)	3.74	3.65	3.55	3.45
3	Loss of energy (MU)	1008.35	953.9475	946.9266	953.2087
4	Energy handled (MU) (1-3)	24893.47	25181.6	25727.06	26676.03
5	Transmission charges	858.64	953.84	1190.45	1444.24
6	Transmission Charges (Rs./unit)	0.34	0.38	0.46	0.54

10.9 NLDC/RLDC/SLDC charges

10.9.1 An amount of 3 crores is approved in the MYT order towards NLDC/RLDC/SLDC charges vide MYT order dated 08.07.2019. KSEBLtd is claiming the same for the remaining part of the control period.

10.10 Operation & Maintenance Expenses

10.10.1 As per Regulation 79(1) of the tariff regulation, **operation and maintenance expenses as per the norms** specified in Annexure-IX are allowed to be recovered. Regulation allows recovery of the R&M component of O&M expenses viz the R& M expenses at 3 % of opening GFA excluding land along with pro rata allowance for the asset addition during the year. Honorable Commission may please note that the land and land rights amounts to Rs 19.91 Crores as on 31.03.2019. The gross fixed assets of Distribution SBU as on 31.03.2019 is Rs 9450.31 crores. Thus land and land rights contributes to .21 % of total GFA for SBU-D. Hence KSEBL is taking 0.21 % of Gross fixed assets as assets of land and landrights for the remaining part of control period. The parameters used for the The Operation & Maintenance Expenses Claimed and approved for SBU-D of KSEBL for the control period from 2018-19 to 2021-22 is shown in Table below.

Table 10. 89 O&M Expenses claimed vs approved					
Employee Cost and A&G cost projection-KSEBL claim in MYT petition					
No	Parameters	2018-19	2019-20	2020-21	2021-22
1	No. of consumers (Rs.L/1000)	4.8	5.03	5.27	5.53
2	Dist Transformers (Rs. L/DTr)	0.64	0.67	0.7	0.73
3	Length of HT line (Rs. L/km)	0.79	0.83	0.87	0.91
4	Energy sales (Rs/unit)	0.19	0.2	0.21	0.22
5	No. of consumers	12611100	12957080	13314526	13683932
6	No. of Dist Transformers (Nos)	80064	81537	82897	83950
7	HT Line (Ckt-Km)	66225	69686	72654	74729
8	Energy sales in MU	21647.29	22969.67	23957.26	24991.44
9	Employee, A&G Cost (Rs Cr)	1979.53	2153.38	2342.23	2529.65
Approved by the Honorable commission					
No	Parameters	2018-19	2019-20	2020-21	2021-22
1	No. of consumers (Rs.L/1000)	4.8	5.03	5.27	5.53
2	Dist Transformers (Rs. L/DTr)	0.64	0.67	0.7	0.73
3	Length of HT line (Rs. L/km)	0.79	0.83	0.87	0.91
4	Energy sales (Rs/unit)	0.19	0.2	0.21	0.22
5	No. of consumers	12276321	12611100	12957080	13314526
6	No. of Dist Transformers (Nos)	77724	79674	81097	82502
7	HT Line (Ckt-Km)	62835	65236	67058	68613
8	Energy sales in MU	20880.7	21647.29	22969.67	23957.26
9	Employee, A&G Cost (Rs Cr)	1979.83	2142.56	2316.28	2490
R&M estimation for SBU-D (Rs Cr)- Claimed by KSEBL in MYT petition					
No	Item	2018-19	2019-20	2020-21	2021-22
1	Opening GFA	8390	11010.25	12531.99	13894.96
2	GFA Addition	2620.25	1521.74	1362.97	1270.24
3	R&M expenses	261.83	345.41	389.46	426.84
Approved by Honorable Commission					
No	Item	2018-19	2019-20	2020-21	2021-22
1	Opening GFA	8390	11010.25	12531.99	13894.96
3	R&M expenses	246.25	316.39	342.46	358.95
Total normative O&M expenses claimed by KSEBL					
No	Item	2018-19	2019-20	2020-21	2021-22
1	Employee & A&G Expenses	1979.53	2153.38	2342.23	2529.65
2	R&M Expenses	261.83	345.41	389.46	426.84
3	Total	2241.36	2498.79	2731.69	2956.49
Approved by Honorable Commission					
No	Item	2018-19	2019-20	2020-21	2021-22
1	Employee & A&G Expenses	1979.83	2142.56	2316.28	2490
2	R&M Expenses	246.25	316.39	342.46	358.95
3	Total	2226.08	2458.95	2658.74	2848.95

10.10.2 The actual O&M expenditure upto 30.09.2019, revised parameters and revised claim of O&M expenses from 2019-20 to 2021-22 based on revised parameters is furnished as follows

Actuals up to 30.09.2019:

The actual Employee expenses and A& G expenses upto September 2019 is Rs 1470.24 Cr. The actual R&M expenses upto September 2019 is Rs 128.53 Cr. Thus the actual O&M expenses upto September 2019 is Rs 1598.77 Cr. The revised forecast of Employee expenses & A&G expenses, R&M expenses and the revised

parameters based on the revised estimations as explained earlier is given in table below

Table 10. 90 O&M Expenses					
Employee Cost and A&G cost-Revised claim					
No	Parameters	2018-19	2019-20	2020-21	2021-22
1	No. of consumers (Rs.L/1000)	4.8	5.03	5.27	5.53
2	Dist Transformers (Rs. L/DTr)	0.64	0.67	0.7	0.73
3	Length of HT line (Rs. L/km)	0.79	0.83	0.87	0.91
4	Energy sales (Rs/unit)	0.19	0.2	0.21	0.22
5	No. of consumers	12552206	12845839	13146341	13453873
6	No. of Dist Transformers (Nos)	79876	81543	83912	85902
7	HT Line (Ckt-Km)	64568	66935	69990	72731
8	Energy sales in MU	22361.55	23022.04	23668.85	25117.67
9	Employee, A&G Cost (Rs Cr)		2149.69	2313.57	2497.17
*Energy sales inside the State and Interstate sales					
Revised R & M expenses					
		2019-20	2020-21	2021-22	
1	Opening GFA	9450.31	11660.39	13284.06	
2	Less land	19.91	24.57	27.99	
3	R& M @ 3% on opening GFA	282.91	349.07	397.68	
4	R&M at prorata basis on assets added during the year				
5	April	1.97	1.45	1.78	
6	May	4.01	2.95	3.62	
7	June	2.96	2.17	2.67	
8	July	1.18	0.87	1.07	
9	August	1.71	1.25	1.54	
10	September	1.19	0.88	1.08	
11	October	0.87	0.64	0.79	
12	November	0.75	0.55	0.67	
13	December	0.82	0.61	0.74	
14	January	1.10	0.81	1.00	
15	February	0.98	0.72	0.88	
16	March	0.00	0.00	0.00	
17	Sub Total R&M for assets added during the year	17.55	12.89	15.82	
18	Total R&M	300.46	361.97	413.50	
Total normative O&M expenses –Revised estimate					
No	Item	April-Sept 2019	2019-20	2020-21	2021-22
		Actuals	Revised normative expenses		
1	Employee & A&G Expenses	1470.24	2149.69	2313.57	2497.17
2	R&M Expenses	128.53	300.46	361.97	413.50
3	Total O& M expenses	1598.77	2450.15	2675.54	2910.68

The details are furnished under D-2 of the Distribution tariff forms

10.11 Pay Revision Expenses

10.11.1 SBU-D is not claiming pay revision expenses along with this midterm review petition. However, it is requested that pay revision expenses as and when arising in the control period may be allowed over and above the norms in line with Kerala State Electricity

Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2018. Details are furnished in Chapter 11. An estimate of pay revision expenses for the control period is submitted below.

Table 10. 91 : Estimate of Pay revision expenses (Rs Cr)					
Business Unit	Employee cost ratio	2018-19	2019-20	2020-21	2021-22
SBU D	83.56	147.05	219.84	237.58	256.28

10.11.2 Actual provision made in accounts for 2018-19 has been Rs. 147.05 Cr. However, SBU-D has not revised the projection amount proposed in the MYT of SBU-D from 2019-20 to 2021-22. The Hon Commission may allow the said expense during the truing process.

10.12 Total O&M Expenses

10.12.1 Thus, the total Operation & Maintenance expenses of SBU-D projected for the control period **as per the Regulation** is summarised below:

Table 10. 92 : SBU wise O&M expenses				
Item	April-Sept 2019	2019-20	2020-21	2021-22
Normative O&M cost		2450.15	2675.54	2910.68

10.12.2 The projection of the O&M expenses of SBU-D for the control period based on the past actuals is shown in the table below.

Table 10. 93: Projection based on past actual (Rs Cr)				
Item	April-Sept 2019	2019-20	2020-21	2021-22
O&M Cost of SBU-D	1586.92	2744.48	2952.65	3174.64

10.12.3 It may kindly be noted that, the O&M expenses as per norms for the control period are below the actual expense projection. This will lead to under recovery of genuine O&M costs. However, KSEBL is taking earnest efforts to control the O&M expenses to the extent possible. If any variation is found beyond its control then it is humbly requested that the same may be allowed at actual during true up.

Interest and Finance Charges

10.13 Interest on Capital liabilities:

10.13.1 The Interest & Finance charges actually incurred by SBU-D for the year 2019-20 up to September 2019 have been Rs. 156.04 Cr. The Interest & Finance charges approved for the year 2019-20 by Hon'ble Commission vide MYT order dated 8-7-2019, actual incurred up to September 2019 and revised Interest & Finance charges for the years 2019-20, 2020-21 and 2021-22 for SBU-D are submitted below. The revised Interest & Finance charges are arrived based on the opening loan, GFA addition during the year and normative repayment for the year, which is detailed under Chapter-12 of this petition.

Table 10.94: Normative loan and interest for the remaining years (Rs Cr)			
	SBU-D		
	2019-20	2020-21	2021-22
Opening Normative loan	2119.29	3277.83	4375.42
GFA addition net of capital grants & subsidies-Addl normative loan	1,310.11	1,299.99	1,719.86
Normative repayment	151.57	202.40	263.89
Closing normative loan	3277.83	4375.42	5831.39
Av normative loan	2698.56	3826.63	5103.40
Average actual interest rate in 2018-19	10	10	10
Normative interest for the year	269.86	382.66	510.34

Note: Closing normative loan as per TU 2019 has been considered as opening normative loan for 2019-20. Actual rate of interest for 2018-19 has been considered for the remaining years of control period.

Interest on Security Deposit

10.13.2 The interest on security deposit claimed in the MYT petition and approved by the Honorable Commission and revised projection for the remaining years are detailed in Chapter 11. A summary of the revised claim is furnished below:

Table 10. 95: Interest on Security Deposit (Rs Cr)- Revised claim					
No	Particulars	FY 19	FY-20	FY-21	FY-22
1	Opening: SD as on 1 st April	2836.96	3019.12	3319.12	3619.12
2	Addition during the FY	182.16	300.00	300.00	300.00
3	Closing SD as on 31 st March	3019.12	3319.12	3619.12	3919.12
4	Average SD during the FY	2928.04	3169.12	3469.12	3769.12
5	Average interest rate (%)	6.25	6.25	6.25	6.25
6	Interest Charges	177.31	188.70	207.45	226.20
7	Claim based on actual disbursement		177.31	188.70	207.45

Interest on GPF

10.13.3 Details with regard to interest on GPF claimed in MYT petition, approval granted by the Hon'ble Commission and revised estimate for the remaining years of the control

period are detailed in Chapter 11. A summary of the same is furnished in the Table Below:

Table 10. 96 Interest on provident fund of SBU-D (Rs Cr)							
No	Item	Claimed in ARR for 2019-20	Approved for FY 2019-20	Actual upto 30-9-19	Revised estimate for 19-20	Revised estimate for 20-21	Revised estimate for 21-22
1	Interest on Provident fund	160.19	152.55	72.79	152.70	162.73	172.76

Interest on Master Trust bonds

10.13.4 SBU wise interest on Master Trust Bond and interest is calculated in Chapter 11. The interest for SBUD is reproduced in the Table below. This includes the interest contribution of existing bonds as well as additional contribution approved by the Hon'ble Commission.

Table 10. 97 interest on Master Trust bonds (Rs Cr)							
No	Item	Estimated in ARR	Approved vide order dtd.8-7-19	Actual upto 30-9-19	Revised estimate for 19-20	Revised estimate for 20-21	Revised estimate for 21-22
1	Existing bond	646.45	646.45	313.78	612.43	578.40	544.38
2	Additional contribution to Master Trust	311.58	167.10		167.10	167.10	167.10
	Total	958.03	813.55	313.78	779.53	745.50	711.48

Interest on Working Capital

10.13.5 The Normative Working Capital for SBU-D, as per Regulation 32, includes O&M Cost for one month, cost of maintenance spares as one twelfth of average of the book value of stores for that FY, receivables for two months excluding security deposits.

10.13.6 The Interest on Working Capital in this petition is computed at a rate of 10.95% (8.95% as on 1-4-2019 + 2%) as per Regulation 32(2). The parameters adopted for computation of Interest on Working capital for the control period are furnished below.

Table 10. 98: Parameters for Working Capital (Rs Cr)				
Proposed by KSEBL in MYT Petition & Approved by the Commission				
Item	2018-19	2019-20	2020-21	2021-22
Opening GFA	8390	11010.25	12531.99	13894.96
Inventory	485.9	614.98	710.81	801.76
O&M Cost	2241.36	2487.63	2725.56	2958.09
Expected Revenue	12433.68	13143.48	13758.18	14402.37
Revised parameters				
Opening GFA	8390	11010.25	12531.99	13894.96
Inventory	485.9	614.98	710.81	801.76
O&M Cost	2241.36	2487.63	2725.56	2958.09
Expected Revenue	12433.68	13143.48	13758.18	14402.37

10.13.7 The Interest on Working Capital projected and approved for the control period 2018-19 to 2021-22 for SBU-D is submitted below:

Table 10. 99: Interest on Working capital (Rs.Cr.)- Proposed by KSEBL in MYT Petition					
No	Item	2018-19	2019-20	2020-21	2021-22
1	O&M expenses	186.78	207.30	227.13	246.51
2	Cost of Mace spares	4.86	6.15	7.11	8.02
3	Receivables for two months	2072.28	2190.58	2293.03	2400.395
4	Total Working Capital	2263.92	2404.03	2527.27	2654.92
4	Less: Security Deposits	2836.96	3086.96	3386.96	3686.96
5	Net Working Capital	-573.04	-682.93	-859.69	-1032.04
Approved by the Commission					
No	Item	2018-19	2019-20	2020-21	2021-22
1	O&M expenses	185.51	204.91	221.56	237.41
2	Cost of Mace spares	4.86	6.15	7.11	8.02
3	Receivables for two months	2074.97	2209.11	2312.36	2420.56
4	Total Working Capital	2265.34	2420.17	2541.03	2665.99
4	Less: Security Deposits	2836.96	3086.96	3386.96	3686.96
5	Net Working Capital	-571.62	-666.79	-845.93	-1020.97

10.13.8 Since the working Capital requirement is less than the security deposit held at the beginning of the year, no interest is claimed for working capital for the remaining years of the control period as well.

Carrying cost on approved as well as projected revenue gap .

10.13.9 Carrying cost on revenue gap sought in MYT petition, approval and revised estimate based on the approved gap till 2016-17 and revenue gap sought for true up till 2018-19 are detailed in Chapter 11. Hon'ble Commission may kindly note that in addition to the approved revenue gap till FY 17 of Rs.6739.13 Cr, the additional revenue deficit sought for True up for 2016-17 and true up sought for 2017-18 and 2018-19 amounted to Rs.63.76 Cr, Rs.1331.81 Cr and Rs.759.88 Cr respectively. In addition, KSEBL has claimed carrying cost for the revenue gap estimated for the remaining years also. Hon'ble Commission may kindly approve towards carrying cost for the remaining years under SBU D detailed in Chapter 11 as extracted below:

Table 10. 100 Carrying cost (Rs Cr)					
No	Item	2018-19 TU	2019-20	2020-21	2021-22
1	As per MYT petition	281.17	200.32	104.68	9.03
2	Approved as per order	304.08	223.59	121.78	27.08
3	Revised estimate	629.11	688.90	737.61	814.47

10.13.10 Summary of interest and finance charges estimated for SBU-D, approved by the Hon'ble Commission and the revised estimate for the remaining years of the control period is furnished below:

Table 10. 101: Summary of Interest & Finance Charges (Rs Cr) for SBU-D- Proposed by KSEBL in MYT petition					
No	Item	FY-19	FY-20	FY-21	FY-22
1	Interest on capital liabilities	304.86	486.34	594.91	688.82
2	Interest on security Deposit	199.93	218.49	238.74	258.99
3	Interest on GPF	160.19	170.72	181.24	191.77
4	Interest on MT Bonds	646.45	612.43	578.40	544.38
5	Carrying cost	281.17	200.32	104.68	9.03

6	Additional interest to Master Trust	311.58	311.58	311.58	311.58
7	Total Interest & Finance Charges	1934.59	2799.73	3148.71	3433.69
Approved by the Commission					
1	Interest on capital liabilities	149.90	222.94	281.40	329.80
2	Interest on GPF	152.55	162.58	172.60	182.63
3	Interest on Master Trust	646.45	612.43	578.40	544.38
4	Carrying cost	304.08	223.59	121.78	27.08
5	Interest on security Deposit	175.33	199.93	218.49	238.74
6	Additional interest to Master Trust	167.10	167.10	167.10	167.10
7	Total Interest & Finance Charges	1595.41	1421.47	1372.67	1322.63
Revised estimate					
1	Interest on capital liabilities	180.27	269.86	382.66	510.34
2	Interest on security Deposit	170.75	177.31	188.70	207.45
3	Interest on GPF	136.68	152.70	162.73	172.76
4	Interest on MT Bonds	652.08	612.43	578.40	544.38
6	Carrying cost	629.11	688.90	737.61	814.47
7	Other interest	18.41			
8	Additional interest to Master Trust	167.10	167.10	167.10	167.10
9	Total Interest & Finance Charges	1954.40	2068.30	2217.20	2416.50

Note: RE for 2018-19 represent amount sought for truing up as per TU 19.

10.14 Depreciation

10.14.1 The depreciation in line with Tariff Regulation, 2018 for the control period as per MYT petition and approved by the Hon'ble Commission is detailed below:

Table 10. 102 Depreciation for control period (Rs Cr)		
Year	As per MYT petition	As per MYT order
2018-19	109.72	72.24
2019-20	143.99	93.47
2020-21	163.89	121.53
2021-22	181.71	154.91

10.14.2 The methodology for calculation of depreciation is detailed under Chapter-12. The Depreciation approved for the year 2019-20 by Hon'ble Commission vide MYT order dated 8-7-2019, actual incurred up to September 2019 and revised Depreciation for the years 2019-20, 2020-21 and 2021-22 are submitted below.

Table 10. 103 Depreciation for SBU-D (Rs.Cr.)						
Item	Estimated in ARR for 2019-20	Approved vide order dtd. 8-7-2019	Actual upto Sept-2019	Revised estimate for FY-20	Revised estimate for FY-21	Revised estimate for FY-22
Depreciation	143.99	93.47	223.11	151.57	202.40	263.89

10.15 Return on Equity

10.15.1 The ROE for SBU-D claimed, approved revised estimate for the future years of the control period is submitted below.

Table 10. 104 ROE OF SBU-D Return on Equity (Rs.Cr.)							
		Claimed in ARR for the all years	Approved vide order dtd.8-7- 2019	Actual upto 30-9-2019	Revised estimate for 2019-20	Revised estimate for 2020- 21	Revised estimate for 2021- 22
No	Item						
1	Return on Equity	253.50	253.50		253.50	253.50	253.50

10.16 Bad debts to be written off

10.16.1 A provision of Rs 15 Cr is estimated for the control period. Honorable Commission disallowed the same by stating that the same will be examined at the time of truing up. Hence KSEBL is not claiming the same in this petition. Honble Commission may kindly allow the same at the time of truing up.

10.17 Aggregate Revenue Requirement

10.17.1 The SBU-D handles the distribution assets of KSEB Ltd and manages retail supply of power within the State for supply to 99% of total consumers in the State. The Aggregate Revenue Requirement of SBU-D for the control period claimed by KSEBL and approved by Honorable Commission is given in table below:

Table 10. 105ARR of SBUD (Rs Cr.)					
Claimed in MYT Petition					
No	Particulars	2018-19	2019-20	2020-21	2021-22
1	Cost of Generation	522.94	560.87	657.72	792.44
2	Cost of Power Purchase	7942.01	8672.27	8884.51	9184.58
3	Cost of Intra State Transmission	951.47	1106.58	1394.65	1637.52
4	NLDC /RLDC charges	3	3	3	3
5	O&M Expenses	2241.36	2499	2731.69	2956.49
6	I&F charges on long-term loans	304.86	486.34	594.91	688.82
7	Interest on Master Trust Bonds	646.45	612.43	578.4	544.38
8	Interest on additional bonds	311.58	311.58	311.58	311.58
9	Interest on Provident Fund	160.19	170.72	181.24	191.77
10	Interest on Security Deposit	199.93	218.49	238.74	258.99
11	Interest on WC and deposits	0	0	0	0
12	Carrying Cost on Gap	281.17	200.32	104.68	9.03
13	Depreciation	109.72	143.99	163.89	181.71
14	One Time expenses	29.24			
15	Bad debts written off	15	15	15	15
16	Recovery of previous gap	806.47	806.47	806.47	806.47
17	Total Revenue Expenditure	14525.39	15807.05	16666.49	17581.79
18	Return on Equity	253.5	253.5	253.5	253.5
19	Aggregate Revenue Requirement	14778.89	16060.35	16919.99	17835.29

Approved by Honorable Commission					
1	Cost of Generation	481.41	505.93	586.34	639.86
2	Cost of Power Purchase	7,847.77	8,613.94	8,797.94	8,964.44
3	Cost of Intra State Transmission	874.6	983.69	1,162.47	1,283.53
4	NLDC /RLDC charges	3	3	3	3
5	O&M Expenses	2,226.08	2,458.95	2,658.75	2,848.95
6	Interest on long-term loans	149.9	222.94	281.4	329.8
7	Interest on Master Trust Bonds	646.45	612.43	578.4	544.38
8	GPF Interest	152.55	162.58	172.6	182.63
9	Interest on WC	-	-	-	-
10	Charges for proposed addn to Master Trust	167.1	167.1	167.1	167.1
11	Interest on Security Deposit	175.33	199.93	218.49	238.74
12	Carrying Cost on Gap	304.08	223.59	121.78	27.08
13	Depreciation	72.24	93.47	121.53	154.91
14	One Time Expenses CMDRF	-	-	-	-
15	Bad debts written off	-	-	-	-
16	Recovery of previous gap	400	1,000.00	850	850
17	Total Revenue Expenditure	13,500.52	15,247.53	15,719.81	16,234.41
18	Return on Equity	253.5	253.5	253.5	253.5
19	Aggregate Revenue Requirement	13,754.02	15,501.03	15,973.31	16,487.91

10.17.2 The revised ARR based on revised expenses for the remaining years of second control period is given in table below:

Table 10. 106 Aggregate Revenue Requirement of SBU-D (Rs Cr.)-Revised Claim						
No	Particulars	2018-19	April to Sept-19	FY-20	FY-21	FY-22
1	Cost of Generation	506.79	322.37	482.31	533.36	676.09
2	Cost of Power Purchase	7826.68	4386.83	8603.15	9434.65	9813.79
3	Cost of Intra State Transmission	858.64	536.03	953.84	1190.45	1444.24
4	O&M Expenses	2379.04	1586.92	2450.15	2675.54	2910.68
5	Interest on capital liabilities	180.27	76.00	269.86	382.66	510.34
6	Interest on Master Trust Bonds	652.08	313.78	612.43	578.4	544.38
7	Interest on Provident Fund	136.68	72.89	152.70	162.73	172.76
8	Interest on Security Deposit	170.75	172.79	177.31	188.7	207.45
9	Interest on Working Capital		82.81	0	0	0
10	Carrying Cost on revenue gap	629.11		688.90	737.61	814.47
11	Other interest	18.41	0.04			
12	Depreciation	107.98	223.11	151.57	202.40	263.89
13	One Time expenses	29.25	11.84			
14	Other exp	291.38	10.21			
15	T&D achievement claim	28.59				
16	Additional Interest on Master trust	167.1		167.10	167.10	167.10
17	Total Revenue Expenditure	13982.75	7795.62	14709.32	16253.60	17525.18
18	Return on Equity	253.5	89.43	253.50	253.50	253.50
19	Aggregate Revenue Requirement	14236.25	7885.04	14962.82	16507.10	17778.68

10.18 Other Income

10.18.1 The other income of SBU-D includes income from sale of scrap, interest on advances made to contractors, interest on staff loans and advances, Rent from buildings etc.

KSEBLtd is claiming the the other income claimed in MYT petition for future years of control period. The other income of SBU-D for the remaining period of control period is summarized below:

Table 10. 107 : Other Income				
No	Other Income (Rs. Cr.)	FY-20	FY-21	FY-22
1	Interest on staff loans etc	0.10	0.09	0.07
2	Income from statutory investments			
3	Income from rent of land etc	4.06	4.59	5.12
4	Income from sale of scrap	22.00	24.75	27.51
5	Income from staff welfare activities			
6	Rental from staff quarters	0.25	0.28	0.31
7	Excess found on physical verification	0.02	0.02	0.03
8	Interest on investments, fixed and call deposits and bank balances	2.78	2.78	2.78
9	Interest on advances to suppliers/contractors	14.52	15.38	16.23
10	Income from hire charges from contractors and others	0.00	0.00	0.00
11	Income due to right of way granted for paying fibre optic cables/co-axial cables	43.05	48.65	54.24
12	Miscellaneous receipts	118.66	126.33	134.03
13	Commission for collection of electricity duty	9.54	10.78	12.02
14	Interest on delayed or deferred payment on bills	20.01	20.35	20.69
15	Rebate from NTPC & PFC	137.00	139.00	141.00
	Total Other Income (Rs.Cr.)	371.99	393.00	414.03

10.19 Non Tariff Income

10.19.1 The non tariff income of regulated business includes income other than those obtained from tariff such as income from wheeling, receipts on account of cross-subsidy surcharge and additional surcharge on charges of wheeling ,reactive energy charges ,meter rent, rental from electric plants or lines, testing fee, late payment surcharge, prompt payment incentives, recovery from theft and pilferage of energy or such other charges.KSEBL is claiming the same nontariff income as claimed in MYT petition for future years of second controlperiod

Table 10. 108 : Non-Tariff Income(Rs Cr)				
No	Other Income	2019-20	2020-21	2021-22
1	Income from wheeling	0.10	0.10	0.10
2	Reactive energy charges	50.00	50.00	50.00
3	Receipts : cross-subsidy surcharge			
4	Receipts on additional surcharge			
5	Meter Rent	96.37	97.97	99.57
6	Rental from Electrical plants etc			
7	Testing Fee			
8	Late payment from surcharge			
9	Prompt payment incentives			
10	Recovery on Theft and Pilferage	6.36	6.47	6.58
11	Power factor Penalty	23.28	23.69	24.08
	Total Non Tariff Income (Rs.Cr.)	176.11	178.23	180.33

10.20 Net ARR of SBU-D

10.20.1 The net ARR of SBU-D as per MYT petition and approval for the control period is submitted below:

Table 10. 109 Aggregate Revenue Requirement of SBU-D (Rs Cr.)					
Claimed in MYT petition					
No	Particulars	2018-19	2019-20	2020-21	2021-22
1	Aggregate Revenue Requirement	13960.51	15160.62	15916.69	16695.22
2	Less Other Income	357.8	371.99	393	414.03
3	Less Non Tariff Income	173.75	176.11	178.23	180.33
4	Net ARR	13428.96	14612.52	15345.46	16100.86
Approved by the Honorable Commission					
1	Aggregate Revenue Requirement	13754.02	15501.03	15973.31	16487.91
2	Less Other Income/Non Tariff Income	531.55	548.10	571.23	594.36
3	Net ARR	13222.47	14952.93	15402.08	15893.55

10.20.2 The revised claim of net ARR based on revised expenses is given in table below

Table 10. 110 Net ARR of SBU-D (Rs Cr.)-Revised projection					
No	Particulars	Apr-Sept-19	FY-20	FY-21	FY-22
1	Aggregate Revenue Requirement (Table 10.106)	7885.04	14962.82	16507.10	17778.68
2	Less Other Income (Table 10.107)	174.06	371.99	393	414.03
3	Less Non Tariff Income (Table 10.108)	100.98	176.11	178.23	180.33
4	Net ARR (1-2-3)	7610.00	14414.72	15935.87	17184.32

10.21 Wheeling charges

10.21.1 SBU-D handles the entire distribution network of Kerala. The revised projection of the energy input to the Distribution network, energy handled, losses and the wheeling charges estimated for the control period are submitted below:

Table 10. 111 : Wheeling charges for control period				
No	Particulars	FY-20	FY-21	FY-22
1	Energy injected into the system (MU)	26135.55	26673.99	27629.24
2	Percentage of transmission loss (%)	3.65	3.55	3.45
3	Loss of energy (MU)	953.95	946.93	953.21
4	Energy handled by Distribution(MU) (1-3)	25181.60	25727.06	26676.03
5	Sale of energy at 66 KV and above(MU)	2091.84	2156.49	2225.90
6	Less auxiliary consumption of substation(MU)	16.92	17.76	18.65
7	Energy transmitted to HT system(MU)	23072.85	23552.82	24431.48
8	HT loss(MU)	1211.32	1212.97	1233.79
9	Energy handled at HT level (MU) (1-3)	21861.52	22339.85	23197.69
10	Distribution ARR excl Gen PP trn (Rs Cr)	4375.42	4777.41	5250.20
11	Distribution ARR(at HT level)(25 %)(Rs Cr.)	1093.86	1194.35	1312.55
12	Wheeling Charges(Rs/unit)	0.50	0.53	0.57

10.22. Average pooled Power Purchase cost for FY-21 and FY 22

10.22.1 Based on the approved quantum and cost in ARR of 2018-19 vide MYT order 08.07.2019 , KSEBL is considering the average pooled purchase cost for FY-20 as Rs 2.85 per unit for settling the net banked energy. The average pooled cost of power purchase for FY-21 and FY-22 based on revised estimate is given below

10.22.2 Honorable CERC vide Regulation 5(1) (c) of Central Electricity Regulatory Commission (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 defines Average Power Purchase Cost (APPC) as follows:

“for the purpose of these regulations „Pooled Cost of Purchase” means the weighted average pooled price at which the distribution licensee has purchased the electricity including cost of self generation, if any, in the previous year from all the energy suppliers long-term and short-term, but excluding those based on renewable energy sources, as the case may be.”

10.22.3 As per said regulation, the average pooled purchase cost of KSEBL for the year 2020-21 and 2021-22 are tabulated in the tables given below

Table 10.112(a) Parameters for determination of average pooled cost of power purchase						
Particulars	2019-20		2020-21		2021-22	
	Quantity (MU)	Cost (Rs.Cr.)	Quantity (MU)	Cost (Rs.Cr.)	Quantity (MU)	Cost (Rs.Cr.)
Own generation less RE	6079.86	452.16	6122.07	477.01	6179.86	590.80
CGS (KSEB Ltd.periphery)	10517.24	4041.51	11326.55	4526.22	11326.55	4667.17
Traders (Long Term & Medium Term)	8111.05	3492.2	8648.62	3737.65	8648.62	3769.23
short term	1287.65	379.81	384.67	154.01	314.61	170.64
RGCCPP	0	62.35	0	62.35	0	62.35
Less surplus sale excl from renewable energy*	54.76	17.07	1522.168	608.87	1847.35	738.94
Total	25941.04	8410.96	24959.74	8348.37	24622.29	8521.25
*apportioned based on energy from conventional and renewable sources						

Table 10.112(b) Average Pooled Cost of Power Purchase (Rs /unit)		
Particulars	2020-21	2021-22
Total Generation and Power Purchase except from Renewable Sources of previous year(MU)	25941.04	24,959.74
Total Cost of Generation and Power Purchase excluding cost from Renewable Sources& Inter/Intrastate transmission charges of previous year	8410.964	8348.37
Average Pooled Cost of Power Purchase (Rs /unit)	3.24	3.34

10.22.3 The total cost of power purchase considered for computation of APPC excludes cost of generation and procurement from renewable energy sources and transmission charges. Exclusion of cost of generation and procurement from renewable sources is in alignment with the objective of determining APPC, which is to ascertain the average cost of power from conventional sources of electricity. The cost of generation from conventional sources is arrived by apportioning generation ARR on the basis of MW. Interstate as well as intrastate transmission charges have been excluded from these calculations.

10.22.4 As seen in the table above KSEBL estimates the average pooled purchase cost of KSEBL for the year 2020-21 and 2021-22 as Rs 3.24 per unit and Rs 3.34 per unit respectively. Honorable Commission may kindly approve the same.

10.23 EXPECTED REVENUE FROM CHARGES

10.23.1 The revenue from sale of power is estimated on the basis of following.

- Actual revenue for the year 2018-19.
- Actual revenue is taken for the first half of FY 2019-20 and revenue for the second half of FY 2020 is estimated based on the prevailing Schedule of Tariff and terms and conditions for retail supply of electricity dated 08.07.2019.
- The revenue for FY 2021 and 2022 is estimated based on the slabwise consumption of FY 19 and the prevailing Schedule of Tariff and terms and conditions for retail supply of electricity dated 08.07.2019.

10.23.2 Honorable Commission vide order dated 08.07.2019 approved the revenue from tariff for the control period as given in table below.

Table 10.113 Revenue for the control period				
As per Petition				
Item	2018-19	2019-20	2010-21	2021-22
	Rs.Crore	Rs.Crore	Rs.Crore	Rs.Crore
Net Revenue from Sale of power	12,352.03	13,150.46	13,765.29	14,409.63
Fuel Surcharge	81.65			
Revenue from external sales	712.96	962.74	518.19	312.38
Total revenue	13,146.64	14,113.20	14,283.48	14,722.01
Approved by Honorable Commission				
Item	2018-19	2019-20	2010-21	2021-22
	Rs.Crore	Rs.Crore	Rs.Crore	Rs.Crore
Net Revenue from Sale of power	12,352.03	13,209.68	13,841.64	14,489.41
Fuel Surcharge	81.65			
Revenue from external sales	756.64	942.7	615.68	405.61
Total revenue	13,190.32	14,152.38	14,457.33	14,895.02

Revenue from tariff for the year 2018-19

10.23.3 The summary of the KSEBL's revenue from sale as per provisional accounts for the year 2018-19 is given in the table below:

Table 10. 114 : Revenue from sale of power for the year 2018-19						
Category	Consumer Strength (31-3-19)		Energy sale (18-19)		Revenue (18-19)	
	(nos)	%	(MU)	%	(Rs. Cr)	% Total
Domestic	9705347	77.32	10864.34	50.45	4621.04	36.35
Commercial	2196919	17.50	3221	14.96	3062.80	24.09
Industrial	138834.00	1.11	1111.67	5.16	792.76	6.24
Agriculture	470517	3.75	338	1.57	86.78	0.68
Public Lighting	34653	0.28	378	1.75	172.77	1.36
HT & EHT	5913	0.05	4724	21.93	3422.07	26.92
Railway Traction	12	0.00	303	1.41	186.38	1.47
Bulk Supply	11	0.00	597.04	2.92	369.13	2.90
Total	12552206	100	21536.77	100	12713.72	100
Misc					0.20	
Sale outside State			824.78		339.34	
Total	12552206		22361.55		13053.26	

10.23.4 The revenue from tariff for the year 2018-19 amounts to Rs. 12713.72 Cr (Rs.12599.96 Cr after adjusting PFI Rs.114.06 Cr) corresponding to the sale of 21536.77 MU. 824.78 MU was sold outside the State. The total revenue from sale of power including interstate sales amounts to Rs13053.26Cr (Rs.12939.20 Cr net of PFI).

Estimation of revenue from sale of power for the control period

10.23.5 The revised estimate of the revenue based on revised energy sales and revised Tariff and considering the slabwise consumption and consumerwise details. The slab wise data is used for arriving at the slab wise consumption details of consumers and by applying corresponding energy charges and fixed charges revenue is estimated.

10.23.6 The revised revenue estimate of the next control period is given in table below:

Table 10. 115 Revised Estimate of revenue projection for next control period									
No	Category	April-Sept 19(Provisional)		2019-20(Estimate)		2020-21(Estimate)		2021-22(Estimate)	
		MU	Rs Cr	MU	Rs Cr	MU	Rs Cr	MU	Rs Cr
1	LT I Domestic	5988.15	2674.47	11584.02	5272.77	11680.62	5437.09	12087.61	5635.06
2	LT II Colony	2.00	1.32	4.11	2.79	4.23	2.94	4.27	2.96
3	LT IV A Industrial	551.99	394.72	1120.40	811.12	1123.28	826.99	1134.51	835.67
4	LT IV B Industrial	5.28	3.84	10.71	7.86	10.74	7.99	10.84	8.04
5	LT V A Agriculture	125.47	32.32	299.31	77.96	300.51	80.79	311.78	83.69
6	LT V B Agriculture	28.73	8.07	65.15	18.67	62.94	18.46	65.30	19.14
7	LT VI A General	108.37	78.22	216.32	157.83	222.66	164.80	235.13	173.94
8	LT VI B General	62.82	48.94	126.06	99.60	129.39	104.12	136.64	109.90
9	LT VI C General	125.04	129.06	248.91	260.98	259.87	280.40	274.44	296.09
10	LT VI D General	11.40	3.28	22.69	6.93	23.31	6.24	24.61	6.58
11	LT VI E General	1.52	0.87	3.03	1.82	3.12	1.76	3.30	1.84
12	LT VI F General	477.46	454.04	945.50	912.15	979.66	958.52	1034.55	1013.05
13	LT VI G General	39.28	38.29	77.96	75.55	81.05	78.44	85.59	82.85
14	LT VII A Commercial	816.99	794.01	1620.82	1607.85	1678.50	1707.80	1772.55	1802.37
15	LT VII B Commercial	91.23	63.55	181.42	127.91	188.33	134.58	198.88	141.82
16	LT VII C Commercial	12.11	9.68	23.79	19.37	24.39	20.14	25.76	21.26
17	LT VIII A Pub Lighting	135.88	64.76	281.84	135.99	289.53	141.29	295.86	144.38
18	LT VIII B Pub Lighting	49.08	20.94	102.00	44.54	104.97	46.81	107.27	47.80
19	LT IX Ad & Hoardings	1.01	2.03	2.06	4.27	2.15	4.55	2.21	4.67
20	LT X Electrical vehicles	0.01	0.01	0.62	0.32	0.66	0.34	0.70	0.36
	LT Subtotal	8633.82	4822.40	16936.75	9646.30	17169.90	10024.05	17811.80	10431.47
1	HT I A Industrial	1068.35	731.36	2177.86	1514.52	2336.33	1649.19	2433.30	1722.13
2	HT I B Industrial	7.06	5.20	14.29	10.75	15.24	11.74	15.87	12.26
3	HT II A General	101.52	71.75	201.46	144.64	210.53	153.61	222.33	162.20
4	HT II B General	315.78	266.82	634.33	538.70	671.05	576.10	708.67	606.09
5	HT III A Agriculture	3.51	2.01	7.31	4.27	7.76	4.72	8.28	4.93
6	HT III B Agriculture	1.09	0.49	2.27	1.05	2.41	1.19	2.58	1.31
7	HT IV A Commercial	279.52	258.65	452.29	426.54	340.87	332.27	359.98	349.82
8	HT IV B Commercial	99.13	94.01	297.21	314.73	435.78	414.56	460.21	439.25
9	HT V Domestic	8.67	6.94	17.50	14.18	17.98	14.82	18.88	15.52
10	HT VI	0.00	0.00	0.00	0.00	45.00	27.00	90.00	54.00
	HT Sub Total	1884.62	1437.24	3804.53	2969.36	4082.96	3185.19	4320.11	3367.49
1	EHT 66 KV Industrial	104.74	64.02	264.92	161.67	352.38	214.57	361.19	222.49
2	EHT 110KV Industrial	246.56	145.23	613.10	361.82	751.99	436.50	770.79	446.17
3	EHT 220 KV Industrial	52.47	30.59	110.71	64.98	122.73	70.23	126.41	72.22
4	EHT General A	7.29	4.27	15.93	9.39	15.61	9.34	16.08	9.63
5	EHT General B	25.68	22.52	56.10	48.12	54.99	47.32	56.64	48.83
6	EHT Railway Traction	146.96	90.95	304.21	189.24	334.20	208.04	350.91	217.69
7	KMRL	8.07	4.69	15.81	9.00	15.82	9.34	16.29	9.60
	EHT Sub Total	591.78	362.26	1380.78	844.23	1647.71	995.34	1698.30	1026.65

1	KPUPL	47.79	31.02	95.01	62.44	96.65	64.14	101.22	66.81
2	CSEZ	29.10	18.09	58.63	36.86	59.03	37.54	59.46	37.78
3	RPL	13.43	7.26	31.84	17.35	35.17	19.41	37.43	20.48
4	Technopark	46.62	28.98	93.90	55.22	99.31	55.10	104.74	58.08
5	Cochin Port trust	18.92	12.94	36.77	25.50	36.99	25.89	37.80	26.38
6	Thrissur Corporation	81.96	55.06	163.06	110.99	165.28	113.72	169.82	116.47
7	KDHPCL	29.40	13.26	61.25	30.52	64.04	34.68	67.88	36.52
8	MES	35.90	24.20	71.74	49.48	72.07	50.79	73.18	51.44
9	Karnataka	0.37	0.26	0.79	0.58	0.80	0.60	0.82	0.61
10	Infopark	5.14	3.21	10.51	6.82	11.04	7.39	11.59	7.70
11	Smart City	2.16	1.47	4.29	2.91	4.50	3.03	4.73	3.16
	Subtotal	310.79	195.75	627.80	398.68	644.88	412.28	668.66	425.43
	Grand Total	11421.01	6817.65	22749.86	13858.57	23545.45	14616.86	24498.87	15251.04
	Open Access	216.26		216.26					
	Total	11637.26		22966.11					

Impact of revision in power factor incentive.

10.23.8 Honorable Commission vide order dated 08.07.2019 refixed the power factor incentive and approved the power factor incentive and approved the net revenue for the control period as in the following table:

Table 10. 116 : Revenue from sale of power after deducting power factor incentive (Rs Cr)			
Item	FY-20	FY-21	FY-22
Revenue	13254.67	13874.17	14523.36
Power factor incentive	44.99	32.5	33.95
Net Revenue from Tariff	13209.68	13841.67	14489.41

10.23.9 The actual power factor incentive disbursed during the year 2018-19 was Rs 114.07Cr. As per the incentive disbursed for September 2019, the average incentive works out to 6 paise per unit. Based on the same the power factor incentive and net revenue for the FY-20, FY-21 and FY-22 are computed and is furnished in the table below

Table 10. 117 Revised Net Revenue for the control period (Rs Cr.)			
Item	2019-20	2010-21	2021-22
Revenue	13858.57	14616.86	15251.04
Power factor incentive	46.96	32.47	34.10
Net Revenue from Tariff	13811.61	14584.39	15216.94

Revenue from external sales

10.23.10 KSEBL has been taking earnest efforts to sell the excess power whenever opportunity available at better rates. Honorable Commission vide MYT order dated 08.07.2019 approved the revenue from external sales for the second control period as per table given below.

Table 10. 118 Revenue from External sales of surplus energy					
Claimed in MYT petition					
	Unit	2018-19	2019-20	2020-21	2021-22
Energy for external sales	MU	1,598.63	1,925.48	1,036.37	624.75
Rate	Rs./kWh	4.46	5	5	5
Total Revenue expected	Rs.Crore	712.97	962.74	518.19	312.38

Approved by Honorable Commission					
	Unit	2018-19	2019-20	2020-21	2021-22
Energy for external sales	MU	1,513.27	1,885.40	1,231.36	811.21
Rate	Rs./kWh	5	5	5	5
Total Revenue expected	Rs.Crore	756.64	942.7	615.68	405.61

10.23.11 Based on the revised energy availability and energy requirement the revised quantum of surplus energy and the revenue from external sales @ Rs 4 per unit is given in table below

Table 10. 119 Revenue from external sales of surplus energy-Revised claim					
	Unit	April-Sept 2019	FY-20	FY-21	FY-22
Energy for external sales	MU	55.93	56.32	1644.05	2,070.88
Rate	Rs./kWh	3.12	3.12	4.00	4.00
Total Revenue expected	Rs.Crore	17.45	17.56	657.62	828.35

10.23.12 Total estimate of revenue from sale of power during the Control period

The total net revenue estimated for the next control period is given in the table below

Table 10.120 Total Revenue for the control period (Rs Cr)				
Revised claim				
Item	April-Sept 2019	FY-20	FY-21	FY-22
Net Revenue from Sale of power	7025.98	13,811.61	14,584.39	15,216.94
Revenue from external sales	17.45	17.56	657.62	828.35
Total revenue	7043.43	13829.17	15242.01	16045.29

10.24 REVENUE GAP

10.24.1 The revenue gap proposed and approved for the control period is given below:

Table 10. 121 Revenue Gap (Rs.Cr)				
Claimed in the petition				
Particulars	2018-19	2019-20	2020-21	2021-22
Net ARR	14247.34	15512.26	16348.76	17240.92
Net Revenue	13146.64	14113.20	14283.48	14722.01
Revenue Surplus (Gap)	-1100.71	-1399.05	-2065.28	-2518.91
Approved by Honorable Commission				
Net ARR	13,222.47	14,952.93	15,402.08	15,893.55
Net Revenue	13,190.32	14,152.38	14,457.33	14,895.02
Revenue Gap	-32.15	-800.55	-944.75	-998.53

10.24.2 The revised revenue gap for remaining part of the control period is given below:

Table 10. 122 Revenue Gap (Rs.Cr)				
Revised Claim				
Particulars	April-Sept 2019	FY-20	FY-21	FY-22
Net ARR (Table 10. 110)	7610.00	14414.72	15935.87	17184.32
Revenue from SoP (Table 10. 120)	7043.43	13829.17	15242.01	16045.29
Revenue Surplus(+)/ Gap(-)	-566.57	-585.55	-693.86	-1139.03

ANNEXURE I								
DYUTHI PROGRESS AS ON 31-03.2019 for 2018-19 WORK (Under 21 work heads)								
Sl.No.	Master Group		Work Scheduled		Work In Progress		Work Completed	
			Qty	Amt(in Cr.)	Qty	Amt(in Cr.)	Qty	Amt(in Cr.)
1	Construction - HT line	Km	1064	98.79	642	47.26	119	10.07
2	Construction - LT Line	Km	539	32.37	112	5.57	45	1.81
3	Construction – DTR	No	416	14.98	370	13.55	140	5.12
4	Replacement DTR	No	87	1.98	86	1.90	259	4.80
5	Construction - FPI	No	2366	2.84	663	0.80	42	0.05
6	Construction – Switches	No	5138	24.08	3923	17.53	1082	4.69
7	Conversion – HT Line	Km	179	26.55	29	4.27	1	0.09
8	Conversion -LT Line	Km	1491	41.27	336	9.29	181	4.75
9	Reconductoring - HT line	Km	802	6.49	400	3.24	107	0.87
10	Reconductoring - LT Line	Km	15416	66.02	2623	11.18	693	2.97
11	Standardisation - HT line	Km	84	2.69	32	1.04	3	0.08
12	Standardisation -Other Structures	No	10374	27.76	9408	11.75	4572	4.34
13	Metering - Boarder Meter	No	353	1.95	198	1.09	18	0.10
14	Metering - DTR Meter	No	2777	2.74	745	0.73	30	0.03
15	Faulty Meter Changing	No	329153	27.19	94307	7.89	18443	1.58
16	Shifting DTR	No	105	0.76	92	0.67	23	0.16
17	Shifting of lines	Km	19	0.53	14	0.39	2	0.07
18	Earthing	No	56642	5.65	15670	2.23	1375	0.25
19	Dismantling - Lines	Km	172	1.36	46	0.37	14	0.11
20	Dismantling - DTR/ Structure	No	7	0.00	8	0.01	2	0.00
21	Other Works		47944	23.12	10147	5.35	2206	1.54
Amount (in Cr. Lakhs)				409.13		146.09		43.48
System Generated Progress-Work Scheduled will be changed day by day.								

ANNEXURE II								
DYUTHI PROGRESS AS ON 11.03.2020 for 2018-19 WORK (Under 21 work heads)								
Sl.No.	Master Group		Work Scheduled		Work In Progress		Work Completed	
			Qty	Amt(in Cr.)	Qty	Amt(in Cr.)	Qty	Amt(in Cr.)
1	Construction - HT line	Km	137.24	13.06	614.00	59.39	1091.87	85.16
2	Construction - LT Line	Km	104.20	7.84	289.62	21.07	662.73	39.42
3	Construction – DTR	No	49.00	1.78	199.00	7.31	920.00	33.70
4	Replacement DTR	No	19.00	0.37	23.00	0.52	853.00	16.92
5	Construction - FPI	No	537.00	0.64	1349.00	1.62	1246.00	1.50
6	Construction – Switches	No	465.00	2.73	2065.00	9.82	8237.00	35.95
7	Conversion – HT Line	Km	14.60	2.16	117.96	17.46	51.12	7.56
8	Conversion -LT Line	Km	156.33	4.26	405.03	11.45	1853.30	51.08
9	Reconductoring - HT line	Km	305.91	2.48	406.18	3.29	533.94	4.32
10	Reconductoring - LT Line	Km	1775.41	7.63	5994.26	25.83	14757.12	63.18
11	Standardisation - HT line	Km	13.35	0.43	53.02	1.72	33.44	1.05
12	Standardisation - LT line	Km	28.98	0.45	197.52	3.05	691.23	10.05
13	Standardisation -Other Structures	No	972.00	1.92	5247.20	11.36	30121.26	36.33
14	Metering - Boarder Meter	No	62.00	0.34	154.00	0.85	212.00	1.17
15	Metering - DTR Meter	No	380.00	0.38	829.00	0.82	1382.00	1.36
16	Faulty Meter Changing	No	9526.00	0.97	30916.00	2.67	610194.00	50.39
17	Shifting DTR	No	20.00	0.14	43.00	0.31	199.00	1.46
18	Loss Reduction – Shifting line	Km	0.00	0.00	8.00	0.22	29.51	0.83
19	Earthing	No	5907.00	0.66	13886.00	1.63	38012.00	4.76
20	Dismantling - Lines	Km	6.77	0.05	58.56	0.46	155.66	1.23
21	Dismantling - DTR/ Structure	No	0.00	0.00	5.00	0.00	26.00	0.02
22	Construction - Others	No	7841.00	4.15	21783.20	11.67	46014.84	23.48
Total				52.45		192.51		470.93
System Generated Progress-Work Scheduled will be changed day by day.								

ANNEXURE III								
DYUTHI PROGRESS AS ON 11.03.2020 for 2019-20 WORK (Under 21 work heads)								
Sl.No.	Master Group		Work Scheduled		Work In Progress		Work Completed	
			Qty	Amt(in Cr.)	Qty	Amt(in Cr.)	Qty	Amt(in Cr.)
1	Construction - HT line	Km	1193.07	108.70	344.20	28.64	28.08	2.30
2	Construction - LT Line	Km	1073.58	80.92	92.74	5.75	28.70	1.51
3	Construction – DTR	No	560	20.14	200	7.34	36	1.29
4	Replacement DTR	No	165	3.56	68	1.41	84	1.81
5	Construction - FPI	No	1858	2.23	1570	1.88	145	0.17
6	Construction – Switches	No	2914	14.27	1358	5.97	354	1.42
7	Conversion – HT Line	Km	96.71	14.31	22.05	3.26	5.48	0.81
8	Conversion -LT Line	Km	1828.90	51.43	192.85	5.15	111.29	3.09
9	Reconductoring - HT line	Km	778.40	6.30	143.59	1.16	7.53	0.06
10	Reconductoring - LT Line	Km	21225.8 2	90.85	2701.72	11.54	636.56	2.73
11	Standardisation - HT/LT line	Km	714.26	11.53	89.42	1.61	62.11	0.89
12	Standardisation -Other Structures	No	21260	37.59	6933.30	10.48	2676.00	3.39
13	Metering - Boarder Meter	No	67	0.37	16	0.09	3	0.02
14	Metering - DTR Meter	No	1215	1.20	239	0.24	44	0.04
15	Faulty Meter Changing	No	235776	19.75	179987	14.64	151793	12.28
16	Shifting DTR	No	140	1.01	32	0.23	4	0.03
17	Loss Reduction – Shifting line	Km	34.73	0.99	10.57	0.30	0.71	0.02
18	Earthing	No	40017	4.38	9301	1.34	733	0.10
19	Dismantling - Lines	Km	134.13	1.06	52.64	0.42	7.18	0.06
20	Dismantling - DTR/ Structure	No	6	0.00	0	0.00	1	0.00
21	Construction - Others	No	58106	28.85	12698	7.55	3408	1.58
Total Amount (Rs Cr)				499.44		109.00		33.60
System Generated Progress-Work Scheduled will be changed day by day.								

Annexure IV

Status of central aided system strengthening projects as on March & Sept 2019

Deena Dayal Upadhyaya Grama Jyothi Yojana (DDUGJY): Distribution Strengthening for Rural Areas including service connections in Rural areas

- Sanctioned Project Cost : Rs. 485.37Cr
- Date of Sanction : 05.01.2016
- GOI Fund received : Rs.238.63 Cr
- Own Funds infused : Rs 209.63 Cr
- Total Funds : Rs 448.26 Cr
- Total Disbursements under scheme as on 30.09-2019 is Rs. 448.26 Cr.(92.35%)
- Overall Financial Progress as per Physical Achievement as on 30.09-2019 is 99.5%
- Target date of completion: Physical by 30.09.2019, Submission of Closures by 31.03.2020
- Service connections completed (Given-122727/target-98527)
- State is 100% Electrified as on today.

Sansad Adarsh Gram Yojana(SAGY)

- Sagy is one component under DDUGJY aiming holistic development of village sector by MPs.
- Work in all selected villages (27/27) completed.
- Funding pattern is same as in DDUGJY
- Revised DPR after incorporating BOQ changes submitted to REC along with SLSC recommendations.
- Field Inspection by REC Quality Monitor (RQM): Inspection completed in all Districts Defects reported in these districts are being rectified.

SAUBHAGYA : Scheme for 100% electrification of House holds : Free connection including one point wiring to certain categories of households as per scheme guidelines

- Sanction was received for “the project for re-connection of 3 Lakh Rural Households de-electrified in the flood, under SAUBHAGYA” for a total project cost of Rs. 90.00 Crore. Upon submitting required details to REC, MOP released Rs 15.2 Cr as advance. Rs.26.12 Cr was released on 30-09-2019 . Total fund received from GoI under Soubhagya is Rs.41.32 Cr. Funding pattern under Soubhagya is Grant 60%, Loan 30% & State share 10% (Additional 15% grant if project is completed within timeline).

IPDS: System Strengthening for Urban & Semi urban areas

- Sanctioned Project Cost : Rs.592.07Cr
- Date of sanction : 15.6.2016
- Extended Target Date of completion : 30.09.2019

- GoI Fund received : Rs.107.41Cr
- Total disbursement through PFMS : Rs. 373.98 Cr– 63%
- Own Funds infused : Rs. 266.57 Cr (Rs. 59.207 Cr is 10% - utility contribution as per guidelines)
- Overall Financial Progress as per Physical Achievement : Rs. 489.23 Cr – 82.63%

R-APDRP-PART B Distribution strengthening of 43 RAPDRP Towns

(This scheme is now subsumed under IPDS - 50% grant, if losses are brought to 15% or below)

- Total Project Cost sanctioned for the State : Rs:1078.25Cr
- Date of commencement : 08.06.2010
- Original date of completion : 31.03.2017
- Extended Target Date of Completion :- 31st March 2018 (for 8 schemes)
- KSEBLtd has implemented this project through departmental execution mode.All Towns work completed and closed and reported to PFC
- Financial Progress as per Closure : Rs.1115.18 Cr (103.42% - City schemes have more than 100%)

As per closure proposal submitted to PFC balance fund (10%) of Rs. 96.584Cr is released by PFC. Thus total amount received from PFC is Rs. 258.324 Cr (25%)

This scheme has 50% grant, if losses are brought to 15% or below.

Project stand completed with financial closures submitted for 43 schemes.

DDUGJY- status as on 31-03-2019 and as on 30-09-2019 (Rs Cr.)									
Sl No:	Particulars	Achievement as on 30-09-19		Achievement as on 31-03-19		Achievement for the FY 18-19		Achievement for the FY 19-20 up to 30.09.19	
		Qty	Amt	Qty	Amt	Qty	Amt	Qty	Amt
1	Service connections (No:s)	122727	36.82	118324	35.50	7752	2.35	4403	1.32
2	Construction of 11kV lines(ckt km)	1257.45	97.52	1245.2	96.71	662.78	63.39	12.246	0.81
3	Construction of LT lines(ckt km)	2793.51	102.04	2722.86	99.76	564.57	26.59	70.648	2.28
4	Installation of distribution transformers (No:s)	549	16.19	544	16.05	198	5.86	5	0.15
5	Enhancement of distribution transformers (No:s)	50	1.27	50	1.27	28	0.79	0	0.00
6	LT Reconductoring (ckt. km)	670.54	15.17	666.23	15.05	281.65	7.34	4.31	0.12
7	HT Reconductoring (ckt. km)	370.789	9.45	349.499	8.94	141.9	4.18	21.29	0.51
8	Others		80.37		72.97		63.45		7.41
	Total		484.48		465.26		224.39		19.22

IPDS –status of works as on 31-03-2019						
Sl. No.	Particular	Unit	Revised Sanctioned Qty	Physical Achievement	Revised Project Cost (Rs. In Cr.)	Financial achievement as on 31-03-2019
1	Status of New Substation: 66/11kV & 33/11 KV S/S : New 1. 33kV Pandalam S/s - 2*5 MVA => 10MVA 2. 66kV GIS S/s - 2*10 MVA => 20MVA, including 1.5 km 66kV UG feeder 3. 33kV Containerised S/s, VB, Tvp- 2*5MVA => 10 MVA including 2.5km 33kV UG Cable feeder	Nos	3	*	29.62	17.05
2	110/33 ; 33/11 KV S/S : Additional Transformer	Nos.	1	0.75	2.47	1.53
3	66/11kV & 33/11 KV S/S : Transformer capacity enhancement	Nos.	14	8	14.93	7.91
4	Renovation & Modernisation of 110, 66 & 33/11 kV SS	Nos.	95	86	24.33	21.78
5	New 33 KV new OH feeder	km	26.87	7.78	9.74	2.04
6	66 KV feeders Reconductoring Kalamassery - Vyttila 66 kV feeder - 5.7 km - HTLS 66kV CHKD feeder - 22 km - AL 59 conductor	km	27.7	26.56	7.5	7.21
7	33 kV Line Bay Extension at EHV station	Nos	6	3.035	2.53	1.12
8	11 kV Line : New Feeder/ Feeder Bifurcation	km	326.69	256.707	21.31	16.75
9	11 kV Line : Augmentation/Reconductoring	km	184.97	101.34	6.26	3.38
10	Arial Bunched Cable (HT & LT)	km	1152.393	343.574	178.89	58.84
11	11 kV UG Cable	km	192.19	50.407	60.07	15.75
12	11 KV Bay Extension	km	0	0	0	0
13	Installation of Distribution Transformer	Nos.	829	745	25.89	22.98
14	Capacity enhancement of LT sub-station	Nos.	384	363	10.52	9.84
15	LT Line : New Feeder/ Feeder Bifurcation	km	218.015	128.061	10.57	6.03
16	LT Line : Augmentation/Reconductoring	km	2416.49	1790.94	61.85	51
17	Capacitor Bank	Nos.	0	0	0	0
18	HVDS	Nos.	107	8	1.07	0.08
19	Metering	Nos.	655393	459030	79.55	38.9
	Consumer meter			457959	0	35.19
		1 ph	583808	428318	0	29.77
		3 ph	48113	29222	0	5.35
		CT	273	101	0	0.07
	Smart Meter		20000 (ES/Ksdpm)	0	0	0
	Boundary Meter		288	136	0	2.04
	Feeder Meter		250	40	0	0.16
	DTR Meter		2661	895	0	1.5
20	Provisioning of solar panel	kWp	5465	4245	38.26	29.72
21	RMU, Sectionalizer, Auto reclosures, FPI etc.	E	58	3	2.78	0.14
22	Others				3.93	2.46
	GRAND TOTAL				592.07	388.6
	% overall Progress					53.23%

IPDS –Status of works as on 30-09-2019						
Sl. No.	Particular	Unit	Revised Sanctioned Qty	Physical Achievement	Revised Project Cost (Rs. Lac)	Financial achievement as on 30-09-2019 (Total)
1	Status of New Substation: 66/11kV & 33/11 KV S/S : New 1. 33kV Pandalam S/s - 2*5 MVA => 10MVA 2. 66kV GIS S/s - 2*10 MVA => 20MVA, including 1.5 km 66kV UG feeder	Nos	3	*	29.83	28.67

	3. 33kV Containerised S/s, VB, Tvpm- 2*5MVA => 10 MVA including 2.5km 33kV UG Cable feeder					
2	110/33 ; 33/11 KV S/S : Additional Transformer	Nos.	1	1	2.47	2.01
3	66/11kV & 33/11 KV S/S : Transformer capacity enhancement	Nos.	11	11	12.82	12.65
4	Renovation & Modernisation of 110, 66 & 33/11 kV SS	Nos.	171	119	29.25	27.47
5	New 33 KV & 66 kV new OH feeder	km	45.62	29.4	23.69	17.96
6	66 KV feeders Reconductoring Kalamassery - Vyttila 66 kV feeder - 5.7 km - HTLS 66kV CHKD feeder - 22 km - AL 59 conductor	km	27.7	27.025	8.55	8.45
7	33 kV Line Bay Extension at EHV station	Nos	6	5	2.52	1.85
8	11 kV Line : New Feeder/ Feeder Bifurcation	km	331.06	311.021	21.81	20.29
9	11 kV Line : Augmentation/Reconductoring	km	163.97	140.002	5.47	4.67
10	Arial Bunched Cable (HT & LT)	km	1162.85	837.216	180.67	145.88
11	11 kV UG Cable	km	203.74	85.045	64.27	26.58
12	11 KV Bay Extension	km	0	0	0	0
13	Installation of Distribution Transformer	Nos.	829	818	26.18	25.58
14	Capacity enhancement of LT sub-station	Nos.	384	378	10.52	10.32
15	LT Line : New Feeder/ Feeder Bifurcation	km	187.05	165.426	9	7.82
16	LT Line : Augmentation/Reconductoring	km	2354.21	2193.709	59.36	62.3
17	Capacitor Bank	Nos.	0	0	0	0
18	HVDS	Nos.	107	107	1.07	1.07
19	Metering	Nos.	632649	580527	58.8	52.1
	Consumer meter			577997	0	44.8
		1 ph	583808	537261	0	37.34
		3 ph	48113	40289	0	7.37
		CT	273	129	0	0.09
	Smart Meter		0	0	0	0
	Boundary Meter		288	234	0	3.75
	Feeder Meter		250	108	0	0.15
	DTR Meter		2661	2188	0	3.39
20	Provisioning of solar panel	kWp	5465	4215	38.26	29.51
21	RMU,Sectionaliser, Auto reclosures, FPI etc.	E	68	27	3.26	0.53
22	Others				4.28	3.53
	GRAND TOTAL				592.07	586.14
	% overall Progress					82.83%
	Pandalam 33 kV -Substation commissioned on 28.3.19					
	66kV Trippunithura GIS -S/s completed - commisioned on 17.12.18					
	33 kV Vydyuthi BhavanTvpm - Containerised S/s - Commissioned on 21.6.2019					

Annexure V

Project Status of Centrally Aided new /ongoing IT projects as on September 2019

IPDS – Real Time Data Acquisition System (RT-DAS) for Non-SCADA Towns

The objective of this scheme is to implement Feeder Remote Terminal Units (FRTUs) and Real Time Data Acquisition System in the substations within the Non-SCADA towns for the automated measurement of SAIDI/SAIFI (Reliability Indices) to assess the reliability of power. As per the direction of PFC, a DPR amounting to Rs.5.25 Crore was prepared with an estimated cost of Rs.2.75 Lakhs per substation having 5 or lesser number of feeders and Rs. 3

Lakhs per substation having 5 or more number of feeders for setting up FRTU and Rs. 1.5 Cr for setting up RT-DAS at Data center. Approval of the DPR is awaited.

Towards the objective of reducing the AT&C loss and to attain better power distribution reliability, accurate measurement, diagnosis and remedial actions are essential. The reliability of power is measured in the terms of SAIFI and SAIDI which requires solutions based on real time. A Real Time Data Acquisition System (RT-DAS) using FRTU (Feeder Remote Terminal Unit) at substations can be implemented to measure the reliability of power. PFC has sanctioned the implementation of RT-DAS in KSEBL to cover non-SCADA RAPDRP and IPDS towns with eligible approved project cost of Rs. 5.25 Crore having a grant component of Rs. 3.15 Crore, being 60% of approved project cost. 40 towns under RAPDRP are eligible for the scheme (excluding 3 SCADA towns) along with 23 exclusive IPDS towns. Subsequently, the RFP was published on 07.08.2018 vide E-Tender No. CE (IT, CR & CAPs)/05/2019-20.

The technical bid was opened on 07.09.2019. The following 3 bidders participated in the tender: Dongfang Electronics Pvt Ltd., SCOPE TNM Pvt Ltd. and SUN Industrial automation and solutions Pvt Ltd. The technical evaluation is progressing.

IPDS-Phase 2 : Incremental IT for 21 Towns/municipalities.

The project is for IT enabling of 21 Towns / municipalities as Phase II for facilitating Energy Audit. The work includes supply and installation of additional hardware in the towns (such as router, switches, PC, printer etc), GPS based GIS survey of assets, data migration and project management. The project also covers preparation of Feeder and Town wise consumer database / bill book and linking with existing GIS Application, so that Feeder wise AT&C loss and Town wise AT&C loss can be calculated. An amount of Rs 22.86 Cr for 21 towns has been approved. About 60 % of the project cost (ie Rs 13.72 Cr) would be GOI grant. The project was sanctioned on 20.02.2017 and to be completed within 30 months.

The DPR for Rs 22.86 Crore, covering 21 Towns was sanctioned on 20-02-2017. M/s. KPMG Advisory Service Private Limited was appointed as the Project Management Agency. M/s. BCITS, Bangalore (LoA issued on 17.11.2018) was appointed as the IT Implementation Agency.

The Letter of Award for the procurement of server, storage etc. has been issued and their installation is expected to be completed within few weeks.

Implementation related activities like ring fencing has been completed in 21 towns. ITIA installed about 367 modems in border meters and feeder meters of all 21 towns. Modems are communicating with central server. Kottarakkara town has been selected as pilot town. DTR metering has been completed in Kottarakkara town and activities for asset surveying and DTR modem installation have been progressing. 189/198 DTR meters have been installed in the pilot town of Kottarakkara. Aol of Vaikom, Chengannur , Mavellikara, Pandalam and Adoor towns have been finalised. Aol surveying is progressing in Pala. DTR meter installation has been completed in Nileshwaram, Nilambur, Chavakkad, Tripunithara, Kottakal, Manjeri, Koothuparambu, Chengannur, Chottanikara and is progressing in remaining towns.

IPDS-ERP Implementation

The Enterprise Resource Planning implementation under IPDS covers the area of Human Resource Management, Financial Accounting and Supply Chain Management system. The project was sanctioned on 07.02.2018 and expected to be completed within 30 months from date of sanction.

M/s. KPMG Advisory Service Private Limited was appointed as the Project Management Agency (PMA) to conduct an As-Is-Study and Gap-Analysis of business processes & work flow applications, to find which activities are yet to be re-engineered and automated from the perspective of an integrated ERP solution. DPR for Rs. 42.64 crore was approved vide letter dated 7.2.2018 of PFC. NIT & RFP were published on 27.11.2018. No bidders participated even after re-tendering. On 09.05.2019, Board decided to carry out customisation/development and implementation of ERP solution with the in-house development team under IT wing as part of partial turnkey basis execution sanctioned by PFC and supply, installation and commissioning of server, storage etc through open tender process. The processes towards in-house development are in progress. Gol Grant would be Rs. 25.58 Crores (60% of the Project Cost).

IPDS-Smart Meter Implementation

The objectives of this scheme is to convert Energy meters of **(a)** *all consumers* under Electrical Section, Kesavadasapuram to smart meters at a project cost Rs 19.5251 Cr (approval awaited) and **(b)** another 3,21,800 energy meters with per month consumption more than 230 units from all categories for UDAY participating states. M/s KPMG Advisory Service Private Limited has been appointed as Project Management Agency. The Approved Amount of the project is Rs. 64.36 Cr (for 3,21,800 nodes) with 60% Gol Grant amounting to Rs. 38.62 Cr. The project was sanctioned on 28.03.2018 and to be commissioned by 30 months from date of sanction.

PFC has sanctioned DPR for Rs. 64.36 crore towards implementation of 3,21,800 smart meters for consumers within IPDS towns. M/s KPMG has been appointed as the PMA. NIT for appointing implementation agency was published on 25.07.2018. It has been decided to select the implementation agency through reverse bidding process. The RFP document was published on 17.06.2019 with last date of bid submission on 5.08.2019. Pre-bid meeting was convened on 27.06.2018. 10 firms participated in the Pre-bid meeting. Based on the request from various Smart meter manufacturers, the date of bid submission extended to 26.08.2019. The technical bids were opened on 30.08.2019. Only M/s. United Electrical Industries Ltd. participated in the tender. The Pre-Qualification Committee Meeting held on 31.08.2019 decided to proceed with re-tendering. The details are being submitted to the Board for deciding future action plan.

Under IPDS (System strengthening) about 16,000 smart meters are to be installed for all consumers under Electrical Section, Kesavadasapuram. NIT was published on 12.07.2018 and the RFP was released on 23.07.2018. Technical bid opened on 31.10.2018. Two bidders M/s L&T Ltd and M/s United Electricals have submitted bids. As the latter failed to meet PQ criteria it was re-tendered with last date of submission as 23.11.2018. Again M/s L&T Ltd and M/s United Electricals Ltd. submitted bids. Technical bids opened on 27.11.18. On completion

of Technical evaluation, only M/s. L&T Ltd. qualified. Financial bid of the qualified single bidder (M/s. L&T Ltd) was opened on 01.02.2019. On 25.04.2019, Board decided to re-tender the work on the basis of financial bid evaluation. Re-tendered with last date of bid submission as 24.06.2019. Technical bid was opened on 27.06.2019 and the following 4 bidders participated: Larsen and Toubro Limited, Genus Power Infrastructures Limited, KSEDC Ltd-Keltron Controls Division and United Electrical Industries Ltd. The Pre-Qualification Committee Meeting held on 31.08.2019 decided to technically qualify Larsen and Toubro Limited and Genus Power Infrastructures Limited to proceed further (to open financial bids after successful completion of testing). M/s. L&T Ltd. had requested to consider their earlier test results, which was carried out as part of the cancelled tender. The Technical evaluation of the sample meters submitted by M/s. Genus is progressing.

In the meantime, PFC has directed for the closure of System strengthening projects by September 2019. Hence, new work was included under IPDS, instead of implementation of 16000 Smart meters.

Smart Grid Kochi

The Scope of Work and proposed features of implementation of Smart Grid in Kochi Smart City covering five electrical sections includes the following:

- | | |
|--|---|
| I. AMI (Approx One Lakh Nos) | II. EV Charging Stations. |
| III. Peak Load Management. | IV. Estimated cost:- Rs 103.35 Cr |
| V. Distribution Trans Monitoring (240) | VI. Approved cost: Rs 90.87 |
| VII. Facilitate Distr Gen (Roof top PV). | VIII. GoI Grant:- 30% |
| IX. Energy Storage Systems (500 kWh x 2nos). | X. Project to be completed in 18 months |

Ministry of Power (MoP) has directed the utilities to formulate Detailed Project Reports (DPRs) for implementation of Smart grid. As part of Smart City Kochi project, Smart Grid implementations for section offices under the Smart City area were preferred. A Project proposal including an estimate cost of Rs.103.35Crore for the Smart Grid implementation at smart city Kochi is prepared. The State Level Project Monitoring Unit had finalized the Detailed Project Reports (DPR) for implementation of Smart Grid in the State and recommended the DPR to the National Smart Grid Mission (NSGM). The Kochi Smart Grid DPR has been submitted to National Smart Grid Mission (NSGM) by KSEBL on 16-2-2018. The NSGM technical committee held on 28-4-2018 approved the project for a moderated cost of Rs.90.7Crore which includes Rs. 29.31Crore as NSGM grant portion (30%) and Rs.68.39 Crore as Utility Share (70%). The DPR had been revised based on the decision of the SLPMU committee held on 03.05.2019. The Scope of Work & Proposed feature of implementation of Smart Grid in Kochi includes the following:

- Advance Metering Infrastructure
- Peak Load Management.
- DT Monitoring
- Facilitate Distributed Generation (Roof top PV).
- Electric Vehicle Charging Stations.

The Project has to be commissioned within 18 months post award. The Smart Grid project involves component cost of Smart Meter, EV Charging Stations which are the same involved in developing Smart City. The Smart Grid implementation will advance the Smart City features and helps in conserve the energy using advance metering infrastructure and control systems. Also KSEBL requested necessary financial aid from Cochin Corporation and Cochin Smart Mission Limited towards the implementation of Smart Grid implementation in Kochi Smart City.

CYBER SECURITY

The request for Proposal for Appointment of Consultant for Cyber Security Assessment, Preparation of Cyber Security Policy & Security audit for KSEBL is in progress. Rfp floated and tender opened on 15-09-2018. PQ evaluation is in progress. Estimated cost is Rs. 50 Lakhs. Project implementation is planned for the control period 2018-19.

CENTRALLY AIDED NEW – ONGOING IT PROJECTS

R – APDRP (Part A) Scheme- Status of implementation

Government of India sanctioned R-APDRP scheme during 2010, which focuses on actual demonstrable performance in terms of sustained loss reduction. In Kerala, 43 schemes were sanctioned under Part A and B. The total outlay for Part A schemes comes to Rs.214.32 Crore towards IT and Rs 83.15 Cr towards SCADA scheme

Part-A of R-APDRP – IT:

This scheme includes works related for IT enabling of 43 Town schemes for installation of Data Centre, Customer Care Centre and related applications for facilitating Energy Audit, IT based consumer indexing GIS mapping etc. with 100 % grant. The details of projects are given below.

- Total Project Cost Sanctioned by PFC : Rs. 214.38 Cr
- IT Implementing Agency : M/s. KEPCO KDN
- LoA for IT Implementation issued on : 07.11.2012
- Date of Completion of Implementation : 31st March 2018
- Financial Closure : 30th April 2018
- Estimated Project cost at completion : Rs 175.23 Cr
- Amount Received so far from PFC : Rs. 141.23Cr.
- TPIEA verification by PGCIL completed and reports submitted to PFC.

The project stand closed and financial closure is submitted. Release of balance tranche Rs 34.03 Cr is pending from PFC for which letter already issued to Nodal Officer, PFC.

PART A of R-APDRP- SCADA (Ongoing Project): This scheme envisages the advanced distribution automation, loss reduction and reliability improvement in three cities of Trivandrum, Kochi & Kozhikode. For this scheme, 100 % grant is provided by Government of India. The details of project are as follows:

- Implementation Agency : M/s Schneider Electric India Pvt. Ltd.

- Total Project cost as Approved by PFC : Rs. 83.15Cr
- Awarded cost to Schneider Electric (SIA) : Rs. 56.7Cr
- Target date of Completion :30.09.2019- project completed
- Status:

PART A SCADA is implemented in Three cities of Tvpm, Kochi & Kozhikode for advanced distribution automation, loss reduction and reliability .The SCADA/DMS system is functional with 50 RTUs (at substations) and 2865 FRTUs (at RMU locations) installed and integrated to the three SCADA/DMS Control Centres TVM,EKM,KZD with counts of RTU 14,25 & 11 and FRTU counts 1450,644 & 771 respectively. The integration of GIS with SCADA/DMS is implemented and Distribution Network developed in SCADA/DMS system for Trivandrum, Ernakulam& Kozhikode towns using CIM XML from GIS. Final tests such as SAT, SAVT for three cities completed and 11kV Control room operations for the cities shifted to the SCADA/DMS control room. Third Party Independent Evaluation Agency (TPIEA) Audit completed. Documentation is in progress. All the required milestones have been reached within the Target date of completion sanctioned by PFC, ie, 30th September 2019.The project is fully funded by PFC.

The sanctioned cost of the project is Rs. 83.15Cr and award cost is Rs.61.86 Cr.

Annexure VI

EV charging infrastructure proposal and mode of implementation

Kerala aims to be one of the front-runners in the adoption of Electric Mobility and has been among the earliest States in India to adopt an approved Electric Vehicles Policy and tariff. The Policy targets to have 1 million EVs on the road by 2022 with special emphasis to public transport. As part of the Policy, the Kerala State Electricity Board Ltd. (KSEB) has been appointed as the State Nodal Agency for establishing a charging infrastructure for electric vehicles (EVs).

As articulated in the Central and State policies, there is an urgent need to promote electric mobility. A critical requirement for accelerating EV adoption is the development of an appropriate charging infrastructure for EVs. In this scenario, KSEB with the support of the Government of Kerala, is committed to take a proactive stance in promoting both public and private investment in charging infrastructure in the State.

EV charging infrastructure proposal

EV Charging Infrastructure development plan focus on the following

- **Setting up Energy availability and Grid capability:**

KSEB has already initiated steps to ensure power availability and to enhance the transmission capacity for bringing more power from the national grid foreseeing future demand. Steps are being taken by KSEB to increase the Renewable Energy content in its energy portfolio, thereby increasing the clean component of the State's energy basket. It

is expected that during the pilot stage energy requirement for meeting the eV demand will be around 1.5 Million Units (MU) per day, which is less than the current daily fluctuation in energy demand of KSEB and can easily be met.

However, there can be local stresses in the distribution grid to cater to the power requirements of EV charging, especially during peak hours. In the long run, requirement in transport sector will play a significant role in the total power demand. It is expected that in a scenario when the population of eV in the State matches with existing number of ICE vehicles, the daily energy requirement for eV will be approximately 50 MU. KSEB will be taking steps to closely monitor the available resources and will make adequate investments to cater to the emerging needs.

- **Setting up Charging Pyramid:**

EV Charging Ecosystem is expected in three tiers; at (1) homes & offices, (2) other slow charging stations and (3) fast charging stations. It is expected that the vast majority of energy consumed in EV charging will be delivered through overnight charging at the owners' homes or office (in case of official vehicles) using slow AC chargers. Home charging is expected to be the predominant mode of charging for auto-rickshaws as well as private two & four - wheelers in Kerala. Dependence on interim charging arises when a user has to travel beyond the range offered by the vehicle battery. Even in such cases, slow AC charging will be sufficient for most situations. Slow Charging is expected to play a major role in public charging considering the vehicle mix which is likely to be predominated by two- and three-wheelers which do not usually feature fast charging technologies. Public DC fast chargers enable users to quickly charge their vehicles and resume their journey during long trips. Establishments like government offices, malls, hotels etc may install fast chargers for the convenience of visitors or to attract customers.

KSEB will partner with the Government of Kerala, PSUs and other private investors to create an adequate network of fast charging stations in Kerala, in the following categories.

Category A	<i>At public places for commercial purpose and will be made available to any individual without any restrictions</i> <i>(e.g., EV Charging station established in at Municipal Parking Lots, Petrol Stations, Streets, Malls, and Market Complexes etc.)</i>
Category B	Within the premises of a State or Central Government Office Complexes, Hospitals, educational Institutions or any other Public Office for non-commercial use. <i>(e.g., EV Charging station established in KSEB complexes, Public Office Building, Govt Hospital complex etc.)</i>
Category C	Within the semi-restricted premises for commercial or non-commercial purpose and will be made available to any individual for charging of eVs without any restrictions. <i>(e.g., EV Charging stations established by Taxi Car / Auto Operators, Co-operative housing societies)</i>

Swappable batteries on a pay-as-you-go model which eliminates the need to pay upfront for the battery, thus potentially making EVs cheaper than conventional vehicles is another business model which KSEB foresees in near future. From utility perspective, swappable batteries also support grid balancing as they can be charged during low demand period.



Development Phases

The development of a charging ecosystem is envisaged in three stages i.e. Pilot, Coverage and Scaling – each with distinct objectives, investment requirements, risk and role of various stakeholders. During the Pilot stage, the first few charging stations will be up in each city wherein the new technology is demonstrated and awareness is created. The chargers installed in the initial period will generate only minimal revenue.

During the second phase, KSEB, with the support of Government plan to provide adequate support to companies who plan to invest in establishing a state-wide coverage for its charging station network. KSEB proposes to establish more (i) Public Charging Stations – PCS (with AC as well as DC fast, moderate & slow chargers) catering to different vehicle segments in same location and (ii) Mini Charging Stations (with AC slow charges necessitating minimum investment) which give more focus on two & three wheelers, taking the vehicle population in to account. If required, KSEB may also partner with potential investors through various business models.

Scaling Stage begins once a critical mass of vehicle adoption has been reached and the utilization of charging stations begins to increase. The focus will then shift to waiting time and effective utilization of chargers. State may take few more years to reach this stage.

Road map for rollout

- KSEB has already established the first fast charging station in the State at Government Secretariat, Trivandrum. KSEB is now in to installation of Charging Stations in Board's own land along the National Highway in six Corporation areas viz. Thiruvananthapuram, Kollam, Kochi, Thrissur, Kozhikode & Kannur. These locations will have multiple charging points Tender for the same is already floated by KSEB. The work is expected to be completed within two months' from the date of award of work.
- In appreciation of the efforts being taken by KSEB to support eMobility initiatives of KSEB, Government of Kerala was kind enough to allocate ₹ 8.2 Crore from its e-mobility promotion fund. This amount will be utilized for installation of Charging Stations in 32 locations in Thiruvananthapuram District; the work is expected to be commenced by May, 2020 and completed by September, 2020.

- The Government of Kerala is gearing up to increase the adoption of EVs for its fleet of official vehicles. KSEB will work with the Government to quickly set up charging stations in all District Collectorates as well as other office complexes with more than 20 government vehicles. These infrastructures can be utilized by the public as well. DC fast chargers can also be installed based on need.
- KSEB has invited an Expression of Interest (Eoi) for short listing firms for setting up Public Charging Stations in Kerala, based on which the detailed technical specification and business model will be finalized. About 70 locations are already identified across Trivandrum, Kochi and Kozhikode districts, where PCS will be installed this year itself. Further rollout to other Districts will follow. Slow charging kiosks as well as fast charging coverage are proposed along the National Highway. KSEB has set an internal target of March 2021 for completing these installations.
- **Phasing out of existing vehicles of KSEB:** As a matter of policy, KSEB will scrap the own old vehicles plying in the Corporate offices and other field Offices and replace it with EVs in a phased manner. In future, petrol and diesel cars hired on contract for use of field officers will also be replaced with EVs, as far as possible. If required, the services of EESL / NTPC / Government / Private Agencies for possible leasing of EVs will be explored for this.
- **Utilization of FAME-II incentives:** The Department of Heavy Industries, Government of India has invited applications for availing incentives for the deployment of charging infrastructure in cities where funds are being offered for setting up 25 charging stations having 7 or 8 chargers each under each city. The incentives ranges from 50% to 100% of capital cost depending on the category, specifically defined in this respect in the EOI. With Kerala having 7 one million plus population cities, KSEB has already applied under this scheme. 131 EV charging stations were approved in four cities as phase I, remaining will be approved in phase II
- **Backend support:** KSEB is taking proactive role in ensuring backend support to stakeholders. A web based application will soon be developed for demand aggregation. This will not only help land / building owners who are willing to utilize their available space for eV charging infrastructure and Investors to identify the available properties, but also enable KSEB to plan ahead for developing its infrastructure. A mobile app is also being developed for capturing characteristics of such properties – which is now in testing phase before final rollout. A mobile App required for the EVSE will also be developed by our team with the support of Kerala State IT mission for enabling eV users to locate and navigate to available charging points in their location, advance booking of slots, Integrated Payment Gateways, Authentication and Remote Monitoring by eVSE (Electric Vehicle Supply Equipment) owners etc.
- **E Mobility for Public Transport:** The State's eV Policy is developed with a key focus on Public Transport. Transformation of conventional Three Wheelers and fleets including those owned by KSRTC may be gradual, but will eventually happen. KSEB is gearing up to support these initiatives. Mini Charging Stations exclusively for 2 & 3 Wheelers will be a cost effective option for Auto Stands. It is expected that large fleet operators, including KSRTC, will be setting up their own (Captive) charging stations, but will require support of KSEB for network adequacy. During the last pilgrim season at the

request of KSRTC, KSEB has developed the backend infrastructure to set up a charging station at Nilakkal base camp, which helped KSRTC to successfully operate eBuses between Nilakkal & Pampa. Now KSRTC is operating 3 charging stations, one each at Thiruvananthapuram, Haripad & Aluva. KSEB has expressed its support to KSRTC and is now helping them in selection of charging locations.

KSEB is committed to support the rapid adoption of electric vehicles in Kerala. It recognizes that Electric Mobility is still in its early stages with rapid changes in technologies, standards, Government policies and consumer preferences. KSEB will continue its efforts to understand the emerging needs and come up with proactive plans to satisfy the ambitions of the State in Electric Mobility and a clean future.



ANNEXURE - 7



भारत सरकार



I.S.O.: 9001: 2008

**Government of India
केन्द्रीय विद्युत प्राधिकरण**

**Central Electricity Authority
तापीय परियोजना नवीनीकरण एवं आधुनिकीकरण प्रभाग
Thermal Projects Renovation & Modernisation Division**



R&M of Turbine of Unit-3 (210 MW) of Wanakbori TPS of GSECL

Quarterly Review Report Renovation & Modernisation of Thermal Power Stations

Quarter: April-June, 2018

C O N T E N T S

Sl No.	Description	Page No.
	Highlights	01-02
1.0	Introduction	03
2.0	Objective of R&M programme	03
3.0	Objective of LE programme	03
4.0	R&M and LE programme from 7th Plan onwards till 12th Plan	03-04
5.0	LE/R&M Programme during (2017-22)	04
5.1	Achievement of LE/R&M Programme during the 2017-22 up to 31st December,2017	05
5.2	Details of thermal units under shut down for R&M and LE works	05
5.3	Status of R&M activities under BRGF Scheme	05-06
6	Phasing Plan for FGD installation/ ESP upgradation in respect of new Environmental Norms	06-07
6.1	Summary of current status of Implementation of phasing plan for FGD installation	8
6.2	FGD-ESP Phasing Plan of Thermal Powers located in Delhi NCR	9--12
7	Flexible Operation of Thermal Power Stations	12-13
8.1	Coal Fired Generation Rehabilitation programme funded by World Bank	13-15
8.2	Indo-Japan co-operation for study on Efficiency and Environmental improvement of Coal fired stations	15-17
Annexure-1	Status of units where Life Extension/ Renovation & Modernisation works have been taken up for implementation during 2017-22	17-31
Annexure-2	Details of Thermal Power Units where the Life Extension (LE) Works have been completed during 2017-22	31
Annexure-3	Details of Thermal Power Units where the Renovation & Modernisation (R&M) Works have been completed during 2017-22	32
Annexure-4	Details of Thermal Power Units where the Renovation & Modernisation (R&M)/ LE (Life Extension) Works have been completed during 12th Plan	34-35
Annexure-5	Summary of implementation for phasing plan for FGD installation/ESP Upgradation	36
Annexure-6	FGD Planned	37-49

Foreword

Renovation & Modernization (R&M) has been recognized as one of the cost effective options for obtaining the additional generation and better outputs from the existing old thermal power units. The R&M of such units is very essential for performance improvement of the units as well as to comply the stricter environmental norms for improving environmental conditions. On the other hand, the Life Extension (LE) of the old thermal power units is carried out with an aim to extend their useful life 15 to 20 years beyond the original design economical life.

The Thermal Projects Renovation & Modernization (TPR&M) Division is entrusted with the responsibility of monitoring the progress of R&M/LE activities in thermal power generating units in the country under Section 73(f) of the Electricity Act, 2003. Based on the interaction and information received from various utilities, the Quarterly Review Report (QRR) is prepared highlighting the latest status of the physical progress of R&M/LE works at various thermal units.

R&M/LE works in 03 units of capacity of 443.5 MW have been completed upto 30-06-2018. At present, 5 coal based generating units with aggregate capacity of 820 MW are under shut down for carrying out the R&M/LE works.

Under the Indo-Japan Co-operation, 3rd Phase MoU between CEA and JCOAL, Japan has conducted a study on O&M enhancement of existing unit no.-1 of DTPS, DVC. Final Report has been prepared and submitted at DVC in May 2018 by JCOAL. A diagnostic study for optimal environmental measures in Dadri TPS was carried out in February 2018 and debriefing meeting was held in June 2018. One-day workshop on " Project on Efficiency and Environmental Improvement for Sustainable, Stable and Low-carbon Supply of Electricity" was held on 10th Nov 2017 at New Delhi by CEA and JCOAL. Mini-workshops were organized on 30-01-2018 at GSECL(Gujrat) and on 01-02-2018 at APGENCO (Andhra Pradesh) respectively for 2017-18 period under CEA-JCOAL Cooperation. SCR Pilot test at NTPC's Sipat TPS is being carried out to meet the NO_x level as per new environmental norms. Under Clean Coal Technology (CCT) Programme a study tour to Japan has been organised from 29th Nov, 2017 to 7th Dec, 2017. The participants from CEA, MoP, DVC NTPC and State Utilities visited the latest USC power stations at Japan.

To ensure compliance of the new Environmental Norms notified by Ministry of Environment, Forest & Climate Change (MoEF&CC) on 7th Dec. 2015, phasing plan for FGD installation/ ESP –upgradation have prepared and concerned utilities are requested to furnish the details of action taken for timely compliance of these norms.

A committee was constituted in CEA to find out the level of flexibilization required from thermal power stations and future roadmap for integration of 175 MW RES generation into Indian grid by 2022. Interim Report of the committee has been submitted in June 2018. It was found in the report that thermal units have to be operated at less than 30% load during the peak RES generation in the year 2021-22. Various measures have been suggested to improve the situation. A pilot test of 40% minimum load and 3% ramp up/ ramp down (i.e. 15 MW/ Min) has been successfully conducted in Dadri TPS and similar pilots are planned in other utilities.

Finally, I would like to express my sincere thanks and gratitude to the Utilities and other stakeholders for obeying CEA's guidelines during implementation of R&M/LE works at old thermal power plant and furnishing status of R&M. I would also like to thank for timely submission of status of installation of FGD/ upgradations of ESP to comply with new environmental norms thus helping us to prepare & publish quarterly review report.

Dated: 09-08-2018

(B.C. Mallick)
CE (TPR&M)

Highlights

1. LE/ R&M Achievements during 12th Plan (2012-17)

Sl. No.	Particulars	State Sector		Central Sector		Total (State + Central)	
		No. of units	Capacity (MW)	No. of units	Capacity (MW)	No. of units	Capacity (MW)
A)	LE works						
1.	Completed during 12 th Plan	10	1380	11	1261.76	21	2641.76
B)	R&M works						
2.	Completed during 12 th Plan	05	850	11	3710.5	16	4560.5
	TOTAL	15	2230	22	4972.26	37	7202.26

2. LE / R&M Programme during (2017 - 22)

Category	LE/R&M works identified during 2017-22 No. of units & capacity (MW)		Total (State Sector + Central Sector)
	State Sector	Central Sector	
LE	34 (7570)	--	34 (7570)
R&M	30 (7135)	07 (224)	37 (7359)
Total	64 (14705)	07 (224)	71 (14929)

3. Achievements of R&M and LE Projects during 2017-18

Sl. No.	Particulars	LE/R&M works completed No. of units & capacity (MW)		Total (State Sector + Central Sector) MW
		State Sector	Central Sector	
1	LE	02(410)	--	02(410)
2	R&M	--	33.5	33.5
	Total	02(410)	--	03(443.5)

4. Implementation of Phasing Plan for FGD installation/ ESP upgradation in respect of new Environmental Norms notified by MoEF&CC on 7th Dec. 2015.

Ministry of Environment, Forest & Climate Change (MoEF&CC) notified “Environment (Protection) Amendment Rules, 2015” for thermal power stations on 07.12.2015. As per notification existing stations were required to comply with the new Standards within 2 years (i.e. by Dec. 2017) and the new stations including all station presently under construction were required to meet the new norms by 06-12-2017.

To review the various issues arising out of new environmental norms for thermal power stations, a meeting was held on 01.09.2017 in MoEF & CC among Secretary MoEF & CC, Secretary, MoP and Chairperson, CEA and it was decided that the action plan submitted by MoP to MoEF & CC extending up- to 2024 should commence from 2018 and implemented before 2022. Further the implementation of measure to the thermal plants situated in NCR region for compliance of new environmental shall be complied by December 2019. In this regard utilities were requested to furnish the details of action taken and a report has been prepared and submitted to MoP on the status of phasing plan of FGD installation/ ESP upgradation at TPS.

5. Flexible Operation of Thermal Power Stations

A committee was constituted in CEA under the chairmanship of Chief Engineer (TPRM) to find out the level of flexibilization required from thermal power stations and future roadmap for integration of 175 MW RES generation capacity into Indian grid by 2022. The committee has come up with the findings of the quantum of flexibilization, minimum thermal load, and ramp rate required in its interim report in June 2018. It was found in the report that about 30% load operation of thermal plant is requires in June, July & August, 2021 if we consider must run status of RES plant. A pilot test of 40% minimum load operation and 3% ramp up/ ramp down (i.e. 15 MW/ Min) has been successfully conducted in Dadri TPS and similar pilot studies are being planned in other utilities.

6. External Co-operation for R&M/LE of TPS

The status of activities under external co-operation for R&M/LE of TPS is furnished below:-

(A) Indo-Japan Co-operation for Project on Efficiency & Environment Improvement for Sustainable, Stable and Low Carbon Supply of Electricity of Coal Fired Stations.

The 3rd Memorandum of Understanding (MoU) on Indo – Japan Cooperation for Project on Efficiency & Environment Improvement for Sustainable, Stable and Low Carbon Supply of Electricity between CEA and JCOAL was signed on 22nd January, 2016. The objective of the MoU is to address issues and barriers in promoting sustainable, stable and low-carbon thermal power development in India. Under this MoU, JCOAL has carried out feasibility study for replacement of Badarpur TPS by new units based on SC/USC technologies. RLA study of unit-3 (210 MW), Dadari TPS has been carried out by JCOAL. The feasibility study for Singrauli STPS Stg. I & II units (5x200 MW+2x200 MW) of NTPC has been carried out during December 2016 to March 2017. An Environmental Study through Combustion Test of Indian Coal has also been carried out by JCOAL. 25 tonnes, G12 grade coal was sent to Japan from Talcher coal mine for Combustion test. The combustion test was done at Akitsu Works, MHPS, Japan and report was submitted in January 2017. Under Clean Coal Technology (CCT) Programme a study tour to Japan has been organised during current year from 29th Nov, 2017 to 7th Dec, 2017. The participants from CEA, MoP, DVC, NTPC and State Utilities visited the latest USC power stations at Japan. A study on best O&M practices of thermal power unit has been carried out by JCOAL at unit-1, DTPS, DVC in 2017-18. Final Report was submitted in May 2018 by JCOAL. Mini-workshops were organized on 30-1-2018 at GSECL(Gujrat) and on 01-02-2018 at APGENCO (Andhra Pradesh) respectively for 2017-18 period under CEA-JCOAL Cooperation. SCR Pilot test at NTPC's Sipat TPS is being carried out to meet the NO_x level in the flue gas as per new environmental norms. A diagnostic study for optimal environmental measures at Dadri TPS was conducted in February, 2018 and debriefing meeting was held in June 2018.

Quarterly Review Report on Renovation, Modernisation and Life Extension of Thermal Power Plants

1.0 Introduction

At the time of independence, the total installed capacity in the power sector was 1362 MW of which steam power plants contributed 756 MW. The installed generation capacity has since grown manifold. The total installed capacity as on 30.06.2018 was 343898.39.39 MW of which thermal power plants contributed 222692.59 MW (64.76 %). The contribution of Coal, Gas and Diesel based thermal power plants of total installed capacity is 57.27 %, 7.24 % and 0.24 % respectively.

Renovation & Modernization (R&M) is seen as a cost-effective option for additional generation from the existing thermal power stations and better asset management due to its low cost and short gestation period. Besides generation improvement and improvement in availability, other benefits achieved from R&M / LE include life extension, improved safety, reliability & environmental conditions.

Many of the thermal power plants are not operating to their full potential and large numbers of thermal units including 200/210 MW units are old and outlived their normal economical design life. The 66 LMZ units of 200/210 MW Capacity are potential target for Energy Efficiency R&M (EE R&M).

2.0 Objective of R&M Programme

The main objective of Renovation & Modernisation (R&M) of thermal generating units is to make the operating units well equipped with modified / augmented with latest technology with a view to improve their performance in terms of output, reliability, availability, reduction of outage time, ease of maintenance and minimizing inefficiencies.

3.0 Objective of Life Extension Programme

The R&M programme is primarily aimed at generation sustenance and overcoming problems. The life extension (LE) programme on the other hand focuses on plant operation beyond their original design life after carrying out specific life assessment studies of critical components with an aim to increase the life beyond the design economic life of 25 years.

4.0 Renovation and Modernisation (R&M) and Life Extension Programme (LEP) from 7th Plan onwards till 11th Plan

R&M Programme in a structured manner was initiated in 1984 as a centrally sponsored programme during 7th Plan and the programme continued during the two Annual Plans 1990-91 & 1991-92. The Plan wise details are given below: -

S. No.	Five Year Plan	Year	No. of TPS / No. of Units	Capacity (MW)	Additional Generation Achieved MU/ Annum*	Equivalent MW**
1	7 th Plan & 2 Annual Plans	85-86 to 89-90 & 90-91, 91-92	34 / 163	13570	10000	2000
2	8 th Plan (R&M) (LEP)	1992 to 1997	44 / 198 43/(194) 1 /(4)	20869 (20569) (300)	5085	763
3	9 th Plan (R&M) (LEP)	1997 to 2002	37 / 152 29/ (127) 8/ (25)	18991 (17306) (1685)	14500	2200
4	10 th Plan (R&M) (LEP)	2002 to 2007	9/25 5/(14) 4/(11)	3445 (2460) (985)	2000	300
5	11 th Plan (R&M) (LEP)	2007 to 2012	21/72 15/(59) 6/(13)	16146 (14855) (1291)	5400	820
6	12 th Plan (R&M) (LEP)	2012 to 2017	18/37 8/16 10/21	7202.5 4560.50 2641.76	----	----

*Tentative figure.

** Equivalent MW has been worked out assuming PLF prevailing during that period.

5.0 R&M/ LE Programme during (2017 - 22)

The Summary of R&M/ LE Programme to be implemented during 2017-22 is given below. The status of implementation of the R&M/LE works at various units is furnished at Annexure-1.

Category	LE/R&M works identified during 2017-22 No. of units & capacity (MW)		Total (State Sector + Central Sector)
	State Sector	Central Sector	
LE	34 (7570)	--	34 (7570)
R&M	30 (7135)	07 (224)	37 (7359)
Total	64 (14705)	07 (224)	71 (14929)

The Summary of achievements of R&M/ LE Projects is given below:

As on 30.06.2018

Year	LE No. of units (MW)		R & M No. of units (MW)		Total (state + central) No. of units (MW)		Total LE and R&M No. of units (MW)
	State	Central	State	Central	State	Central	
2017-18	02(410)	--	--	01(33.5)	02(410)	01(33.5)	03(443.5)
2018-19	--	--	--	--	--	--	--
Total No. of units (MW)	02(410)	--	--	01(33.5)	02(410)	01(33.5)	03(443.5)
	02(410)		01(33.5)		03(443.5)		

5.1 Details Achievements of LE and R&M Programme during 2017-22 upto 30.06.2018.

	Name of the TPS	Unit No.	Date of S/D	Capacity (MW)	Utility	Sector	Date of Achievement
1. 2017-18							
LE	Ukai TPS	4	07-12-2016	200	GSECL	State	17.05.2017
	Wanakbori TPS	3		210	GSECL	State	27-11-2017
R&M	Kathalguri CCGT	6	--	33.5	NEEPCO	Central	31-03-2018
Sub Total		03 (unit)		443.5			
Total LE	02 (410)	State	02(unit)	410			
		Centre	--	--			
Total R&M	01 (33.5)	State	--	--			
		Centre	01(unit)	33.5			
Grand Total		03(unit)		443.5			

Details of thermal power units where the R&M/ LE Works have been completed during 2017-22 up to 30.06.2018 are given at **Annexure 2& 3**.

5.2 Details of thermal units under shut down for R&M and LE works

The following 5 units are under shut down for R&M and Life Extension works.

Sl.No.	Name of Project	Utility	State	Unit No.	Capacity (MW)
1.	Obra TPS	UPRVUNL	U.P.	7	100
2.	Barauni TPS	BSPGCL	Bihar	6	110
3.	Koradi TPS	MSPGCL	Maharashtra	6	210
4.	Obra TPS	UPRVUNL	U.P.	12	200
5.	Obra TPS	UPRVUNL	U.P.	13	200
Total					820

5.3 Status of R&M activities under Backward Region Grant Fund (BRGF) Scheme.

Under RSVY (now BRGF), Planning Commission in a meeting held on 10.05.2005 identified Barauni TPS, units 6&7 and Muzaffarpur TPS units 1&2 for carrying out Life Extension (LE) works. Subsequently, a five party agreement between the Government of India, Govt. of Bihar, BSEB, BHEL and NTPC was signed on 29.5.2006.

Planning Commission vide their letter dated 16.11.2009 approved Rs. 1053 crores including consultancy charges under the Special Plan for Bihar for LE works of Barauni TPS (Unit 6&7) and Muzaffarpur TPS (Unit 1&2) as per details given below:

Barauni TPS Unit (6&7)	:	Rs. 554.16 crores
Muzaffarpur TPS (1&2)	:	Rs. 471.80 Crores
Consultancy charges to NTPC(for Barauni TPS only):	:	Rs. 27.04 Crores

TOTAL : Rs. 1053.00 Crores

Details of Funds released by Planning Commission upto 31.03.2018:

i)	BHEL	:	Rs. 725.07 crores
ii)	KBUNL	:	Rs. 180.00 crores
iii)	NTPC	:	Rs. 20.11 crores
	Total	:	Rs. 925.18 crores

The remaining amount of Rs. 127.80 Crs has been released by the Govt. of India to BSPGCL. Now BSPGCL is releasing money directly to the vendors.

Name of TPS	Unit No.	Zero Date	Contractual Completion Date	Anticipated Completion Date	Present physical status as on 31.12.2015
Barauni TPS	7	15.11.2009	15.11.20011	Completed	Unit was synchronized on 03.08.2016.
	6	15.11. 2009	15.06.2012	May 2018	Boiler: 97% work completed Turbine : 98% work completed Anticipated completion of Unit- 6 is in July 2018.
Muzaffarpur TPS	1	15.04. 2010	15.04.2012	Completed	Unit synchronised on 05.07.2013.
	2	15.04. 2010	15.08.2012	Completed	Unit synchronised on 30.09.2014.

6. Implementation of Phasing Plan for FGD installation/ ESP upgradation in respect of new Environmental Norms notified by MoEF&CC on 7th Dec. 2015.

Ministry of Environment, Forest & Climate Change (MoEF&CC) notified “Environment (Protection) Amendment Rules, 2015” for thermal power stations on 07.12.2015. All existing stations are required to comply with the new Standards within 2 years (i.e. by Dec. 2017) and the new stations including all station presently under construction are required to meet the new norms by 01-01-2017.

To review the various issues arising out of new environmental norms for thermal power stations, a meeting was held on 01.09.2017 in MoEF&CC among Secretary MoEF & CC, Secretary, MoP and Chairperson, CEA and it was decided that the action plan submitted by MoP to MoEF & CC extending up- to 2024 should commence from 2018 and implemented before 2022.

The MOEFCC gave its concurrence to the revised implementation plan for FGD installation/ESP upgradation vide letter no. F. No. Q-15017/40/2007-CPW dated 07.12.2017.

Further, it has been decided that the target date for environmental compliance in respect of thermal plant located in NCR is December,2019. The progress report of installation of measures of 10 nos. thermal power plant situated in NCR region is given separately.

The implementation plan including units commissioned up- to 31.08.2017 is enclosed at Annexure 5. The year-wise FGD Phasing Plan and ESP Upgradation Plan are given below.

i) Year wise FGD Phasing Plan

Year	Capacity (MW)	No. of Units
2018	500	1
2019	4940	8
2020	26330	53
2021	64268	174
2022	64055	178
Total	160092	414

ii) Year wise ESP Upgradation Plan

Year	Capacity (MW)	No. of Units
2018	500	1
2019	1300	2
2020	10405	27
2021	23495	97
2022	27725	93
Total	63425	220

To ensure compliance of the new Environmental Norms letters have been issued to concerned utilities for furnishing the details of action taken till date and further plan for FGD installation/ ESP –upgradation.

In view of the above CEA has started the monitoring of the implementation of the revised implementation plan.

6.1 Summary of Current Status of Implementation of phasing plan for FGD Installation

Sl	Description	Capacity (MW)	No. of Units
	Total Capacity Where FGD to be installed	153817	401
A	Central Sector		
	Total Capacity	46905	122
1	FGD Commissioned	0	0
2	Bid Awarded	3320	9
3	NIT issued	10905	21
4	Tender Specification finalized	8610	19
5	Feasibility Study completed	17530	56
6	Feasibility Study started	6540	17
B	State Sector		
	Total Capacity	49585	158
1	FGD Commissioned	0	0
2	Bid Awarded	0	0
3	NIT issued	1630	6
4	Tender Specification finalized	5420	14
5	Feasibility Study completed	16230	46
6	Feasibility Study started	24455	85
•	Complies with norms as per developer	1650	6
•	Not Possible as per developer	200	1
C	Private Sector		
	Total Capacity	57327	121
1	FGD Commissioned	1820	3
2	Bids Awarded	0	0
3	NIT issued	13930	27
4	Tender Specification finalized	13730	25
5	Feasibility Study completed	13040	25
6	Feasibility Study started	13967	38
•	Complies with norms as per developer	840	3

6.2 FGD- ESP Phasing Plan of Thermal Power Plants located in Delhi NCR

Sl. No.	Name of Thermal Power Station	Unit No.	Capacity (MW)	Timeline for FGD	Current Status
1	Dadri (NCTPP), U.P		1820		
	Dadri (NCTPP), U.P	1	210	31.12.2019	FGD: Under retendering Process DE-Nox: No action required as statutory limits being complied. ESP: Statutory limits being complied.
	Dadri (NCTPP), U.P	2	210	31.12.2019	FGD: Under retendering Process DE-Nox: No action required as statutory limits being complied. ESP: Statutory limits being complied.
	Dadri (NCTPP), U.P	3	210	31.12.2019	FGD: Under retendering Process DE-Nox: No action required as statutory limits being complied. ESP: Statutory limits being complied.
	Dadri (NCTPP), U.P	4	210	31.12.2019	FGD: Under retendering Process DE-Nox: No action required as statutory limits being complied. ESP: Statutory limits being complied.
	Dadri (NCTPP), U.P	5	490	31.12.2019	FGD: Wet type FGD Package awarded to M/s BHEL. Work in Progress DE-Nox: Equipment is under procurement. NIT published. Bid opened on 23.05.2018. Under award Approval. ESP: Statutory limits being complied.
	Dadri (NCTPP), U.P	6	490	31.12.2019	FGD: Wet type FGD Package awarded to M/s BHEL. Work in Progress DE-Nox: Equipment is under procurement. NIT published. Bid opened on 23.05.2018. Under award Approval. ESP: Statutory limits being complied.
2	GHTP (Lehra Mohabbat), Punjab		920		
	GHTP (Lehra Mohabbat), Punjab	1	210	31.12.2019	FGD: Board of Directors, PSPCL have approved the agenda for issuing global tender for taking Consultancy Services for FGD. The tender shall be issued shortly. ESP: Case regarding ESP Upgradation will be initiated after finalizing feasibility report to install FGD.
	GHTP (Lehra Mohabbat), Punjab	2	210	31.12.2019	FGD: Board of Directors, PSPCL have approved the agenda for issuing global tender for taking Consultancy Services for FGD. The tender shall be issued shortly. ESP: Case regarding ESP Upgradation will be initiated after finalizing feasibility report to install FGD.
	GHTP (Lehra Mohabbat), Punjab	3	250	31.12.2019	FGD: Board of Directors, PSPCL have approved the agenda for issuing global tender for taking Consultancy Services for FGD. The tender shall be issued shortly. ESP: Case regarding ESP Upgradation will be initiated after finalizing feasibility report to install FGD.
	GHTP (Lehra Mohabbat), Punjab	4	250	31.12.2019	FGD: Board of Directors, PSPCL have approved the agenda for issuing global tender

					for taking Consultancy Services for FGD. The tender shall be issued shortly. ESP: Case regarding ESP Upgradation will be initiated after finalizing feasibility report to install FGD.
3	Harduaganj, U.P		665		
	Harduaganj, U.P	8	250	31.12.2019	FGD: Offer of Pre-Award Consultancy for FGD Installation has been obtained from M/s NTPC. Administrative approval is under process. ESP: Offer of Pre-award consultancy for retrofitting of ESP is awaited from M/s NTPC.
	Harduaganj, U.P	9	250	31.12.2019	FGD: Offer of Pre-Award Consultancy for FGD Installation has been obtained from M/s NTPC. Administrative approval is under process. ESP: Offer of Pre-award consultancy for retrofitting of ESP is awaited from M/s NTPC.
4	Indira Gandhi STPP, Haryana		1500		
	Indira Gandhi STPP, Haryana	1	500	31.12.2019	FGD: Bid Awarded on 30 Jan'18. Implementation schedule is 18 to 24 months DE-Nox: NIT is planned in April 2018 for combustion modification. Scheduled Implementation is before Dec 2019. ESP: Already designed to meet the environmental norms.
	Indira Gandhi STPP, Haryana	2	500	31.12.2019	FGD: Bid Awarded on 30 Jan'18. Implementation schedule is 18 to 24 months DE-Nox: NIT is planned in April 2018 for combustion modification. Scheduled Implementation is before Dec 2019. ESP: Already designed to meet the environmental norms.
	Indira Gandhi STPP, Haryana	3	500	31.12.2019	FGD: Bid Awarded on 30 Jan'18. Implementation schedule is 18 to 24 months DE-Nox: NIT is planned in April 2018 for combustion modification. Scheduled Implementation is before Dec 2019. ESP: Already designed to meet the environmental norms.
5	Mahatma Gandhi TPP, Haryana		1320		
	Mahatma Gandhi TPP, Haryana	1	660	31.12.2019	FGD: FGD Installed and is Under Renovation ESP: Statutory limits being complied. DE-Nox: Combination of low Nox burner and secondary over fired damper already installed. A third party has been engaged to control NOX emission through combustion optimisation technique.
	Mahatma Gandhi TPP, Haryana	2	660	31.12.2019	FGD: FGD Installed and is Under Renovation ESP: Statutory limits being complied. DE-Nox: Combination of low Nox burner and secondary over fired damper already installed. A third party has been engaged to control NOX emission through combustion

					optimisation technique.
6	Panipat TPS, Haryana		920		
	Panipat TPS, Haryana	6	210	31.12.2019	FGD: Matter has been taken up with MOEF&CC of unit from compliance of new norms keeping in view the low PLF during last 3 years and less remaining life of this unit ESP: SPM values are within limits.
	Panipat TPS, Haryana	7	250	31.12.2019	FGD: NTPC has been engaged as consultant for pre-bid and post-bid activities for installation of FGD. ESP: Overhauling of ESP fields carried out and now all the ESP fields are in working order. After the overhauling of ESP, the value of SPM is within the norms
	Panipat TPS, Haryana	8	250	31.12.2019	FGD: NTPC has been engaged as consultant for pre-bid and post-bid activities for installation of FGD. ESP: Overhauling of ESP fields carried out and now all the ESP fields are in working order. After the overhauling of ESP, the value of SPM is within the norms
7	Rajiv Gandhi TPS, Hisar, Haryana		1200		
	Rajiv Gandhi TPS, Hisar, Haryana	1	600	31.12.2019	FGD: NTPC has already carried out the Feasibility Study for installation of FGD. NTPC has been engaged as consultant for pre-bid and post-bid activities for installation of FGD. ESP: 2 nos. ESP fields in respect of Unit-1 are not in service. For rectification of these fields NIT is in process and fields will get repaired during forthcoming overhaul of unit.
	Rajiv Gandhi TPS, Hisar, Haryana	2	600	31.12.2019	FGD: NTPC has already carried out the Feasibility Study for installation of FGD. NTPC has been engaged as consultant for pre-bid and post-bid activities for installation of FGD. ESP: The overhauling of ESP in respect of Unit-2 has already been carried out and all the ESP fields are in working order.
8	Yamunanagar (DCTPS), Haryana		600		
	Yamunanagar (DCTPS), Haryana	1	300	31.12.2019	FGD: NTPC has already carried out the Feasibility Study for installation of FGD. NTPC has been engaged as consultant for pre-bid and post-bid activities for installation of FGD. ESP: The work for revival of ESP fields of Unit1&2 has been awarded to M/s GE Power India Ltd. The work of unit-1 has already been completed on 05.05.2018 and SPM are within the limits.
	Yamunanagar (DCTPS), Haryana	2	300	31.12.2019	FGD: NTPC has already carried out the Feasibility Study for installation of FGD. NTPC has been engaged as consultant for pre-bid and post-bid activities for installation of FGD. ESP: The work for revival of ESP fields of

					Unit1&2 has been awarded to M/s GE Power India Ltd. The complete material for unit-2 received at site and work shall be executed during forthcoming overhauling.
9	Talwandi Sabo TPS, Mansa, Punjab		1980		
	Talwandi Sabo TPS, Mansa, Punjab	1	660	31.12.2019	FGD: Feasibility Study Carried Out. NIT Issued. PPA issues pending with regulator. ESP: Talwandi Sabo Power Ltd. Has already installed Hybrid ESP (ESP+Fabric Filter) to meet up the SPM emission limit as per the new environmental norms.
	Talwandi Sabo TPS, Mansa, Punjab	2	660	31.12.2019	FGD: Feasibility Study Carried Out. NIT Issued. PPA issues pending with regulator. ESP: Talwandi Sabo Power Ltd. Has already installed Hybrid ESP (ESP+Fabric Filter) to meet up the SPM emission limit as per the new environmental norms.
	Talwandi Sabo TPS, Mansa, Punjab	3	660	31.12.2019	FGD: Feasibility Study Carried Out. NIT Issued. PPA issues pending with regulator. ESP: Talwandi Sabo Power Ltd. Has already installed Hybrid ESP (ESP+Fabric Filter) to meet up the SPM emission limit as per the new environmental norms.
10	Nabha Power Ltd, Rajpura, Punjab		1400		
	Nabha Power Ltd, Rajpura, Punjab	1	700	31.12.2019	FGD: Feasibility Study Carried Out and technology finalised as Wet Limestone based FGD and submitted to PSPCL. Bid documents for Wet limestone based FGD completed. Regulatory approval under process. ESP: Statutory limits being complied. De-Nox: Combustion tuning done. SCNR to be installed. Discussion with proven technology supplier under progress.
	Nabha Power Ltd, Rajpura, Punjab	2	700	31.12.2019	FGD: Feasibility Study Carried Out and technology finalised as Wet Limestone based FGD and submitted to PSPCL. Bid documents for Wet limestone based FGD completed. Regulatory approval under process. ESP: Statutory limits being complied. De-Nox: Combustion tuning done. SCNR to be installed. Discussion with proven technology supplier under progress.

7.0 Flexible Operation of Thermal Power Stations

India's Intended Nationally Determined Contributions (INDCs) include a reduction in the emissions intensity of its GDP by 33 to 35 percent by 2030 from 2005 level, and to create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent. Generating power from renewable sources of energy is of cardinal importance if India is to meet its INDC targets. With the aim to ensure future security & reliability of power supply and stability of electricity grids while maximizing generation from renewables flexibilization of existing coal-fired power plants is an important measure.

A committee was constituted in CEA to find out the level of flexibilization required from thermal power stations and future roadmap for integration of 175 MW RES generation into Indian grid by 2022. The committee has come up with the findings of the quantum of flexibilization, minimum thermal load, and ramp rate required in its interim report in June 2018. A presentation on Interim Report of the committee was arranged in MoP & CEA on 17-07-2018 and 25-07-2018 respectively. A pilot test of 40% minimum load and 3% ramp up/ ramp down (i.e. 15 MW/ Min) has been successfully conducted in Dadri TPS and similar pilots are planned in other utilities.

8.1 “Coal-Fired Generation Rehabilitation Project-India” funded by World Bank.

The World Bank has financed the “Coal-Fired Generation Rehabilitation Project-India” for demonstrating Energy Efficiency Rehabilitation & Modernization (EE R&M) at coal fired generating units through rehabilitation of 640 MW of capacity across three States-West Bengal, Haryana and Maharashtra. The above project has two components: -

Component-1. Energy Efficiency R&M at Pilot Projects

This component would fund implementation of Energy Efficient R&M of 640 MW capacity comprising Bandel TPS Unit-5(210 MW) of WBPDC, Koradi TPS Unit-6(210 MW) of Mahagenco and Panipat TPS Unit-3&4 (2x110 MW) of HPGCL. The World Bank has earmarked US \$ 180 million of IBRD loan and US \$ 37.9 million of GEF grants for the Component-1.

Component-2. Technical Assistance to CEA and Utilities

The Technical Assistance component of the project is aimed at providing support in implementation of EE R&M pilots, developing a pipeline of EE R&M interventions, addressing barriers to EE R&M projects and strengthening institutional capacities of implementing agencies for improved operation and maintenance practices. The World Bank has earmarked US \$ 7.5 million GEF grant for the Component-2.

8.1.1 World Bank Funded Energy Efficiency Pilot R&M Projects

(A) Bandel TPS (Unit-5, 210 MW)

The total estimated cost of R&M project is around US \$ 107.38 Million comprising of loan of around US \$ 59, GEF Grant of around US \$ 12.45 million. In addition to above, Technical Assistance of US \$ 1.3 million under GEF Grant has been provided for consultancy. Further, additional US\$ 22.21 million comprising of IBRD loan of US\$ 18.01 million and GEF grant of US\$ 4.2 million due to restructuring of funds as a result of cancellation of R&M works in Panipat TPS have also been provided for Bandel TPS.

Status of Physical Progress

The unit- 5 was taken under S/D for R&M/LE works in November.2013 and the unit synchronized on coal on 21st September, 2015. The unit attained a load of 215 MW on 24th November, 2015.

(B) Koradi TPS (Unit-6, 210 MW)

Background

The total estimated cost of the project is around US\$ 110.5 Million and the fund allocation for the Koradi TPS is loan of around US \$ 59 million (Loan)), grant of around US \$ 12.45 million. In addition to above Technical Assistance of US \$ 3.3 million under GEF Grant has been provided for 10 consultancy studies.

The Commercial Operation Date of the unit is 30.03.1982 & the unit is about 34 years old. The estimated cost of the R&M project based on award of contract is Rs. 486 Crore. The zero date for R&M project is 3rd March, 2014. The unit is under shutdown since 20th July, 2015 and targeted synchronization date is 18-02-2018.

Status of Physical Progress

- i) BTG Package:** i) Mahagenco issued that the Letter of Award to BHEL on May 31, 2013. The contract was signed on December 18, 2013. Overall 98% work of BTG package completed. Approximately 96% of the material (on Amount basis) is supplied by BHEL at site & further supply is in progress. 100% civil work and 95% electrical work of new ESP Control Room building at new location are completed. Turbine Mill overhauling work is 60 % completed. Coal Mill erection of 5 out of 6 are completed. All 3 FD fan replaced. Erection of BFP is 100% completed. Turbine is on barring since dated 10-01-2018.Overhauling of CW/CEP pumps are 100% completed. Generator package electrical is 80% completed and GTR erection is 99% completed.
- ii) Electrical Package:** Mahagenco issued the Letter of Award to M/s ABB Ltd on March 19, 2012 and the final contract was signed on May 25, 2012. Later on the package price escalation issue was resolved & M/s ABB restarted the work at site from 07.10.2015. Overall 78.79% work of Electrical package completed. Approximately 87% of the material (on Amount basis) is supplied by M/s ABB at site & further supply is in progress. Breaker ON/OFF time test completed. Retrofitting of HT breakers completed. HT/LT Motors overhaul are 70% and 75% completed respectively.LT Motor Erection and Testing is 25% completed. Unit Aux. Transformer (UAT) placed in position. FBT panel erection work is 40% completed. HT switchgear work 100% completed.
- iii) BOP Package:** Letter of Award (LOA) for Cooling Tower Plant Package, Ash Handling Plant package and Fire Detection, Protection & Inert Gas System Package are issued and contract is signed on 23.09.2016, 26.10.2016 & 05.11.2016 respectively. DM Plant & Pre-Treatment System Package has been cancelled. The need based work of DM Plant & Pre-Treatment System shall be carried out separately by O&M section. Under Cooling Tower Plant Package overall 70.47% work completed. 99% of overall material has been supplied at site & 85% of the dismantling work has been completed. 71% installation & civil works completed. Design Engg. work is in progress of Ash Handling Plant. 100% material supplied at site, Installation & Civil works completed and commissioning balance for Fire Detection, Protection & Inert Gas System Package.

Various Revised Milestones for R&M work at Unit-6, Koradi TPS are as under:

S.No.	Milestone	Target Date	Revised Target Date	Actual Date
1.	Zero date R&M Project	03-03-2014	--	03-03-2014
2.	Date of Shut Down for R&M	25-08-2015	--	20-07-2015
3.	Synchronization	20-04-2016	July 2018	--
4.	Trial Run or Reliability Run	20-05-2016	--	--
5.	P.G. Test	18-08-2016	--	--

In view of synchronization, full speed rolling of the TG was carried out on 11.03.2018. Full speed of the turbine was achieved and Generator dynamic testing was completed. Synchronization could not be achieved as turbine tripped without any alarm/indication and with high horizontal shaft vibrations. After Inspection all TG Bearings and after carrying out necessary rectifications rolling activity was again taken up on 25.03.2018. However, TG speed could not be raised beyond 1450 rpm due to high shaft vibrations (@ 412 microns) and high pedestal vibration (@ 90 microns) at Bearing No.1. Internal inspection of HP rotor is carried out- HP rotor sent to BHEL-Haridwar for rectification and full speed balancing. After rectification, all above components of TG are received at site on 22-05-2018. Re-assembly of TG is in progress. Re-assembly will be completed by 26-06-2018. Tentative date of synchronisation

C) Panipat TPS (Unit-3&4, 2x110 MW)

The unit 3 & 4 of Panipat TPS was initially identified for R&M under World Bank Programme. A loan of 448.36 Crores was assigned under R&M of Unit 3&4, PTPS, Panipat. As per the final TAR of consultant R&M cost was 561.27 Crores which was not found financial viable due to high sensitivity of returns to Station Heat Rate and exceeding of estimated cost against available funds. Therefore, HPGCL requested World Bank for foreclosure of the Loan Agreement.

8.2 Japan-India Co-operation for Study on Efficiency and Environmental Improvement of Coal Fired Stations

A MOU between Central Electricity Authority and Japan Coal Energy Centre (JCOAL) for preliminary study of Efficiency and Environment improvement study in coal fired power plants was signed on 30.4.2010 to carryout necessary diagnostic activities in few coal-fired power plants pertaining to Energy Efficient Renovation & Modernisation works and suggest measures to overcome barriers for promoting R&M, measurement for environmental improvement of coal-fired power plants in India. Accordingly, generating units are selected from Ukai and Wanakbori TPS (GSECL), Ramagundem STPS (NTPC) and Vijaywada TPS (APGENCO) for pre – primary studies. After Pre-Primary Studies, JCOAL finalized 3 units viz., Vijaywada TPS Unit-1 (210MW) of APGENCO, Wanakbori TPS Unit-1 (200 MW) of GSECL and Kahelgaon STPS Unit-2 (210 MW) of NTPC for full-fledged diagnosis. The final report had been submitted in December 2012.

The 2nd Phase MOU between CEA and JCOAL was signed on 11.06.2012 for carrying out detail diagnostic study for energy efficiency oriented R&M activities in three nos. of units. Durgapur

TPS unit no.4 (210 MW LMZ Unit) of DVC and one unit each from Badarpur TPS and Unchahar TPS of NTPC were selected for studies during the 2nd phase. JCOAL team visited these stations during December, 2012. The final study report for energy efficiency oriented R&M activities was submitted on 15th April, 2013.

The 3rd Memorandum of Understanding (MoU) on India – Japan Cooperation for Project on Efficiency & Environment Improvement for Sustainable, Stable and Low Carbon Supply of Electricity was signed on 22nd January, 2016.

Under Clean Coal Technology (CCT) Programme a study tour to Japan has been organised during current year from 29th Nov, 2017 to 7th Dec, 2017. The participants from CEA, MoP, DVC, NTPC and State Utilities visited the latest USC power stations at Japan. The total 89 officers from MoP, CEA and different power utilities were participated in the study tour under CCT Training Programme.

Under CEA- JCOAL Co-operation a study on replacement of old units of Badarpur TPS by highly efficient super critical units of higher size has been carried out. JCOAL team has carried out three site surveys and investigations in the month of Nov, 2015, Jan, 2016 and in March, 2016. The report on the study has been submitted in June, 2016 by JCOAL.

JCOAL has also carried out feasibility study on replacement of Singrauli STPS Stg. I & II units (5x200 MW+2x200 MW) of NTPC between December, 2016 to March, 2017.

Unit-3 of Dadri TPS of NTPC was identified for implementation of full-fledged diagnosis study i.e. Residual Life Assessment (RLA) study. JCOAL team has conducted RLA/Diagnostic Study at Unit-3 Dadri TPS of NTPC from 30th November, 2015 to 10th of December, 2015. The report on RLA/CA study of Unit-3 of Dadri TPS has been submitted by JCOAL. The objective of the RLA Study is to identify the remaining life and the current condition of Unit -3, to constitute the base for formulation of the plan of R&M implementation that is tentatively scheduled in 2018.

One-day workshop on " Project on Efficiency and Environmental Improvement for Sustainable, Stable and Low-carbon Supply of Electricity" was held on 11th Nov, 2016 and 10th Nov 2017 at New Delhi by CEA and JCOAL. Various stake holders from Central/State/Private in power sector participated in the workshop.

A Meeting on Study on O&M enhancement of existing units of DSTPS, DVC under CEA-JCOAL Cooperation was held among NEDO, JCOAL, CEA and DVC on 13th October 2017 at Kolkata in order to share O&M and safety related best practices. The expert team from Japan also visited DSTPS, DVC and collected required data for the purpose of O&M Study from 11.12.2017 to 14.12.2017.

Interim Report of the Study was submitted by JCOAL on 15th Dec 2017. Final Report has been prepared and was submitted in May 2018.

Mini-workshops were organized on 30-1-2018 at GSECL(Gujrat) and on 01-02-2018 at APGENCO (Andhra Pradesh) respectively for the year 2017-18 under CEA-JCOAL Cooperation for the project on Efficiency and Environment improvement of Coal Fired Power Stations in India.

Under CEA- JCOAL Co-operation a study is being carried out by JCOAL on adoption of available technologies to meet new environment standards and the economic viability of using such technologies in existing power plants. Combustion test of Indian Coal has been done at Japan. The Report of Combustion test of Indian Coal has been submitted. SCR Pilot test at NTPC's Sipat TPS is being carried out to meet the NO_x level in the flue gas as per new environmental norms. A diagnostic study for optimal environmental measures at Dadri TPS was conducted in February, 2018 and debriefing meeting was held in June 2018.

4th MoU to be signed between CEA and JCOAL is under process. The purpose of this MoU is to address issues and barriers in expediting sustainable, stable and low carbon thermal power

development by means of studies, training program and knowledge-sharing activities, outcomes of which are to be conducive to overall power development in India as well as to expedite relevant policy implementation by the Government of India. Following activities to be carried out under 4th MoU:

- Update on the current and future policy trend in the Indian power sector.
- Consideration of the identified issues/barriers to find out those which could be addressed through mutual collaboration.
- Identification of issues to be addressed regarding both existing and upcoming facilities, and also operation and maintenance.
- Implementation of studies with priorities, but not limited to environmental technologies for coal fired power generation such as IGCC, IGFC.
- Flexibilization measures and biomass utilization are also of high priority. Biomass study includes:
 - *Co firing of biomass pellets*
 - *Dedicated firing in Coal based plants*
 - *Dedicated biomass fired plants and*
 - *Waste to Energy Technologies*
- Study on Coal Washery and Coal GCV loss in power plant and its remedies
- Implementation of an annual workshop in India and CCT Training Programme in Japan
- Hold a joint meeting

**Status of units where Life Extension/ Renovation & Modernisation works have been taken up
for implementation during 2017-22**

STATE SECTOR LE Works

(as on 30.06.2018)

S.No.	State	Name of Station	Unit No.	Year of Comm.	Cap. (MW)	Status
1.	U.P.	Obra	12	1981	200	Unit is under s/d since 01-10-2016 for R&M works. LE Works started on 01.10.2016. Boiler: Work started from 15.02.7. Nearly 95% work completed. Turbine. Work started on 03.07.2017. Nearly 95% work completed. Generator: 100% work completed. ESP foundation completed, Pass-A-95%, Pass-B-50%. Ash Handling: Nearly 40% works completed (common for both unit-12 & unit-13) Switch Yard 400 kv CB- 100% work completed. Water treatment plant- 98% work completed. Coal Handling plant- nearly 50% work over. Date of commissioning given by M/s. BHEL is 15-09-2018.
2.	U.P.	Obra	13	1982	200	Date of commissioning given by M/s. BHEL is 31-12-2018. R&M works started from 17-05-2018. Unit is under s/d from 16-05-2018
3.	U.P.	Anpara TPS	1	1986	210	LE works yet to be decided by the utility
4.	U.P.	Anpara TPS	2	1987	210	LE works yet to be decided by the utility
5.	U.P.	Anpara TPS	3	1988	210	LE works yet to be decided by the utility
6.	Gujarat	Ukai	3	1979	200	<u>ESP R&M:</u> ESP retrofitting of unit-3 has been completed and unit lit up on 26-04-2016. PG test has been carried out and guarantee parameter achieved. <u>Turbine & Boiler R&M:</u> Order for consultancy work R&M of turbine & boiler and auxiliaries considering heat rate (efficiency) improvement with ramping up/ down of the load and PG test of ESP is placed on STEAG, Noida on 30.03. 2016. After observing the satisfactory performance of Phase-I(Ukai-4) retrofitted unit, the R&M of Phase-II R&M of LMZ turbine will be implemented. <u>C&I Up-gradation :-</u> Order of awarded for C&I upgradation to BHEL on 18.06.2015. C&I upgradation of Unit-3 has been completed and unit lit up 26-04-2016. Ash slurry pump house: - LOI issued to M/s Deccan Mechanical & Chemical Industries Pvt. Ltd., Pune on 29-05-2018 at the cost of Rs. 13.87 Crs. <u>Boiler Back Pass Modification:</u> Work at unit-3 started after observing performance of unit-4.
7.	Gujarat	Ukai	4	1979	200	

						<p>Ukai TPS Unit -4 was taken under S/D on 07-12-2016 and synchronised on 17.05.2017 and COD achieved on 24.05.2017. PG test for retrofitted ESP, Boiler after modification and retrofitted Turbine was completed on 17-06-2017, 23-08-2017 and 02-11-2017 respectively. Guaranty parameters achieved.</p> <p><u>Boiler Back Pass Modification:</u> Order awarded to BHEL for availability & efficiency improvement through modification in Boiler Back Pass and replacement of APH. Work completed and unit lit up on 04-05-2017. PG test carried out and guaranty parameter achieved.</p> <p><u>Ash slurry pump house:-</u> - LOI issued to M/s Deccan Mechanical & Chemical Industries Pvt. Ltd., Pune on 29-05-2018 at the cost of Rs. 13.87 Crs.</p>
8.	Gujarat	Ukai	5	1985	200	<p>ESP R&M: ESP retrofitting of Ukai unit-5 completed and unit lit up on 28-03-2017. PG test of ESP has been completed.</p> <p>Turbine & Boiler R&M</p> <p>Order for consultancy work R&M of turbine & boiler and auxiliaries considering heat rate (efficiency) improvement with ramping up/ down of the load and PG test of ESP is placed on STEAG, Noida of Rs. 2.24 Crs. on 30.03. 2016. After observing the satisfactory performance of Phase-I(Ukai-4) retrofitted unit, the Phase-II R&M of LMZ turbine will be implemented.</p> <p>The consultancy services for turbine retrofitting and modification in Boiler Back Pass with achievement of revised emission norms for Ukai unit 3 & 5 is already awarded. Based on the feasibility report for implementation of FGD & PG test results of Ukai Unit No. 4, the implementation of R&M of proposed Units shall be decided. For implementation of DeNOx system, GSECL is awaiting the results of pilot projects of NTPC. Meanwhile,</p> <p>Ash slurry pump house:- - LOI issued to M/s Deccan Mechanical & Chemical Industries Pvt. Ltd., Pune on 29-05-2018 at the cost of Rs. 13.87 Crs.</p>
9.	Gujarat	Wanakbori	1	1982	210	<p>The consultancy services for turbine retrofitting and modification in Boiler Back Pass with achievement of revised emission norms for Wanakbori unit 1&2 is already awarded. Based on the feasibility report for implementation of FGD & PG test results of Ukai Unit No. 4, the implementation of R&M of proposed Units shall be decided. For implementation of DeNOx system, GSECL is awaiting the results of pilot projects of NTPC.</p> <p>ESP R&M: The order for retrofitting is issued to BHEL on 18.03.2016 and Zero date started from 14-01-2016. ESP retrofitting unit-1 & 2 completed and units lit up on 07-03-2017 and 08-04-2018 respectively.</p> <p>Turbine&Boiler R&M: Order for consultancy</p>
10.	Gujarat	Wanakbori	2	1983	210	

					<p>work R&M of turbine & boiler and auxiliaries considering heat rate (efficiency) improvement with ramping up/ down of the load and PG test of ESP is placed on STEAG, Noida of Rs. 2.24 Crs. on 30.03. 2016.</p> <p>After observing the satisfactory performance of Phase-I(Ukai-4) retrofitted unit, the Phase-II R&M of LMZ turbine will be implemented.</p> <p>Approx. 93% material supplied. Meanwhile, GSECL has initiated feasibility study for replacement of WTPS 2x 210 MW Units by 1x800 MW Super Critical Units.</p> <p>Pending work of 1 No. of Unit-2, Bus coupler will be carried out in available shutdown.</p>
11.	Gujarat	Wanakbori	3		<p>210 ESP Retrofitting work</p> <p>Shutdown of WTPS Unit No. 3 is commenced from 25.07.2017. ESP retrofitting unit -3 completed and unit lit up on 27-11-2017. PG test is planned in April 2018.</p> <p>Turbine R&M:- Order awarded to M/s NASL Noida on 29-04-2015 and zero date started from 10.03.2015. Turbine R&M of Wankbori Unit -3 completed and unit lit up 27-11-2017 and 72 hrs. trial run on full load completed successfully on 5-12-2017. PG test carried out on 10-03-2018 and guaranteed parameters achieved.</p> <p>Boiler Back Pass Modification: - Order awarded to M/s BHEL for availability & efficiency improvement through modification in Boiler back pass and replacement of APH. Boiler back pass modification and APH replacement work completed and unit lit up on 27-11.2017 and synchronized on 01.12.2017. PG test carried out on 09-03-2018 and guaranteed parameters achieved.</p>
11.	Maharashtra	Koradi	6	1982	<p>210 The unit is being taken up by WB funded project. The total cost of the project including IDC is 636.93 crores. The unit is under shutdown since 25th August, 2015 and expected to be synchronized on 18-02-2018.</p> <p>BTG Package: Mahagenco issued that the Letter of Award to BHEL on May 31, 2013. The contract was signed on December 18, 2013. Overall 98% work of BTG package completed. Approximately 96% of the material (on Amount basis) is supplied by BHEL at site & further supply is in progress. 100% civil work and 95% electrical work of new ESP Control Room building at new location are completed. Turbine Mill overhauling work is 60 % completed. Coal Mill erection of 5 out of 6 are completed. All 3 FD fan replaced. Erection of BFP is 100% completed. Turbine is on barring since dated 10-01-2018.Overhauling of CW/CEP pumps are 100% completed. Generator package electrical is 80% completed and GTR erection is 99% completed.</p>

						<p>Electrical Package: Mahagenco issued the Letter of Award to M/s ABB Ltd on March 19, 2012 and the final contract was signed on May 25, 2012. Later on the package price escalation issue was resolved & M/s ABB restarted the work at site from 07.10.2015. Overall 78.79% work of Electrical package completed. Approximately 87% of the material (on Amount basis) is supplied by M/s ABB at site & further supply is in progress. Breaker ON/OFF time test completed. Retrofitting of HT breakers completed. HT/LT Motors overhaul are 70% and 75% completed respectively. LT Motor Erection and Testing is 25% completed. Unit Aux. Transformer (UAT) placed in position. FBT panel erection work is 40% completed. HT switchgear work 100% completed.</p> <p>BOP Package: Letter of Award (LOA) for Cooling Tower Plant Package, Ash Handling Plant package and Fire Detection, Protection & Inert Gas System Package are issued and contract is signed on 23.09.2016, 26.10.2016 & 05.11.2016 respectively. DM Plant & Pre-Treatment System Package has been cancelled. The need based work of DM Plant & Pre-Treatment System shall be carried out separately by O&M section. Under Cooling Tower Plant Package overall 70.47% work completed. 99% of overall material has been supplied at site & 85% of the dismantling work has been completed. 71% installation & civil works completed. Design Engg. work is in progress of Ash Handling Plant. 100% material supplied at site, Installation & Civil works completed and commissioning balance for Fire Detection, Protection & Inert Gas System Package.</p>
12.	Maharashtra	Koradi	7	1983	210	R&M/LE study not carried out
13.	Maharashtra	Bhusawal	2	1979	210	All studies Completed, Final DPR received from M/s Energo Engg Ltd has been approved by MSPGCL Board in May, 2016. Further, MSPGCL Board directed that no other R&M work shall be taken up without monitoring results of Koradi U-6.
14.	Maharashtra	Bhusawal	3	1982	210	RLA/ Feasibility study for EER&M has not been carried out.
15.	Maharashtra	Nashik	3	1979	210	DPR finalised, Govt. of Maharashtra has approved 20% equity. The Unit-3 was to be taken up under KfW funded project. All studies completed, and DPR has been prepared. Also Tender documents have been prepared. But Nasik Unit-3 R&M project withheld and Nasik Unit -4 R&M shall be taken up on priority. Further, MSPGCL Board directed that no other R&M work shall be taken up without monitoring results of Koradi U-6.
16.	Maharashtra	Nashik	4	1980	210	All studies Completed, Final DPR is submitted by M/s Steag. Approval of DPR is in progress. Nasik Unit -4 R&M shall be taken up on priority. Further, MSPGCL Board directed that no other R&M work shall be taken up without monitoring results of Koradi U-6.
17.	Maharashtra	Nashik	5	1981	210	R&M/LE feasibility study completed.

						MSPGCL Board directed that no other R&M work shall be taken up without monitoring results of Koradi U-6.
18.	Maharashtra	Parli	4	1985	210	R&M/LE study not carried out. Board directed that no other R&M work shall be taken up without monitoring results of Koradi U-6.
19.	Maharashtra	Parli	5	1987	210	R&M/LE study not carried out. Board directed that no other R&M work shall be taken up without monitoring results of Koradi U-6.
20.	Maharashtra	Chandrapur	3	1983	210	R&M/LE study not carried out. Board directed that no other R&M work shall be taken up without monitoring results of Koradi U-6.
21.	Maharashtra	Chandrapur	4	1984	210	R&M/LE study not carried out. Board directed that no other R&M work shall be taken up without monitoring results of Koradi U-6.
22.	Maharashtra	Chandrapur	5	1983	500	R&M/LE study not carried out. Board directed that no other R&M work shall be taken up without monitoring results of Koradi U-6.
23.	Maharashtra	Chandrapur	6	1984	500	R&M/LE study not carried out
24.	Maharashtra	Khaperkheda	1	1989	210	R&M/LE study not carried out
25.	Maharashtra	Khaperkheda	2	1990	210	R&M/LE study not carried out
26.	Bihar	Barauni	6	1983	110	Unit-6 is likely to be synchronized by the end of July 2018. Boiler: 97% work completed, Turbine: 98% work completed PG Test for both units is pending.
27.	W.Bengal	Kolaghat	1	1990	210	DPR has been prepared and accepted. After successful completion of the unit-3 work the R&M works of the Unit -1&2 will be taken up.
28.	W.Bengal	Kolaghat	2	1985	210	DPR has been prepared and accepted. After successful completion of the unit No. 3 work the R&M works of the Unit No 1&2 will be taken up.
29.	W.Bengal	Kolaghat	3	1984	210	Estimated cost of L.E.of Unit# 1,2&3: 1090 Crs U# 1, 2 & 3: There are 3 packages (ESP, AHP & BTG). ESP (1,2,3) : LOA placed on M/s KCIN. Starting date is 22.03.17. (Schedule is 35 months from LOA). ESP (unit- 3): Mechanical erection work is in progress. ESP (unit- 1): Dismantling work under progress. AHP (1,2,3): LOA placed on M/s Indure. Starting date 26/07/2017. (schedule is 29 months from LOA) Unit#3 Dismantling work is completed. BTG (1,2,3): Initial bid evaluation is completed. (Schedule is 33 months from LOA). Technical bids are submitted on 03-01-2018. Initial bid evaluation is completed.

						<p>Boiler & Auxiliary System: - DPR is ready. Initial bid evaluation is completed.</p> <p>.</p> <p>BOP: - Clarifloculator:- Technical bids are submitted on 03-01-2018. Initial bid evaluation is completed.</p> <p>Electrical and Instrumentation: - Technical bids are submitted on 03-01-2018.</p> <table border="1"><tr><td colspan="3">Electrical</td></tr><tr><td>1</td><td>GPR and 2 breaker Relay</td><td>Initial bid evaluation is completed</td></tr><tr><td colspan="3">Instrumentation</td></tr><tr><td>1</td><td>ESP</td><td>Engg. going on. C&I : No material received at site and no erection has been started.</td></tr><tr><td>2</td><td>AHP</td><td>-do-</td></tr><tr><td>3</td><td>Governing System</td><td>Initial bid evaluation is completed</td></tr><tr><td>4</td><td>Upgradation/ replacement of instrumentation system as per mechanical scope of work.</td><td>Initial bid evaluation is completed</td></tr><tr><td>5</td><td>Incorporation of ATRS</td><td>Initial bid evaluation is completed</td></tr></table> <p>NOTE:</p> <p>Shutdown of ESP and AHP shall be matched. BTG package of Unit-1 and 2 shall be matched with respective ESP and AHP. BTG Package of unit-3 shall start last if situation permits.</p> <p>Total estimated cost of R & M/LE works is Rs. 1090 Crs for unit-1,2 & 3.</p> <p>Financial progress:</p> <p>ESP- Payment Rs 21 crore was made for ESP up to 30-06-2018.</p> <p>AHP- Payment Rs. 16.32 crore was made for AHP till 30-06-2018.</p>	Electrical			1	GPR and 2 breaker Relay	Initial bid evaluation is completed	Instrumentation			1	ESP	Engg. going on. C&I : No material received at site and no erection has been started.	2	AHP	-do-	3	Governing System	Initial bid evaluation is completed	4	Upgradation/ replacement of instrumentation system as per mechanical scope of work.	Initial bid evaluation is completed	5	Incorporation of ATRS	Initial bid evaluation is completed
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5	Incorporation of ATRS	Initial bid evaluation is completed																												
30.	W.Bengal	Kolaghat	5	1991	210	<p>U# 4, 5 & 6 : Only 1 package for ESP ESP Package: L 1 bidder is selected. M/s Soil & Enviro Industries Pvt. Ltd. Is successful bidder.</p>																								
31.	Karnataka	Raichur	1	1985	210	Boiler C&I works completed.																								
32.	Karnataka	Raichur	2	1986	210	<p>DPR is being revised, duly incorporating additional works in the R&M/LE scope of work is put up for Head Office approval. Once the DPR is approved, same will be submitted to KERC for approval. Project cost is Rs. 1240.18 crores. However, all the efforts are being made to reduce the R&M expenditure to minimum considering essential works required for enhancing performance/ Heat Rate.</p> <p>KPCL has engaged a consultant to explore the technologies/ possibilities to meet the new environmental norms. Consultant has submitted feasibility reports/DPR. The same</p>																								

						<p>has been put up to HO. After finalization of DPR, KPCL will take decision on comprehensive R&M Works of unit 1&2 according to the recommendations of DPR.</p> <p>Further, proposal for implementation of environmental solutions is being prepared after visiting some of the power plants who have already installed FGD system. FGD tender document preparation under progress.</p>
33.	Karnataka	Raichur	3	1991	210	<p>M/s Energo Engineers Projects limited., Gurgaon is appointed as consultant for conducting Feasibility studies, Preparation of DPR, Technical Specifications & Bid Document and assisting KPCL in selection of EPC contractor for R&M of 210 MW Coal fired TPS Unit-3, at RTPS. As a part of Comprehensive R&M of unit-3 consultant conducted Energy Audit during the month of Feb-17 & Condition assessment during the month of March-17, and carried out RLA studies of Boiler in month of June-2017. Awaiting for EA & RLA reports from the consultant. The reports will be submitted by the firm after completing some of the pending works of Energy Audit.</p>
Sub Total State Sector (LE)			34		7570	

**STATE SECTOR
(R&M Programme)**

S.N.	State	Name of Station	Unit No.	Year of Comm.	Cap. (MW)	Status
1.	U.P.	Obra	7	1974	100	<p>- Work is being executed by BHEL.</p> <p>- Zero date of the scheme is 04.12.2009. Unit was scheduled on 23 months from zero date i.e Nov 2011. The revised cost of R&M scheme for unit 7 is 144.11 crores.</p> <p>All mechanical works completed. Lightup of unit was withheld due to fire in 6.6 kV breaker in Nov., 2016. BHEL and Scheider experts are called to assess the extent of damage and submit list of required spares for revival of switchgear of the unit. Erection work has been completed.</p> <p>Boiler: 100% work completed (steam blowing done).</p> <p>Turbine: 100% work completed (Only rolling pending).</p> <p>Generator: 99% work completed (Only H₂ filling pending)</p> <p>BoP: 100% work completed (only mill-7A trial pending. Reserve supply required)</p> <p>Restoration of electrical supply in S/G room is under progress.</p>
2.	U.P.	Anpara'B	4	1993	500	<p>R&M works is being executed by BHEL & M/s MITSUI & Toshiba OEM, Japan. –</p> <p>Total cost of scheme is Rs. 691.97 cr. Total expenditure upto 30.06.2018 is 441.00 crs.</p> <p>Boiler: Nearly 70% work completed.</p> <p>TG: Nearly 70% work completed.</p> <p>Electrical & Instrumentation: Nearly 70% work completed.</p> <p>BoP: Nearly 70% work completed.</p> <p>- The R&M work would be carried out in AOH and are likely to be completed by 31-03-2019. Utility decided to carry out Feasibility Study to meet the environmental norms.</p>
3.	U.P.	Anpara'B	5	1994	500	<p>Boiler: Nearly 70% work completed.</p> <p>TG: Nearly 70% work completed.</p> <p>Electrical & Instrumentation: Nearly 70% work completed.</p> <p>BoP: Nearly 70% work completed.</p> <p>- The R&M work would be carried out in AOH and are likely to be completed by 31-03-2019. Utility decided to carry out Feasibility Study to meet the environmental norms.</p>
4.	Punjab	Ropar	1	1984	210	Retired from 01-01-2018
5.	Punjab	Ropar	2	1985	210	
6.	Punjab	Ropar	5	1992	210	
7.	Punjab	Ropar	6	2001	210	<p>RLA/CA Study already stands conducted. The consultant M/S NTPC had prepared the DPR on the basis of RLA/CA study & submitted it to GGSSTP, Rupnagar. Further GGSSTP has submitted the same to the erstwhile PSEB for approval of the major R&M/LE Works.</p> <p>Replacement of old and obsolete HP Heaters of unit 1&2 has been completed. Breakers have been fitted & commissioned in the 220KV Switch yard. Work New Replacement of steam & water analysis system have been installed & commissioned on unit 1-6. All the requisitioned valves have been retrofitted & commissioned, while on unit-2, 90% of valves has been retrofitted. The electro Mechanical Vibratory Feeders at ERH in CHP has been installed & commissioned. Upgradation of wagon Trippler No.3 in coal handling plant of GGSSTP, magnetic separators on conveyors in CHP has been installed & commissioned. Material has been supplied by BHEL for the replacement of existing APH with modified design24 Sector APH on unit 1 & 2. But due to Punjab Govt. decision to permanently close unit 1& 2 of Ropar TPS, APH would be installed on unit 6 during next overhauling in 2018-19. Phase-II Migration of WDPF System to Ovation system on</p>

						Unit-5 completed. Replacement of minimum oil circuit breakers (MOCBs) with vacuum circuit breakers of units 3,4,5 & 6 would be carried out during the Year 2018-19. Replacement of Fire Detection & Annunciation system at various locations including cable galleries of Ropar TPS would be carried out in the year 2019-20. Replacement of ESP controllers of stage 3 would be taken up in 2019-20.
8.	Punjab	GH TPS (Leh. Moh.)	1	1997	210	NO R&M/LE activity has been planned. Proposal for availing consultancy service to meet the new environmental norms is under consideration of higher authorities of PSPCL
9.	Punjab	GH TPS (Leh. Moh.)	1	1997	210	
10.	Rajasthan	Kota	3	1988	210	Total 14 activities sanctioned for R&M. Estimated cost of R&M is Rs. 356.13 crores. Expenditure incurred till date is Rs.195 Cers. - 10 nos of works fully completed. - R&M work of CHP system is under progress. Order placed to M/s. Enrtgo Engineering Projects Ltd. (extended upto 18-10-2018 for main package & 11-02-2019 for optional package. Work being executed through M/s Elcon EPC Project, Gujarat. - Installation Vacuum pump is under progress, placed to M/s. Millenium Impex Pvt. Ltd. - 01 no. work of Air Compressor replacement has been dropped due to technical reasons. - E- Tender for VFD cancelled due to technical reasons. <u>Proposal for additional capitalisation during the year 2017-22</u> - Replacement of existing BHEL make Procontrol P-13 SG-TG sysem of unit#5. - Renovation of static excitation and AVR system of 210 MW unit#3 & 4 by digital AVR system. - Strengthening and repair of RCC & steel structure of crusher house. Structure of DM plant, RCC of acid alkali tank, SDG tank and plow feeder at KSTPS. - Strengthening and repair of RCC framed structure od IDCT Cooling Tower of unit #6. - Conversion of Relay logic contrl system of CHO into PLC based system. - Purchase of 3 nos of bulldozer. - Supply, Design, installation, testing and commissioning of online energy accounting and management system of KSTPS.
11.	Rajasthan	Kota	4	1989	210	
12.	Rajasthan	Kota	5	1994	125	
13.	Rajasthan	Suratgarh TPS	1	1998	250	
14.	Rajasthan	Suratgarh TPS	2	2000	250	- Modification in ACW system of Unit 1& 2 has been completed on 28.01.2017. - Augmentation of DMCCW system of Unit 1 & 2 completed in September, 2016 - Blow down system for cooling Tower of Unit 2,3,4&5 completed in 2015. - Replacement of LR beam of ESO on Unit-1 is likely to be completed in financial year 2018-19, subject to shutdown of Unit -1 - NIT dropped & new NIT will be floated by H/Q for providing dense phase conveying system from existing intermediate silo system of ESP of unit 1,2,3,4,5& 6 . - SOx, NOx & CO Analyser for Unit 2,3 & 4 has been completed on 15.02.2017 - Upgradation of HMI system of unit 2 completed on 06.09.2016. - PO Placed Upgradation of workshop . CSPGCL has taken-up need based R&M for life
15.	Rajasthan	Suratgarh TPS	3	2001	250	
16.	Rajasthan	Suratgarh TPS	4	2002	250	
17.	Chhattisgarh	Korba (West)	1	1983	210	

18.	Chhattisgarh	Korba (West)	2	1984	210	extension on the basis of R&LA studies and also plan for compliance of new environmental norms. RLA studies done by M/s Evonik. Scope of work of Boiler, Turbine, Electrical Instrumentation, Civil and BOP is being finalised. The CSERC in its order dated 61-03-2016 has approved such scheme under capital investment plan. Order placed on BHEL Noida for Augmentation, R&M and up-gradation of ESPs to maintain emission level limit below 50mg/Nm ³ and work is under progress. LOI issued to BHEL for Augmentation of DCS/ C&I System. Tender floated and offer received, Techno commercial scrutiny is under process for Fire protection system of Transformer & Cables Vault Galleries. M/s DCPL, Kolkata is engaged to carry out feasibility study for installation of FGD. Other schemes approved by CSERC for financial year 2016-17 to 2020-21 are under tendering process.
19.	Chhattisgarh	Korba (West)	3	1985	210	
20.	Chhattisgarh	Korba (West)	4	1986	210	
21.	M.P.	Sanjay Gandhi	1	1993	210	Unit-1 –The consultant has completed RLA/CA Studies in Dec 2014 and submitted the DPR in March 2015.
22.	M.P.	Sanjay Gandhi	2	1994	210	Unit-2- The consultant have completed RLA/CA Studies in Aug 2016 and submitted the DPR in Jan 2017. Boiler: - A consultancy order has been placed on M/s Steag Energy Services(I) Pvt. Ltd., Noida for providing consultancy services to prepare bid documents, assistance in selection of executing agency & monitoring of implementation of R&M Works. The consultant has submitted draft tender specifications for R&M of BTG, Air compressor, DM & CW system, Electrical, fuel oil system, Hydrogen generation plant & Ash Handling Plant. The same were forwarded to all concerned for scrutiny. In this regard, several round of discussions held amongst all concerns to finalise specifications. Based on the discussion held on commercial part of BTG & APH specification, M/s. Steag has submitted revised draft specification & consultant also submitted draft PQR of other packages. These are being evaluated. TG:- M/s. Steag has submitted draft tender specifications. BOP :- The M/s Steag has submitted draft tender specifications. Electrical & C&I:- The M/s Steag team made site visit & discussions to freeze the detailed scope of work. M/s FICHTNER consulting Engineers (India) Ltd. appointed as consultant to carry out feasibility study and preparation of tender document for installation of FGD & other equipment in April 2018. Recommendation cum DPR submitted by consultant. Likely to be accepted by MPPGCL by August 2018. Technical and commercial specification are scheduled to be completed by September 2018. NIT will be floated by the end of September, placement of order will be done by March 2019 and installation of FGD completed by September 2021.
23.	Maharashtra	Chandrapur	7	1997	500	R&M works yet to be decided by the utility.
24.	Maharashtra	Khaperkheda	3	2000	210	R&M works yet to be decided by the utility.
25.	Maharashtra	Khaperkheda	4	2001	210	R&M works yet to be decided by the utility.
26.	Tamil Nadu	Tuticorin TPS	1	1978	210	1st and 2nd RLA already completed. Boiler: Strengthening of weak insulation of Boiler-To be carried out during 2018-19. T.G.: -Minor repair works such as attending cracks in the Strengthening of weak insulation of Boiler

						<p>carried out during 2017-18. All diaphragm in HP, IP & LP had been renewed & work completed during 2009-10.</p> <p>Electrical & C&I: - Existing 3 nos. single phase GT were replaced by new one during 2012-13.</p> <p>BOP: -Replacement of complete ESP internals. Modification of APH sealing system by double sealing completed during 2009-10.</p> <p>Complete replacement of economizer coils assembly, LTSH supply tubes and straight tubes panels for super heater rear wall near economizer. Tender open on 03-11-2017. Price bid opened on 04-05-2018 and approval for placing order is under process.</p> <p>Administrative approval for Distributed Digital Control Monitoring and Information System (DDCMIS) accorded on 29-12-2015. Technical specification was approved by Board of TANGEDCO on 30-04-2018. Open tender floated with due date 03-08-2018 at TTPS.</p> <p>Administrative approval for Augmentation of ESP is under process. Budgetary offers are under scrutiny.</p> <p>Administrative approval accorded for Replacement of 2 nos of Primary Air Fan motors with journals bearing by new motors with antifriction bearings in units I,II&III.</p> <p>Purchase order issued to BHEL, Chennai on 25-05-2018 for retrofitting of 210 MW, LMW surface condenser in any one of the unit-1, 2 & 3 TPS. Material to be supplied. Delivery period is 8 months.</p> <p>Replacement of unit auxiliary transformer in unit 1 & 2- Administrative approval proposal is under process.</p> <p>Tender for Installation of 10 MLD Desalination Plant consultancy services floated and opened on 11-10-2017 (common to station)</p>
27.	Tamil Nadu	Tuticorin TPS	2	1980	210	<p>Need based R&M works have been carried out in Boiler TG, C&I and BoP. Following works have been completed in unit-2.</p> <p>Boiler: - Replacement of reheater Rear Pendant Assembly-work completed in 2007-08.</p> <p>T.G:- All diaphragms in HPT,LPT,IPT had been renewed. All 3 rotors have been replaced with reconditioned spare rotors-during 2008.</p> <p>Electrical & C&I: Modernisation of DCS-work completed during 2008-09.</p> <p>Approval for replacement of 2 nos Primary Air Fan motors with journal bearings by New motors with antifriction bearings in units 1,2 and 3 for tender specification accorded by on 07-04-2018. Tender opened on 06-06-2018. Evaluation is under process.</p> <p>Purchase order issued to BHEL, Chennai on 25-05-2018 for retrofitting of 210 MW, LMW surface condenser in any one of the unit-1, 2 & 3 TPS. Material to be supplied. Delivery period is 8 months.</p> <p>Replacement of unit auxiliary transformer in unit</p>

					<p>& 2- Administrative approval proposal is under process. Strengthening of weak insulation of Boiler-To be carried out during 2018-19.</p> <p>Purchase order issued to BHEL, Chennai on 25-05-2018 for retrofitting of 210 MW, LMW surface condenser in any one of the unit-1, 2 & 3 TPS. Material to be supplied. Delivery period is 8 months.</p> <p>BOP:-Refurbishment of complete bottom ash system-work completed in 2008-09. Modification of APH sealing system by Double sealing-work completed on 27.3.2017. Replacement of existing steam ejectors by Vacuum pumps-commissioned on 14.07.16.</p> <p>Consultancy awarded to M/s. Fitchner Consulting Engineer, Chennai on 12-02-2018 for Installation of 10 MLD Desalination Plant consultancy services. Administrative approval accorded on 07-04-2017 for retrofitting of 210 MW, LMW surface condenser in any one of the unit-I, II & III at TPS.</p>	
28.	Tamil Nadu	Tuticorin TPS	3	1982	210	<p>1st and 2nd RLA already completed. Boiler:- Replacement of Eco. Header-work completed in 2007-08. Replacement of water wall tubes in high heat zone (20M to 40M)-Work completed during 2013-14. Strengthening of weak insulation of Boiler completed during 2017-18. T.G.:- IP Rotor, diaphragms, IP Nozzle segment, TG Bearing 5,6&7, HPT Control Valve 3&4 renewed during COH in 2011-12. Electrical & C&I:- Replacement of existing static AVR by DVR work completed during 2013. BOP:- Modification of APH by double sealing completed in 2013-14.</p> <p>- Approval for replacement of 2 nos Primary Air Fan motors with journal bearings by New motors with antifriction bearings in units 1,2 and 3 for tender specification accorded by on 07-04-2018. Tender opened on 06-06-2018. Evaluation is under process.</p> <p>Administrative approval for Augmentation of ESP is under process. Budgetary offers are under scrutiny. Replacement of unit auxiliary transformer in unit 1 & 2- Administrative approval proposal is under process.</p> <p>- awarded to M/s. Fitchner Consulting Engineer, Chennai on 12-02-2018 for Installation of 10 MLD Desalination Plant consultancy services. -Administrative approval accorded on 07-04-2017 for retrofitting of 210 MW, LMW surface condenser in any one of the unit-I, II & III at TPS. (common to station)</p>
29.	Tamil Nadu	Tuticorin TPS	4	1992	210	<p>Boiler: Replacement of Eco. Coil assembly works completed during COH 2014-15 T.G.- Minor repair works-completed during COH 2014-15 Electrical & C&I:- Generator Stator replaced with new, static AVR replaced by DVR, Upgrading of Hitachi DCS, R&M of man machine interface system during 2014-15. Replaced existing analog type static generation protection system by numerical type Gen. protection system during 2015-16. BOP:- Modification of APH sealing system by</p>

						<p>Double Sealing, Replacement of complete ESP internals for first two rows and controllers, renewal of flue gas duct from APH outlet to ESP inlet completed during COHof 2014-15.</p> <p>Administrative approval accorded on 29-05-2017 for Hot Re-heater Assembly in Unit IV Boiler. Tender opened on 11-01-2018. Proposal for price bid opening was approved by BLTC, under process at TTPS.</p> <p>Consultancy awarded to M/s. Fitchner Consulting Engineer, Chennai on 12-02-2018 for Installation of 10 MLD Desalination Plant consultancy services. (common to station)</p> <p>-Tender open and technical evaluation under process for complete replacement of Hor Reheater Assembly in unit IV Boiler.</p>
30.	Tamil Nadu	Tuticorin TPS	5	1991	210	<p>Ist RLA completed.</p> <p>Boiler:- Replacement of Eco. Coil assembly works completed during 2016-17.</p> <p>T.G.:- During the Capital overhaul 2015-16 CRH strainer alone renewed.</p> <p>Electrical & C&I:- static AVR replaced by DVR, Provision of integrated energy management system during 2015-16. Upgradation of turbine control system completed during 2016-17.</p> <p>Administrative approval accorded on 19-05-2017, tender specification approval accorded on 05-01-2018. Open tender floated and technical bid opened on 04-05-2018 for replacement of existing outdated Pro-control systems in FSSS, SBC, APRDS, STC, SADC and scanner system by latest DCS in Unit-V.</p> <p>BOP:- Modification of APH sealing system by double sealing completed in 2015-16. Replacement of ESP field internals, high voltage transformer rectifiers, electronic control panel with latest technology completed in 2015-16 Renewal of flue gas duct from APH outlet to ESP inlet during 2015-16.</p> <p>Consultancy awarded to M/s. Fitchner Consulting Engineer, Chennai on 12-02-2018 for Installation of 10 MLD Desalination Plant consultancy services. (common to station)</p> <p>Administrative approval accorded on 19-05-2017. Tender specification approved on 05-01-2018. Open tender floated with due date on 13-03-2018. Due date has been extended.</p>
Sub Total State Sector (R&M)				30	7135	
Total State Sector (LE+R&M)				64	14705	

CENTRAL SECTOR R&M (Gas Based)

1	NEEPCO	Kathalguri CCGT	GT-1	1995	33.50	<p>Gt#1 (a) Order for supply of M/s MHI make MEGAC V, Diasys Netmation System for Up gradation and replacement of old controller MACTUS 620 sequencer and MEGAC III analog Governor already placed with the OEM, M/s MHI, Japan on 26.03.2015. Work completed on 15-02-2017.</p> <p>(b) The new vibration monitoring system procured against unit-1 had to be installed in unit-4 due to available s/d and requirement of the unit. The process for tender for procurement of another new vibration monitoring system is under progress and expected to be completed in 2018-19.</p> <p>(c) Order for Compressor Rotor Refurbishment (CRR) and Comprehensive Rotor Inspection (CRI) for unit#1 to unit #4 have already been placed with the OEM, M/s MHI, Japan on 28.05.2013 and unit is planned in 2019-20 as per the maintenance schedule of OEM.</p>
2		Kathalguri CCGT	GT-2	1995	33.50	<p>GT#2 : (a) Order for supply and commissioning of M/s MHI make MEGAC V, Diasys Netmation System for Up gradation and replacement of old controller MACTUS 620 sequencer and MEGAC III analog Governor already placed with the OEM, M/s MHI, Japan on 26.03.2015. The materials already received and commissioned on 31.07.2017.</p> <p>(b) The process of tender procurement of new vibration monitoring system is under progress and expected to be completed in 2018-19.</p> <p>(c) Order for Compressor Rotor Refurbishment (CRR) and Comprehensive Rotor Inspection (CRI) for unit#1 to unit #4 have already been placed with the OEM, M/s MHI, Japan on 28.05.2013 and this unit is planned in 2018-19 (Feb./March 2019) as per the maintenance schedule of OEM. .</p>
3		Kathalguri CCGT	GT-3	1995	33.50	<p>Order for Compressor Rotor Refurbishment (CRR) and Comprehensive Rotor Inspection (CRI) for unit#1 to unit #4 have already been placed with the OEM, M/s MHI, Japan on 28.05.2013 and the rotor after CRR/CRI in Japan already reached the Plant site. The above works for GT 3 executed w.e.f. 19-06-2017 and completed on 20-07-2017.</p> <p>The order for procurement of new vibration monitoring system is already placed and installed in July 2017 along with major overhauling of Gas Turbine planned in July 2018.</p>
4		Kathalguri CCGT	GT-6	1996	33.5	<p>Upgradation and replacement of Mark IV control system M/s. BHEL make Gas Turbine Unit 6 with Mark Vie Control System has been completed on 31-03-2018</p>
5		Kathalguri CCGT	ST-1	1998	30.00	<p>a) Upgradation of Programmer/ EPROM writer for Procontrol-13 Control System: already completed.</p> <p>b) Upgradation of AVR: LOI for upgradation of AVR already placed with M/s.ABB and material received. Expected to be commissioned in 2018-19.</p> <p>c) Upgradation of 3300-series, BENTLEY-NEVADA- make vibration system: tendering under process. Expected to be completed 2018-19.</p> <p>d) Upgradation of 3300-series, BENTLEY-NEVADA- make temperature monitoring system: Tendering under progress. Expected to be completed 2018-19.</p> <p>The OEM, M/s. BHEL has been requested to study the system and submit a comprehensive offer for upgradation of the system. Got delayed as the new available system with the OEM, M/s. BHEL is not compatible for retrofitting into the existing system. Expected execution of thes by 2019-20.</p>
6		Kathalguri CCGT	ST-2	1998	30.00	<p>Upgradation of 3300-series, BENTLEY-NEVADA- make vibration system: Tendering process is under progress. Expected to be completed in 2018-19.</p>
7		Kathalguri CCGT	ST-3	1998	30.00	<p>a) Upgradation of 3300-series, BENTLEY-NEVADA- make vibration system: Tendering process is under progress. Expected to be completed in 2018-19</p> <p>b) PO placed for upgradation of AVR already placed with M/s.ABB and material received. expected to be commissioned in 2018-19.</p>
Total Central Sector- Gas (R&M)			7		224	
Total R&M/LE (State+ Centre)			70		14929	

Details of Thermal Power Units where the Life Extension (LE) Works have been Completed During 2017-22

Sl. No.	Name of the TPS	Unit No.	Capacity MW	Utility	State/Central Sector	Date of Synchronisation after LE Works
1.	Ukai	4	200	GSECL	State Sector	17-05-2017
2.	Wanakabori	3	210	GSECL	State Sector	27-11-2017

Total (State) - 02 Units 410.00 MW

Details of Thermal Power Units where the R&M Works have been Completed During 2017-22

Sl. No.	Name of the TPS	Unit No.	Capacity MW	Utility	State/Central Sector	Date of completion of R&M works
1	Kathalguri CCGT	6	33.5	NEEPCO	Central	31-03-2018

Total (Central) - 01 Unit 33.50 MW

Details of Thermal Power Units where the Renovation & Modernisation (R&M)/Life Extension (LE) Works have been Completed During 12th Plan

Sl. No.	Name of the TPS	Unit No.	Capacity MW	Utility	State/Central Sector	Date of Synchronisation after LE Works
Units where Life Extension Works completed during 12 th Plan						
1.	Bathinda	3	110	PSPCL	State Sector	05.08.2012
2.	Kawas	GT-1A	106	NTPC	Central Sector	21.01.2013
3.	Parichha	2	110	UPRVUNL	State Sector	05.05.2013
4.	Muzafarpur	1	110	KBUNL	Joint venture of BSPGCL & NTPC	05.07.2013
5.	Kawas	GT-1B	106	NTPC	Central Sector	28.08. 2013
6.	Gandhar	GT – 3	131	NTPC	Central Sector	29.09. 2013
7.	Kawas	GT-2B	106	NTPC	Central Sector	05.03.2014
8.	Bathinda	4	110	PSPCL	State Sector	10.07. 2014
9.	Muzafarpur	2	110	KBUNL	Joint venture of BSPGCL & NTPC	30.09.2014
10.	Auraiya	GT-1	111.19	NTPC	Central Sector	22.06. 2014
11.	Gandhar	GT-1	131	NTPC	Central Sector	06.07.2014
12.	Kawas	GT-2A	106	NTPC	Central Sector	22.08.2014
13.	Auraiya	GT-2	111.19	NTPC	Central Sector	28.10.2014
14.	Auraiya	GT-3	111.19	NTPC	Central Sector	25.12.2014
15.	Auraiya	GT-4	111.19	NTPC	Central Sector	02.03.2014
16.	Harduaganj	7	110	UPRVUNL	State Sector	01.05. 2015
17.	Bandel	5	210	WBPDC	State Sector	21.09.2015
18.	Gandhar	GT-2	131	NTPC	Central Sector	15.04.2015
19.	Obra	10	200	UPRVUNL	State Sector	08.04.2016
20.	Barauni	7	110	BSPGCL	State Sector	03.08.2016
21.	Obra	11	200	UPRVUNL	State Sector	31.12.2016
Total State Sector		10 units	1380.00 MW			
Total Central Sector		11 units	1261.76 MW			
Total LE (Central +State)		21 units	2641.76 MW			
Units where Renovation & Modernisation Works completed during 12 th Plan						
1.	DPL	6	110	WBPDC	State Sector	07.05.2012
2.	Patratu	10	110	JSEB	State Sector	24.05.2012
3.	Anpara’A	1	210	UPRVUNL	State Sector	21.03.2013
4.	Anpara’A	2	210	UPRVUNL	State Sector	21.03.2013
5.	Anpara’A	3	210	UPRVUNL	State Sector	21.03.2013
6.	Tanda	2	110	NTPC	Central Sector	15.09.2012

7.	Kathalguri	GT-3	33.5	NTPC	Central Sector	31.03.2014
8.	Kathalguri	GT-4	33.5	NTPC	Central Sector	31.03.2014
9.	Kathalguri	GT-5	33.5	NTPC	Central Sector	31.03.2014
10.	Simhadri	1	500	NTPC	Central	31.03.2016
11.	Simhadri	2	500	NTPC	Central	31.03.2016
12.	Ramagundam	4	500	NTPC	Central	March, 2017
13.	Ramagundam	5	500	NTPC	Central	March, 2017
14.	Ramagundam	6	500	NTPC	Central	March, 2017
15.	Rihand STPS	1	500	NTPC	Central	March, 2017
16.	Rihand STPS	2	500	NTPC	Central	March, 2017
Total R&M State Sector		05 units	850.00 MW			
Total R&M Central Sector		11 units	3710.50 MW			
Total R&M (Central +State)		16 units	4560.50 MW			
Total (R&M+LE)		37 units	7202.26			

Annexure-5**Summary of implementation for phasing plan for FGD installation/ESP Upgradation**

Sl. No.	Description	Capacity (MW)	Units
1.	Total Capacity Considered	196667	650
2.	Capacity retired/identified for retirement	8967	82
3.	Capacity after Retirement (1-2)	187700	568
4.	Capacity already having FGD capable of meeting new Sox norms	6130	15
5.	Capacity with CFBC Boilers	5524	48
6.	Capacity taken for analysis (3-4-5)	176046	505
7.	FGD Implementation Plan		
a)	Capacity which claims to be Sox complaint	5115	23
b)	Balance Capacity (6-7 (a))	170931	482
c)	Capacity where FGD has been planned (Annexure-6)	161552	415
d)	Capacity where FGD implementation plan available	161402	414
e)	Capacity where FGD implementation plan not submitted by developer	150	1
f)	TOTAL CAPAICTY WHICH WOULD BE FGD NON COMPLAINT f (i) + f(ii)	9379	67
(i)	Capacity where FGD installation is being explored	690	7
(ii)	Capacity where FGD cannot be installed	8689	60
8.	ESP IMPLEMENTATION PLAN		
(i)	Capacity which is SPM non- complaint	72659	273
(ii)	Capacity which would be Sox non- complaint	6344	38
(iii)	Capacity FGD installation being Explored	390	4
(iv)	Balance Capacity (i-ii-iii) where ESP upgradation considered	65925	231
(v)	Capacity where ESP Implementation plan available	64525	222
(vi)	Capacity where ESP Implementation plan not submitted by developer	1400	9

Annexure-6

FGD Planned

Sr. No.	Developer	Name of Project	Sector	State	Region	Unit No	Unit Capacity	DATE of COMMISSIONING	Feasibility Study Completed	Tender Specifications	NIT Issued (Y/N)	Bids Awarded (Y/N)	FGD Commissioned	FGD Phasing Plan for	Current Status
1	NTPC	BARH II	Central S	Bihar	ER	4	660	20-11-13	Y	Y	Y	N	N	30/09/2021	Price bid submitted on 29.06.2018.
2	NTPC	BARH II	Central S	Bihar	ER	5	660	04-03-15	Y	Y	Y	N	N	31/03/2022	Price bid submitted on 29.06.2018.
3	NTPC	KAHALGAON TPS	Central S	Bihar	ER	1	210	31-03-92	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
4	NTPC	KAHALGAON TPS	Central S	Bihar	ER	2	210	17-03-94	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
5	NTPC	KAHALGAON TPS	Central S	Bihar	ER	3	210	24-03-95	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
6	NTPC	KAHALGAON TPS	Central S	Bihar	ER	4	210	18-03-96	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
7	NTPC	KAHALGAON TPS	Central S	Bihar	ER	5	500	31-03-07	Y	Y	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :
8	NTPC	KAHALGAON TPS	Central S	Bihar	ER	6	500	16-03-08	Y	Y	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :
9	NTPC	KAHALGAON TPS	Central S	Bihar	ER	7	500	31-07-09	Y	Y	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :
10	NTPC	NABI NAGAR TPP	Central S	Bihar	ER	1	250	20-03-16	Y	Y	Y	N	N	31/12/2021	Price bid submitted on 25.06.2018.
11	NTPC	NABI NAGAR TPP	Central S	Bihar	ER	2	250	04-04-17	Y	Y	Y	N	N	31/12/2022	Price bid submitted on 25.06.2018.
12	NTPC & Bihar	MUZAFFARPUR TPS	Central S	Bihar	ER	3	195	31-03-15	Y	Y	Y	N	N	31/12/2022	Price bid submitted on 29.06.2018.
13	NTPC & Bihar	MUZAFFARPUR TPS	Central S	Bihar	ER	4	195	24-03-17	Y	Y	Y	N	N	31/12/2022	Price bid submitted on 29.06.2018.
14	Adhunik Power&N	MAHADEV PRASAD STP	Private S	Jharkha	ER	1	270	19-11-12	0	0	0	0	0	30/06/2022	Complies with new Norms as per d
15	Adhunik Power&N	MAHADEV PRASAD STP	Private S	Jharkha	ER	2	270	29-03-13	0	0	0	0	0	30/06/2022	Complies with new Norms as per d
16	D.V.C	BOKARO 'A' TPS	Central S	Jharkha	ER	1	500	22-03-16	0	0	0	0	0	30/06/2022	Feasibility Study Under Progress
17	D.V.C	CHANDRAPURA(DVC)	Central S	Jharkha	ER	7	250	04-11-09	0	0	0	0	0	31/12/2022	Feasibility Study Under Progress
18	D.V.C	CHANDRAPURA(DVC)	Central S	Jharkha	ER	8	250	31-03-10	0	0	0	0	0	31/12/2022	Feasibility Study Under Progress
19	D.V.C	KODARMA TPP	Central S	Jharkha	ER	1	500	20-07-11	0	0	0	0	0	31/12/2021	Feasibility Study Under Progress
20	D.V.C	KODARMA TPP	Central S	Jharkha	ER	2	500	15-02-13	0	0	0	0	0	31/12/2021	Feasibility Study Under Progress
21	TATA Power Co.	JOJOBBERA TPS	Private S	Jharkha	ER	2	120	02-01-01	0	0	0	0	0	31/12/2020	Feasibility under process
22	TATA Power Co.	JOJOBBERA TPS	Private S	Jharkha	ER	3	120	02-01-02	0	0	0	0	0	31/12/2020	Feasibility under process
23	TATA Power Co.	MAITHON RB TPP	Private S	Jharkha	ER	1	525	01-09-11	Y	Y	Y	0	0	30/09/2021	NIT Issued
24	TATA Power Co.	MAITHON RB TPP	Private S	Jharkha	ER	2	525	24-07-12	Y	Y	Y	0	0	30/06/2022	NIT Issued
25	TenughatVN Ltd	TENUGHAT TPS	State Sec	Jharkha	ER	1	210	14-04-94	Y	0	0	0	0	31/12/2020	Feasibility Study Carried out. Prepa
26	TenughatVN Ltd	TENUGHAT TPS	State Sec	Jharkha	ER	2	210	10-10-96	Y	0	0	0	0	31/12/2020	Feasibility Study Carried out. Prepa
27	GMR	KAMALANGA TPS	Private S	Odisha	ER	1	350	29-03-13	Y	0	0	0	0	31/12/2021	Feasibility study carried out. PPA is
28	GMR	KAMALANGA TPS	Private S	Odisha	ER	2	350	28-09-13	Y	0	0	0	0	31/12/2021	Feasibility study carried out. PPA is
29	GMR	KAMALANGA TPS	Private S	Odisha	ER	3	350	21-03-14	Y	0	0	0	0	30/09/2021	Feasibility study carried out. PPA is
30	Ind barath	IND BARATH TPP	Private S	Odisha	ER	1	350	25-02-16	0	0	0	0	0	31/03/2022	Feasibility Study under process
31	JIPL	DERANG TPP	Private S	Odisha	ER	1	600	10-04-14	Y	Y	0	0	0	31/03/2021	Technical Bid evaluation
32	JIPL	DERANG TPP	Private S	Odisha	ER	2	600	24-01-15	Y	Y	0	0	0	31/03/2021	Technical Bid evaluation
33	NTPC	TALCHER STPS	Central S	Odisha	ER	1	500	19-02-95	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
34	NTPC	TALCHER STPS	Central S	Odisha	ER	2	500	27-03-96	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2

35	NTPC	TALCHER STPS	Central S	Odisha	ER	3	500	21-02-03	Y	N	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :
36	NTPC	TALCHER STPS	Central S	Odisha	ER	4	500	25-10-03	Y	N	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :
37	NTPC	TALCHER STPS	Central S	Odisha	ER	5	500	13-05-04	Y	Y	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :
38	NTPC	TALCHER STPS	Central S	Odisha	ER	6	500	06-02-05	Y	Y	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :
39	OPGCLtd	IB VALLEY TPS	State Sec	Odisha	ER	1	210	02-06-94	Y	0	0	0	0	30/09/2021	Tender specifications are under fin
40	OPGCLtd	IB VALLEY TPS	State Sec	Odisha	ER	2	210	22-10-95	Y	0	0	0	0	30/09/2021	Tender specifications are under fin
41	Sterlite Energy Ltd	STERLITE TPP	Private S	Odisha	ER	2	600	29-12-10	0	0	0	0	0	31/03/2022	Feasibility Study under process
42	C.E.S.C. Pvt.	BUDGE BUDGE TPS	Private S	West B	ER	1	250	16-09-97	0	0	0	0	0	31/12/2022	Feasibility under process
43	C.E.S.C. Pvt.	BUDGE BUDGE TPS	Private S	West B	ER	2	250	06-03-99	0	0	0	0	0	31/12/2022	Feasibility under process
44	C.E.S.C. Pvt.	BUDGE BUDGE TPS	Private S	West B	ER	3	250	29-09-09	0	0	0	0	0	31/12/2022	Feasibility under process
45	C.E.S.C. Pvt.	SOUTHERN REPL. TPS	Private S	West B	ER	1	68	10-04-91	0	0	0	0	0	31/03/2022	Feasibility under process
46	C.E.S.C. Pvt.	SOUTHERN REPL. TPS	Private S	West B	ER	2	68	12-08-90	0	0	0	0	0	31/12/2021	Feasibility under process
47	D.P.L.	D.P.L. TPS	State Sec	West B	ER	6	110	03-07-85	0	0	0	0	0	31/03/2022	Feasibility under process
48	D.P.L.	D.P.L. TPS	State Sec	West B	ER	7	300	24-11-07	0	0	0	0	0	30/06/2022	Feasibility under process
49	D.P.L.	D.P.L. TPS EXT.	State Sec	West B	ER	8	250	31-03-14	0	0	0	0	0	31/03/2022	Feasibility under process
50	D.V.C	DURGAPUR STEEL TPS	Central S	West B	ER	1	500	29-07-11	Y	Y	0	0	0	30/06/2021	Tender specification made
51	D.V.C	DURGAPUR STEEL TPS	Central S	West B	ER	2	500	23-03-12	Y	Y	0	0	0	30/06/2021	Tender specification made
52	D.V.C	MEJIA TPS	Central S	West B	ER	1	210	01-03-96	0	0	0	0	0	31/12/2022	Feasibility Study Under Progress
53	D.V.C	MEJIA TPS	Central S	West B	ER	2	210	24-03-97	0	0	0	0	0	31/12/2022	Feasibility Study Under Progress
54	D.V.C	MEJIA TPS	Central S	West B	ER	3	210	25-03-98	0	0	0	0	0	31/12/2022	Feasibility Study Under Progress
55	D.V.C	MEJIA TPS	Central S	West B	ER	4	210	12-10-04	0	0	0	0	0	31/12/2022	Feasibility Study Under Progress
56	D.V.C	MEJIA TPS	Central S	West B	ER	5	250	01-10-07	0	0	0	0	0	31/12/2022	Feasibility Study Under Progress
57	D.V.C	MEJIA TPS	Central S	West B	ER	6	250	31-03-07	0	0	0	0	0	31/12/2022	Feasibility Study Under Progress
58	D.V.C	MEJIA TPS	Central S	West B	ER	7	500	30-09-10	0	0	0	0	0	30/09/2021	Feasibility Study Under Progress
59	D.V.C	MEJIA TPS	Central S	West B	ER	8	500	26-03-11	0	0	0	0	0	30/09/2021	Feasibility Study Under Progress
60	D.V.C	RAGHUNATHPUR TPP	Central S	West B	ER	1	600	24-08-14	0	0	0	0	0	31/03/2022	Feasibility Study Under Progress
61	D.V.C	RAGHUNATHPUR TPP	Central S	West B	ER	2	600	18-01-16	0	0	0	0	0	31/03/2022	Feasibility Study Under Progress
62	M/s Haldia Energy	HALDIA TPP	Private S	West B	ER	1	300	14-01-15	0	0	0	0	0	31/12/2022	Feasibility under process
63	M/s Haldia Energy	HALDIA TPP	Private S	West B	ER	2	300	16-02-15	0	0	0	0	0	31/12/2022	Feasibility under process
64	Bishagarh Power	India Power TPP	Private S	West B	ER	1	150	07-06-17	0	0	0	0	0	0	Feasability study under progress
65	NTPC	FARAKKA STPS	Central S	West B	ER	1	200	01-01-86	Y	Y	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
66	NTPC	FARAKKA STPS	Central S	West B	ER	2	200	24-12-86	Y	Y	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
67	NTPC	FARAKKA STPS	Central S	West B	ER	3	200	06-08-87	Y	Y	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
68	NTPC	FARAKKA STPS	Central S	West B	ER	4	500	25-09-92	Y	Y	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
69	NTPC	FARAKKA STPS	Central S	West B	ER	5	500	16-02-94	Y	Y	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
70	NTPC	FARAKKA STPS	Central S	West B	ER	6	500	07-03-11	Y	Y	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :

71	WBPDC	KOLAGHAT TPS	State Sec	West Be	ER	1	210	16-01-93	Y	0	0	0	0	30/06/2022	Tendering Process to be initiated in
72	WBPDC	KOLAGHAT TPS	State Sec	West Be	ER	2	210	13-08-90	0	0	0	0	0	31/03/2021	Tendering Process to be initiated in
73	WBPDC	KOLAGHAT TPS	State Sec	West Be	ER	3	210	16-12-85	0	0	0	0	0	30/09/2021	Tendering Process to be initiated in
74	WBPDC	KOLAGHAT TPS	State Sec	West Be	ER	4	210	24-01-84	Y	0	0	0	0	31/03/2022	Tendering Process to be initiated in
75	WBPDC	KOLAGHAT TPS	State Sec	West Be	ER	5	210	28-12-93	0	0	0	0	0	30/06/2021	Tendering Process to be initiated in
76	WBPDC	KOLAGHAT TPS	State Sec	West Be	ER	6	210	17-03-91	0	0	0	0	0	31/12/2021	Tendering Process to be initiated in
77	WBPDC	SAGARDIGHI TPS	State Sec	West Be	ER	1	300	20-07-08	0	0	0	0	0	31/12/2020	Tendering Process to be initiated in
78	WBPDC	SAGARDIGHI TPS	State Sec	West Be	ER	2	300	21-12-07	0	0	0	0	0	31/03/2021	Tendering Process to be initiated in
79	WBPDC	SAGARDIGHI TPS	State Sec	West Be	ER	3	500	14-12-15	Y	0	0	0	0	31/03/2022	Tendering Process to be initiated in
80	WBPDC	SAGARDIGHI TPS	State Sec	West Be	ER	4	500	15-12-16	0	0	0	0	0	31/03/2020	Tendering Process to be initiated in
81	WBPDC	SANTALDIH TPS	State Sec	West Be	ER	5	250	07-11-07	0	0	0	0	0	31/03/2021	Tendering Process to be initiated in
82	WBPDC	SANTALDIH TPS	State Sec	West Be	ER	6	250	29-06-11	0	0	0	0	0	31/12/2021	Tendering Process to be initiated in
83	CHINA LIGHT PC	MAHATMA GANDHI TPS	Private S	Haryana	NR	1	660	12-01-12	Y	Y	Y	Y	Y	31/12/2019	FGD Installed and is Under Renov
84	CHINA LIGHT PC	MAHATMA GANDHI TPS	Private S	Haryana	NR	2	660	11-04-12	Y	Y	Y	Y	Y	31/12/2019	FGD Installed and is Under Renov
85	HGPCorpn	PANIPAT TPS	State Sec	Haryana	NR	6	210	31-03-01	0	0	0	0	0	31/12/2019	Developer wants exemption
86	HGPCorpn	PANIPAT TPS	State Sec	Haryana	NR	7	250	28-09-04	0	0	0	0	0	31/12/2019	Feasibility Study Under Progress
87	HGPCorpn	PANIPAT TPS	State Sec	Haryana	NR	8	250	28-01-05	0	0	0	0	0	31/12/2019	Feasibility Study Under Progress
88	HGPCorpn	RAJIV GANDHI TPS	State Sec	Haryana	NR	1	600	31-03-10	Y	0	0	0	0	31/12/2019	Feasibility Study Completed.
89	HGPCorpn	RAJIV GANDHI TPS	State Sec	Haryana	NR	2	600	01-10-10	Y	0	0	0	0	31/12/2019	Feasibility Study Completed.
90	HGPCorpn	YAMUNA NAGAR TPS	State Sec	Haryana	NR	1	300	01-11-07	Y	0	0	0	0	31/12/2019	Feasibility Study Completed.
91	HGPCorpn	YAMUNA NAGAR TPS	State Sec	Haryana	NR	2	300	29-03-08	Y	0	0	0	0	31/12/2019	Feasibility Study Completed.
92	NTPC	INDIRA GANDHI STPP	Central S	Haryana	NR	1	500	31-10-10	Y	Y	Y	Y	0	31/12/2019	Bid awarded on 30 Jan 2018
93	NTPC	INDIRA GANDHI STPP	Central S	Haryana	NR	2	500	05-11-11	Y	Y	Y	Y	0	31/12/2019	Bid awarded on 30 Jan 2018
94	NTPC	INDIRA GANDHI STPP	Central S	Haryana	NR	3	500	07-11-12	Y	Y	Y	Y	0	31/12/2019	Bid awarded on 30 Jan 2018
95	GVK Power Ltd.	GOINDWAL SAHIB	Private S	Punjab	NR	1	270	14-02-16	0	Y	Y	0	0	30/04/2020	EOI was invited vide newspaper ac
96	GVK Power Ltd.	GOINDWAL SAHIB	Private S	Punjab	NR	2	270	15-03-16	0	Y	Y	0	0	28/02/2020	EOI was invited vide newspaper ac
97	L&T Power Devel	Nabha TPP (Rajpura TPP	Private S	Punjab	NR	1	700	24-01-14	Y	Y	0	0	0	31/12/2019	Feasibility Study Carried Out. PPA i
98	L&T Power Devel	Nabha TPP (Rajpura TPP	Private S	Punjab	NR	2	700	06-07-14	Y	Y	0	0	0	31/12/2019	Feasibility Study Carried Out. PPA i
99	PSEB	GH TPS (LEH.MOH.)	State Sec	Punjab	NR	1	210	29-12-97	0	0	0	0	0	31/12/2019	Administrative approval is under pr
100	PSEB	GH TPS (LEH.MOH.)	State Sec	Punjab	NR	2	210	16-10-98	0	0	0	0	0	31/12/2019	Administrative approval is under pr
101	PSEB	GH TPS (LEH.MOH.)	State Sec	Punjab	NR	3	250	03-01-08	0	0	0	0	0	31/12/2019	Administrative approval is under pr
102	PSEB	GH TPS (LEH.MOH.)	State Sec	Punjab	NR	4	250	31-07-08	0	0	0	0	0	31/12/2019	Administrative approval is under pr
103	Talwandi Sabo P	TALWANDI SABO TPP	Private S	Punjab	NR	1	660	17-06-14	Y	0	Y	0	0	31/12/2019	Feasibility Study Carried Out. PPA i
104	Talwandi Sabo P	TALWANDI SABO TPP	Private S	Punjab	NR	2	660	25-10-15	Y	0	Y	0	0	31/12/2019	Feasibility Study Carried Out. PPA i
105	Talwandi Sabo P	TALWANDI SABO TPP	Private S	Punjab	NR	3	660	29-03-16	Y	0	Y	0	0	31/12/2019	Feasibility Study Carried Out. PPA i
106	Adani Power Ltd.	KAWAI TPS	Private S	Rajasth	NR	1	660	28-05-13	Y	Y	0	0	0	31/08/2020	NIT to be issued soon.

107	Adani Power Ltd.	KAWAI TPS	Private S	Rajasth	NR	2	660	24-12-13	Y	Y	0	0	0	30/06/2020	NIT to be issued soon.
108	RRVUNL	CHHABRA TPP	State Sec	Rajasth	NR	1	250	30-10-09	Y	0	0	0	0	31/12/2021	Feasibility Study Completed.
109	RRVUNL	CHHABRA TPP	State Sec	Rajasth	NR	2	250	04-05-10	Y	0	0	0	0	31/10/2021	Feasibility Study Completed.
110	RRVUNL	CHHABRA TPP	State Sec	Rajasth	NR	3	250	14-09-13	Y	0	0	0	0	31/08/2021	Feasibility Study Completed.
111	RRVUNL	CHHABRA TPP	State Sec	Rajasth	NR	4	250	30-06-14	Y	0	0	0	0	31/08/2021	Feasibility Study Completed.
112	RRVUNL	CHHABRA TPP	State Sec	Rajasth	NR	5	660	04-04-17	0	0	0	0	0	30/04/2020	Feasability study under progress
113	RRVUNL	KALISINDH TPS	State Sec	Rajasth	NR	1	600	02-05-14	Y	0	0	0	0	30/06/2021	Feasibility Study Completed.
114	RRVUNL	KALISINDH TPS	State Sec	Rajasth	NR	2	600	06-06-15	Y	0	0	0	0	30/04/2021	Feasibility Study Completed.
115	RRVUNL	KOTA TPS	State Sec	Rajasth	NR	5	210	26-03-94	Y	0	0	0	0	31/12/2022	Feasibility Study Completed.
116	RRVUNL	KOTA TPS	State Sec	Rajasth	NR	6	195	30-07-03	Y	0	0	0	0	31/12/2022	Feasibility Study Completed.
117	RRVUNL	KOTA TPS	State Sec	Rajasth	NR	7	195	30-08-09	Y	0	0	0	0	31/10/2022	Feasibility Study Completed.
118	RRVUNL	SURATGARH TPS	State Sec	Rajasth	NR	1	250	10-05-98	Y	0	0	0	0	31/12/2022	Feasibility Study Completed.
119	RRVUNL	SURATGARH TPS	State Sec	Rajasth	NR	2	250	28-03-00	Y	0	0	0	0	31/10/2022	Feasibility Study Completed.
120	RRVUNL	SURATGARH TPS	State Sec	Rajasth	NR	3	250	29-10-01	Y	0	0	0	0	31/08/2022	Feasibility Study Completed.
121	RRVUNL	SURATGARH TPS	State Sec	Rajasth	NR	4	250	25-03-02	Y	0	0	0	0	30/06/2022	Feasibility Study Completed.
122	RRVUNL	SURATGARH TPS	State Sec	Rajasth	NR	5	250	30-06-03	Y	0	0	0	0	30/04/2022	Feasibility Study Completed.
123	RRVUNL	SURATGARH TPS	State Sec	Rajasth	NR	6	250	29-08-09	Y	0	0	0	0	28/02/2022	Feasibility Study Completed.
124	Lalitpur Power Ge	LALITPUR TPS	Private S	Uttar Pa	NR	2	660	08-01-16	Y	0	0	0	0	28/02/2021	Petition was filed with UPERC for a
125	Lalitpur Power Ge	LALITPUR TPS	Private S	Uttar Pa	NR	3	660	01-04-16	Y	0	0	0	0	31/10/2021	Petition was filed with UPERC for a
126	Lalitpur Power Ge	LALITPUR TPS	Private S	Uttar Pa	NR	1	660	26-03-16	Y	0	0	0	0	31/12/2020	Petition was filed with UPERC for a
127	Lanko Anpara Po	ANPARA C TPS	Private S	Uttar Pa	NR	1	600	12-10-11	Y	Y	0	0	0	31/08/2022	Tender Specification made
128	Lanko Anpara Po	ANPARA C TPS	Private S	Uttar Pa	NR	2	600	18-01-12	Y	Y	0	0	0	30/06/2022	Tender Specification made
129	NTPC	DADRI (NCTPP)	Central S	Uttar Pa	NR	1	210	21-12-91	Y	Y	Y	N	N	31/12/2019	Dry Sorbent Injection (DSI) SYSTE
130	NTPC	DADRI (NCTPP)	Central S	Uttar Pa	NR	2	210	18-12-92	Y	Y	Y	N	N	31/12/2019	Dry Sorbent Injection (DSI) SYSTE
131	NTPC	DADRI (NCTPP)	Central S	Uttar Pa	NR	3	210	23-03-93	Y	Y	Y	N	N	31/12/2019	Dry Sorbent Injection (DSI) SYSTE
132	NTPC	DADRI (NCTPP)	Central S	Uttar Pa	NR	4	210	24-03-94	Y	Y	Y	N	N	31/12/2019	Dry Sorbent Injection (DSI) SYSTE
133	NTPC	DADRI (NCTPP)	Central S	Uttar Pa	NR	5	490	25-01-10	Y	Y	Y	Y	N	31/12/2019	Work in progress
134	NTPC	DADRI (NCTPP)	Central S	Uttar Pa	NR	6	490	16-07-10	Y	Y	Y	Y	N	31/12/2019	Work in progress
135	NTPC	RIHAND STPS	Central S	Uttar Pa	NR	1	500	31-03-88	Y	N	N	N	N	28/02/2022	NIT IN LOT-3 PLANNED IN OCT 2
136	NTPC	RIHAND STPS	Central S	Uttar Pa	NR	2	500	05-07-89	Y	N	N	N	N	31/12/2021	NIT IN LOT-3 PLANNED IN OCT 2
137	NTPC	RIHAND STPS	Central S	Uttar Pa	NR	3	500	31-01-05	Y	Y	Y	N	N	30/10/2021	Price bid submitted on 29.06.2018.
138	NTPC	RIHAND STPS	Central S	Uttar Pa	NR	4	500	24-09-05	Y	Y	Y	N	N	30/04/2021	Price bid submitted on 29.06.2018.
139	NTPC	RIHAND STPS	Central S	Uttar Pa	NR	5	500	25-05-12	Y	Y	Y	N	N	28/02/2021	Price bid submitted on 29.06.2018.
140	NTPC	RIHAND STPS	Central S	Uttar Pa	NR	6	500	17-10-13	Y	Y	Y	N	N	31/12/2020	Price bid submitted on 29.06.2018.
141	NTPC	SINGRAULI STPS	Central S	Uttar Pa	NR	1	200	14-02-82	Y	N	N	N	N	31/12/2021	NIT IN LOT-3 PLANNED IN OCT 2
142	NTPC	SINGRAULI STPS	Central S	Uttar Pa	NR	2	200	25-11-82	Y	N	N	N	N	31/12/2021	NIT IN LOT-3 PLANNED IN OCT 2

143	NTPC	SINGRAULI STPS	Central S	Uttar Pa	NR	3	200	28-03-83	Y	N	N	N	N	31/08/2021	NIT IN LOT-3 PLANNED IN OCT 2
144	NTPC	SINGRAULI STPS	Central S	Uttar Pa	NR	4	200	02-11-83	Y	N	N	N	N	31/08/2021	NIT IN LOT-3 PLANNED IN OCT 2
145	NTPC	SINGRAULI STPS	Central S	Uttar Pa	NR	5	200	26-02-84	Y	N	N	N	N	30/04/2021	NIT IN LOT-3 PLANNED IN OCT 2
146	NTPC	SINGRAULI STPS	Central S	Uttar Pa	NR	6	500	23-12-86	Y	N	N	N	N	28/02/2021	NIT IN LOT-3 PLANNED IN OCT 2
147	NTPC	SINGRAULI STPS	Central S	Uttar Pa	NR	7	500	24-11-87	Y	N	N	N	N	31/12/2020	NIT IN LOT-3 PLANNED IN OCT 2
148	NTPC	UNCHAHAH TPS	Central S	Uttar Pa	NR	1	210	21-11-88	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN SEP 2
149	NTPC	UNCHAHAH TPS	Central S	Uttar Pa	NR	2	210	22-03-89	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN SEP 2
150	NTPC	UNCHAHAH TPS	Central S	Uttar Pa	NR	3	210	27-01-99	Y	N	N	N	N	31/10/2022	NIT IN LOT-3 PLANNED IN SEP 2
151	NTPC	UNCHAHAH TPS	Central S	Uttar Pa	NR	4	210	22-10-99	Y	N	N	N	N	31/10/2022	NIT IN LOT-3 PLANNED IN SEP 2
152	NTPC	UNCHAHAH TPS	Central S	Uttar Pa	NR	5	210	28-09-06	Y	Y	N	N	N	30/04/2022	NIT IN LOT-2 PLANNED IN JULY
153	NTPC	UNCHAHAH TPS	Central S	Uttar Pa	NR	6	500	31-03-17	Y	Y	Y	N	N	0	Price bid submitted on 29.06.2018.
154	Prayagraj Power	PRAYAGRAJ TPP	Private S	Uttar Pa	NR	1	660	25-12-16	0	0	0	0	0	30/04/2020	Feasibility Study is under process.
155	Prayagraj Power	PRAYAGRAJ TPP	Private S	Uttar Pa	NR	2	660	06-09-15	0	0	0	0	0	30/06/2020	Feasibility Study is under process.
156	Prayagraj Power	PRAYAGRAJ TPP	Private S	Uttar Pa	NR	3	660	22-05-17	0	0	0	0	0	29/02/2020	Feasibility Study under progress
157	Rosa Power Supp	ROSA TPP Ph-I	Private S	Uttar Pa	NR	1	300	10-02-10	Y	0	0	0	0	31/12/2021	Tendering Under Process
158	Rosa Power Supp	ROSA TPP Ph-I	Private S	Uttar Pa	NR	2	300	26-06-10	Y	0	0	0	0	31/12/2021	Tendering Under Process
159	Rosa Power Supp	ROSA TPP Ph-I	Private S	Uttar Pa	NR	3	300	28-12-11	Y	0	0	0	0	31/10/2021	Tendering Under Process
160	Rosa Power Supp	ROSA TPP Ph-I	Private S	Uttar Pa	NR	4	300	28-03-12	Y	0	0	0	0	31/10/2021	Tendering Under Process
161	UPRVUNL	ANPARA TPS	State Sec	Uttar Pa	NR	1	210	24-03-86	0	0	0	0	0	31/10/2022	Administrative approval is under p
162	UPRVUNL	ANPARA TPS	State Sec	Uttar Pa	NR	2	210	28-02-87	0	0	0	0	0	31/08/2022	Feasiblity Study Under Progress
163	UPRVUNL	ANPARA TPS	State Sec	Uttar Pa	NR	3	210	12-03-88	0	0	0	0	0	30/06/2022	Feasiblity Study Under Progress
164	UPRVUNL	ANPARA TPS	State Sec	Uttar Pa	NR	4	500	19-07-93	0	0	0	0	0	30/04/2022	Administrative approval is under p
165	UPRVUNL	ANPARA TPS	State Sec	Uttar Pa	NR	5	500	04-07-94	0	0	0	0	0	28/02/2022	Administrative approval is under p
166	UPRVUNL	ANPARA TPS	State Sec	Uttar Pa	NR	6	500	08-06-15	Y	0	0	0	0	30/06/2021	Feasiblity Study Carried out
167	UPRVUNL	ANPARA TPS	State Sec	Uttar Pa	NR	7	500	06-03-16	Y	0	0	0	0	30/04/2021	Feasiblity Study Carried out
168	UPRVUNL	HARDUAGANJ TPS	State Sec	Uttar Pa	NR	8	250	27-09-11	0	0	0	0	0	31/12/2019	Administrative approval is under pr
169	UPRVUNL	HARDUAGANJ TPS	State Sec	Uttar Pa	NR	9	250	25-05-12	0	0	0	0	0	31/12/2019	Administrative approval is under p
170	UPRVUNL	OBRA TPS	State Sec	Uttar Pa	NR	9	200	26-10-80	0	0	0	0	0	31/08/2022	Feasibility Study Under Progress
171	UPRVUNL	OBRA TPS	State Sec	Uttar Pa	NR	10	200	14-01-79	0	0	0	0	0	31/10/2022	Feasibility Study Under Progress
172	UPRVUNL	OBRA TPS	State Sec	Uttar Pa	NR	11	200	31-12-77	0	0	0	0	0	31/12/2022	Feasibility Study Under Progress
173	UPRVUNL	OBRA TPS	State Sec	Uttar Pa	NR	12	200	28-03-81	0	0	0	0	0	30/06/2022	Feasibility Study Under Progress
174	UPRVUNL	OBRA TPS	State Sec	Uttar Pa	NR	13	200	21-07-82	0	0	0	0	0	30/04/2022	Feasibility Study Under Progress
175	UPRVUNL	PARICHHA TPS	State Sec	Uttar Pa	NR	3	210	29-03-06	0	0	0	0	0	30/04/2022	Administrative approval is under pr
176	UPRVUNL	PARICHHA TPS	State Sec	Uttar Pa	NR	4	210	28-12-06	0	0	0	0	0	30/04/2022	Administrative approval is under pr
177	UPRVUNL	PARICHHA TPS	State Sec	Uttar Pa	NR	5	250	24-05-12	0	0	0	0	0	28/02/2022	Administrative approval is under pr
178	UPRVUNL	PARICHHA TPS	State Sec	Uttar Pa	NR	6	250	11-03-13	0	0	0	0	0	31/12/2021	Administrative approval is under p

179	APGENCO	Dr. N.TATA RAO TPS	State Sec	Andhra	SR	7	500	08-10-09	0	0	0	0	0	31/12/2020	Feasibility studies are in progress th
180	APGENCO	RAYALASEEMA TPS	State Sec	Andhra	SR	1	210	31-03-94	0	0	0	0	0	31/12/2021	Complies with new Norms as per d
181	APGENCO	RAYALASEEMA TPS	State Sec	Andhra	SR	2	210	25-02-95	0	0	0	0	0	30/09/2021	Complies with new Norms as per d
182	APGENCO	RAYALASEEMA TPS	State Sec	Andhra	SR	3	210	25-01-07	0	0	0	0	0	30/09/2020	Complies with new Norms as per d
183	APGENCO	RAYALASEEMA TPS	State Sec	Andhra	SR	4	210	20-11-07	0	0	0	0	0	30/06/2021	Complies with new Norms as per d
184	APGENCO	RAYALASEEMA TPS	State Sec	Andhra	SR	5	210	31-12-10	0	0	0	0	0	30/06/2020	Complies with new Norms as per d
185	APPDCL	DAMODARAM SANJEEV	State Sec	Andhra	SR	1	800	28-08-14	0	0	0	0	0	31/12/2020	Feasibility studies are in progress th
186	APPDCL	DAMODARAM SANJEEV	State Sec	Andhra	SR	2	800	17-03-15	0	0	0	0	0	31/12/2019	Feasibility studies are in progress th
187	HNPCL	VIZAG TPP	Private S	Andhra	SR	1	520	27-12-15	Y	0	0	0	0	31/12/2022	HNPCL had appointed a consultan
188	HNPCL	VIZAG TPP	Private S	Andhra	SR	2	520	30-03-16	Y	0	0	0	0	31/12/2022	HNPCL had appointed a consultan
189	NTPC	SIMHADRI	Central S	Andhra	SR	1	500	22-02-02	Y	Y	N	N	N	31/03/2022	NIT IN LOT-2 PLANNED IN JULY :
190	NTPC	SIMHADRI	Central S	Andhra	SR	2	500	24-08-02	Y	Y	N	N	N	30/06/2022	NIT IN LOT-2 PLANNED IN JULY :
191	NTPC	SIMHADRI	Central S	Andhra	SR	3	500	29-03-11	Y	Y	Y	N	N	30/09/2022	NIT IN LOT-3 PLANNED IN OCT 2
192	NTPC	SIMHADRI	Central S	Andhra	SR	4	500	30-03-12	Y	Y	Y	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
193	Sembcorp Gayatr	Sembcorp Gayatri P.Ltd.	Private S	Andhra	SR	1	660	12-11-16	0	0	0	0	0	31/12/2021	Pilot plant trials under progress. To
194	Sembcorp Gayatr	Sembcorp Gayatri P.Ltd.	Private S	Andhra	SR	2	660	15-02-17	0	0	0	0	0	30/09/2021	Feasability study under progress
195	THERMAL POWE	PAINAMPURAM TPP	Private S	Andhra	SR	1	660	07-02-15	0	0	0	0	0	31/12/2021	Pilot plant trials under progress. To
196	THERMAL POWE	PAINAMPURAM TPP	Private S	Andhra	SR	2	660	03-09-15	0	0	0	0	0	30/09/2021	Pilot plant trials under progress. To
197	Adani Power Ltd.	UDUPI TPP	Private S	Karnata	SR	1	600	23-07-10	Y	Y	0	0	0	31/03/2022	Existing FGD to be dismantled and
198	Adani Power Ltd.	UDUPI TPP	Private S	Karnata	SR	2	600	16-04-11	Y	Y	0	0	0	30/06/2022	Existing FGD to be dismantled and
199	Jindal (Pvt Co)	TORANGALLU TPS EXT	Private S	Karnata	SR	1	300	23-04-09	Y	0	0	0	0	30/06/2022	Discussions with vendor is in progr
200	Jindal (Pvt Co)	TORANGALLU TPS EXT	Private S	Karnata	SR	2	300	24-08-09	Y	0	0	0	0	30/09/2022	Discussions with vendor is in progr
201	KPCL	BELLARY TPS	State Sec	Karnata	SR	1	500	03-12-07	Y	Y	0	0	0	31/12/2020	Tender preparation is in process
202	KPCL	BELLARY TPS	State Sec	Karnata	SR	2	500	23-03-12	Y	Y	0	0	0	30/06/2021	Tender preparation is in process
203	KPCL	BELLARY TPS	State Sec	Karnata	SR	3	700	01-03-16	Y	Y	0	0	0	31/12/2021	Tender preparation is in process
204	KPCL	RAICHUR TPS	State Sec	Karnata	SR	1	210	29-03-85	Y	Y	0	0	0	31/03/2021	Tender preparation is under proces
205	KPCL	RAICHUR TPS	State Sec	Karnata	SR	2	210	02-03-86	Y	Y	0	0	0	30/06/2021	Tender preparation is under proces
206	KPCL	RAICHUR TPS	State Sec	Karnata	SR	3	210	30-03-91	Y	Y	0	0	0	30/09/2021	Tender preparation is under proces
207	KPCL	RAICHUR TPS	State Sec	Karnata	SR	4	210	29-09-94	Y	Y	0	0	0	31/12/2021	Tender preparation is under proces
208	KPCL	RAICHUR TPS	State Sec	Karnata	SR	5	210	31-01-99	Y	Y	0	0	0	31/03/2022	Tender preparation is under proces
209	KPCL	RAICHUR TPS	State Sec	Karnata	SR	6	210	22-07-99	Y	Y	0	0	0	30/06/2022	Tender preparation is under proces
210	KPCL	RAICHUR TPS	State Sec	Karnata	SR	7	210	11-12-02	Y	Y	0	0	0	30/09/2022	Tender preparation is under proces
211	KPCL	RAICHUR TPS	State Sec	Karnata	SR	8	250	26-06-10	Y	Y	0	0	0	31/12/2022	Tender preparation is under proces
212	KPCL	YERMARUS TPP	State Sec	Karnata	SR	1	800	29-03-16	0	Y	0	0	0	31/12/2021	Feasibility study/ Tender preparatic

213	KPCL	YERMARUS TPP	State Sec	Karnata	SR	2	800	29-03-17	0	0	0	0	0	31/12/2022	Feasability study under progress
214	NTPC	KUDGI	Central S	Karnata	SR	1	800	25-12-16	Y	Y	N	N	N	30/06/2022	Price bid submitted on 25.06.2018.
215	NTPC	KUDGI	Central S	Karnata	SR	2	800	23-03-17	Y	Y	N	N	N	30/09/2022	Price bid submitted on 25.06.2018.
216	Coastal Energen	MUTHIARA TPP	Private S	Tamil N	SR	1	600	02-12-14	Y	0	0	0	0	30/09/2022	Feasibility Study Completed
217	Coastal Energen	MUTHIARA TPP	Private S	Tamil N	SR	2	600	02-01-16	Y	0	0	0	0	31/12/2022	Feasibility Study Completed
218	NEYVELI LIGNIT	NEYVELI (EXT) TPS	Central S	Tamil N	SR	1	210	21-10-02	Y	0	0	0	0	30/06/2021	Technical specification furnished b
219	NEYVELI LIGNIT	NEYVELI (EXT) TPS	Central S	Tamil N	SR	2	210	22-07-03	Y	0	0	0	0	31/12/2021	Technical specification furnished b
220	NEYVELI LIGNIT	NEYVELI TPS- II	Central S	Tamil N	SR	1	210	17-01-88	Y	0	0	0	0	31/12/2021	Technical specification furnished b
221	NEYVELI LIGNIT	NEYVELI TPS- II	Central S	Tamil N	SR	2	210	06-02-87	Y	0	0	0	0	30/09/2021	Technical specification furnished b
222	NEYVELI LIGNIT	NEYVELI TPS- II	Central S	Tamil N	SR	3	210	29-03-87	Y	0	0	0	0	30/06/2021	Technical specification furnished b
223	NEYVELI LIGNIT	NEYVELI TPS- II	Central S	Tamil N	SR	4	210	30-03-91	Y	0	0	0	0	31/03/2022	Technical specification furnished b
224	NEYVELI LIGNIT	NEYVELI TPS- II	Central S	Tamil N	SR	5	210	31-12-91	Y	0	0	0	0	30/06/2022	Technical specification furnished b
225	NEYVELI LIGNIT	NEYVELI TPS- II	Central S	Tamil N	SR	6	210	30-10-92	Y	0	0	0	0	30/09/2022	Technical specification furnished b
226	NEYVELI LIGNIT	NEYVELI TPS- II	Central S	Tamil N	SR	7	210	19-06-93	Y	0	0	0	0	31/12/2022	Technical specification furnished b
227	NTEC LTD.	VALLUR TPP	Central S	Tamil N	SR	1	500	28-03-12	Y	Y	0	0	0	30/06/2022	NIT is planned in July 2018
228	NTEC LTD.	VALLUR TPP	Central S	Tamil N	SR	2	500	28-02-13	Y	Y	0	0	0	30/09/2022	NIT is planned in July 2018
229	NTEC LTD.	VALLUR TPP	Central S	Tamil N	SR	3	500	28-02-14	Y	Y	0	0	0	31/12/2022	NIT is planned in July 2018
230	NLC + TANGEDCO	TUTICORIN (JV) TPP	Central S	Tamil N	SR	1	500	10-03-15	Y	0	0	0	0	31/12/2021	Feasibility Study completed. Prepa
231	NLC + TANGEDCO	TUTICORIN (JV) TPP	Central S	Tamil N	SR	2	500	09-07-15	Y	0	0	0	0	30/06/2020	Feasibility Study completed. Prepa
232	TAQA, Neyveli	TAQA, Neyveli	Private S	Tamil N	SR	2	250	21-10-02	0	0	0	0	0	30/06/2020	Feasibility Study Under Progress
233	TANGEDCO	NORTH CHENNAI Ext. TP	State Sec	Tamil N	SR	1	600	09-03-13	0	0	0	0	0	31/12/2019	Requested for FGD implementation
234	TANGEDCO	NORTH CHENNAI Ext. TP	State Sec	Tamil N	SR	2	600	13-09-13	0	0	0	0	0	30/09/2020	Requested for FGD implementation
235	TANGEDCO	NORTH CHENNAI TPS	State Sec	Tamil N	SR	1	210	25-10-94	Y	Y	Y	0	0	31/12/2022	Budgetary offer awaited from M/s. I
236	TANGEDCO	NORTH CHENNAI TPS	State Sec	Tamil N	SR	2	210	27-03-95	Y	Y	Y	0	0	30/06/2022	Budgetary offer awaited from M/s. I
237	TANGEDCO	NORTH CHENNAI TPS	State Sec	Tamil N	SR	3	210	24-02-96	Y	Y	Y	0	0	31/03/2022	Budgetary offer awaited from M/s. I
238	NTPC	RAMAGUNDEM STPS	Central S	Telanga	SR	1	200	27-10-83	Y	N	N	N	N	31/03/2022	NIT IN LOT-3 PLANNED IN OCT 2
239	NTPC	RAMAGUNDEM STPS	Central S	Telanga	SR	2	200	29-05-84	Y	N	N	N	N	31/03/2022	NIT IN LOT-3 PLANNED IN OCT 2
240	NTPC	RAMAGUNDEM STPS	Central S	Telanga	SR	3	200	13-12-84	Y	N	N	N	N	30/06/2022	NIT IN LOT-3 PLANNED IN OCT 2
241	NTPC	RAMAGUNDEM STPS	Central S	Telanga	SR	4	500	26-06-88	Y	N	N	N	N	30/06/2022	NIT IN LOT-3 PLANNED IN OCT 2
242	NTPC	RAMAGUNDEM STPS	Central S	Telanga	SR	5	500	26-03-89	Y	N	N	N	N	30/09/2022	NIT IN LOT-3 PLANNED IN OCT 2
243	NTPC	RAMAGUNDEM STPS	Central S	Telanga	SR	6	500	16-10-89	Y	N	N	N	N	30/09/2022	NIT IN LOT-3 PLANNED IN OCT 2
244	NTPC	RAMAGUNDEM STPS	Central S	Telanga	SR	7	500	26-09-04	Y	Y	Y	N	N	31/12/2022	NIT ISUED ON 15.06.2018.
245	Singareni Collierie	SINGARENI TPP	State Sec	Telanga	SR	1	600	13-03-16	0	0	0	0	0	31/12/2019	Tender has been floated and techn
246	Singareni Collierie	SINGARENI TPP	State Sec	Telanga	SR	2	600	25-11-16	0	0	0	0	0	30/09/2019	Tender has been floated and techn
247	TSGENCO	KAKATIYA TPS	State Sec	Telanga	SR	1	500	27-05-10	0	0	0	0	0	31/03/2020	Feasibility Study Under Progress
248	TSGENCO	KAKATIYA TPS	State Sec	Telanga	SR	2	600	31-12-15	0	0	0	0	0	30/06/2020	Feasibility Study Under Progress

249	TSGENCO	KOTHAGUDEM TPS (NEV	State Sec	Telanga	SR	11	500	26-06-11	0	0	0	0	0	30/09/2019	Feasibility Study Under Progress
250	Bharat Aluminium	BALCO TPS	Private S	Chhatis	WR	1	300	04-06-15	0	0	0	0	0	30/09/2021	Feasibility Study under progress.
251	Bharat Aluminium	BALCO TPS	Private S	Chhatis	WR	2	300	24-03-16	0	0	0	0	0	30/06/2021	Feasibility Study under progress.
252	CSEB	MARWA TPS	State Sec	Chhatis	WR	1	500	30-03-14	Y	0	0	0	0	30/06/2021	Feasibility Study Carried out
253	CSEB	MARWA TPS	State Sec	Chhatis	WR	2	500	15-07-16	Y	0	0	0	0	31/03/2021	Feasibility Study Carried out
254	CSPGCL	DSPM TPS	State Sec	Chhatis	WR	1	250	30-03-07	Y	0	0	0	0	30/06/2021	Feasibility Study Carried out
255	CSPGCL	DSPM TPS	State Sec	Chhatis	WR	2	250	11-12-07	Y	0	0	0	0	30/09/2021	Feasibility Study Carried out
256	CSPGCL	KORBA-WEST Ext. TPS	State Sec	Chhatis	WR	5	500	22-03-13	Y	0	0	0	0	30/09/2021	Feasibility Study Carried out
257	DB Power	BARADARHA TPS	Private S	Chhatis	WR	1	600	23-02-14	Y	Y	Y	0	0	30/06/2021	NIT issued
258	DB Power	BARADARHA TPS	Private S	Chhatis	WR	2	600	24-03-15	Y	Y	Y	0	0	30/09/2020	NIT issued
259	GMR	RAIKHEDA TPP	Private S	Chhatis	WR	1	685	24-02-15	Y	0	0	0	0	30/06/2020	Feasibility study carried out. PPA is
260	GMR	RAIKHEDA TPP	Private S	Chhatis	WR	2	685	28-03-16	Y	0	0	0	0	30/09/2020	Feasibility study carried out. PPA is
261	KORBA-WEST T	AVANTHA BHANDAR	Private S	Chhatis	WR	1	600	31-03-14	Y	Y	0	0	0	31/03/2022	Feasibility Study carried out. Tende
262	KSK Mahanadi P	AKALTARA TPS	Private S	Chhatis	WR	1	600	13-08-13	0	0	0	0	0	30/06/2022	Feasibility Study under process
263	KSK Mahanadi P	AKALTARA TPS	Private S	Chhatis	WR	2	600	22-08-14	0	0	0	0	0	31/03/2022	Feasibility Study under process
264	M/s Lanko Amark	PATHADI TPP	Private S	Chhatis	WR	1	300	04-06-09	Y	Y	0	0	0	31/03/2021	Tender Specification made
265	M/s Lanko Amark	PATHADI TPP	Private S	Chhatis	WR	2	300	25-03-10	Y	Y	0	0	0	31/03/2021	Tender Specification made
266	M/s O.P.Jindal	OP JINDAL TPS	Private S	Chhatis	WR	1	250	02-09-07	Y	Y	Y	0	0	31/03/2022	Issuance of Bid document on Nov :
267	M/s O.P.Jindal	OP JINDAL TPS	Private S	Chhatis	WR	2	250	10-02-08	Y	Y	Y	0	0	31/03/2022	Issuance of Bid document on Nov :
268	M/s O.P.Jindal	OP JINDAL TPS	Private S	Chhatis	WR	3	250	06-03-08	Y	Y	Y	0	0	30/06/2022	Issuance of Bid document on Nov :
269	M/s O.P.Jindal	OP JINDAL TPS	Private S	Chhatis	WR	4	250	17-06-08	Y	Y	Y	0	0	30/06/2022	Issuance of Bid document on Nov :
270	M/s O.P.Jindal	TAMNAR TPP	Private S	Chhatis	WR	1	600	10-03-14	Y	Y	Y	0	0	31/03/2021	Issuance of Bid document on Nov :
271	M/s O.P.Jindal	TAMNAR TPP	Private S	Chhatis	WR	2	600	30-03-14	Y	Y	Y	0	0	31/12/2021	Issuance of Bid document on Nov :
272	M/s O.P.Jindal	TAMNAR TPP	Private S	Chhatis	WR	3	600	07-01-15	Y	Y	Y	0	0	31/03/2022	Issuance of Bid document on Nov :
273	M/s O.P.Jindal	TAMNAR TPP	Private S	Chhatis	WR	4	600	28-03-15	Y	Y	Y	0	0	30/06/2022	Issuance of Bid document on Nov :
274	NTPC	KORBA STPS	Central S	Chhatis	WR	1	200	28-02-83	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
275	NTPC	KORBA STPS	Central S	Chhatis	WR	2	200	31-10-83	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
276	NTPC	KORBA STPS	Central S	Chhatis	WR	3	200	17-03-84	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
277	NTPC	KORBA STPS	Central S	Chhatis	WR	4	500	31-05-87	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
278	NTPC	KORBA STPS	Central S	Chhatis	WR	5	500	25-03-88	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
279	NTPC	KORBA STPS	Central S	Chhatis	WR	6	500	26-02-89	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
280	NTPC	KORBA STPS	Central S	Chhatis	WR	7	500	25-11-10	Y	Y	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :
281	NTPC	SIPAT STPS	Central S	Chhatis	WR	4	500	20-06-08	Y	Y	Y	N	N	31/12/2021	NIT ISSUED ON 15.06.2018.
282	NTPC	SIPAT STPS	Central S	Chhatis	WR	5	500	01-01-09	Y	Y	Y	N	N	31/12/2021	NIT ISSUED ON 15.06.2018.
283	NTPC	SIPAT STPS	Central S	Chhatis	WR	1	660	01-10-11	Y	Y	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :
284	NTPC	SIPAT STPS	Central S	Chhatis	WR	2	660	25-05-12	Y	Y	N	N	N	31/12/2022	NIT IN LOT-2 PLANNED IN JULY :

285	NTPC	SIPAT STPS	Central S	Chhatis	WR	3	660	08-01-12	Y	Y	Y	N	N	31/12/2021	NIT IN LOT-2 PLANNED IN JULY
286	NTPC & Sail	BHILAI TPS	Central S	Chhatis	WR	1	250	20-04-08	Y	0	0	0	0	31/12/2022	Finalisation of specifications(FSC)
287	NTPC & Sail	BHILAI TPS	Central S	Chhatis	WR	2	250	12-07-09	Y	0	0	0	0	31/12/2022	Finalisation of specifications(FSC)
288	RKM Powergen P	UCHPINDA TPP	Private S	Chhatis	WR	1	360	28-10-15	0	0	0	0	0	31/03/2022	Technical discussion with various v
289	RKM Powergen P	UCHPINDA TPP	Private S	Chhatis	WR	3	360	28-01-16	0	0	0	0	0	31/12/2021	Technical discussion with various v
290	SKS Power Gen.	Binjkote TPP	Private S	Chhatis	WR	1	300	25-04-17	0	0	0	0	0	30/09/2020	Feasability study under progress
291	TRN Energy Priv	NAWAPARA TPP	Private S	Chhatis	WR	2	300	18-04-17	0	0	0	0	0	30/09/2020	Already meeting the environmental
292	Adani Power Ltd.	MUNDRA TPS	Private S	Gujarat	WR	1	330	04-08-09	Y	Y	0	0	0	31/12/2022	NIT is to be issued soon.
293	Adani Power Ltd.	MUNDRA TPS	Private S	Gujarat	WR	2	330	17-03-10	Y	Y	0	0	0	31/12/2022	NIT is to be issued soon.
294	Adani Power Ltd.	MUNDRA TPS	Private S	Gujarat	WR	3	330	02-08-10	Y	Y	0	0	0	30/09/2022	NIT is to be issued soon.
295	Adani Power Ltd.	MUNDRA TPS	Private S	Gujarat	WR	4	330	20-12-10	Y	Y	0	0	0	30/09/2022	NIT is to be issued soon.
296	Adani Power Ltd.	MUNDRA TPS	Private S	Gujarat	WR	5	660	26-12-10	Y	Y	0	0	0	30/06/2022	NIT is to be issued soon.
297	Adani Power Ltd.	MUNDRA TPS	Private S	Gujarat	WR	6	660	20-07-11	Y	Y	0	0	0	31/03/2022	NIT is to be issued soon.
298	Essar Gujarat	SALAYA TPP	Private S	Gujarat	WR	1	600	04-01-12	0	0	0	0	0	30/06/2021	Feasibility study under process
299	Essar Gujarat	SALAYA TPP	Private S	Gujarat	WR	2	600	15-06-12	0	0	0	0	0	31/03/2021	Feasibility study under process
300	GSECL	GANDHI NAGAR TPS	State Sec	Gujarat	WR	3	210	20-03-90	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
301	GSECL	GANDHI NAGAR TPS	State Sec	Gujarat	WR	4	210	20-07-91	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
302	GSECL	GANDHI NAGAR TPS	State Sec	Gujarat	WR	5	210	17-03-98	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
303	GSECL	KUTCH LIG. TPS	State Sec	Gujarat	WR	1	70	29-03-90	0	0	0	0	0	31/12/2021	Feasibility Study under progress.
304	GSECL	KUTCH LIG. TPS	State Sec	Gujarat	WR	2	70	25-03-91	0	0	0	0	0	31/12/2021	Feasibility Study under progress.
305	GSECL	KUTCH LIG. TPS	State Sec	Gujarat	WR	3	75	31-03-97	0	0	0	0	0	31/12/2021	Feasibility Study under progress.
306	GSECL	SIKKA REP. TPS	State Sec	Gujarat	WR	3	250	29-03-15	Y	Y	Y	0	0	31/01/2022	Bidding Under Progresse
307	GSECL	SIKKA REP. TPS	State Sec	Gujarat	WR	4	250	25-09-15	Y	Y	Y	0	0	31/01/2022	Bidding Under Progresse
308	GSECL	UKAI TPS	State Sec	Gujarat	WR	3	200	21-01-79	0	0	0	0	0	31/12/2021	Not Feasible as per Developer. Un
309	GSECL	UKAI TPS	State Sec	Gujarat	WR	4	200	28-03-79	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
310	GSECL	UKAI TPS	State Sec	Gujarat	WR	5	210	30-01-85	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
311	GSECL	UKAI TPS	State Sec	Gujarat	WR	6	500	05-03-13	Y	Y	Y	0	0	31/03/2022	e-tender for EPC floated & technic
312	GSECL	WANAKBORI TPS	State Sec	Gujarat	WR	1	210	23-03-82	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
313	GSECL	WANAKBORI TPS	State Sec	Gujarat	WR	2	210	15-01-83	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
314	GSECL	WANAKBORI TPS	State Sec	Gujarat	WR	3	210	15-03-84	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
315	GSECL	WANAKBORI TPS	State Sec	Gujarat	WR	4	210	09-03-86	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
316	GSECL	WANAKBORI TPS	State Sec	Gujarat	WR	5	210	23-09-86	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
317	GSECL	WANAKBORI TPS	State Sec	Gujarat	WR	6	210	18-11-87	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
318	GSECL	WANAKBORI TPS	State Sec	Gujarat	WR	7	210	31-12-98	0	0	0	0	0	31/12/2021	Feasiblity Study Under Progress
319	Tata Power (CGP	MUNDRA UMTTP	Private S	Gujarat	WR	1	800	07-03-12	Y	0	0	0	0	30/06/2020	Feasibility Study Carried Out
320	Tata Power (CGP	MUNDRA UMTTP	Private S	Gujarat	WR	2	800	30-07-12	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out

321	Tata Power (CGP)	MUNDRA UMTTP	Private S	Gujarat	WR	3	800	27-10-12	Y	0	0	0	0	30/06/2021	Feasibility Study Carried Out
322	Tata Power (CGP)	MUNDRA UMTTP	Private S	Gujarat	WR	4	800	21-01-13	Y	0	0	0	0	31/03/2022	Feasibility Study Carried Out
323	Tata Power (CGP)	MUNDRA UMTTP	Private S	Gujarat	WR	5	800	22-03-13	Y	0	0	0	0	31/03/2022	Feasibility Study Carried Out
324	Torrent Power Ge	SABARMATI	Private S	Gujarat	WR	1	120	12-10-78	0	0	0	0	0	31/12/2022	Feasibility Study under process
325	Torrent Power Ge	SABARMATI	Private S	Gujarat	WR	2	121	31-12-84	0	0	0	0	0	31/12/2022	Feasibility Study under process
326	Torrent Power Ge	SABARMATI	Private S	Gujarat	WR	3	121	28-09-88	0	0	0	0	0	31/12/2022	Feasibility Study under process
327	ESSAR power	MAHAN TPP	Private S	Madhya	WR	1	600	24-02-13	0	0	0	0	0	31/12/2020	Feasibility study under process
328	Jaiprakash Power	NIGRI TPP	Private S	Madhya	WR	1	660	29-08-14	0	0	0	0	0	30/06/2020	Feasibility Study is under process.
329	Jaiprakash Power	NIGRI TPP	Private S	Madhya	WR	2	660	27-02-15	0	0	0	0	0	30/09/2020	Feasibility Study is under process.
330	Jhabua Power Ltd	SEIONI TPP	Private S	Madhya	WR	1	600	22-03-16	0	0	0	0	0	31/03/2020	Feasibility Study under progress.
331	MB Power	ANUPPUR TPP	Private S	Madhya	WR	1	600	20-04-15	Y	Y	Y	0	0	31/03/2022	Technical Bid under evaluation
332	MB Power	ANUPPUR TPP	Private S	Madhya	WR	2	600	30-03-16	Y	Y	Y	0	0	30/06/2022	Technical Bid under evaluation
333	MPPGCL	AMARKANTAK EXT TPS	State Sec	Madhya	WR	5	210	15-06-08	0	0	0	0	0	31/03/2021	Feasibility Study Under Progress
334	MPPGCL	SANJAY GANDHI TPS	State Sec	Madhya	WR	1	210	26-03-93	0	0	0	0	0	31/03/2021	Feasibility Study Under Progress
335	MPPGCL	SANJAY GANDHI TPS	State Sec	Madhya	WR	2	210	27-03-93	0	0	0	0	0	31/03/2021	Feasibility Study Under Progress
336	MPPGCL	SANJAY GANDHI TPS	State Sec	Madhya	WR	3	210	28-02-99	0	0	0	0	0	30/06/2021	Feasibility Study Under Progress
337	MPPGCL	SANJAY GANDHI TPS	State Sec	Madhya	WR	4	210	23-11-99	0	0	0	0	0	30/06/2021	Feasibility Study Under Progress
338	MPPGCL	SANJAY GANDHI TPS	State Sec	Madhya	WR	5	500	18-06-07	0	0	0	0	0	31/03/2021	Feasibility Study Under Progress
339	MPPGCL	SATPURA TPS	State Sec	Madhya	WR	10	250	22-03-13	0	0	0	0	0	31/03/2021	Feasibility Study Under Progress
340	MPPGCL	SATPURA TPS	State Sec	Madhya	WR	11	250	25-12-13	0	0	0	0	0	31/03/2021	Feasibility Study Under Progress
341	MPPGCL	SHRI SINGHAJI TPP	State Sec	Madhya	WR	1	600	18-11-13	Y	Y	0	0	0	31/03/2021	NIT to be floated in May 2018
342	MPPGCL	SHRI SINGHAJI TPP	State Sec	Madhya	WR	2	600	15-10-14	Y	Y	0	0	0	31/03/2021	NIT to be floated in May 2018
343	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	1	210	10-10-87	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
344	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	2	210	23-07-88	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
345	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	3	210	03-02-89	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
346	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	4	210	26-12-89	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
347	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	5	210	31-03-90	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
348	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	6	210	01-02-91	Y	N	N	N	N	31/12/2022	NIT IN LOT-3 PLANNED IN OCT 2
349	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	7	500	03-03-99	Y	N	N	N	N	30/06/2021	NIT IN LOT-3 PLANNED IN OCT 2
350	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	8	500	26-02-00	Y	N	N	N	N	30/06/2021	NIT IN LOT-3 PLANNED IN OCT 2
351	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	9	500	27-07-06	Y	Y	Y	N	N	30/09/2021	Price bid submitted on 29.06.2018.
352	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	10	500	08-03-07	Y	Y	Y	N	N	30/09/2021	Price bid submitted on 29.06.2018.
353	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	11	500	14-06-12	Y	Y	Y	N	N	31/12/2021	Price bid submitted on 29.06.2018.
354	NTPC	VINDHYACHAL STPS	Central S	Madhya	WR	12	500	22-03-13	Y	Y	Y	N	N	31/12/2021	Price bid submitted on 29.06.2018.
355	Reliance Power L	SASAN UMTTP	Private S	Madhya	WR	1	660	30-05-13	Y	Y	Y	0	0	30/09/2021	Tender Floated
356	Reliance Power L	SASAN UMTTP	Private S	Madhya	WR	2	660	18-12-13	Y	Y	Y	0	0	30/06/2021	Tender Floated

357	Reliance Power L	SASAN UMTTP	Private S	Madhya	WR	3	660	21-05-14	Y	Y	Y	0	0	31/03/2022	Tender Floated
358	Reliance Power L	SASAN UMTTP	Private S	Madhya	WR	4	660	25-03-14	Y	Y	Y	0	0	31/03/2022	Tender Floated
359	Reliance Power L	SASAN UMTTP	Private S	Madhya	WR	5	660	24-08-14	Y	Y	Y	0	0	31/12/2021	Tender Floated
360	Reliance Power L	SASAN UMTTP	Private S	Madhya	WR	6	660	19-03-15	Y	Y	Y	0	0	30/09/2021	Tender Floated
361	Adani Power Mah	TIRORA TPS	Private S	Mahara	WR	1	660	11-09-12	Y	Y	0	0	0	31/03/2022	NIT to be issued soon.
362	Adani Power Mah	TIRORA TPS	Private S	Mahara	WR	2	660	25-03-13	Y	Y	0	0	0	31/12/2021	NIT to be issued soon.
363	Adani Power Mah	TIRORA TPS	Private S	Mahara	WR	3	660	10-06-13	Y	Y	0	0	0	31/09/2021	NIT to be issued soon.
364	Adani Power Mah	TIRORA TPS	Private S	Mahara	WR	4	660	23-03-14	Y	Y	0	0	0	31/06/2021	NIT to be issued soon.
365	Adani Power Mah	TIRORA TPS	Private S	Mahara	WR	5	660	25-09-14	Y	Y	0	0	0	31/03/2021	NIT to be issued soon.
366	Dhariwal Infrastru	DHARIWAL TPP	Private S	Mahara	WR	1	300	03-11-13	0	0	0	0	0	31/03/2022	Feasibility Study under process
367	Dhariwal Infrastru	DHARIWAL TPP	Private S	Mahara	WR	2	300	28-05-14	0	0	0	0	0	31/03/2022	Feasibility Study under process
368	GMR emco ENER	EMCO WARORA TPS	Private S	Mahara	WR	1	300	07-02-13	Y	0	0	0	0	31/03/2022	Feasibility Study Under Progress. P
369	GMR emco ENER	EMCO WARORA TPS	Private S	Mahara	WR	2	300	27-08-13	Y	0	0	0	0	31/03/2022	Feasibility Study Under Progress. P
370	MAHAGENCO	BHUSAWAL TPS	State Sec	Mahara	WR	3	210	18-09-82	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
371	MAHAGENCO	BHUSAWAL TPS	State Sec	Mahara	WR	4	500	07-03-12	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
372	MAHAGENCO	BHUSAWAL TPS	State Sec	Mahara	WR	5	500	30-03-12	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
373	MAHAGENCO	CHANDRAPUR STPS	State Sec	Mahara	WR	3	210	03-05-85	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
374	MAHAGENCO	CHANDRAPUR STPS	State Sec	Mahara	WR	4	210	08-03-86	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
375	MAHAGENCO	CHANDRAPUR STPS	State Sec	Mahara	WR	5	500	22-03-91	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
376	MAHAGENCO	CHANDRAPUR STPS	State Sec	Mahara	WR	6	500	11-03-92	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
377	MAHAGENCO	CHANDRAPUR STPS	State Sec	Mahara	WR	7	500	01-10-97	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
378	MAHAGENCO	CHANDRAPUR STPS	State Sec	Mahara	WR	8	500	29-03-15	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
379	MAHAGENCO	CHANDRAPUR STPS	State Sec	Mahara	WR	9	500	21-03-16	Y	0	0	0	0	31/03/2020	Feasibility Study Carried Out
380	MAHAGENCO	KHAPARKHEDA TPS	State Sec	Mahara	WR	1	210	26-03-89	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
381	MAHAGENCO	KHAPARKHEDA TPS	State Sec	Mahara	WR	2	210	08-01-90	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
382	MAHAGENCO	KHAPARKHEDA TPS	State Sec	Mahara	WR	3	210	31-05-00	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
383	MAHAGENCO	KHAPARKHEDA TPS	State Sec	Mahara	WR	4	210	07-01-01	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
384	MAHAGENCO	KHAPARKHEDA TPS	State Sec	Mahara	WR	5	500	05-08-11	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
385	MAHAGENCO	KORADI TPS	State Sec	Mahara	WR	6	210	30-03-82	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
386	MAHAGENCO	KORADI TPS	State Sec	Mahara	WR	7	210	13-01-83	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
387	MAHAGENCO	KORADI TPS	State Sec	Mahara	WR	8	660	30-03-15	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
388	MAHAGENCO	KORADI TPS	State Sec	Mahara	WR	9	660	15-03-16	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
389	MAHAGENCO	KORADI TPS	State Sec	Mahara	WR	10	660	28-12-16	Y	0	0	0	0	31/12/2020	Feasibility Study Carried Out
390	MAHAGENCO	NASIK TPS	State Sec	Mahara	WR	3	210	26-04-79	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
391	MAHAGENCO	NASIK TPS	State Sec	Mahara	WR	4	210	10-07-80	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
392	MAHAGENCO	NASIK TPS	State Sec	Mahara	WR	5	210	30-01-81	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out

393	MAHAGENCO	PARLI TPS	State Sec	Mahara	WR	4	210	26-03-85	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
394	MAHAGENCO	PARLI TPS	State Sec	Mahara	WR	5	210	31-12-87	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
395	MAHAGENCO	PARLI TPS	State Sec	Mahara	WR	6	250	16-02-07	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
396	MAHAGENCO	PARLI TPS	State Sec	Mahara	WR	7	250	10-02-10	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
397	MAHAGENCO	PARLI TPS	State Sec	Mahara	WR	8	250	30-03-16	Y	0	0	0	0	31/03/2021	Feasibility Study Carried Out
398	NTPC	MOUDA TPS	Central S	Mahara	WR	1	500	19-04-12	Y	Y	Y	N	N	31/12/2022	Price bid submitted on 25.06.2018.
399	NTPC	MOUDA TPS	Central S	Mahara	WR	2	500	29-03-13	Y	Y	Y	N	N	31/12/2022	Price bid submitted on 25.06.2018.
400	NTPC	MOUDA TPS	Central S	Mahara	WR	3	660	28-03-16	Y	Y	Y	N	N	31/12/2022	Price bid submitted on 29.06.2018.
401	NTPC	MOUDA TPS	Central S	Mahara	WR	4	660	18-03-17	Y	Y	Y	N	N	31/12/2020	Price bid submitted on 29.06.2018.
402	NTPC	SOLAPUR	Central S	Mahara	WR	1	660	07-04-17	Y	Y	Y	N	N	31/12/2020	Price bid submitted on 25.06.2018.
403	Ratan Power	NASIK (P) TPS	Private S	Mahara	WR	1	270	25-02-14	Y	Y	0	0	0	31/03/2021	Bids under Evaluation
404	Ratan Power	NASIK (P) TPS	Private S	Mahara	WR	2	270	15-02-17	0	0	0	0	0	31/03/2021	Feasibility study under progress
405	Ratan Power	NASIK (P) TPS	Private S	Mahara	WR	3	270	14-04-17	0	0	0	0	0	31/12/2022	Feasibility study under progress
406	Ratan Power	NASIK (P) TPS	Private S	Mahara	WR	4	270	19-05-17	0	0	0	0	0	31/12/2022	Feasibility study under progress
407	Ratan Power	NASIK (P) TPS	Private S	Mahara	WR	5	270	30-05-17	0	0	0	0	0	31/12/2022	Feasibility study under progress
408	TATA Power Co.	TROMBAY TPS	Private S	Mahara	WR	5	500	25-01-84	Y	Y	Y	Y	Y	31/03/2018	Sea water FGD is installed at Unit#
409	Vidarbha Industries	BUTIBORI TPP	Private S	Mahara	WR	1	300	17-08-12	Y	Y	Y	0	0	30/06/2021	Reliance Power has floated the Int
410	Vidarbha Industries	BUTIBORI TPP	Private S	Mahara	WR	2	300	19-03-13	Y	Y	Y	0	0	31/03/2021	Reliance Power has floated the Int
411	Wardha P C P L	WARDHA WARORA TPP	Private S	Mahara	WR	1	135	05-06-10	0	0	0	0	0	30/09/2021	Feasibility Study under process
412	Wardha P C P L	WARDHA WARORA TPP	Private S	Mahara	WR	2	135	10-10-10	0	0	0	0	0	30/09/2021	Feasibility Study under process
413	Wardha P C P L	WARDHA WARORA TPP	Private S	Mahara	WR	3	135	21-01-11	0	0	0	0	0	31/12/2021	Feasibility Study under process
414	Wardha P C P L	WARDHA WARORA TPP	Private S	Mahara	WR	4	135	30-04-11	0	0	0	0	0	31/12/2021	Feasibility Study under process
415	NTPC	KUDGI	Central S	Karnat	SR	3	800	12-03-18	Y	Y	Y	N	N	31/12/2022	Price bid submitted on 25.06.2018.
416	NTPC	Lara STPP	Central S	Chhattis	WR	1	800	23-03-18	Y	Y	Y	N	N	0	Price bid submitted on 25.06.2018.
417	NTPC	Meja STPP	Central S	UP	NR	1	660	30-03-18	Y	Y	0	0	0		FGD will award in LOT-1A of NTPC
418	APGENCO	Rayalaseema TPP St-IV	State Sec	AP	SR	6	600	12-03-18	0	0	0	0	0		Commitment yet to received
419	BSEB	Barauni TPS Extn.	State Sec	Bihar	ER	8	250	11-01-18	0	0	0	0	0		Feasibility examining under pr
420	BSEB	Barauni TPS Extn.	State Sec	Bihar	ER	9	250	31-03-18	0	0	0	0	0		Feasibility examining under pr
421	KSK Mahandi Power	Akaltara TPP (Naiyara)	Private S	Chhatt	WR	3	600	18-01-18	0	0	0	0	0		Feasibility study under progres
422	SKS Power Gen.	Binjkote TPP	Private S	Chhattis	WR	2	300	28-03-18	0	0	0	0	0	30/09/2020	Feasibility study under progres
423	RKM Powergen	Uchpinda TPP	Private S	Chhatt	WR	3	360	12-09-17	0	0	0	0	0	Mar-22	Feasibility study under progres
424	Shirpur Power Pl	Shirpur TPP	Private S	Mahara	WR	1	150	28-09-17	0	0	0	0	0		Feasibility study under progres
425	India Power Co	India Power TPP	Private S	WB	ER	2	150	31-12-17	0	0	0	0	0		Feasibility study under progres

CHAPTER – 11: GENERAL EXPLANATION FOR VARIOUS EXPENSES

11.1 KSEBL, as per MYT petition dated 31.10.2018 sought approval of ARR & ERC and capital investment plan for the four year control period from 2018-19 to 2021-22 in respect of its three SBUs along with tariff revision proposals for the years 2018-19 and 2020-21, strictly adhering to the MYT Regulations 2018 notified by KSERC. Hon'ble Commission, as per order dated 08.07.2018, has decided the petition and was also pleased to revise the electricity tariff of all categories of consumers in the state along with bulk supply tariff applicable to the small licensees. Even though KSEBL had requested tariff revision for 2018-19 and 2020-21 tariff revision was ordered only for one year (2019-20). Salient features of the KSERC order are summarized below:

- (i) **Capital Investment Plan (CIP)**: KSEBL proposed a CIP for Rs. 15113.08 Cr. But only provisional approval is granted for Rs.9373.06 Cr. Considering the higher level of investment proposed, Hon'ble Commission has decided to conduct public hearing and to conduct prudence check based on it. In order to finalize the ARR for the control period, provisionally approved values of CIP have been taken in to account. Methodology adopted for granting provisional approval are as follows:
 - (a) Normative capital cost per MW is considered to approve CIP of SBU (G). Pallivasal extension project and RMU works of Kuttiadi HEP have not been considered since the completion of these projects are not expected within the control period.
 - (b) In the case of SBU (T) works that are not tendered, those TRANSGRID projects which are likely to get extended beyond the control period and the "Idamon - Kochi line compensation package" have not been considered.
 - (c) Curtailment has been made in the financial targets proposed for Dyuthi works. Hon'ble Commission was of the view that the rates proposed are at higher side and has directed KSEBL to submit evidences to substantiate how such investments shall ensure quality power supply at affordable cost. Curtailment made in the CIP for Dyuthi works amounts to Rs.2021 Cr (Rs.4036.31 Cr proposed and approved Rs.2015.25 Cr). Even then Hon'ble Commission considered Grants in excess by Rs.726.61 Cr over the projection submitted by KSEBL. Moreover, denied O&M cost for GFA addition of Rs.258.14 Cr towards Centrally Aided IT Projects for 2021-22 (Table 11-page 421). Function wise as well as detailed comparison of Cap-ex is attached as **Appendix 1 & 2** for ready reference.
- (ii) **GFA addition considered for ARR**: As briefed above, the GFA addition considered for O&M cost is Rs 9373.06 Cr and GFA amount considered for loan and depreciation is Rs.7142.81 Cr, after excluding consumer contribution and grants. In this connection kind attention is invited on the following:

Under regulatory regime, which is intended to eliminate regulatory uncertainties, the CIP approval for the control period is required to be obtained before 01.04.2019, ie before the beginning of the control period itself, in the absence of which the investments become uncertain.
- (iii) **Consumer contribution and grants**: Hon'ble Commission considered Rs.2230.25 Cr as consumer contribution and grants for the control period against Rs.1746.61 Cr projected by

KSEBL. Thus Rs.483.64 Cr (net) was considered in excess because of which depreciation was denied.

- (iv) **Tariff Revision:** KSEBL proposed tariff revision for 2018-19 and 2020-21 seeking additional revenue of Rs 1101.72 Cr and Rs. 700.44 Cr but revision has been approved only for the year 2019-20 in a way to fetch additional revenue of Rs.902.90 Cr on full year basis.
- (v) **Amortization of past gap:** KSEBL proposed amortization of past gap @ Rs.806.46 Cr per year (Rs.3225.84 Cr in total for 4 years) but Hon'ble Commission has considered amortization of Rs.3100 Cr only, for the corresponding period.
- (vi) **Approved Revenue Gap:** Revenue gap approved for each of the years of the control period are Rs.31.15 Cr, 800.56 Cr, Rs.944.75 Cr and 998.53 Cr against Rs.1100.71 Cr, Rs.1399.05 Cr, Rs. 2065.28 Cr and Rs.2518.91 Cr proposed by KSEBL.

11.1.1 Actual capital expenditure for the year 2018-19, half year achievement till 30.09.2019 in the FY 20 and revised projection for the remaining years of the control period are discussed in detail in TU 19 and the chapters containing details for the respective SBUs. Based on the revised capital expenditure, expenses like interest on normative loan, depreciation and O&M expenses are projected for the remaining years of the control period from 2019-20 to 2021-22 as detailed in succeeding paragraphs.

11.2 **Interest and finance charges:** Interest and Finance charges projected by KSEBL, approved by the Hon'ble Commission along with true up sought for 2018-19 and revised projections for the ensuing 3 years of the control period are briefly summarized in the Table below. Detailed item wise explanation is furnished thereafter. Item wise and SBU wise break up is furnished in **Appendix 3.**

Table 11.1: Comparison of Interest & Finance charges for the Control period from 2018-19 to 2021-22 (Rs Cr)				
Particulars	2018-19	2019-20	2020-21	2021-22
As per MYT Petition	2405.48	2627.15	2880.48	3069.82
As per MYT Order	2005.76	2065.14	2127.79	2143.62
Revised projections	2317.13 (TU 19)	2479.27	2776.91	3185.61

11.2.1 **Interest on loans:** Hon'ble Commission may kindly note that the closing normative loan balance as per TU 19 (as per Table below) amounting to Rs. 3866.10 Cr has been considered as opening normative loan for the year 2019-20. Normative loan as on 31.03.2017 as per TU 17 Order amounted to Rs.1951.51 Cr (excluding normative loan applicable for the GFA addition during 2016-17). KSEBL, in compliance of the direction contained in TU 17 order has already submitted details claiming additional normative loan of Rs.899.91 Cr. Further, KSEBL was aggrieved on the determination of normative loan balance as on 01.04.2015 (Rs.2276.22 Cr) by the Hon'ble Commission and sought review for an additional claim of Rs.467.60 Cr, which was turned down as per order dated 16.05.2019. It is respectfully submitted that considering the long lasting financial implication, KSEBL has filed an appeal before the Hon'ble APTEL. In view of the above, normative loan as on 01.04.2017 has been worked out at Rs.3319.02 Cr after considering loan for 2016-17 and for the additional amount claimed as per Appeal before Hon'ble APTEL. Eligible normative loan for 2017-18 and 2018-19 and

normative repayments as per truing up petition has also been considered to arrive at the normative loan as on 01.04.2019 as detailed below:

Table 11.2: Computation of normative interest for loan till 01.04.2019 (Rs Cr)					
Sl. No	Particulars	SBU G	SBU T	SBU D	Total
1	Normative loan as on 01.04.2017 as per TU order	564.38	547.59	839.54	1951.51
2	KSEBL claim before Hon'ble APTEL	135.23	131.21	201.16	467.60
3	Normative loan for FY-17-As per additional submission	291.21	241.44	367.26	899.91
4=(1+2+3)	Normative loan as on 01.04.2017	990.82	920.24	1407.96	3319.02
5	Normative loan 2017-18 as per TU Petition	42.35	280.38	305.30	628.03
6=(4+5)	Gross normative loan as on 31.03.2018	1033.17	1200.62	1713.26	3947.05
7	Less: Normative repayment as per TU 2017-18	143.48	156.36	236.78	536.62
8=(6-7)	Normative loan as on 31.03.2018	889.69	1044.26	1476.48	3410.43
9	GFA addition 2018-19	46.95	365.43	1,203.72	1,616.10
10	Less: Cons contr & grants-2018-19	13.34	289.69	452.93	755.96
11=(9-10)	Addition to normative loan during 2018-19	33.61	75.74	750.79	860.14
12	Repayment-Depreciation for 2018-19	137.60	158.88	107.98	404.47
13=(9+12)	Normative loan balance as on 31.03.2019	785.70	961.11	2119.29	3866.10
	Average actual interest rate in 2018-19	8.34	9.06	10.00	9.46

11.2.2 Function wise average actual rate of interest for 2018-19 has been adopted as such for the computation of normative interest for the remaining years. Based on the revised capital expenditure for the remaining years of the control period as detailed under chapters dealing with the respective SBUs, normative loan and interest are computed and furnished in **Appendix 4**. A summary of the same is furnished below:

Table 11. 3: Normative loan for the remaining years			
Particulars	2019-20	2020-21	2021-22
Opening Normative loan	3,866.10	6,053.89	9,509.86
GFA addition during the year	3,972.42	4,441.84	5,000.26
Less: Contribution & Grants	1,300.75	370.68	395.98
GFA addition net of capital grants & subsidies-Additional normative loan	2,671.67	4,071.16	4,604.28
Normative repayment	483.87	615.20	766.97
Closing normative loan	6,053.89	9,509.86	13,347.17
Av normative loan	4960.00	7781.88	11428.51
Normative interest for the year	469.47	734.02	1070.77

11.2.3 **Capitalization of expenses:** The accounting treatment followed in annual accounts towards capitalization of expenses differs from that adopted for Regulatory purposes. Regulatory approval of normative interest is granted only for the commissioned assets and no allowance is permissible for CWIP. Similarly, O&M expenses with regard to GFA are allowed on assets put to use at normative basis. Therefore, in this petition, only normative interest and normative O&M expenses are considered as a charge in ARR and as such no portion is earmarked towards capitalization of interest or employee cost.

11.2.4 **Interest on PF:** KSEBL projected interest on GPF at 8.40% but Hon'ble Commission approved the same at 8%. Revised estimations are based on GPF balance as on 01.04.2019 at approved interest rate of 8.00% as detailed below:

Table 11.4: Revised estimation of interest on provident fund (Rs Cr)												
	As per MYT Petition				Approved				TU	Projections		
	2018-19	2019-20	2021-21	2021-22	2018-19	2019-20	2021-21	2021-22	2018-19	2019-20	2021-21	2021-22
Opening: Provident Fund as on 1 st April -	2207.33	2357.33	2507.33	2657.33	2207.33	2357.33	2507.33	2657.33	2207.33	2209.47	2359.47	2509.47
Addition during the Financial Year	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	2.14	150.00	150.00	150.00
Closing: Provident Fundy as on 31 st March	2357.33	2507.33	2657.33	2807.33	2357.33	2507.33	2657.33	2807.33	2209.47	2359.47	2509.47	2659.47
Average Consumer PF during the Financial Year	2282.33	2432.33	2582.33	2732.33	2282.33	2432.33	2582.33	2732.33	2208.40	2284.47	2434.47	2584.47
Average interest rate (%)	8.40	8.40	8.40	8.40	8.00	8.00	8.00	8.00		8.00	8.00	8.00
Interest Charges	191.72	204.32	216.92	229.52	182.59	194.59	206.59	218.58	162.17	182.76	194.76	206.76
SBU wise segregation												
	As per MYT Petition				Approved				Revised Projections*			
	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
Employee cost ratio (2017-18)	5.13	11.32	83.56	100.00	5.13	11.32	83.56	100.00	5.13	11.32	83.56	100.00
2018-19	9.83	21.70	160.19	191.72	9.37	20.67	152.55	182.59	8.92	16.57	136.68	162.17
2019-20	10.48	23.12	170.72	204.32	9.98	22.03	162.58	194.59	9.37	20.68	152.70	182.76
2020-21	11.12	24.55	181.24	216.92	10.60	23.39	172.60	206.59	9.99	22.04	162.73	194.76
2021-22	11.77	25.97	191.77	229.52	11.21	24.74	182.63	218.58	10.60	23.40	172.76	206.76

Figures for 2018-19 are as per TU petition.

- 11.2.5 Interest on Master Trust Bonds:** State Government, as per notifications dated 31.10.2013 and 28.01.2015, ordered creation of a Master Trust for meeting the unfunded liability of pension, gratuity and leave surrender as on 31.10.2013, in respect of the personnel transferred from erstwhile KSEB to KSEBL. Funding arrangements were put in place through issue of 2 series of Bonds for the total liability as on 31.10.2013 amounting to Rs.12418.72 Cr. Hon Commission recognized the unfunded pension liabilities as above and approved recovery of interest on KSEBL share of Bonds as per Tariff Regulations, 2014. Hon Commission approved interest on Master Trust bonds in the order as proposed by KSEBL. No change is proposed under this head for the remaining years as detailed below:

Table 11.5: Interest on Master Trust Bonds (Rs Cr)				
Item	SBU G	SBU T	SBU D	Total
2019-20	37.58	82.95	612.43	732.96
2020-21	35.50	78.34	578.40	692.24
2021-22	33.41	73.43	544.38	651.22

- 11.2.6 Additional interest on Master Trust:** Tariff Regulations provide that, the annual pension contribution by KSEBL to the Master Trust based on the actuarial valuation is allowed to recover through tariff on annual basis. Claiming the entire additional contribution to the Master Trust in one-go is likely to result in huge accumulation of Regulatory Asset and subsequent tariff shock. Therefore, KSEBL has sought Rs. 372.90 Cr towards interest on unfunded portion of actuarial liability in the MYT petition but Hon'ble Commission provisionally approved Rs. 200 Cr with the following observation:

.....Considering all these factors, the Commission is decided to hold separate proceedings towards the determination of funds requirements of Master Trust. Till such time, the Commission provisionally allows Rs.200 crore as an additional funding for the Master Trust. Hence the figures shown as additional funding for the trust is only provisional and is subject to a prudency check before the same is finally allowed.

- 11.2.7** In view of the above, Hon'ble Commission may be pleased to approve Rs.200 Cr in the Midterm review as well till a final decision in the matter is taken. The claim in this petition for the remaining years is as detailed below:

Table 11.6: Interest on Master Trust Bonds (Rs Cr)				
Item	SBU G	SBU T	SBU D	Total
Interest on Bonds	10.26	22.64	167.10	200.00

11.2.8 Working capital interest: Proposal of KSEBL in MYT petition, approval by Hon'ble Commission and revised projections for the remaining years are tabulated below. Detailed calculation is furnished in the respective chapters dealing with SBU G, SBU T and SBU D.

Table 11.7: Estimation of interest on Working capital (Rs Cr)												
	Projections				Approved				Revised Projections			
	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
2018-19*	5.86	17.99		23.85	6.08	15.67		21.75	6.21	15.76		21.97
2019-20	6.19	20.59		26.78	6.23	17.40		23.63	6.17	21.70		27.87
2020-21	6.89	25.57		32.46	6.84	20.48		27.32	6.31	23.28		29.59
2021-22	8.38	30.99		39.37	7.60	23.28		30.88	7.53	27.10		34.63

Revised projection for 2018-19 is as per TU petition for 2018-19.

11.2.9 Interest on security deposit: The interest on security deposit claimed in the MYT petition and approved by the Hon'ble Commission is given in table below

Table 11.8: Interest on Security Deposit (Rs Cr)						
No	Particulars	2017-18	2018-19	2019-20	2020-21	2021-22
1	Opening: SD as on 1 st April	2597.51	2836.96	3086.96	3386.96	3686.96
2	Addition during the FY	239.45	250.00	300.00	300.00	300.00
3	Closing SD as on 31 st March	2836.96	3086.96	3386.96	3686.96	3986.96
4	Average SD during the FY	2717.235	2961.96	3236.96	3536.96	3836.96
5	Average interest rate (%)	6.75	6.75	6.75	6.75	6.75
6	Interest Charges	175.33	199.93	218.49	238.74	258.99
Approved by the Commission						
No	Particulars	2017-18	2018-19	2019-20	2020-21	2021-22
1	Opening: SD as on 1 st April	2597.51	2836.96	3086.96	3386.96	3686.96
2	Addition during the FY	239.45	250.00	300.00	300.00	300.00
3	Closing SD as on 31 st March	2836.96	3086.96	3386.96	3686.96	3986.96
4	Average SD during the FY	2717.235	2961.96	3236.96	3536.96	3836.96
5	Average interest rate (%)	6.45	6.75	6.75	6.75	6.75
6	Interest Charges for the year	175.33	199.93	218.49	238.74	258.99
7	Actual disbursements allowed into ARR		175.33	199.93	218.49	238.74

11.2.10 The security deposit as on 31st March 2019 has been Rs 3019.12 Cr and interest was provided at 6.25%. Considering an addition of Rs 300 Cr per annum and at an interest of 6.25% (against 6.75% as per MYT Petition), the interest on security deposit for the remaining years of the control period is given in table below. Hon Commission approved interest on SD as projected by KSEBL on yearly disbursement basis ie interest applicable for a particular year is actually disbursed during next year and therefore entitlement for 2018-19 has been approved for 2019-20.

Table 11.9: Estimation of interest on Security deposit (Rs Cr)								
	Projections (SBU D)				TU 19	Revised projection		
Parameter	2018-19	2019-20	2021-21	2021-22	2018-19	2019-20	2020-21	2021-22
Opening: SD as on 1 st April - Rs. Cr	2836.96	3086.96	3386.96	3686.96	2836.96	3019.12	3319.12	3619.12
Addition during the Financial Year - Rs. Cr	250	300	300	300	182.16	300	300	300
Closing SD as on 31 st March - Rs. Cr	3086.96	3386.96	3686.96	3986.96	3019.12	3319.12	3619.12	3919.12
Average SD during the Financial Year- Rs. Cr	2961.96	3236.96	3537	3836.96	2928.04	3169.12	3469.12	3769.12
Average interest rate (%)	6.75	6.75	6.75	6.75	6.25	6.25	6.25	6.25
Interest Charges - Rs. Cr	199.93	218.49	238.74	258.99	177.31	188.70	207.45	226.20
Interest claimed on payment basis						177.31	188.70	207.45

11.2.11 Carrying cost on approved revenue gap: Carrying cost claimed in MYT petition as well as approval granted by the Hon'ble Commission is tabulated below:

Table 11.10: Carrying cost for the accumulated revenue gap (Rs Cr)					
Proposed by KSEBL in MYT petition					
No	Particulars	2018-19	2019-20	2020-21	2021-22
1	Opening revenue gap (approved)	5645.26	4838.79	4032.33	3225.86
2	Recovery proposed to be amortized	806.47	806.47	806.47	806.47
3	Balance gap	4838.79	4032.33	3225.86	2419.4
4	Av revenue gap	5242.03	4435.56	3629.1	2822.63
5	Av GPF balance for the year	2282.33	2432.33	2582.33	2732.33
6	Balance	2959.70	2003.23	1046.77	90.3
7	Interest rate	9.50	10	10	10
8	Carrying cost	281.17	200.32	104.68	9.03
Approved by the Honourable Commission					
1	Opening revenue gap (approved)	5693.25	5293.25	4293.25	3443.25
2	Recovery proposed to be amortized	400	1000	850	850
3	Balance gap	5293.25	4293.25	3443.25	2593.25
4	Av revenue gap	5493.25	4793.25	3868.25	3018.25
5	Av GPF balance for the year	2282.33	2432.33	2582.33	2732.33
6	Balance	3210.92	2360.92	1285.92	285.92
7	Interest rate	9.47%	9.47%	9.47%	9.47%
8	Carrying cost	304.08	223.59	121.78	27.08

11.2.12 Hon'ble Commission may kindly note that the amortized portion of approved revenue gap ordered for 2017-18 and 2018-19 has not actually been materialized. Further, KSEBL has claimed additional revenue gap for 2016-17 amounting to Rs. 63.76 Cr. Revenue gap sought for true up for the years 2017-18 and 2018-19 amounted to Rs.1331.81 Cr and Rs 759.88 Cr respectively. Further, revenue gap for 2019-20 (excluding carrying cost for current year revenue gap) has also been considered. Average interest rate for 2018-19 for SBU D has been 10%. On the basis of the above, the revised claim towards carrying cost amounts to Rs.688.90 Cr for 2019-20 as detailed below:

Table 11.11: Computation of carrying cost on approved revenue gap	Rs Cr
Total un bridged revenue gap as on 31-03-2011	424.11
Revenue gap as per the orders on truing up for the year 2011-12	1386.97
Revenue gap as per the orders on truing up for the year 2012-13	3132.97
Remand order dated 09.05.17-2009-10	107.90
Remand order dated 19.05.17-2010-11	204.70
True up order 2013-14 dated 20.06.2017	195.50
RP 2/2017 dated 07.09.2017 on TU 2011-12	4.96
True up order 2015-16 dated 21.08.2018	202.97
True up order 2016-17 dated 14.09.2018	1031.06
RP 3/2019 on TU 2016-17	47.99
Total trued up revenue gap	6739.13
Less: Average PF balance	2284.47
Net revenue gap	4454.66
Carrying cost at average interest rate of 10% on above (A)	445.47
Carrying cost on revenue gap for subsequent years	
2016-17-Additional submission	63.76
2017-18	1331.81
2018-19	759.88
Revenue gap sought for true up from 2016-17 to 2018-19	2155.45
Carrying cost at average interest rate of 10% on above (B)	215.55
Revenue gap for the year (excl carrying cost for current year revenue gap)	
2019-20	557.66
Carrying cost at 10%—C	27.88
Eligible carrying cost (A+B+C)	688.90

11.2.13 Hon'ble Commission had true up revenue gap of Rs.6739.13 Cr till 2016-17 (excluding 2014-15, for which orders are yet to be issued). Based on the methodology adopted by the Hon'ble Commission in TU 16 & TU 17, average GPF balance of Rs.2284.47 Cr has been excluded from the approved gap to determine the revenue gap for which carrying cost is eligible. Actual average interest on loans during 2018-19 for SBU D had been 10 %. Accordingly, a sum of Rs.445.47 Cr is computed as carrying cost for the approved revenue gap.

11.2.14 It is further submitted that the Hon'ble APTEL, as per judgment dated 08.04.2015 in Appeal 160 of 2012 and batch has laid down the principle based on which carrying cost is to be allowed. The decision was reiterated in judgment dated 22.04.2015 in Appeal 174 of 2013 as well. The same is reproduced below:

42. We find that for carrying cost, the State Commission has considered the revenue gap to be applicable from the end of the year of the occurrence of the revenue gap up to the middle of the year in which the same is proposed to be recovered. This is not correct. The interest to be calculated for the period from the middle of the financial year in which the revenue gap had occurred up to the middle of the financial year in which the recovery has been proposed...This is because the expenditure is incurred throughout the year and its recovery is also spread out throughout the year. Admittedly, the revenue gap will be determined at the end of the financial year in which the expenditure is incurred. However under or over recovery is the resultant of the cost and revenue spread out throughout the year. Similarly, the revenue gap of the past year will be recovered throughout the financial year in which its recovery is allowed. Therefore interest on revenue gap as a result of true up for a financial year should be calculated from the mid of that year till the middle of the financial year in which such revenue gap is allowed to be recovered.

43. To explain this point let us assume that there is a revenue gap of 12 crores in the true up of FY 2010-11. If the cost and the revenue and the permitted expenditure had been properly balances, this gap of 12 crores would have been recovered throughout the 12 months of FY 2010-11. Now, this revenue gap is allowed to be recovered in tariff during FY 2013-14. The recovery of gap of Rs. 12 crores from the distribution licensee consumers will be spread over the 12 months period of 2013-14. Therefore carrying cost would be calculated from the middle of FY 2010-11 to middle of FY 2013-14 ie 3 years.

11.2.15 Hon'ble Commission may kindly note that the additional revenue deficit sought for True up for 2016-17 and true up sought 2017-18 and 2018-19 amounted to Rs.63.76 Cr, Rs.1331.81 Cr and Rs.759.88 Cr respectively. In view of the above judgment, the carrying cost for the revenue gap till 2018-19 is computed at Rs.215.55 Cr.

11.2.16 Further, revenue gap for 2019-20 (excluding carrying cost on current year gap) is estimated at Rs. 557.66 Cr on which eligible carrying cost works out to Rs.27.88 Cr. Therefore Hon'ble Commission may kindly approve Rs.688.90 Cr towards carrying cost for 2019-20 since amortization of past gap has not materialized in previous years also.

11.2.17 Carrying cost for the remaining years for the control period without amortization of past gap is furnished below.

Table 11.12: Computation of carrying cost on approved revenue gap (Rs Cr)	2020-21	2021-22
Total trued up revenue gap as per Table 11.11	6739.13	6739.13
Less: Average PF balance	2434.47	2584.47
Net revenue gap	4304.66	4154.66
Carrying cost at average interest rate of 10% on above (A)	430.47	415.47
Carrying cost on revenue gap for subsequent years		
2016-17-Additional submission	63.76	63.76
2017-18	1331.81	1331.81
2018-19	759.88	759.88
2019-20	585.54	598.32
2020-21		693.86
Total revenue gap sought for true up	2740.99	3447.63
Carrying cost @10% (B)	274.10	344.76
Revenue gap for the year (excl carrying cost for current year revenue gap)		
2020-21	660.82	
2021-22		1084.79
Carrying cost at 10%-(C)	33.041	54.24
Eligible carrying cost (A+B+C)	737.61	814.47

11.2.18 In view of the submission in foregoing paragraphs, Hon'ble Commission may kindly approve interest and finance charges as summarized below:

Table 11.13: Revised estimate of Interest and Finance charges (Rs Cr)												
Particulars	2019-20				2020-21				2021-22			
	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
Interest on outstanding Loans	61.05	138.56	269.86	469.47	80.96	270.40	382.66	734.02	146.19	414.25	510.34	1070.77
Interest on Security Deposit	0.00	0.00	177.31	177.31	0.00	0.00	188.70	188.70	0.00	0.00	207.45	207.45
Interest on working capital	6.17	21.70	0.00	27.87	6.31	23.28	0.00	29.59	7.53	27.10	0.00	34.63
Interest on PF	9.37	20.68	152.70	182.76	9.99	22.04	162.73	194.76	10.60	23.40	172.76	206.76
Interest on Bonds to Master Trust	37.58	82.95	612.43	732.96	35.50	78.34	578.40	692.24	33.41	73.73	544.38	651.52
Carrying cost	0.00	0.00	688.90	688.90	0.00	0.00	737.61	737.61	0.00	0.00	814.47	814.47
Additional Interest on Master Trust	10.26	22.64	167.10	200.00	10.26	22.64	167.10	200.00	10.26	22.64	167.10	200.00
Total Interest and Finance Charges	124.44	286.53	2068.30	2479.27	143.01	416.70	2217.20	2776.91	207.99	561.12	2416.50	3185.61

11.3 Depreciation: The depreciation claimed in line with Tariff Regulation, 2018 for the control period as per MYT petition and approved by the Hon'ble Commission is detailed below:

Table 11.14: Statement showing comparison of depreciation for the control period 2019-2022													
	Particulars	As per MYT Petition				As per KSERC Order dt 08.07.2019				Variation			
		2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
1	SBU G	122.26	125.01	137.68	168.12	130.19	141.38	174.35	196.26	7.93	16.37	36.67	28.14
2	SBU T	172.32	199.58	257.03	344.70	146.41	173.47	222.92	261.09	-25.91	-26.11	-34.11	-83.61
3	SBU D	109.72	143.99	163.89	181.71	72.24	93.47	121.53	154.91	-37.48	-50.52	-42.36	-26.80
4	Total	404.30	468.58	558.60	694.53	348.84	408.32	518.80	612.26	-55.46	-60.26	-39.80	-82.27

11.3.1 As part of changes proposed in GFA, revised estimation for the control period, strictly in line with the Regulation is given in Table below:

Table 11.15 Computation of Normative depreciation for the remaining years of control period (Rs Cr)					
No	Particulars	TU	Revised projections		
		2018-19	2019-20	2020-21	2021-22
1	GFA excluding revaluation	18122.58	19738.68	23711.10	28152.94
2	Opening Contribution & grants	6248.75	7004.71	8305.46	8676.14
3	GFA net of contribution (1-2)	11873.83	12733.97	15405.64	19476.80
4	Addition during the year	1616.10	3972.42	4441.84	5000.26
5	Total (3+4)	13489.93	16706.39	19847.48	24477.06
6	Contribution & grants during the year	755.96	1300.75	370.68	395.98
7	GFA addition net of contribution (4-6)	860.14	2671.67	4071.16	4604.28
8	Depreciation for Op GFA	382.36	415.21	510.57	648.64
9	Depreciation on current year addition	22.11	68.66	104.63	118.33
10	Total depreciation for the year (10+11)	404.47	483.87	615.20	766.97

11.3.2 SBU wise details are furnished in **Appendix 4**. Depreciation rate for 2018-19 (as per TU petition) on GFA net of contribution has been considered for the determination of depreciation on opening GFA. Depreciation rate has been determined as shown below:

Table 11.16: Determination of depreciation rate for the control period (Rs Cr)				
Particulars	SBU G	SBU T	SBU D	Total
GFA net of contribution as on 31.03.2018	4781.95	4819.70	2272.18	11873.83
GFA Addition net of contribution 18-19	33.60	75.74	665.77	775.11
GFA net of contribution as on 31.03.2019	4815.55	4895.44	2937.95	12648.94
Depreciation on op GFA (as per TU petition)	136.73	156.94	88.69	382.36
On addition at half the normal rate (5.17%/2=2.57%)	0.86	1.95	19.30	22.11
Total depreciation	137.60	158.88	107.98	404.47
Depreciation rate for opening GFA (%)	2.86	3.26	3.90	

11.3.3 Depreciation on current year GFA addition is computed on addition net of Contribution and grants at half the normal depreciation rate of depreciation as computed by the Hon'ble Commission in MYT order (5.14/2=2.57%). Paragraph 3.65 of the order is extracted below for ready reference.

Based on the mix of assets, for the first 12 years the average rate of depreciation will be 5.14%. Since the weighted average life of the assets is 31 years, the balance 27% of the value of assets (90%-63%) is to be depreciated in balance 19 years (31-12 years) of the useful life. Hence the average rate of depreciation for assets more than 12 years old will be 27%/19 ie., 1.4% per year on a straight line basis.

11.4 **Contribution and Grants:** Details of Consumer Contribution and grants as per Tariff Regulation, 2018 till 31.03.2019 and revised projection for the remaining years are detailed below:

Table 11.17: SBU DETAILS OF CONTRIBUTIONS, GRANTS AND SUBSIDIES TOWARDS COST OF CAPITAL ASSETS (GROSS) (Rs. Cr)					
SL No.	PARTICULARS	Up to 31.03.2019			
		GEN	TRANS	DIST	TOTAL
1	Consumer contribution grants & subsidies till 31.10.2013			4169.88	4169.88
2	From 01.11.2013 to 31.03.2019	88.65	488.62	2257.55	2834.82
3	Total Capital receipts within the meaning of Tariff Regulation, 2018 (1+2)	88.65	488.62	6427.43	7004.70

4	Revised projection 2019-20		400.78	899.97	1300.75
5	Revised projection 2020-21	47.00		323.68	370.68
6	Revised projection 2021-22	44.50	78.53	292.95	395.98
7	Total revised Projection (4+5+6)	91.50	479.31	1516.60	2087.41
8	Revised projection at the end of the Control period (3 +7)	180.15	967.93	7944.03	9092.11

11.4.1 Hon Commission may kindly note that decommissioning liability and concessional loan considered under this head as per accounts does not involve cash flow. Therefore actual receipt of Consumer Contribution and grants till 31.03.2019 for regulatory purpose amounted to Rs.2834.82 Cr as detailed in chapter 5. Consumer contribution & grants till 31.10.2013 has been considered as such at Rs.4169.88 Cr. SBU wise break up of consumer contribution and grants as on 31.03.2019 are furnished in **Appendix 5** hereto.

11.5 O&M Expenses: O&M expenses projected by KSEBL and approved by the Hon'ble Commission under normative basis is summarized below:

Table 11.18: Statement showing comparison of O&M for the control period 2019-2022													
		As per MYT Petition				As per KSERC Order dt 08.07.2019				Variation			
	Particulars	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
1	SBU G	127.86	152.44	176.59	211.77	124.15	135.04	153.37	172.01	-3.71	-17.40	-23.22	-39.76
2	SBU T	363.23	397.46	452.88	491.28	363.23	397.46	452.88	491.28	0.00	0.00	0.00	0.00
3	SBU D	2732.45	3048.69	3361.16	3659.54	2713.46	2991.45	3265.00	3512.24	-18.99	-57.24	-96.16	-147.30
4	Total	3223.54	3598.59	3990.63	4362.59	3200.84	3523.95	3871.25	4175.53	-22.70	-74.64	-119.38	-187.06

11.5.1 Revised projection for the control period based on the TU petition for 2018-19 and the revised projection of capital expenditure for the remaining years of the control period is detailed in the respective chapters dealing with SBU G, SBU T & SBU D and a summary thereof is furnished below:

Table 11.19: Revised projection of O&M for the control period 2019-2022 (Rs Cr)							
No	Particulars	TU 2018-19			2019-20	2020-21	2021-22
		As per norms	Pay revision	Total	As per norms	As per norms	As per norms
1	SBU G	124.47	8.05	132.52	130.89	153.55	202.99
2	SBU T	363.23	23.48	386.71	390.83	440.48	496.30
3	SBU D	2234.79	144.47	2379.26	2450.15	2675.54	2910.68
4	Total	2722.49	176.00	2898.49	2971.87	3269.57	3609.97

11.5.2 Pay Revision Expenses: The Regulation 14 (3) provides for admission of expenses relating to pay revision during the control period for the same level of employees as admitted in the truing up of accounts for the year 2016-17. The pay revision of Officers/workmen of KSEBL is due from July / August 2018. The additional liability is estimated at 10% of Basic pay and DA. Accordingly, the amount of provision required is furnished in the table below:

Table 11.20: Pay Revision Expenses (Cr)				
Particulars	2018-19	2019-20	2020-21	2021-22
Basic + DA	2375.79	2631.10	2843.33	3067.19
10% of above	238.58			
Provision for Pay Revision	176.00	263.11	284.33	306.72

11.5.3 The SBU wise breakup of the above anticipated expenses in employee cost ratio is given in the table below and that related to SBU-D for the control period are high-lighted in the table and the details have been furnished along with MYT petition dated 31.10.2018.

Table 11.21: SBU wise Pay revision expenses					
SBU	Employee cost ratio	2018-19	2019-20	2020-21	2021-22
SBU G	5.13	9.03	13.49	14.58	15.73
SBU T	11.32	19.92	29.78	32.18	34.71
SBU D	83.56	147.05	219.84	237.58	256.28
Total	100	176.00	263.11	284.33	306.72

11.5.4 Actual provision made in accounts for 2018-19 has been Rs. 176 Cr. However, SBU-D has not revised the projection amount proposed in the MYT of SBU-D from 2019-20 to 2021-22. The Hon Commission may allow the said expense during the truing process. Details of expenses sought for true up in 2018-19 is furnished in chapter 5, which is summarized below:

Table 11.22: Normative O&M expenses for 2018-19 (Rs. Cr)					
Sl. No	Particulars	SBU G	SBU T	SBU D	Total
1	As per norms	124.47	363.23	2234.79	2722.49
2	Provision for pay revision	8.05	23.48	144.47	176.00
3	Total O&M expense	132.52	386.71	2379.26	2898.49

11.6 **Return on Equity:** Return on equity as per MYT petition and approval has been 14% on the Government equity in KSEBL amounting (Rs.3499.05 Cr) to Rs.489.86 Cr. No change is proposed in this submission. The function wise break up of equity is made on the basis of equity allocation among SBUs in the Trifurcated Balance sheet as detailed below:

Table 11.23: Allocation of Equity and RoE (Rs. Cr)				
Particulars	SBU G	SBU T	SBU D	Total
Equity Capital	831.27	857.05	1810.73	3499.05
RoE @14% on above	116.38	119.99	253.50	489.87

11.7 **One Time Expenses:** KSEBL suffered badly during the Monsoon floods of 2018 and 2019. There were damages to poles, transformers, conductors, RMU etc. Further there were severe damages to substations and offices in submerged buildings. Computers and IT infrastructure in these offices needed replacement. However, with earnest efforts Board have restored almost all our plants to normalcy. This fact had already been brought to the kind attention of the Hon'ble Commission through the MYT petition with a request to true up actually incurred expenses during truing up over and above normative values. Hon'ble Commission, however, has turned down the request. In this regard, it may kindly be noted that the Government of Kerala has sanctioned financial assistance to KSEBL for flood restoration works. In view of the above, additional expenses for the restoration works will be met from the Government assistance and as such KSEBL does not claim any additional expenses in this petition.

11.8 **Non- Tariff Income:** Hon Commission fully approved the projections made under Non Tariff income for the control period. Actual income sought for true up in 2018-19 was higher than the sum approved by Rs.11.14 Cr (1.90%), which is considered as such in the midterm review. no change is proposed for the remaining years as summarized below:

Table 11.24: Statement showing comparison of Non tariff income for the control period 2019-2022									
		As per MYT Petition & approval				Revised projection			
No	Particulars	2018-19	2019-20	2020-21	2021-22	2018-19 TU	2019-20	2020-21	2021-22
1	SBU G	25.83	33.38	37.28	41.17	17.94	33.38	37.28	41.17
2	SBU T	28.85	37.30	41.82	46.35	42.07	37.30	41.82	46.35
3	SBU D	531.55	548.10	571.23	594.36	537.36	548.10	571.23	594.36
4	Total	586.23	618.78	650.33	681.88	597.37	618.78	650.33	681.88

11.9 **Revenue from Tariff:** Revenue from tariff for the control period has been approved by the Hon'ble Commission as proposed by KSEBL in the MYT petition. But the approval of total revenue, net of PF incentive and external sale, differ slightly as summarized below:

Table 11.25: Statement showing comparison of Revenue from tariff & external sale for the control period 2019-2022													
		As per MYT Petition				Approved				Variation			
No	Particulars	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
1	Revenue from Tariff	12531.47	13254.67	13874.14	14523.36	12531.47	13254.67	13874.14	14523.36	0.00	0.00	0.00	0.00
2	Less: PF Incentive	97.79	104.21	108.85	113.73	97.79	44.99	32.50	33.95	0.00	-59.22	-76.35	-79.78
3	Net revenue from tariff	12433.68	13150.46	13765.29	14409.63	12433.68	13209.68	13841.64	14489.41	0.00	59.22	76.35	79.78
4	Revenue from external sale	712.96	962.74	518.19	312.38	756.64	942.70	615.68	405.61	43.68	-20.04	97.49	93.23
5	Total revenue	13146.64	14113.20	14283.48	14722.01	13190.32	14152.38	14457.32	14895.02	43.68	39.18	173.84	173.01

11.9.1 Break up of revenue is furnished below:

Table 11.26: Revenue for the control period as per MYT petition & approval (Rs Cr)				
As per MYT Petition				
Item	2018-19	2019-20	2010-21	2021-22
Revenue from Sale of power(net of PFI)	12,352.03	13,150.46	13,765.29	14,409.63
Fuel Surcharge	81.65			
Revenue from external sales	712.96	962.74	518.19	312.38
Total revenue	13,146.64	14,113.20	14,283.48	14,722.01
Approved by Hon'ble Commission				
Item	2018-19	2019-20	2010-21	2021-22
Revenue from Sale of power (net of PFI)	12,352.03	13,209.68	13,841.64	14,489.41
Fuel Surcharge	81.65			
Revenue from external sales	756.64	942.7	615.68	405.61
Total revenue	13,190.32	14,152.38	14,457.33	14,895.02

11.9.2 Actual revenue sought for true up in 2018-19 (Rs.12939.20 Cr) was less than Rs.251.12 Cr (1.90%) of the sum approved. Revenue from tariff has been re estimated on the basis of the tariff ordered by the Hon'ble Commission as per order dated 08.07.2019. Based on energy availability and demand for the remaining years, surplus energy available for external sale has been assessed. Based on the above, total revenue has been projected as summarized below. Detailed explanation is furnished in chapter dealing with SBU D.

Table 11.27: Revenue from sale of power after deducting power factor incentive (Rs Cr)				
Item	April-Sept 2019	FY-20	FY-21	FY-22
Revenue from tariff	7043.43	13858.57	14616.86	15251.04
Less: Power factor incentive	31.62	46.96	32.47	34.10
Net Revenue from Tariff	7025.98	13811.61	14584.39	15216.94
Add: Revenue from external sale	17.45	17.56	657.62	828.35
Total revenue	7043.43	13829.17	15242.01	16045.29

11.10 **Comparison of approval and revised projections:** The following table summarizes the variation between approval granted by the Hon'ble Commission as per order dated 08.07.2019 and revision proposed in this petition. SBU wise and KSEBL as whole details are furnished in Appendix 6, 7, 8 & 9.

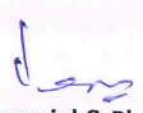
Table 11.28: Comparison of ARR & ERC of KSEBL as per MYT petition, approval and revised estimates (Rs Cr)									
No	Particulars	Filed as per MYT Regulation				Provisional approval			
		2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
1	Total ARR	14833.57	16131.03	16999.09	17922.81	13808.70	15571.72	16052.40	16575.43
2	Total ERC/ Transfer price	13732.87	14731.98	14933.81	15403.89	13776.55	14771.16	15107.65	15576.90
3	Net Revenue Gap	1100.70	1399.05	2065.28	2518.92	32.15	800.56	944.75	998.53
		Actuals		As per Mid Tem Review					
		2018-19	30.09.2019	2019-20	2020-21	2021-22			
1	Total ARR	14782.80	7909.70	15033.50	16586.20	17866.20			
2	Total ERC	14002.94	7343.13	14447.95	15892.34	16727.17			
3	Net Revenue Gap	779.86	566.57	585.55	693.86	1139.03			

Prayer

KSEBL humbly requests before the Hon Commission that:

- (1) Truing up of Expenses and Revenue as per the Audited Accounts of KSEBL for the year 2018-19 and explained in this petition in chapters 1 to 6 may kindly be approved,
- (2) Revised projection of Expenses and Revenue of KSEBL for the remaining years of the control period from 2019-20 to 2021-22 along with the revised CIP as explained in this petition in chapters 7 to 12 may kindly be approved, in view of the care and caution taken by the Board for carrying out the functions of the Board as a public utility as per the statutory provisions under the Electricity Act, 2003 and also as per the directions, orders and regulations issued by the Hon Commission, policies and directions issued by the State and Central Government and other statutory bodies within the provisions of the Electricity Act-2003.
- (3) The revenue gap as per the petition may be accounted as regulatory asset or any other appropriate means deemed fit by the Hon Commission according to the provisions of law.

On Behalf of KSEB limited


Deputy Chief Engineer (Commercial & Planning)
With full powers of Chief Engineer

APPENDICES

Appendix 1 Summary of GFA addition proposed in MYT petition, provisionally approved and disallowance (Rs. Cr)															
	Proposed					Approved (Provisional)					Disallowance (provisional)				
	2018-19	2019-20	2020-21	2021-22	Total	2018-19	2019-20	2020-21	2021-22	Total	2018-19	2019-20	2020-21	2021-22	Total
SBU G	99.47	477.68	1008.86	665.71	2251.72	65.79	448.07	593.59	153.76	1261.21	33.68	29.61	415.27	511.95	990.51
SBU T	840.84	1772.05	2703.95	769.32	6086.16	511.60	1082.11	1427.76	615.21	3636.68	329.24	689.94	1276.19	154.11	2449.48
SBU D	2620.25	1521.74	1362.97	1270.24	6775.20	1773.70	1242.17	831.69	627.61	4475.17	846.55	279.57	531.28	642.63	2300.03
Total	3560.56	3771.47	5075.78	2705.27	15113.08	2351.09	2772.35	2853.04	1396.58	9373.06	1209.47	999.12	2222.74	1308.69	5740.02
Contribution & Grants															
SBU G	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SBU T	196.60	71.37	389.58	100.00	757.55	0.00	25.00	389.58	100.00	514.58	196.60	46.37	0.00	0.00	242.97
SBU D	377.92	201.69	203.71	205.74	989.06	906.94	399.28	203.71	205.74	1715.67	-529.02	-197.59	0.00	0.00	-726.61
Total	574.52	273.06	593.29	305.74	1746.61	906.94	424.28	593.29	305.74	2230.25	-332.42	-151.22	0.00	0.00	-483.64
GFA net of consumer contribution and grants															
SBU G	99.47	477.68	1008.86	665.71	2251.72	65.79	448.07	593.59	153.76	1261.21	33.68	29.61	415.27	511.95	990.51
SBU T	644.24	1700.68	2314.37	669.32	5328.61	511.60	1057.11	1038.18	515.21	3122.10	132.64	643.57	1276.19	154.11	2206.51
SBU D	2242.33	1320.05	1159.26	1064.50	5786.14	866.76	842.89	627.98	421.87	2759.50	1375.57	477.16	531.28	642.63	3026.64
Total	2986.04	3498.41	4482.49	2399.53	13366.47	1444.15	2348.07	2259.75	1090.84	7142.81	1541.89	1150.34	2222.74	1308.69	6223.66

Appendix 2 Summary of SBU wise GFA addition proposed, provisionally approved and disallowance SBU G (Rs. Cr)															
	Proposed					Approved (Provisional)					Disallowance (provisional)				
	2018-19	2019-20	2020-21	2021-22	Total	2018-19	2019-20	2020-21	2021-22	Total	2018-19	2019-20	2020-21	2021-22	Total
New Hydel projects			87.99	87.23	175.22			53.03	42.42	95.45	0.00	0.00	34.96	44.81	79.77
RMU-new		12.22	327.20		339.42		12.22			12.22	0.00	0.00	327.20	0.00	327.20
Solar		57.51			57.51		57.51			57.51	0.00	0.00	0.00	0.00	0.00
On going hydel	99.47	384.55	331.41	578.48	1393.91	65.79	354.94	278.30	111.34	810.37	33.68	29.61	53.11	467.14	583.54
RMU ongoing		20.40	252.26		272.66		20.40	252.26		272.66	0.00	0.00	0.00	0.00	0.00
Others DRIP etc		3.00	10.00		13.00		3.00	10.00		13.00	0.00	0.00	0.00	0.00	0.00
Total	99.47	477.68	1008.86	665.71	2251.72	65.79	448.07	593.59	153.76	1261.21	33.68	29.61	415.27	511.95	990.51

Summary of GFA addition proposed, provisionally approved and disallowance SBU T (Rs. Cr)															
	2018-19	2019-20	2020-21	2021-22	Total	2018-19	2019-20	2020-21	2021-22	Total	2018-19	2019-20	2020-21	2021-22	Total
Ongoing plus new works	804.12	568.73	196.28	254.26	1823.39	499.60	312.80	20.00	0.00	832.40	304.52	255.93	176.28	254.26	990.99
New above 10 Cr	0.00	662.59	421.83	41.65	1126.07	0.00	353.74	150.92	141.80	646.46	0.00	308.85	270.91	-100.15	479.61
Transgrid	0.00	362.57	2073.84	260.96	2697.37	0.00	362.57	1244.84	260.96	1868.37	0.00	0.00	829.00	0.00	829.00
Edamon-Kochi compensation	10.00	118.02	0.00	0.00	128.02					0.00	10.00	118.02	0.00	0.00	128.02
SLDC	26.72	60.14	12.00	212.45	311.31	12.00	53.00	12.00	212.45	289.45	14.72	7.14	0.00	0.00	21.86
Total	840.84	1772.05	2703.95	769.32	6086.16	511.60	1082.11	1427.76	615.21	3636.68	329.24	689.94	1276.19	154.11	2449.48
PSDF Grant	196.6	71.37	389.58	100	757.55	0	25	389.58	100	514.58	196.6	46.37	0	0	242.97
GFA excl Grants	644.24	1700.68	2314.37	669.32	5328.61	511.60	1057.11	1038.18	515.21	3122.10	132.64	643.57	1276.19	154.11	2206.51

Summary of GFA addition proposed, provisionally approved and disallowance SBU D (Rs. Cr)															
	2018-19	2019-20	2020-21	2021-22	Total	2018-19	2019-20	2020-21	2021-22	Total	2018-19	2019-20	2020-21	2021-22	Total
Normal works- Dyuthi etc	808.64	1300.55	1139.26	787.86	4036.31	312.23	691.67	607.98	403.37	2015.25	496.41	608.88	531.28	384.49	2021.06
Other funded works	199.70	201.69	203.71	205.74	810.84	199.70	201.69	203.71	205.74	810.84	0.00	0.00	0.00	0.00	0.00
System strengthening & IT works	1593.91				1593.91	1243.77	329.31			1573.08	350.14	-329.31	0.00	0.00	20.83
IT related works -CAPs				258.14	258.14				258.14	258.14	0.00	0.00	0.00	0.00	0.00
Safety	18.00	19.50	20.00	18.50	76.00	18.00	19.50	20.00	18.50	76.00	0.00	0.00	0.00	0.00	0.00
Total	2620.25	1521.74	1362.97	1270.24	6775.20	1773.70	1242.17	831.69	627.61	4475.17	846.55	279.57	531.28	384.49	2041.89
Contribution & grants	377.92	201.69	203.71	205.74	989.06	906.94	399.28	203.71	205.74	1715.67	-529.02	-197.59	0.00	0.00	-726.61
GFA excl Grants	2242.33	1320.05	1159.26	1064.50	5786.14	866.76	842.89	627.98	421.87	2759.50	1375.57	477.16	531.28	384.49	2768.50

Note: 1. Approved GFA before Consumer Contribution & grants has been considered for O&M Cost

2. Approved GFA for 2021-22 as per Table 11 (page 421) of the order is Rs.627.61 Cr, instead of Rs.885.75 Cr, thereby O&M for 258.14 Cr towards IT related CAPs denied.

Appendix 3: Comparison of Interest and Finance charges																
Particulars	As per MYT Regulation															
	2018-19				2019-20				2020-21				2021-22			
	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
I - Interest on outstanding Loans	106.00	151.37	304.86	562.23	127.05	257.99	486.34	871.38	191.72	435.91	594.91	1222.54	264.66	555.01	688.82	1508.49
II - Interest on Security Deposit			199.93	199.93			218.49	218.49			238.74	238.74			258.99	258.99
OD/ working capital interest	5.86	17.99		23.85	6.19	20.59		26.78	6.89	25.57		32.46	8.38	30.99		39.37
Interest on PF	9.83	21.70	160.19	191.72	10.48	23.12	170.72	204.32	11.12	24.55	181.24	216.92	11.77	25.97	191.77	229.52
Interest on Bonds Issue to Master Trust by KSEBL	39.67	87.56	646.45	773.68	37.58	82.95	612.43	732.96	35.50	78.34	578.40	692.24	33.41	73.73	544.38	651.52
Interest on unfunded actuarial liability	19.12	42.2	311.58	372.90	19.12	42.2	311.58	372.90	19.12	42.2	311.58	372.90	19.12	42.2	311.58	372.90
Carrying cost			281.17	281.17			200.32	200.32			104.68	104.68			9.03	9.03
Interest and Finance Charges	180.49	320.81	1904.18	2405.48	200.42	426.85	1999.88	2627.15	264.35	606.57	2009.56	2880.48	337.34	727.91	2004.58	3069.82
Particulars	As per MYT Order															
	2018-19				2019-20				2020-21				2021-22			
	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
I - Interest on outstanding Loans	71.15	127.28	149.90	348.33	82.45	185.05	222.94	490.44	116.32	263.65	281.4	661.37	133.9	313.12	329.8	776.82
II - Interest on Security Deposit			175.33	175.33			199.93	199.93			218.49	218.49			238.74	238.74
OD/ working capital interest	6.08	15.67		21.75	6.23	17.4		23.63	6.84	20.48		27.32	7.6	23.28		30.88
Interest on PF	9.37	20.67	152.55	182.59	9.98	22.03	162.58	194.59	10.6	23.39	172.6	206.59	11.21	24.74	182.63	218.58
Interest on Bonds Issue to Master Trust by KSEBL	39.67	87.56	646.45	773.68	37.58	82.95	612.43	732.96	35.50	78.34	578.40	692.24	33.41	73.73	544.38	651.52
Interest on unfunded actuarial liability	10.26	22.64	167.1	200.00	10.26	22.64	167.1	200.00	10.26	22.64	167.1	200.00	10.26	22.64	167.1	200.00
Carrying cost			304.08	304.08			223.59	223.59			121.78	121.78			27.08	27.08
Interest and Finance Charges	136.53	273.82	1595.41	2005.76	146.50	330.07	1588.57	2065.14	179.52	408.50	1539.77	2127.79	196.38	457.51	1489.73	2143.62
Particulars	As per TU 2019								Revised projections							
	2018-19				2019-20				2020-21				2021-22			
	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total	SBU G	SBU T	SBU D	Total
I - Interest on outstanding Loans	69.88	90.89	180.27	341.04	61.05	138.56	269.86	469.47	80.96	270.40	382.66	734.02	146.19	414.25	510.34	1070.77
II - Interest on Security Deposit	0.00	0.00	170.75	170.75	0.00	0.00	177.31	177.31	0.00	0.00	188.70	188.70	0.00	0.00	207.45	207.45
OD/ working capital interest	6.21	15.76	0.00	21.97	6.17	21.70	0.00	27.87	6.31	23.28	0.00	29.59	7.53	27.10	0.00	34.63
Interest on PF	8.92	16.57	136.68	162.17	9.37	20.68	152.70	182.76	9.99	22.04	162.73	194.76	10.60	23.40	172.76	206.76
Interest on Bonds Issue to Master Trust by KSEBL	42.56	79.04	652.08	773.68	37.58	82.95	612.43	732.96	35.50	78.34	578.40	692.24	33.41	73.73	544.38	651.52
Additional interest on Master trust	10.26	22.64	167.10	200.00	10.26	22.64	167.10	200.00	10.26	22.64	167.10	200.00	10.26	22.64	167.10	200.00
Carrying cost	0.00	0.00	629.11	629.11	0.00	0.00	688.90	688.90	0.00	0.00	737.61	737.61	0.00	0.00	814.47	814.47
Interest and Finance Charges	137.84	224.90	1950.20	2317.13	124.44	286.53	2068.30	2479.27	143.01	416.70	2217.20	2776.91	207.99	561.12	2416.50	3185.61

Appendix 4: Normative loan for the remaining years																
	GFA SBU G				GFA SBU T				GFA SBUD				Total			
Addition during the control period	2019-20	2020-21	2021-22	Total	2019-20	2020-21	2021-22	Total	2019-20	2020-21	2021-22	Total	2019-20	2020-21	2021-22	Total
Opening Normative loan	785.70	678.39	1,263.06		961.11	2,097.67	3,871.38		2,119.29	3,277.83	4,375.42		3,866.10	6,053.89	9,509.86	
GFA addition during the year	31.22	789.36	1,213.97	2,034.55	1,731.12	2,028.81	1,793.48	5,553.41	2,210.08	1,623.67	1,992.81	5,826.56	3,972.42	4,441.84	5,000.26	13,414.52
Less: Contribution & Grants	0.00	47.00	44.50	91.50	400.78	0.00	78.53	479.31	899.97	323.68	272.95	1,496.60	1,300.75	370.68	395.98	2,067.41
GFA addition net of capital grants & subsidies-Addl normative loan	31.22	742.36	1,169.47	1,943.05	1,330.34	2,028.81	1,714.95	5,074.10	1,310.11	1,299.99	1,719.86	4,329.96	2,671.67	4,071.16	4,604.28	11,347.11
Normative repayment	138.53	157.70	189.90	486.13	193.78	255.10	313.17	762.06	151.57	202.40	263.89	766.97	483.87	615.20	766.97	1,866.04
Closing normative loan	678.39	1,263.06	2,242.62		2,097.67	3,871.38	5,273.16		3,277.83	4,375.42	5,831.39		6,053.89	9,509.86	13,347.17	9,481.07
Av normative loan	732.05	970.72	1,752.84		1,529.39	2,984.52	4,572.27		2,698.56	3,826.63	5,103.41		4,960.00	7,781.88	11,428.51	
Average actual interest rate in 2018-19	8.34	8.34	8.34		9.06	9.06	9.06		10.00	10.00	10.00					
Normative interest for the year	61.05	80.96	146.19	288.20	138.56	270.40	414.25	823.21	269.86	382.66	510.34	1,162.86	469.47	734.02	1,070.77	2,274.27

Appendix 5 Computation of Normative depreciation for the remaining years of control period																	
		2018-19				2019-20				2020-21				2021-22			
		G	T	D	Total	G	T	D	Total	G	T	D	Total	G	T	D	Total
1	GFA excluding revaluation	4857.26	5018.73	8246.59	18122.58	4904.21	5384.16	9450.31	19738.68	4935.43	7115.28	11660.39	23711.10	5724.79	9144.09	13284.06	28152.94
2	Contribution & grants	75.31	199.03	5974.41	6248.75	88.66	488.72	6427.33	7004.71	88.66	889.50	7327.30	8305.46	135.66	889.50	7650.98	8676.14
3	GFA net of contribution (1-2)	4781.95	4819.70	2272.18	11873.83	4815.55	4895.44	3022.98	12733.97	4846.77	6225.78	4333.09	15405.64	5589.13	8254.59	5633.08	19476.80
4	Addition during the year	46.95	365.43	1203.72	1616.10	31.22	1731.12	2210.08	3972.42	789.36	2028.81	1623.67	4441.84	1213.97	1793.48	1992.81	5000.26
5	Total (3+4)	4828.90	5185.13	3475.90	13489.93	4846.77	6626.56	5233.06	16706.39	5636.13	8254.59	5956.76	19847.48	6803.10	10048.07	7625.89	24477.06
6	Contribution & grants	13.35	289.69	452.92	755.96	0.00	400.78	899.97	1300.75	47.00	0.00	323.68	370.68	44.50	78.53	272.95	395.98
7	GFA addition net of contribution (4-6)	33.60	75.74	750.80	775.11	31.22	1330.34	1310.11	2671.67	742.36	2028.81	1299.99	4071.16	1169.47	1714.95	1719.86	4604.28
8	Depreciation rate for 2018-19					2.86	3.26	3.90	3.22	2.86	3.26	3.90	3.22	2.86	3.26	3.90	3.22
9	Depreciation rate for GFA addition					2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57
10	Depreciation for Op GFA (3x8)	136.73	156.94	88.69	382.36	137.72	159.59	117.90	415.21	138.62	202.96	168.99	510.57	159.85	269.10	219.69	648.64
11	Depreciation on current year addition (7X9)	0.86	1.95	19.30	19.92	0.80	34.19	33.67	68.66	19.08	52.14	33.41	104.63	30.06	44.07	44.20	118.33
12	Total depreciation for the year (10+11)	137.60	158.88	107.98	404.47	138.53	193.78	151.57	483.87	157.70	255.10	202.40	615.20	189.90	313.17	263.89	766.97

Depreciation on opening GFA has been computed at average rate for 2018-19 TU on GFA net of contribution. Depreciation on current year addition is computed on GFA addition net of Contribution and grants at half the normal depreciation rate determined by the Hon'ble Commission in MYT order (5.14/2=2.57%).

Appendix 6: Comparison of ARR & ERC of SBU G as per MYT petition, approval and revised estimates (Rs Cr)														
		Filed as per MYT Regulation				Provisional approval as per KSERC order dated 08.07.2019				Actuals		As per Mid Tem Review		
No	Particulars	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19-Actual	Up to 30.09.2019 (2019-20)	2019-20 Revised	2020-21 Revised	2021-22 Revised
6	Cost of generation of power									3.29	5.46	5.46		
7	Interest & Financial Charges													
8	Interest on loans	106.00	127.05	191.72	264.66	71.15	82.45	116.32	133.90	101.98	43.78	61.05	80.96	146.79
9	Less: Capitalized									34.72	21.02			
10	Net interest	106.00	127.05	191.72	264.66					67.26	22.76	61.05	80.96	146.79
11	Interest on GPF	9.83	10.48	11.12	11.77	9.37	9.98	10.60	11.21	8.92	3.84	9.37	9.99	10.60
12	Other interest									1.01	0.00			
13	Interest on Master Trust	39.67	37.58	35.50	33.41	39.67	37.58	35.50	33.41	42.56	16.53	37.58	35.50	33.41
14	Int on SD											0.00	0.00	0.00
15	Working capital interest	5.86	6.19	6.89	8.38	6.08	6.23	6.84	7.60	8.19	4.36	6.17	6.31	7.53
17	Total I&F	180.49	200.43	264.35	337.34	126.27	136.24	169.26	186.12	127.94	47.49	114.18	132.75	197.73
18	Depreciation	122.26	125.01	137.68	168.12	130.19	141.38	174.35	196.26	132.36	68.16	138.53	157.70	189.90
19	Master Trust Contribution	19.12	19.12	19.12	19.12	10.26	10.26	10.26	10.26			10.26	10.26	10.26
20	O&M Expenses													
21	Employee cost									225.56	114.06			
22	Less: Capitalized									97.18	10.25			
23	Balance									128.38	103.81			
24	R&M expenses									27.13	15.49			
25	A&G expenses									41.81	15.53			
26	Less: Capitalized									0.00				
27	Balance									41.81	15.53			
28	O&M New stations													
29	Total O&M Expenses	127.86	152.44	176.59	211.77	124.15	135.04	153.37	172.01	197.32	134.83	130.89	153.55	202.99
31	Return on equity (14%)	116.38	116.38	116.38	116.38	116.38	116.38	116.38	116.38	153.33	69.05	116.38	116.38	116.38
32	Other Expenses									-4.68	0.14			
33	Onetime expenses CMDRF	1.79												
36	FV Adjustments									-1.52				
37	Onetime expenses-flood									3.11	1.88			
39	Total ARR	548.78	594.26	695.00	833.61	507.24	539.31	623.62	681.03	611.15	327.01	515.69	570.64	717.26
43	Less Non-Tariff Income	25.83	33.38	37.28	41.17	25.83	33.38	37.28	41.17	24.48	4.63	33.38	37.28	41.17
44	Total ERC/ Transfer price	522.94	560.88	657.72	792.44	481.41	505.93	586.34	639.86	586.67	322.37	482.31	533.36	676.09

Appendix 7: Comparison of ARR & ERC of SBU T as per MYT petition, approval and revised estimates (Rs Cr)														
		Filed as per MYT Regulation				Provisional approval as per KERC order dated 08.07.2019				Actuals		As per Mid Tem Review		
No	Particulars	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19-Actual	Up to 30.09.2019 (2019-20)	2019-20 Revised	2020-21 Revised	2021-22 Revised
1	Interest & Financial Charges													
2	Interest on loans	151.37	257.99	435.91	555.01	127.28	185.05	263.65	313.12	119.67	50.59	138.56	270.40	414.25
3	Less: Capitalized									23.35	15.98			
4	Net interest	151.37	257.99	435.91	555.01					96.32	34.60	138.56	270.40	414.25
5	Interest on GPF	21.70	23.12	24.55	25.97	20.67	22.03	23.39	24.74	16.57	8.40	20.68	22.04	23.40
6	Other interest									0.46	0.00			
7	Interest on Master Trust	87.56	82.95	78.34	73.73	110.20	105.59	100.98	96.37	79.04	36.17	82.95	78.34	73.73
14	Int on SD											0.00	0.00	0.00
15	Working capital interest	17.99	20.59	25.57	30.99	15.67	17.40	20.48	23.28	15.22	9.55	21.70	23.28	27.10
16	Carrying cost											0.00	0.00	0.00
17	Total I&F	320.81	426.85	606.57	727.90	273.82	330.07	408.50	457.51	207.61	88.73	263.89	394.06	538.48
18	Depreciation	172.32	199.58	257.03	344.70	146.41	173.47	222.92	261.09	239.43	123.30	193.78	255.10	313.17
19	Master Trust Contribution	42.20	42.20	42.20	42.20							22.64	22.64	22.64
20	O&M Expenses													
21	Employee cost									402.71	208.13			
22	Less: Capitalized									64.49	22.60			
23	Balance									338.22	185.53			
24	R&M expenses									43.66	20.79			
25	A&G expenses									108.48	50.07			
26	Less: Capitalized									0.00				
27	Balance									108.48	50.07			
29	Total O&M Expenses	363.23	397.46	452.88	491.28	363.23	397.46	452.88	491.28	490.36	256.39	390.83	440.48	496.30
31	Return on equity (14%)	119.99	119.99	119.99	119.99	119.99	119.99	119.99	119.99	189.30	86.45	119.99	119.99	119.99
32	Other Expenses									-2.11	1.17			
33	Onetime expenses CMDRF	3.96												
36	FV Adjustments									0.08				
37	Onetime expenses-flood									0.44	0.01			
39	Total ARR	980.31	1143.88	1436.47	1683.87	903.45	1020.99	1204.29	1329.88	1125.11	556.05	991.14	1232.27	1490.58
43	Less Non-Tariff Income	28.85	37.30	41.82	46.35	28.85	37.30	41.82	46.35	56.45	20.03	37.30	41.82	46.35
44	Total ERC/ Transfer price	951.47	1106.58	1394.65	1637.52	874.60	983.69	1162.47	1283.53	1068.66	536.03	953.84	1190.45	1444.24

Appendix 8: Comparison of ARR & ERC of SBU D as per MYT petition, approval and revised estimates (Rs Cr)

		Filed as per MYT Regulation				Provisional approval				Actuals		As per Mid Tem Review		
No	Particulars	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19- Actual	Up to 30.09.2019	2019-20 Revised	2020-21 Revised	2021-22 Revised
1	Cost of Generation (SBU-G)	522.94	560.88	657.72	792.44	481.41	505.93	586.34	639.86	586.67	322.37	482.31	533.36	676.08
2	Cost of Power Purchase	7945.01	8675.27	8887.51	9187.58	7847.77	8613.94	8797.94	8964.44	7869.32	4386.83	8600.15	9431.65	9810.79
4	Cost of Intra-State Transmission (SBU-T)	951.47	1106.58	1394.65	1637.52	874.60	983.69	1162.47	1283.53	1068.66	536.03	953.84	1190.45	1444.24
5	NLDC/RLDC Charges					3.00	3.00	3.00	3.00			3.00	3.00	3.00
7	Interest & Financial Charges													
8	Interest on loans	304.86	486.34	594.91	688.82	149.90	222.94	281.40	329.80	348.47	156.04	269.86	382.66	510.34
9	Less: Capitalized									202.80	80.04			
10	Net interest	304.86	486.34	594.91	688.82					145.67	76.00	269.86	382.66	510.34
11	Interest on GPF	160.19	170.72	181.24	191.77	152.55	162.58	172.60	182.63	136.68	72.89	152.70	162.73	172.76
12	Other interest									26.06	0.04			
13	Interest on Master Trust	646.45	612.43	578.40	544.38	646.45	612.43	578.40	544.38	652.08	313.78	612.43	578.40	544.38
14	Int on SD	199.93	218.49	238.74	258.99	175.33	199.93	218.49	238.74	177.31	172.79	177.31	188.70	207.45
15	Working capital interest									125.54	82.81	0.00	0.00	0.00
16	Carrying cost	281.17	200.32	104.68	9.03	304.08	223.59	121.78	27.08			688.90	737.61	814.47
17	Total I&F	1623.01	1799.56	1904.88	1995.55	1428.31	1421.47	1372.67	1322.63	1263.34	718.31	1901.20	2050.10	2249.40
18	Depreciation	109.72	143.99	163.89	181.71	72.24	93.47	121.53	154.91	433.24	223.11	151.57	202.40	263.89
19	Master Trust Contribution	311.58	311.58	311.58	311.58	167.10	167.10	167.10	167.10			167.10	167.10	167.10
20	O&M Expenses													
21	Employee cost									2726.37	1443.81			
22	Less: Capitalized									300.95	220.30			
23	Balance	1979.53	2153.38	2342.23	2529.65					2425.42	1223.51			
24	R&M expenses	261.83	345.41	389.46	426.84					232.96	116.68			
25	A&G expenses									447.87	246.73			
26	Less: Capitalized									0.00				
27	Balance									447.87	246.73			
29	Total O&M Expenses	2241.36	2498.79	2731.69	2956.49	2226.08	2458.95	2658.75	2848.95	3106.25	1586.92	2450.15	2675.54	2910.68
31	Return on equity (14%)	253.50	253.50	253.50	253.50	253.50	253.50	253.50	253.50	147.23	89.43	253.50	253.50	253.50
32	Other Expenses									209.40	10.21			
33	Onetime expenses CMDRF	29.24				0.00								
35	Bad debts written off	15.00	15.00	15.00	15.00									
36	FV Adjustments									5.37				
37	Onetime expenses-flood									12.39	11.84			
38	Recovery of past approved gap	806.47	806.47	806.47	806.47	400.00	1000.00	850.00	850.00					
39	Total ARR	14778.89	16060.36	16919.99	17835.28	13754.02	15501.06	15973.31	16487.93	14701.86	7885.04	14962.82	16507.10	17778.68
40	Less Tariff Income	12433.68	13150.46	13765.29	14409.63	12531.47	13254.67	13874.14	14523.36	13521.21	7217.49	13811.61	14584.39	15216.94
41	Less: PF Incentive					97.79	44.99	32.50	33.95					
42	Less: Revenue from external sale	712.96	962.74	518.19	312.38	756.64	942.70	615.68	405.61			17.56	657.62	828.35
43	Less Non-Tariff Income	531.55	548.10	571.23	594.36	531.55	548.10	571.23	594.36	400.80	100.98	548.10	571.23	594.36
44	Total ERC/ Transfer price	13678.19	14661.30	14854.71	15316.37	13721.87	14700.48	15028.55	15489.38	13922.01	7318.47	14377.27	15813.24	16639.65
45	Net Revenue surplus (Gap)	-1100.71	-1399.05	-2065.28	-2518.91	-32.15	-800.59	-944.75	-998.53	-779.85	-566.57	-585.55	-693.86	-1139.03

Appendix 9: Comparison of ARR & ERC of KSEBL as per MYT petition, approval and revised estimates (Rs Cr)														
		Filed as per MYT Regulation				Provisional approval				Actuals		As per Mid Tem Review		
No	Particulars	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19-	30.09.2019	2019-20	2020-21	2021-22
		Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
1	Cost of Generation (SBU-G)													
2	Cost of Power Purchase	7945.01	8675.27	8887.51	9187.58	7847.77	8613.94	8797.94	8964.44	7869.32	4386.83	8600.15	9431.65	9810.79
4	Cost of Intra-State Transmission (SBU-T)													
5	NLDC/RLDC Charges					3.00	3.00	3.00	3.00			3.00	3.00	3.00
7	Interest & Financial Charges									3.29	5.46	5.46		
8	Interest on loans	562.23	871.38	1222.54	1508.49	348.33	490.44	661.37	776.82	570.12	250.41	469.47	734.02	1070.77
9	Less: Capitalized	0.00			0.00					260.87	117.05			
10	Net interest	562.23	871.38	1222.54	1508.49					309.25	133.36	469.47	734.02	1070.77
11	Interest on GPF	191.72	204.32	216.92	229.52	182.59	194.59	206.59	218.58	162.17	85.14	182.76	194.76	206.76
12	Other interest									27.53	0.04			
13	Interest on Master Trust	773.68	732.96	692.24	651.52	796.32	755.60	714.88	674.16	773.68	366.48	732.96	692.24	651.52
14	Int on SD	199.93	218.49	238.74	258.99	175.33	199.93	218.49	238.74	177.31	172.79	177.31	188.70	207.45
15	Working capital interest	23.85	26.78	32.46	39.37	21.75	23.63	27.32	30.88	148.95	96.72	27.87	29.59	34.63
16	Carrying cost	281.17	200.32	104.68	9.03	304.08	223.59	121.78	27.08			688.90	737.61	814.47
17	Total I&F	2124.31	2426.83	2775.81	3060.79	1828.40	1887.78	1950.43	1966.26	1598.89	854.52	2279.27	2576.91	2985.61
18	Depreciation	404.30	468.58	558.60	694.53	348.84	408.32	518.80	612.26	805.03	414.57	483.87	615.20	766.97
19	Master Trust Contribution	372.90	372.90	372.90	372.90	177.36	177.36	177.36	177.36			200.00	200.00	200.00
20	O&M Expenses													
21	Employee cost									3354.64	1766.00			
22	Less: Capitalized									462.62	253.15			
23	Balance									2892.02	1512.85			
24	R&M expenses									303.75	152.96			
25	A&G expenses									598.16	312.33			
27	Total													
28	O&M New stations													
29	Total O&M Expenses	2732.45	3048.69	3361.16	3659.54	2713.46	2991.45	3265.00	3512.24	3793.93	1978.14	2971.87	3269.57	3609.97
31	Return on equity (14%)	489.87	489.87	489.87	489.87	489.87	489.87	489.87	489.87	489.86	244.93	489.87	489.87	489.87
32	Other Expenses									202.61	11.52			
33	Onetime expenses CMDRF	35.00												
35	Bad debts written off	15.00	15.00	15.00	15.00									
36	FV Adjustments									3.93				
37	Onetime expenses-flood									15.94	13.73			
38	Recovery of past approved gap	806.47	806.47	806.47	806.47	400.00	1000.00	850.00	850.00					
39	Total ARR	14833.57	16131.03	16999.09	17922.81	13808.70	15571.72	16052.40	16575.43	14782.80	7909.70	15033.50	16586.20	17866.20
40	Less Tariff Income	12433.68	13150.46	13765.29	14409.63	12531.47	13254.67	13874.14	14523.36	13521.21	7217.49	13811.61	14584.39	15216.94
41	Less: PF Incentive					97.79	44.99	32.50	33.95					
42	Less: Revenue from external sale	712.96	962.74	518.19	312.38	756.64	942.70	615.68	405.61			17.56	657.62	828.35
43	Less Non-Tariff Income	586.23	618.78	650.33	681.88	586.23	618.78	650.33	681.88	481.73	125.64	618.78	650.33	681.88
44	Total ERC/ Transfer price	13732.87	14731.98	14933.81	15403.89	13776.55	14771.16	15107.65	15576.90	14002.94	7343.13	14447.95	15892.34	16727.17
45	Net Revenue surplus (Gap)	-1100.70	-1399.05	-2065.28	-2518.92	-32.15	-800.56	-944.75	-998.53	-779.86	-566.57	-585.55	-693.86	-1139.03