

BUSINESS PLAN
FOR THE
CONTROL PERIOD FY2019-20 to FY 2021-22
OF
ELECTRICITY DEPARTMENT, GOVERNMENT OF PUDUCHERRY
SUBMITTED TO
THE HON'BLE JOINT ELECTRICITY REGULATORY COMMISSION
GURGAON

BY

ELECTRICITY DEPARTMENT, GOVERNMENT OF PUDUCHERRY

AUGUST- 2018

**BEFORE THE JOINT ELECTRICITY REGULATORY COMMISSION FOR THE STATE OF GOA, &
UNION TERRITORIES, GURGAON**

Filing No.....

Case No.....

IN THE MATTER OF: Petition for approval of the Business Plan for control period from FY 2019-20 to FY 2021-22 for the Electricity Department of Puducherry as per Regulation 8.1 and 16 of JERC (Generation, Transmission & Distribution Multi Year Tariff) Regulations, 2018.

AND

IN THE MATTER OF: Electricity Department, Government of Puducherry

.....Petitioner

Electricity Department, Government of Puducherry (hereinafter referred to as "PED"), files petition for approval of the Business Plan for FY 2019-20 to FY 2021-22 as per Regulation 8.1 and 16 of JERC (Generation, Transmission & Distribution Multi Year Tariff) Regulations, 2018.

**Electricity Department, Government of Puducherry
Petitioner**

Place: Puducherry

Dated: 31st August 2018

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LIST OF ABBREVIATIONS

Sr. No	Abbreviations	Descriptions
1	A&G	Administrative and General
2	ABT	Availability Based Tariff
3	ACoS	Average Cost of Supply/ Service
4	AMI	Automated Metering Infrastructure
5	AMR	Automatic Meter Reading
6	ARR	Aggregate Revenue Requirement
7	CAGR	Compound Annual Growth Rate
8	CEA	Central Electricity Authority
9	CERC	Central Electricity Regulatory Commission
10	CGS	Central Generating Station
11	CPI	Consumer Price Index
12	DELP	DSM based Efficient Lighting Programme
13	Discom	Distribution Companies
14	DSM	Demand Side Management
15	EA/The Act	The Electricity Act 2003
16	PED/ PED	Electricity Department, Government of Puducherry
17	FOR	Forum of Regulators
18	FY	Financial Year
19	GFA	Gross Fixed Assets
20	GoI	Government of India
21	HT	High Tension
22	JERC	Joint Electricity Regulatory Commission
23	JICA	Japan International Cooperation Agency
24	KSEB	Kerala State Electricity Board
25	KV	Kilo Volt
26	kVA	Kilo Volt Ampere
27	kVAh	Kilo Volt Ampere Hour
28	kW	Kilo Watt
29	kWh	Kilo Watt Hour
30	LT	Low Tension
31	MOD	Merit Order Despatch
32	MoP	Ministry of Power
33	MOU	Memorandum of Understanding
34	MU	Million Units (Million kWh)
35	MVA	Mega Volt Ampere
36	MW	Mega Watt

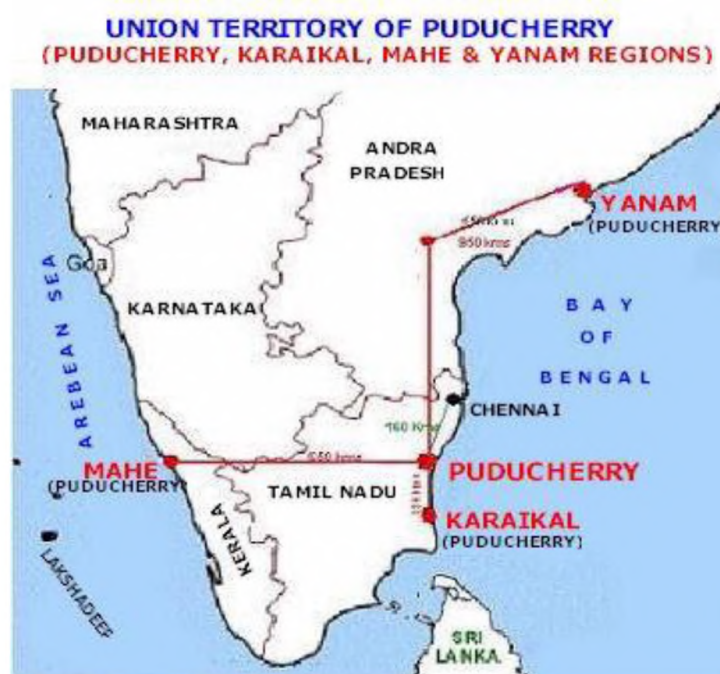
Sr. No	Abbreviations	Descriptions
37	MYT	Multi Year Tariff
38	NTP	National Tariff Policy
39	NTPC	National Thermal Power Corporation
40	O&M	Operation & Maintenance
41	PFC	Power Finance Corporation
42	PGCIL	Power Grid Corporation of India Limited
43	PLCC	Power Line Carrier Communication
44	PLR	Prime Lending Rate
45	POSOCO	Power System Operation Control
46	PPA	Power Purchase Agreement
47	PPCL	Puducherry Power Corporation Limited
48	R&M	Repair and Maintenance
49	R-APDRP	Restructured Accelerated Power Development and Reforms Programme
50	REC	Renewable Energy Certificate
51	ROE	Return on Equity
52	RPO	Renewable Purchase Obligation
53	Rs	Rupees
54	SBI	State Bank of India
55	SECI	Solar Energy Corporation of India
56	SLDC	State Load Dispatch Centre
57	SRPC	Southern Regional Power Committee
58	SWOT	Strength, Weakness, Opportunity and Threats
59	TNEB	Tamil Nadu Electricity Board
60	T&D	Transmission and Distribution
61	UI Charges	Unscheduled Interchange Charges
62	w.e.f	With effect from
63	WPI	Wholesale Price Index
64	y-o-y	Year on year

1. INTRODUCTION

1.1 Background

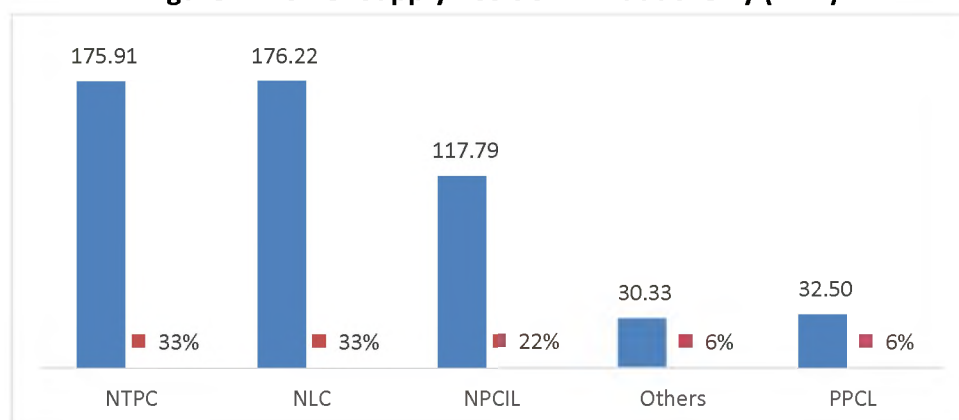
- 1.1.1 The Union Territory of Puducherry is spread over an area of 492 sq. km and consists of four enclaves which are widely scattered in the three Southern States viz Puducherry and Karaikal enclaves in Tamil Nadu, Mahe enclave in Kerala and Yanam enclave in Andhra Pradesh. Puducherry which is the headquarters of the Union Territory is located 160 Kms down South of Chennai, while Karaikal is located further down South at about 160 Kms from Puducherry. Mahe is located horizontally opposite to Puducherry on the Western coast at about 647 Kms from Puducherry and 58 Kms from Kozhikode, 24 Kms from Kannur in Kerala State. Yanam is located up North of Puducherry on the eastern coast at about 870 Kms from Puducherry and 24 Kms from Kakinada. The total population of the UT of Puducherry is 12,44,464 as per provisional results of Census 2011.

Figure 1: Union Territory of Puducherry



Source: Puducherry Electricity Department

- 1.1.2 The requirement of Power for the Union Territory is met from the allocation of power from various Central Generating Stations (CGS), purchase of power from neighbouring State Utilities and from the State owned Pondicherry Power Corporation which is running a 32.5 MW Gas based power plant in Karaikal region. The entire power generated from this plant is consumed within Karaikal region.

Figure 2: Power Supply Position in Puducherry (MW)

* TNEB

Source: Puducherry Electricity Department

1.1.3 The Electricity Department, Government of Puducherry (hereinafter referred to as “PED”), performs the functions of transmission and distribution of electric power to the Union Territory. The Puducherry Electricity Department is a deemed licensee under Section 14 of Electricity Act, 2003 and is carrying on the business of Transmission, Distribution and Retail supply of Electricity in Puducherry, Karaikal, Yanam and Mahe Regions of the Union Territory of Puducherry. With all the Towns and villages electrified in as early as 1972, the Union Territory is 100% fully electrified.

1.2 Business Activities

1.2.1 The Electricity Department Puducherry is a deemed Distribution Licensee within the meaning of Section 2 (17) of Electricity Act 2003 and pursuant to the Section 14 of the Electricity Act. Further, Section 42 and 43 of the Electricity Act 2003 prescribes the following duties of the deemed Distribution Licensee:

- To develop and maintain an efficient, co-ordinated and economical distribution system;
- To supply electricity on an application of the consumer in accordance with the provisions specified in the Electricity Act 2003;
- To provide non-discriminatory open access to the consumers;
- To establish a forum for redressal of grievances of the consumers.

1.2.2 The main functions of the Department is to undertake the transmission, distribution and retail supply of electricity in its license area and to plan, construct, erect, lay, operate and maintain, renovate, modernize the power system network in all its aspects and also to carry on the business of purchasing, selling, importing, exporting, wheeling, trading of electrical energy, including formulation of tariff, billing and collection thereof and then to collect information and data, review operations, plan,

research, design and prepare project reports, diagnose operational difficulties and weaknesses and advise on the remedial measures to improve and modernize existing sub-transmission and supply lines and sub-stations.

1.3 Objective of Business Plan

1.3.1 A business plan is conventionally defined as:

“Business Plan is a formal statement of a set of business goals, the reasons why they are believed attainable, and the plan for reaching those goals. It may also contain background information about the organization or team attempting to reach those goals.”

1.3.2 Accordingly, the business plan for PED is developed keeping in mind the growth plan for the control period after considering the strengths and weaknesses of the department and evaluating its business environment. The business environment has evolved considerably in a number of ways that affects PED’s strategic planning. The business plan is intended to give a comprehensive and up-to-date representation of the department, its market, the impact of new regulations, and the strategies that has been developed by PED to achieve the same. However, as mentioned above, there are number of internal and external factors which affect the planning of the department and thus, it makes this a very dynamic document and which calls for regular reviews of the plan with a view to introduce any corrections.

1.3.3 PED submitted its first Business Plan for the period starting from April 2015 to March 2018 (3 year control period) on 01.10.2014 under Regulation 12.1 of the MYT Regulation, 2014. As per provisions in clause 5.1 (as per amendment dated 10th August 2015) and 12.1 of the JERC Multi Year Distribution Tariff Regulations, 2014, the Petitioner has filed for approval of its Business Plan for three years control period i.e. from FY 2016-17 to FY 2018-19 with details for each year of the control period before the Commission. The Commission has approved the Business Plan for three years control period FY 2016-17 to FY 2018-19 vide order dated 4.12.2015.

1.3.4 The Commission has come with the new MYT Regulations 2018 and as per Regulation 8 of the new MYT Regulations 2018 for the Control Period FY 2019-20 to FY 2021-22, the Business Plan shall cover as under:

Quote

“8 Business Plan

8.1 The Transmission Licensee and Distribution Licensee shall file for the Commission’s approval a Business Plan for the entire Control Period, approved by its authorized signatory by August 31, 2018:

Provided that the Generation Company shall not be required to file a Business Plan

for the Control Period.

8.2 The Business Plan filed by the Distribution Licensee shall contain separate sections on Distribution Wires Business and Retail Supply Business.

8.3 The Business Plan filed by the Transmission Licensee shall inter-alia contain:

a) Projections for growth of load in the transmission network;

.....

.....

8.4 The Business Plan filed by Distribution Licensee shall inter-alia contain;

a) Capital Investment Plan for each Year of the Control Period commensurate with load growth, distribution loss reduction trajectory and quality improvement measures proposed in the Business Plan in accordance with Regulation 8.5;

b) Capital Structure of each scheme proposed and cost of financing (interest on debt and return on equity), terms of the existing loan agreements, etc;

c) Sales Forecast for each customer category and sub-categories for each Year of the Control Period in accordance with Regulation 8.6;

d) Power Procurement Plan based on the Sales Forecast and distribution loss trajectory for each Year of the Control Period in accordance the Regulation 8.7;

e) Targets for distribution loss for each Year of the Control Period consistent with the Capital Investment Plan proposed by the Licensee;

f) Projections for number of employees during each Year of the Control Period based on proposed recruitments and retirement;

g) Proposals in respect of income from Other Business for each Year of the Control Period.

Unquote

- 1.3.5 The Business Plan prepared by PED does not include the forecast of Aggregate Revenue Requirement for the control period as the same has to be submitted based on the Business Plan as approved by the Hon'ble Commission by order. The relevant extracts, Regulation 5.2, of the MYT regulations 2018 are mentioned below:

"5.2 The Multi-Year Tariff framework for determination of Aggregate Revenue Requirement and expected revenue from tariff and charges for Generating Company, Transmission Licensee, Distribution Wires Business and Retail Supply Business shall include the following:

a) Business Plan for the Licensee, for the entire Control Period as submitted to the Commission for approval, prior to the start of the Control Period;

b) A detailed Multi-Year Tariff Application comprising of the year-wise forecast of Aggregate Revenue Requirement for the entire Control Period and determination of expected revenue from existing tariffs for the first Year of the Control Period submitted by the Applicant:

Provided that the performance parameters, whose trajectories have been specified in these Regulations or the Business Plan or the Multi-Year Tariff Order, shall form the basis for projection of these performance parameters in the Aggregate Revenue Requirement for the entire Control Period:

Provided further that a Mid-term Review of the Aggregate Revenue Requirement may be undertaken for the Generating Company, Transmission Licensee and Distribution Licensee on an application that shall be filed by the utilities along with the application for tariff determination for the third Year of the Control Period;”

1.4 Approach to Business Plan

- 1.4.1 PED has prepared the Business Plan taking cognizance of the existing internal factors and external business environment affecting the business. PED submits that the Business Plan being a dynamic document may need to be updated at periodic intervals taking into account the changes in the internal and external environment and these changes would be intimated to the Hon'ble Commission from time to time. In line with clause 8.4 of the MYT Regulations 2018, the Business Plan comprises of the category-wise sales and demand projections, power procurement plan, capital investment plan, financing plan and targets of distribution loss for the control period starting from FY 2019-20 to FY 2021-22. Apart from this, PED has also attempted to develop this business plan with a view to chart out the growth plan for the period after considering the strengths and weaknesses of the department and evaluating its business environment by conducting a SWOT analysis.
- 1.4.2 The projections are based on the audited figures of PED for FY 2014-15, FY 2015-16 and FY 2016-17 and unaudited actuals of FY 2017-18. The Financial Statements of PED are enclosed as Annexure 1, Annexure 2 and Annexure 3.
- 1.4.3 Therefore, the basic principles considered while preparing the Business Plan is keeping in mind the requisites to address the initiatives to enhance the performance of power sector viz. network development, tariff management, efficient operation and customer service.
- 1.4.4 Network development strategy:
As per Section 43 of the Electricity Act, 2003, the distribution licensees are obliged to supply power to bonafide consumer who desires to avail power supply.
PED would continue to carry out its universal service obligation of supplying power to the bonafide consumers in the future as well. PED will also maintain its current efforts in order to strengthen its distribution system furthermore so as to provide even better services and also to meet the load growth within the area of the

licensee. PED is further planning to use new technologies to improve the reliability of the system. PED is in the process of availing a loan from Japan International Cooperation Agency (JICA) for improvement in transmission and distribution system to meet the growing power demand and to design a system with lesser T&D loss.

1.4.5 Tariff management:

The Tariff is being determined by the Hon'ble Commission on a cost plus approach in line with the provisions specified in section 62 of the Electricity Act 2003. The major components of tariff are power purchase cost, O&M cost, cost associated with capital and such costs needs to be optimized. PED has been rationalizing these costs through long term PPA with CGS, maintaining reduced loss levels and efficient business operations.

1.4.6 Customer service:

The main intent of PED is to serve their consumers effectively and efficiently and in an attempt to do the same PED has been carrying out various initiatives like setting up Consumer Grievance Redressal Forum (CGRF), Customer Relationship Centre, internet based payment, DSM initiatives like distribution of LED lamps and plans on extending the same to street lights.

1.5 Review of previous control period

This section elucidates briefly of business plan filed in the earlier control periods providing the highlights of the targets vs. achievement on various parameters discussed as under:

1.5.1 Capital Investment Plan vs Actuals:

The Commission in the business plan for the control period FY 2016-17 to FY 2018-19 approved the capital expenditure after detailed scrutiny of the justifications provided by PED.

The Commission considered the proposed costs of schemes reasonable and approved the same by keeping the funding from JICA from transmission projects and 100% metering programme in mind. However, some schemes could not be started in the previous control period. The status of targets vs. achievement is provided in the table below:

Table 1 : Capital expenditure in previous control period

Sr. No.	Particulars	Capital Expenditure					
		Approved			Actuals		Projection
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17	FY 2017-18	FY 2018-19
A	Transmission Schemes						
1	Establishment of New Substations	-	71.20	43.47		10.34	11.33
2	Augmentation of System Capacity	-	15.48	3.96			6.87
3	Renovation and Modernization Works of Existing Capacity	1.65	17.79	8.41			
4	Replacement of Capacitor Banks	-	4.00	1.50			
	Land acquisition						
5	Erection/ establishment/ upgradation of 230kV and 110kV Substations	20.00	40.40	20.81		2.23	
	Total Transmission	21.65	148.87	78.15	-	12.57	18.20
B	Distribution Schemes						
1	R-APDRP Part-A Works	1.72	-	-			4.16
2	R-APDRP Part-B Works	30.00	30.00	-			32.15
3	System Strengthening Schemes	7.80	7.96	8.12			
4	Normal Development Schemes	10.35	10.56	10.77		16.85	22.42
5	Rural Electrification (BNP)	0.75	0.77	0.78			
6	100% Metering Programme	4.19	4.19	-			
7	Conversion of HT Overhead lines into UG cables	4.10	4.18	4.27			
8	Reliable communication						1.77
9	IPDS						11.00
10	DDUGJY						10.00
11	PSDF						7.88
	Total Distribution	58.91	57.66	23.94	-	16.85	89.38
C	Generation						
1	Solar Power Generation						
A+B+C	Total Capital expenditure	80.56	206.53	102.09	-	29.42	107.58

The actual expenditure is less than the approved figures, due to constraints in budgetary allocation. Moreover, availing of loan from JICA was delayed on account of revision of scope of works and also in getting clearance from CEA. At present, approval of the CEA for the DPR costing Rs. 983.44 Crores has been obtained by PED.

1.5.2 Capitalization

The petitioner in the Business plan petition for the earlier control period has proposed capitalization of the assets during the control period in the ratio of 60:40 of the capital expenditure whereby 60% of the capitalization in the first year and 40% in the succeeding years of the control period. The Commission noted that the ratio 60:40 submitted by the petitioner as a reasonable one and after considering 40% of the capex of FY 2015-16 i.e. Rs. 105.48 Crores (as submitted by the Petitioner) to spill-over into FY 2016-17, capitalization plan for the control period FY 2016-17 to FY 2018-19 has been approved.

Table 2 : Capitalization in previous control period

Sr. No.	Particulars	Capitalization					
		Approved			Actuals		Projection
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17	FY 2017-18	FY 2018-19
A	Transmission Schemes						
1	Establishment of New Substations	4.92	42.72	54.56			51.50
2	Augmentation of System Capacity	0.26	9.29	8.57			
3	Renovation and Mordenization Works of Existing Capacity	1.13	11.33	12.16			
4	Replacement of Capacitor Banks	-	2.40	2.50			
	Land acquisition	0.60	-	-			
5	Erection/ establishment/ upgradation of 230kV and 110kV Substations	23.82	32.24	28.64	3.21		
	Total Transmission	30.73	97.98	106.44	3.21	-	51.50
B	Distribution Schemes						
1	R-APDRP Part-A Works	4.23	0.69	-			8.32
2	R-APDRP Part-B Works	22.80	30.00	12.00	6.71	16.79	49.45
3	System Strenghtning Schemes	9.99	7.89	8.05			
4	Normal Development Schemes	11.99	10.47	10.68	5.33		11.71
5	Rural Electrification (BNP)	0.93	0.76	0.77			
6	100% Metering Programme	5.02	4.19	1.68			
7	Conversion of HT Overhead lines into UG cables	4.85	4.15	4.23			
8	Reliable communication						0.89
9	IPDS						4.00
10	DDUGJY						4.00
11	PSDF						7.02
	Total Distribution	59.81	58.15	37.42	12.04	16.79	85.39
C	Generation						
1	Solar Power Generation						
A+B+C	Total Capitalization	90.53	156.14	143.85	15.25	16.79	136.89

The actual capitalisation is less than the approved figures, due to constraints in budgetary allocation.

1.5.3 Distribution loss trajectory:

The Distribution loss as projected could not be achieved due to less infusion of funds than proposed in the previous Business Plan to strengthen and improve the distribution network. The revised projection of 13% distribution loss for FY 2018-19 is proposed based on schemes proposed through JICA loan for improvement in transmission and distribution network and use of new technology. Further, PED has also started a drive to change all electromechanical meters to smart meters, which would be further add in improving the distribution system efficiency.

Table 3 : Distribution losses in previous control period

	Approved			Actuals		
	FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17	FY 2017-18	FY 2018-19
Distribution Loss %	11.50%	11.25%	11%	13.78%	13.75%	13%

1.5.4 Sales forecast

Quantum of sales is an uncontrollable parameter and the same has been quoted in MYT Regulations. The lower energy sales in previous control period is due to poor industrial growth rate and performance of industries. The reduced consumption by the Steel companies due to poor market demand has also hampered the expected sales growth.

Table 4 : Energy sales in previous control period

Sales(MU)	Approved			Actuals		Approved in T.O	Revised projection
	FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17	FY 2017-18	FY 2018-19	FY 2018-19
Domestic	819.45	891.73	970.38	699.82	723.28	785.14	757.87
OHOB	10.38	10.38	10.38	10.21	10.24	10.22	10.36
Commercial	207.31	217.70	228.60	210.92	216.41	245.79	226.30
Agriculture	57.00	57.00	57.00	57.28	57.61	57.43	57.76
Street lighting	28.16	29.31	30.51	24.24	24.48	27.58	24.48
LT Industries + Water tank	224.03	237.78	252.41	190.67	185.61	184.79	185.61
Temp LT	14.00	14.00	14.00	8.00	8.48	8.00	9.33
HT-I	1008.99	1069.53	1133.70	944.15	897.34	930.18	919.77
HT-II	65.33	68.18	71.14	62.03	98.41	68.98	117.29
HT-III	376.41	398.99	422.93	258.96	326.90	288.20	335.07
Total	2811.07	2994.59	3191.06	2466.27	2548.76	2606.31	2643.85

CAGR of sales corresponding to each category for Last 5 years is used for revising the estimates in FY 2018-19. An exception of rate of increase in HT category is considered due to expected decrease in HT Open access sales due to imposition of additional surcharge.

1.5.5 No. of Consumers

The actual number of Consumers in FY 2016-17 and FY 2017-18 is more than that estimated in MYT order for the control period.

Table 5 : No. of consumers in previous control period

Consumer Category	Approved			Actuals		Revised Projections
	FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17	FY 2017-18	FY 2018-19
Domestic	307421	321112	335412	313367	325845	340834
OHOB	35539	35539	35539	35539	35537	35537
Commercial	49754	51460	53224	52087	53962	56371
Agriculture	6836	6836	6836	6900	6940	6973
Street lighting	50824	51297	51774	50250	50434	50664
LT Industrial+Water tank	6683	6815	6951	6616	6668	6753
HT-I	443	457	472	439	453	463
HT-II	56	60	63	60	61	64
HT-III	7	8	8	7	7	7
Total	457563	473584	490279	465265	479907	497667

1.5.6 Peak demand

Figure 3: Peak demand in FY 2016-17 (MW)

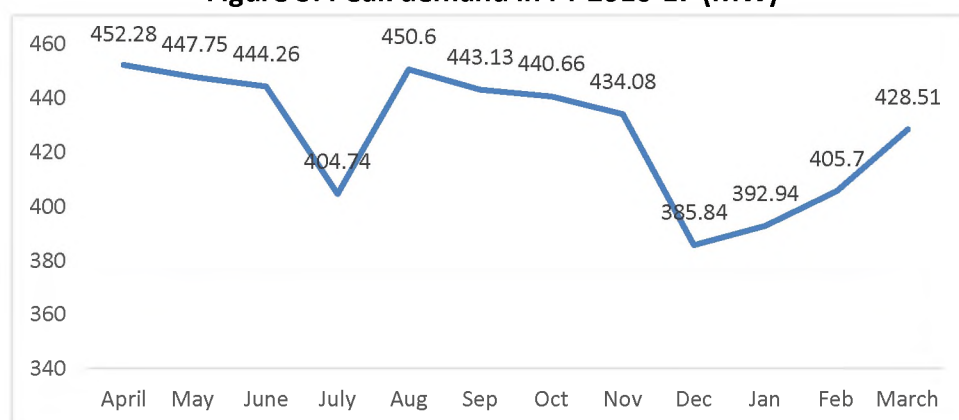
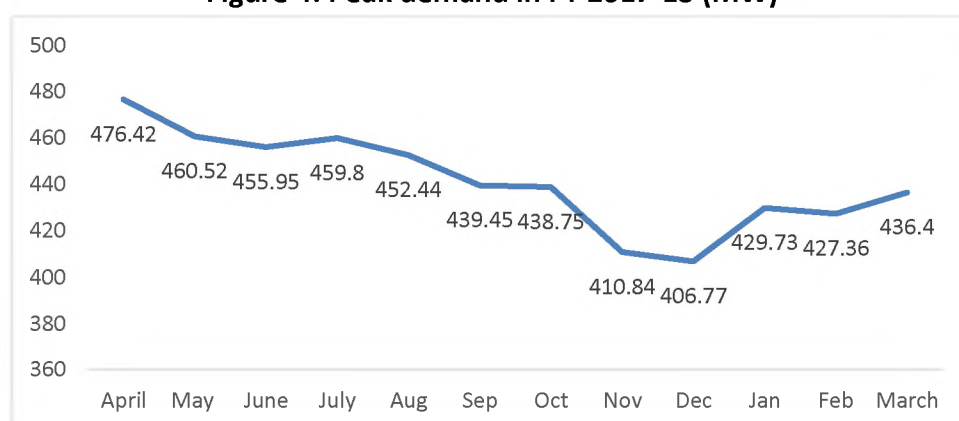


Figure 4: Peak demand in FY 2017-18 (MW)



1.5.7 Power Procurement Plan

Based on actual sales and energy requirement in FY 2016-17 and FY 2017-18, and revised projections in FY 2018-19, power procurement has been scheduled. Due to

lower sales during the previous control period, power procurement as per actuals too is less than what was envisaged as per business plan for the previous control period.

Table 6 : Power procurement plan approved for previous control period

Sr. No.	Particulars	Approved FY 2016-17			Approved FY 2017-18			Approved FY 2018-19		
		Purchase	Total Cost	Rate	Purchase	Total Cost	Rate	Purchase	Total Cost	Rate
		MUs	Rs. Crs	Rs./unit	MUs	Rs. Crs	Rs./unit	MUs	Rs. Crs	Rs./unit
1	NTPC	1050.15	298.78	2.85	1247.33	347.47	2.79	1335.36	370.00	2.77
2	NLC	942.38	279.58	2.97	942.38	279.58	2.97	942.38	279.58	2.97
3	NPCIL	573.83	187.73	3.27	573.83	187.73	3.27	573.83	187.73	3.27
4	KSEB	41.00	23.89	5.83	42.73	24.77	5.80	44.02	25.43	5.78
5	TANGEDCO	309.33	107.34	3.47	318.61	110.56	3.47	328.17	113.87	3.47
6	PPCL	234.07	106.42	4.55	234.07	106.42	4.55	234.07	106.42	4.55
7	Vallur	109.84	41.86	3.81	109.84	41.86	3.81	109.84	41.86	3.81
8	NTPL	0.00	2.44			2.44		123.43	34.98	2.83
9	Other charges		67.78			71.38			75.18	
10	RPO		23.01			28.17			33.92	
11	Rebate		-17.03			-18.12			-19.28	
12	UI Underdrawal/Surplus power Sale/URS/RRAS									
13	UI Overdrawal									
14	Openaccess									
	Grand Total	3260.60	1121.79	3.44	3468.79	1182.26	3.41	3691.10	1249.69	3.39

Table 7 : Actual Power procurement in previous control period

Sr. No.	Particulars	Actual FY 2016-17			Provisional FY 2017-18			Approved in T.O FY 2018-19		
		Purchase	Total Cost	Rate	Purchase	Total Cost	Rate	Purchase	Total Cost	Rate
		MUs	Rs. Crs	Rs./unit	MUs	Rs. Crs	Rs./unit	MUs	Rs. Crs	Rs./unit
1	NTPC	1,213.78	354.81	2.92	1,212.73	348.73	2.88	1,230.88	360.47	2.93
2	NLC	584.78	215.44	3.68	701.56	262.99	3.75	837.75	310.28	3.70
3	NPCIL	545.50	173.79	3.19	554.04	160.75	2.90	567.12	180.74	3.19
4	KSEB	44.91	26.07	5.80	102.60	-	-	-	-	
5	TANGEDCO	167.51	61.08	3.65	181.01	99.01	5.47	-	-	
6	PPCL	231.32	77.72	3.36	214.69	75.14	3.50	215.56	86.85	4.03
7	Vallur	123.97	55.81	4.50	31.96	53.98	16.89	123.68	58.09	4.70
8	NTPL	127.09	56.63	4.46	109.41	61.61	5.63	142.55	67.03	4.70
9	Other charges		62.2			62.11			67.17	
10	RPO		0			50.19			35.19	
11	Rebate		-17.98							
12	UI Underdrawal/Surplus power Sale/URS/RRAS	(116.67)	(12.45)		(17.47)	(4.55)		(126.71)	(40.17)	
13	UI Overdrawal	25.93	0.75		29.22					
14	Openaccess				(39.00)					
	Grand Total	2948.12	1053.87	3.57	3080.74	1169.97		2990.83	1125.65	3.76

1.5.8 O&M Expenses

Since O&M is a controllable expense, the Commission in its true-up, review and ARR orders has maintained same figures as approved in MYT order for the control period for all controllable expenses. For expenses like actual Impact of 7th pay commission and EESL annual payout towards DELP Charges, the Commission approved costs as per actuals.

Table 8 : O&M Expenses in previous control period

	Approved			Actuals	Provisional actuals	Approved in T.O
	FY 2016-17	FY 2017-18	FY 2018-19	FY 2016-17	FY 2017-18	FY 2018-19
Employee Expense	75.13	81.74	88.94	91.57	97.22	104.42
A&G Expense	5.11	5.56	6.05	12.84	9.41	13.45
R&M Expense	19.41	22.02	26.51	18.61	22.02	26.51

2. PED: POWER BUSINESS IN PUDUCHERRY

2.1 Demographic Profile

2.1.1 The Union Territory of Puducherry is spread over an area of 492 sq. km, which comprises the four erstwhile French establishments of Puducherry, Karaikal, Mahe and Yanam. The total population of the UT of Puducherry is 12,44,464 as per provisional results of Census 2011.

- Puducherry region, which is the largest of all four, lies on the east coast, consisting of 12 scattered areas, surrounded by the State of Tamil Nadu and by the Bay of Bengal on the East.
- Karaikal region is about 150 km South of Puducherry. Like Puducherry region, the Karaikal region is also surrounded by the State of Tamil Nadu and by the Bay of Bengal on the East.
- Yanam region is located approximately 840 km north-east of Puducherry near Kakinada in Andhra Pradesh.
- Mahe Region is located approximately 653 km away on the west coast of India, near Tellicherry in Kerala

2.1.2 Puducherry region is situated on the Coramandal Coast north of Pennaiyar River and is bounded by Bay of Bengal on the East and Cuddalore districts of Tamil Nadu on other sides. It has an area of 293 sq. Km and has the highest population of 950289 among the four regions. Puducherry is not a contiguous area but interspersed with bits of territory of Tamil Nadu. Puducherry town is the capital of Union Territory.

2.1.3 Karaikal region lies 150 kilometres south of Puducherry and it is bounded on north, south and west by the Nagapattinam district of Tamil Nadu and on the east by Bay of Bengal. It has an area of 160 sq. km lying in the Cauvery Delta being irrigated by the canals of the Cauvery River. It has the second highest population among the four regions.

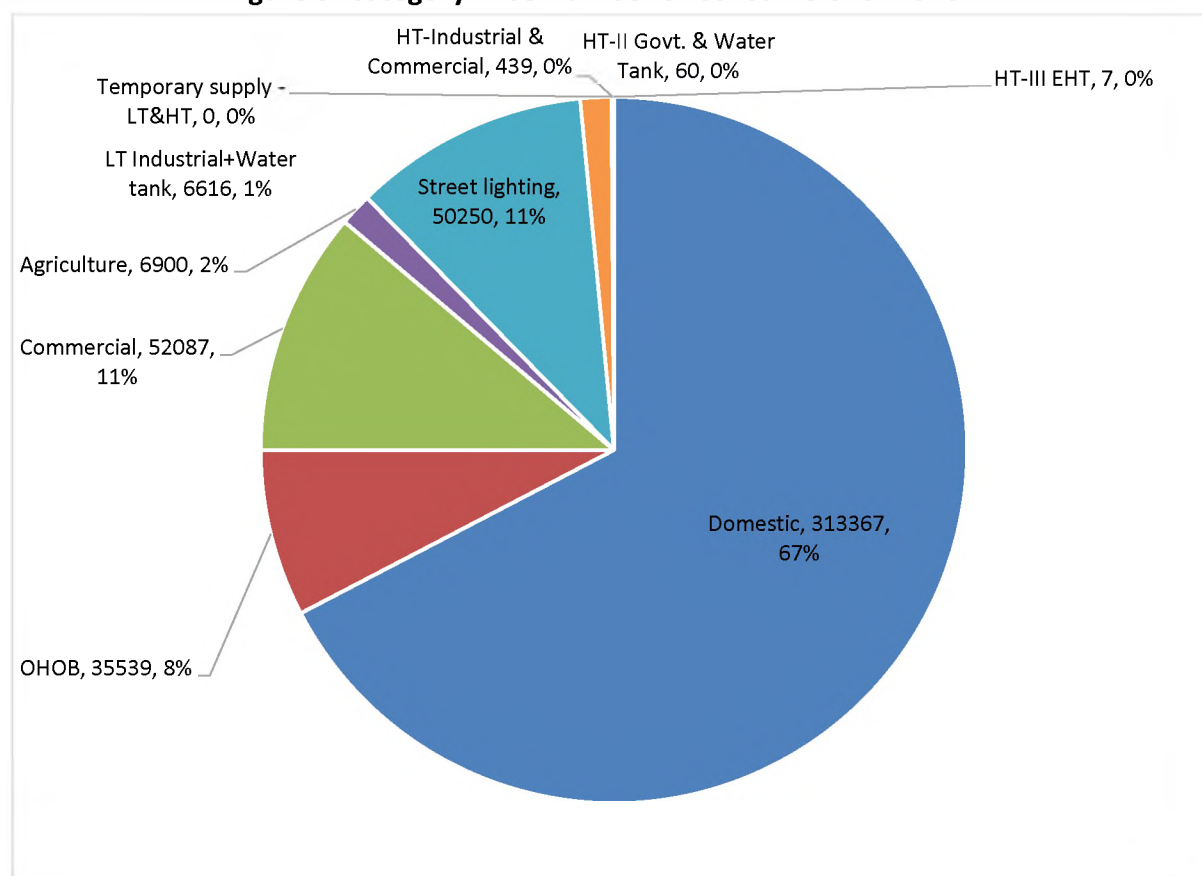
2.1.4 Mahe region is isolated from Puducherry by about 653 km and has an area of 9 sq. km and is located at a distance of about 6 km south of Tellicherry town. Mahe town is situated on the southern bank of Mahe region with the smallest population of 42816.

2.1.5 Yanam region is situated on the East coast as a pocket in the East Godavari District of Andhra Pradesh and Lies at a distance of 28 km south of Kakinada town. It has a population of 55626 spread over an area of 30sq. km. Yanam is built on the spot

where the rivers of Godavari and Coringa separate and is bounded on the east and south by one or the other of these two rivers.

- 2.1.6 The Electricity Department of Government of Puducherry performs the functions of transmission and distribution of electric power to the Union Territory of Puducherry.
- 2.1.7 The entire power requirement of Puducherry is met from the power allocated from the Central Generating Stations (CGS), Tamil Nadu Electricity Board and from the Puducherry Power Corporation Limited. Mahe region has been included under the regional energy accounting of Southern Region enabling to draw power from CGS w.e.f 04-12-2017. In respect of Karaikal region, power requirement is met by availing power from the State owned Combined Cycle Gas Power Plant of PPCL of capacity 32.5 MW at Karaikal and from TANGEDCO. However, it has already been proposed to avail power to Karaikal region from CGS on commissioning of the 230/110 KV Sub-stations at Karaikal and erection of 230 KV from Neyveli to Karaikal which are under execution. The work of erection of 230 KV line from Neyveli to Karaikal is covered under the System Strengthening Works of Southern Region and is being executed by the Power Grid Corporation of India. These works are expected to be completed and commissioned by December 2018. Further, the Government of India has made a power allocation of 57.24 MW from the New NLC Thermal Power Station which is expected to be commissioned by December 2018, in order to meet the power requirement of Karaikal region on de-commissioning of the old NLC Thermal Station-I, from which TANGEDCO is presently diverting power to Karaikal region at 110 KV level through Thiruvavur 230/110 KV Sub-station. SRPC has accorded approval for inclusion of Karaikal region under Regional Energy Accounting of Southern region and the same will be implemented once the required Sub-station and Transmission line works are completed, which is expected by December 2018.
- 2.1.8 System Control Centre (SCC), which is a part of Electricity Department, interacts with Regional Load Dispatch Centre (RLDC) for optimum scheduling and dispatch of electricity. It monitors grid operation on real time basis and passes on necessary instructions to field staff to control flow of energy.
- 2.1.9 PED currently serves a consumer base of around 4.65 lakh spread over the four non-contiguous regions. The Department has a mix of domestic, commercial, agriculture, industrial and HT industrial consumers.

Figure 5: Category-wise Number of Consumers for 2016-17



Source: Puducherry Electricity Department

2.2 Distribution Infrastructure

2.2.1 PED operates a transmission network of 230 kV & 110 kV and distribution network at 33 kV, 22 kV, 11 kV and at LT levels. It supplies power to consumer through its 18 EHV substations, 489 km of EHT line, 2294 km of HT line, 2877 nos of distribution transformers and 3845 km of LT line. PED has also gone for 90 km of HT and 535 km of LT underground cabling of certain urban areas.

2.2.2 The network configuration as on August, 2018 is as given below:

Table 9: Network Configuration (as on August 2018)

Voltage	Line Details	Sub-Station Details		
	Lines	Capacity MVA	Substations	Transformation Capacity
	(Km)	(MVA)	(Nos)	(MVA)
Transmission				
230 kV/110kV	171	4x100+2x80	3	560
132 kV/33-11 kV	42	1x16+2x10	1	36
110 kV/22-11 kV	269	3x16+1x25+2x31.5+2x16+2x25+16x16+7x10	14	644
110 kV/22-11 kV	7			

	Line Details	Sub-Station Details		
Voltage	Lines	Capacity MVA	Substations	Transformation Capacity
	(Km)	(MVA)	(Nos)	(MVA)
(UG Cable)		+5x16+2x10		
Distribution				
33/11kV	19	2x5	1	10
22 kV & 11 kV (Overhead)	2185			
22 kV & 11 kV (Underground)	90			
LT (Overhead)	3310			
LT (Underground)	535			
Distribution Transformer capacity	11kV Transformers	Total Transformation Capacity	22kV Transformers	Total Transformation Capacity
kVA	Nos.	MVA	Nos.	MVA
100	116	12	144	14
200	280	56	1030	206
315	229	72	937	295
500	2	1	43	22
630	95	60	0	0
Total	722	201	2154	537
Total Number of Transformers			Nos.	2877
Capacity			MVA	738

- 2.2.3 Power to Puducherry region is fed through three numbers of 230/110kV Auto-Sub Stations with total installed capacity of 560MVA. 10 number of 110/22kV Sub Stations with a total installed capacity of 469 MVA are connected to the above auto-Sub Stations.
- 2.2.4 Power to Karaikal region is fed through two numbers of the 110/11kV Sub Station with an installed capacity of 80 MVA owned by PED and one number of the 110/11kV Sub Station owned by PPCL with an installed capacity of 30 MVA.
- 2.2.5 In Mahe, there is one 110/11kV Sub Station of capacity 20 MVA and in Yanam region, there is one 132/33-11kV Sub Station of capacity 36MVA and one 33/11kV Sub Station of 10MVA capacity.
- 2.2.6 The Transmission and Distribution Losses and the AT&C Losses are comparatively lower than that in many of the other states and Union Territories. The AT&C Loss and Transmission & Distribution loss of the system is estimated to be around 18.96% and 13.78% for FY2016-17.

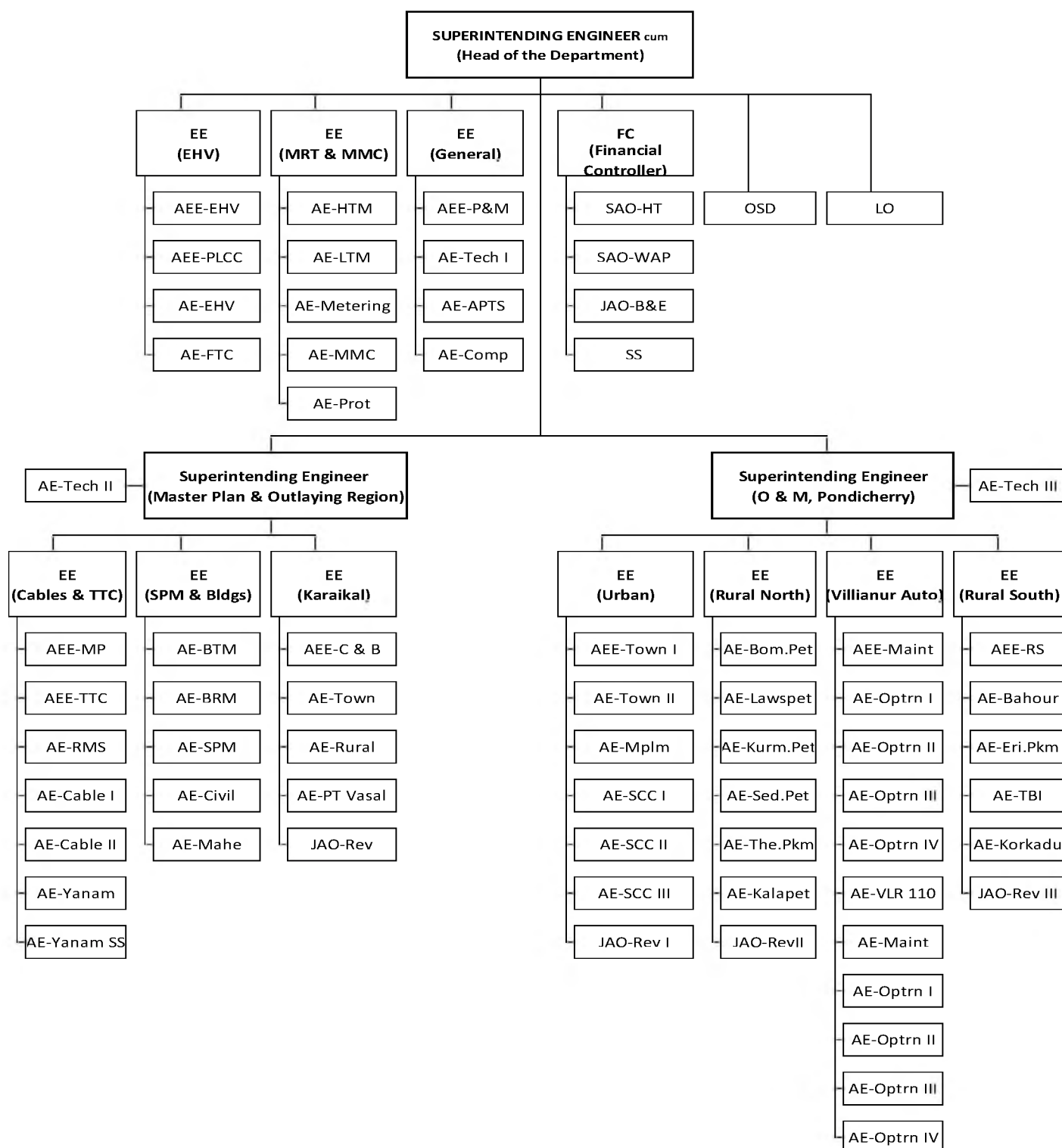
- 2.2.7 The Government of Puducherry has initiated the process of Power Sector reforms in the Union Territory. The objectives of Power Sector Reform program are to achieve sustainable development by promoting competition, efficiency & transparency to result in quality, reliable power supply to all consumers at affordable cost and to make the power sector commercially viable. The power utilities all over the country have taken up institutional strengthening through sustainable initiatives in a systematic & focused approach.

2.3 Organisational Structure

PED is divided into three circles each headed by an officer in the rank of Superintending Engineer. The Superintending Engineer - I (Head of circle I) is also the Head of the Department. The three circles consist of totally ten (10) Technical Divisions and one Finance Division. Each Technical Division is headed by an Executive Engineer and the Finance Division is headed by Financial Controller. Each Division consists of three to seven Sub Divisions. Sub Division offices are headed by Assistant Engineer. There are forty one Sub Division offices and they act as the link between the Divisional office and the field offices consisting of Sections headed by Junior Engineers. Section office is the direct customer facing unit and plays a key role in consumer satisfaction. In addition to the O&M Sub Division, a Revenue Section headed by a Junior Accounts Officer exists to take care of all revenue related activities for the division.

Figure 6: Organisational chart of PED¹

DEPARTMENTAL ORGANISATION CHART
(Upto the Sub-Divisional level)



¹ EE – Executive Engineer; FC – Financial Controller; AEE – Assistant Executive Engineer; AE – Assistant Engineer; OSD – Officer on Special Duty; LO – Labour Officer; SAO – Senior Accounts Officer; JAO – Junior Accounts Officer; SS – Stores Superintendent; APTS – Anti Power Theft Squad; WAP – Works and Pricing Section; MRT – Meter and Relay testing; FCC – Feeder Construction and Commercial; HTM – HT Metering; LTM – LT Metering

2.4 Operation and Maintenance Functions

a) Distribution Network:

In the existing set up, Distribution O&M is handled by Divisions - Urban, Rural North and Rural South for Puducherry region, Division – Cables & TTC for Yanam region, Division – SPM & Buildings for Mahe region and Division - Karaikal for Karaikal region. The main activities falling under O&M of distribution Divisions are:

- Operation and Maintenance of 110/22-11 KV EHT SubStations
- Providing needed supply to consumers of various categories like domestic, Commercial, industry, (HT, LT) Street Lights, agriculture and others
- Maintenance of quality power supply, which includes Breakdown and Preventive maintenance of , DTRs, overhead lines and cables, managing Breakdowns and fuse off calls
- Accurate metering
- Prompt billing
- Efficient Collections
- Customer Care and Customer Services
- Planning for improvement works
- HT Meter reading (by JE)
- Identification of pilferage and theft

The Urban O&M Division is additionally entrusted with the execution of RAPDRP – Part A SCADA project and Smart Grid Pilot Project.

b) Auto Sub-Stations:

In the existing set up, Operation and Maintenance of Auto Sub Stations is handled by Division – Auto SS and is headed by an Executive Engineer at the Division level. The division comprises of three 230/110 KV Sub-Stations at Villianur, Bahour and Thondamanatham. While the maintenance of the Sub-Stations is being attended by maintenance wing headed by an Asst. Executive Engineer, the operations of the Sub-Stations are being attended by shift duty wing headed by Assistant Engineer round the clock.

2.5 Other Functions

a) Division – Cables & TTC

It is the cable construction division responsible for planning, construction and augmentation works of underground cables for all the four regions. The division is headed by an Executive Engineer and there are two sub divisions for construction headed by Assistant Engineers. The Master Plan sub division is

responsible for planning of cable construction and Ring Main System (RMS) sub-division executes the cable construction works. The Technical Training Centre, the centre responsible for imparting training to the employees of the department, headed by an Assistant Executive Engineer falls under this division. The division is also looking after the execution of works under the schemes Integrated Power Development Scheme (IPDS) and Deen Dayal Grama Jyothi Yojana (DDUGJY) and cable works covered under R-APDRP Part B. VHF communication network is also maintained by this division.

b) Division – MMC & MRT

It is responsible for Material Management and MRT. All procurement activities of major and minor materials are carried out by this division. In addition to this, all testing and validation of meters and testing of protection equipment is carried out by MRT. LTM Sub-division carries out the installation and testing of meters in the LT CT services. Issue of permission for grid connectivity of the Solar Power Plants in the UT of Puducherry is being dealt with this Division, apart from compliance of Renewable Power Obligations.

c) Division-EHV

It is responsible for all EHV construction activities (transmission lines and EHV sub stations), new 11 KV and 22 KV feeder construction and augmentation works, planning for extension of supply to new EHT services and maintenance of EHV lines in the UT of Puducherry. This division is also dealing with JICA loan proposals and execution of Part-B of R-APDRP. Works covered under Power System Development Fund (PSDF) is also being implemented by this division. The operation and maintenance of **System Control Centre (SCC)** is under the control of this division.

d) Division SPM & Buildings

It is responsible for repairing the distribution transformers, administration of workshop and electrical maintenance of Government buildings. The O&M sub-Division of Mahe is under this Division

e) Division V-Karaikal

It is responsible for the overall operation of the Karaikal region. This division handles the entire gamut of activities of the Karaikal region namely Operation & Maintenance, Construction and Building Maintenance.

f) Division - General

It is directly attached to the Head of the Department and is responsible for assisting the Head of the Department in technical matters, Budget Planning and Monitoring and the Issue of technical and work sanctions. This division also acts as the Public Relations Office. The Anti Power Theft Squad (APTS) functions under the control of this division. This division is dealing with the Regulatory Matters.

g) Financial Controller

He is responsible for all revenue and accounting activities of the Department. Financial Controller is responsible for preparation of budget estimates, payment for power purchase and centrally procured items, CAG audit, Internal and external Audit, Issue and close of Work Orders and Issue of Work Adjustment bills. Stores Superintendent is responsible for stores administration, for the whole Department.

2.6 Human Resource Management

2.6.1 Man Power Planning

The responsibility towards maintenance of a highly efficient distribution system and the accountability towards discharge of the duties as a service provider have to be shared by the engineers and employees of the PED. The biggest asset of any organization is its work force. Their optimum performance can elevate its progress. At the same time, it is also true that the career growth of its employees is directly related to the growth of the organization. The Electricity Department has a technical work force of over 2192 employees of different ranks who perform multifaceted technical functions and duties, viz., maintaining power supply, metering, billing, revenue collections, customer services etc.

2.6.2 Staffing

a) Tech & Non-tech structuring and staffing

The total sanctioned employee strength of the department is 2854 of which 2192 belong to technical cadre and 665 belong to ministerial cadre. The ministerial cadre employees do not belong to the department and are appointed by the General Administration Department of the Government of Puducherry. In technical cadre, there are around 360 Nos. of posts are lying vacant.

b) Transferability

While all technical employees are transferable to any of the four regions, the

department does not have any control over the appointment or transfer of ministerial employees.

2.6.3 Training

There is a need to ascertain the training of the existing human resource and to identify their core competencies with an aim to enhance their skills and finally place them in appropriate job positions. PED endeavours to conduct training at periodic intervals for capacity building of its manpower. For imparting internal training, PED is having a full-fledged Technical Training Centre, which conducts in-house training and also deposes the technical officer/ staff to outside agencies for specialised training.

2.6.4 Safety of Employees

At Technical Training Centre of PED, classes are being conducted towards electrical and mechanical safety for the staffs with in-house trainees. Every year it is programmed to conduct safety class for 24 batches with 20 staff each.

2.6.5 Rationalization of Workforce

At present, PED is planning to rationalize its workforce to meet the enhanced expectation of the consumers and to fulfill its obligation to supply reliable and quality power. Efficiency improvement in consumer affairs, loss reduction, raising the level of billing and collection efficiency, better management at sectional level and optimum use of the available staff strength are some of the goals sought to be achieved by the rationalization of the work force. A proposal with respect the same has been sent to Ministry of Power, Government of India.

2.7 Initiatives to Improve the System (IT, Technological, Customer Services)

2.7.1 Smart Grid Project in Puducherry

The Government of India, Ministry of Power (MoP) has taken the process of establishment of smart grids in India with an objective of achieving most efficient management of distribution system and to deliver best possible service to consumers. For this purpose MoP has set up “India Smart Grid Task Force (ISGTF)” and “Indian Smart Grid Forum (ISGF)” to evolve a roadmap for development of smart grid. The MoP has proposed to promote fourteen smart grid pilot projects in the country and one such project has been planned at Puducherry Urban Area.

The Electricity Department, Puducherry is one of the 14 selected cities under the National Smart Grid Mission and approval of the Ministry of Power had also been accorded to implement the pilot project with Installation of 34,600 nos of Smart Meters in the Boulevard area of the Puducherry in the town limits and all the LT CT operated services at a cost of Rs. 33.83 crores with 50% contribution by the Government of India. The consumer shall get the following benefits.

- Consumer Engagement & empowerment with greater control over their energy use and bill.
- Improved quality & reliability of power supply
- Increased life of appliances and gadgets due to improved power quality
- No need to invest in power backup solutions like inverters and Gensets.
- Rooftop renewable generation with facility to feed excess power into the grid
- Improvement in overall consumer satisfaction.

The work is under execution by M/s Dong Fang, China under investor model, with balance 50% of the cost of the project invested by the firm. The Project is programmed to be completed by the end of year 2018. So far, 20500 Nos. of Smart Meters had been installed in the consumer premises in town area and the Smart Grid Control Centre is ready for functioning.

2.7.2 DELP Scheme (DSM based Efficient Lighting Programme) and UJALA (Unnath Jyothi by Affordable LEDs for All)

Ministry of Power and Bureau of Energy Efficiency have been promoting energy efficiency. Efficient lighting in households, which accounts for 20% of energy, is an important thrust area to reduce peak demand as well as enhance awareness about energy efficiency and conservation to household consumers

PED has implemented DSM based efficient lighting programme under demand side management programme in Puducherry along with Energy Efficiency Services Limited (EESL). As per the scheme, 3 LED bulbs per household were distributed at a cost of Rs. 10 per bulb in exchange of ordinary incandescent bulb. This scheme will help consumers reduce their electricity bills by way of energy savings resulting from use of energy efficient lamps. The investment made by EESL is being paid by PED on a periodic basis on the accrued energy efficiency resource benefits and the same is recovered through ARR and tariff.

In addition to the above, under the scheme of Government of India viz. “Gram Swaraj Abhiyan”, a total of 40,500 Bulbs have been distributed to the public by EESL so far, at subsidized rates (30500 Bulbs in Puducherry region and 10000 Bulbs in Karaikal region) and another lot of 15000 Bulbs being distributed in Karaikal region.

PED is already insisting EESL to implement UJALA scheme, on a permanent basis so as to make available the LED Bulbs, LED Tubelights and Energy Efficient Fans at affordable price to the public of Puducherry. EESL is expected to commence the UJALA implementation on a permanent basis in Puducherry.

2.7.3 Conversion of conventional Street Lights by LED street lights:

The Electricity Department is maintaining 46,750 Nos. of Street Lights in the U.T of Puducherry, consisting of 36,950 Nos of Single Tube Lights, 9,800 Nos. of Sodium Vapour Lamps, Metal Halide Lamps and LED Lamps of various categories. In addition there are around 9,400 Nos. of Street Light maintained by PWD/Local Bodies and PADCO, consisting of 1148 Nos. of 400 watts Metal Halide Lamps 3,136 Nos of 400 Watts Mini Mast Lights. 5004 Nos. of 400 Watts High Mast Lights, 112 Nos. of 400 Watts Super High Mast Lights. It has been decided to convert the existing conventional street lights into highly reliable energy efficient LED street lights and to set up a computerized control and monitoring centre introducing smart solution in street lighting. Tenders were called for by PED for implementation of the project on 'Deemed Savings Annuity Payment' model. The entire investment will be taken care by the project developer which will be repaid by the State Government in Equated monthly installment over a period of seven years. However, as none of the tenderers have met the Bid Qualifying Requirements, the tender was cancelled. It has been decided to go far retendering by suitably modifying the BQR. On implementation of the scheme, it is expected that the annual energy consumption of the street lights will be reduced by 50%.

2.7.4 Technology Upgradation

As per the Commission's directive to upgrade transmission & distribution lines and substations with latest and advanced technology, PED has taken certain measures to ensure compliance with directive.

- Replacement of mechanical/ struck-up/ defective meters with electronic meters. As part of the same 91,000 meters are to be replaced in FY 2015-16 under R-APDRP and plan schemes and 1,18,000 meters in FY 2016-17 under R-APDRP, plan, IPDS and DDUGJY schemes.
- Replacement of old oil switch gears with SF6.
- Energisation of energy efficient distribution transformers.
- Introduction of SCADA DMS.
- Introduction of aerial bunched conductors.
- Erection of section isolators.
- Installation of automatic power factor capacitors.
- Installation of smart meters.

2.7.5 Upgradation of the Billing Software:

PED has requested the National Informatics Centre to develop **Meter Reading Billing and Collection web based Software** in order to overcome the difficulties experienced in in-house developed, three decade old billing software. The proposed software will be developed with *department's workflow based* using latest

technology and it has provision NIC Puducherry will initially give training to department users after that department has to manage this software of their own. The performance of the software mainly depends on network bandwidth of servers, user computer at collection centres. NIC has proposed to execute the software development work in 5 phases. They are (i) Collection Dissemination - Compilation of collection data through Centralized System from all regions/divisions/collection centres. (ii) Counter Collections - Receipts. (iii) LT - Meter Reading, Billing and Payment Gateway. (iv) HT - Meter Reading, Billing and Payment Gateway. (v) Other Administration of Services.

It is expected that the work will be taken up shortly and implemented within a period of one year.

2.7.6 Anti- Power Theft Squad (ATPS)

In a move to strengthen the action on pilferage of energy and to comply with the Regulations and reduce T&D losses by revoking illegal connections, checking meter tampering and correctness of the energy meters, PED has formed two separate teams of engineers to inspect the consumer premises.

2.7.7 Promotion of Renewable Power

PED has already make request to NTPC to allocate 100 MW solar power from their proposed project at Rajasthan. While confirming the availability of the same, M/s NTPC is also drafting Power Purchase Agreement to be entered in this regard. The Plant is expected in the year 2020-21. In order to meet additional requirement, the department has requested SECI to allocate 100 MW of Non-solar and 50 MW of Solar power from their proposed up-coming projects. In addition to the above, the department has also proposed to establish a total capacity of 31.5 MW under JICA, and also 240 KW under IPDS. In the meanwhile, number of Roof Top PV Solar Plants are being commissioned under private sector and the installed capacity of the same would reach 5 MW by the end of this year.

2.8 Way Forward for PED

2.8.1 PED has been successfully supplying power to its consumers throughout the years, but there is much more that needs and can be done to provide power security to the people of UT of Puducherry. To achieve this, PED has to prioritise the following activities:

- Curb down the distribution losses to optimum level between 10%-11%.
- Achieve collection efficiency of 100%.
- 100% billing on the basis of actual meter reading and elimination of average billing.
- Incorporate centralized MIS system and improve information flow from sub-

divisions to head office.

- Use of technological advance and computerization for improving the efficiency, accountability, information levels & consumer satisfaction.
- Introduce AMI for all revenue intensive consumers.

3. SWOT ANALYSIS

3.1 SWOT Analysis

3.1.1 SWOT analysis (or SWOT matrix) is a strategic planning technique used to help a person or organization identify the Strengths, Weaknesses, Opportunities, and Threats related to business competition or project planning.

3.1.2 The analysis of the strength, weakness, opportunities and threats as perceived by PED is summarized in the following figure:

Figure 7: SWOT Analysis of PED

STRENGTHS • Availability of adequate power • Implementation of latest technologies • Robust system/network • Yearly and timely filing of Tariff petitions, Competitive Tariff and Simple & Robust Tariff Structure	WEAKNESS • Inadequate availability of funds • Old billing system and billing issues. • Filling up of vacant post
OPPORTUNITIES • Strengthening of Infrastructure by availing JICA Loan • Availability of RE power at cheaper rates. • Setting up Robust Smart Grid Infrastructure • Connectivity of all regions with the SR Grid.	THREATS • Increase in cost of conventional power • Reduction in consumption of energy by Industries • Market Uncertainty

3.1.3 **STRENGTHS:**

- **Availability of adequate Power Supply:** PED for long has been able to supply uninterrupted power to its consumers thereby not letting its consumers subject to regular load shedding and has the capability to do so in the future.
- **Robust System/Infrastructure:** PED has invested in its system/network to make it robust and has been providing quality and reliable power supply to its consumers.

- **Implementation of latest technologies:** Further, PED has been very proficient in adoption/implementation of new technologies and keeping the Distribution Losses at lower level over the last few years.
- **Yearly and timely filing of Tariff petitions, Competitive Tariff and Simple & Robust Tariff Structure:** PED has been very efficient in following the policies and Regulations of the Commission timely filing of tariff/true-up/APR petitions on yearly basis. Further, PED has been able to maintain lower tariffs as compared to the other utilities in the neighbouring States and the tariff structure is the one of the simplest and robust when compared to other utilities in the Country.

3.1.4 **WEAKNESSES:**

- **Inadequate availability of Funds:** PED being the government department needs budget allocation by the government for funds to incur any expenditure. Even availing of loan from the financial institutions for the development works of the Electricity Department is subject to overall borrowing limit of the Union Territory.
- **Old Billing Software:** The billing software of PED is very old and almost obsolete and needs continuous upgradation, which leads to a lot of billing and collection issues. Upgradation of the billing software has been covered under the project RAPDRP – Part A (IT Part). However, the work has not been executed due to litigation between TANGEDCO and IT Implementation Agency. In the meantime, in order to resolve various issues in the old billing software, it is proposed to upgrade the Billing Software by entrusting the work to M/s National Informatics Centre.
- **Filling up of vacant posts:** PED network, consumers and sales keep on increasing at a constant growth rate and to cater then a considerable amount of manpower is also required, especially for O&M and fault rectification purposes. However, there are a lot of sanctioned posts still vacant, which PED has not been able to fill up completely.

3.1.5 **OPPORTUNITIES:**

- **Strengthening of Infrastructure by availing JICA Loan:** The CEA accorded the Technical clearance for all three parts of DPR. Total investment is Rs. 983.43 Crore. Implementation period is 5 years. IRR works out to 15.46% which is acceptable for similar works like R-APDRP. In nutshell, implementation of this project will result in uniform coverage of all four region in terms of Transmission

and Distribution infrastructure works. Increase in Transformation capacity and Power transfer capacity across power value chain. The present Transmission and Distribution loss is approximately 15% and after implementation of this project the loss would come down to 10%. The reduction in Power requirement would be 150 MUs and the approximate saving in Power purchase cost would be Rs 60.00 Crores per annum which is more than the annual repayment amount to JICA.

- **Availability of RE power at cheaper rates:** The recent competitive bidding for Renewable Energy sources especially for Solar and Wind, have discovered per unit cost as low as Rs. 2.50/unit. The present RE market is coming at par or even lower than the conventional power cost. PED is keeping track of this opportunity and shall try to avail the cheaper RE power to fulfil its RPO obligations and any excess power requirements.
- **Implementation of energy conservation schemes:** PED has associated with EESL to implement energy conservation schemes in the UT. There are a lot of opportunities that can be explored in the area for example, using all LED street lights, using energy efficient water/agricultural pumps etc. The following measures are proposed to be taken to encourage energy conservation, in addition to conversion of existing street lights into LED street lights.
 - i. Enforcing 10% cut on power consumption in Govt Buildings.
 - ii. Enforcing all new equipments to be of energy efficient / star rated.
 - iii. Energy audit of high consumption buildings such as Hospitals, Government offices etc.
 - iv. Creation of awareness on conservation of energy among public.
- **Setting up Robust Smart Grid Infrastructure:** PED has been the front runner in setting up a live smart grid pilot project to improve the distribution infrastructure. There is further scope for setting up a more robust smart infrastructure with adequate support from both the Central and State Government. PED has entered into a MoU with M/s Power Grid Corporation of India Limited wherein M/s Power Grid along with their associates/ collaborators would be responsible for establishment of pilot Smart Grid in Puducherry to jointly develop the Smart Grid Pilot Project in Puducherry. The project will mainly involve installation of advance metering infrastructure (AMI) with a Central Data Control Centre which will help both the consumer and the PED
- **Connectivity of all Regions to SR Grid:** The integration of the southern power grid with the national grid fulfils a long-felt need of consumers and state

electricity utilities in the South. Now power can be purchased from any part of India without connectivity issues and at cheaper rates.

3.1.6 **THREATS:**

- **Increase in Cost of Conventional Power:** PED relies on external source of power and the cost of generation has been increasing (primarily due to domestic fuel supply concerns and use of imported coal) which may lead to increase in tariffs for consumers. Further, the capital cost of new power plants has gone up substantially resulting in higher power tariff from new generating units both under central sector as well as private power generating companies. This shall cause hardship on its consumers and PED in no way wants to burden its consumers.
- **Reduction of Consumption of Industrial Consumers:** The domestic consumer base has been increasing at a faster pace than the industrial consumer base which may be a cause of concern as decrease in number of high paying consumer's (cross subsidising consumers) may affect revenue generation for the department.
- **Market Uncertainty:** The power sector has been very volatile in the last couple of years. With RE power costs reaching new lows, however projects not getting completed, PPAs being cancelled. Further, the convention thermal generating stations declaring NPAs with the stranded capacities, the future of power availability is uncertain.

3.1.7 The growth path for PED would be the key takeaways which have emerged from the SWOT analysis. While, there would be opportunities galore on the horizon, it would be only prudent on part of PED to first target the short-comings and overcome them. Simultaneously, it would also be necessary to start identifying areas which it intends to target in the short to medium term and which areas it intends to target in the long term. Targeting everything simultaneously would lead no-where.

4. DEMAND & SALES ASSESSMENT

Demand and sales assessment is one of the most important aspects of the distribution business. There are many statistical approaches to project the demand and sales for the future years including the crudest form of CAGR method to the most advanced form of end use survey approach. In fact, CEA has been using partial end use method to project demand in different states. However, the technique adopted is mainly dependent of the kind of data that is available, nature of consumption and size of customer category.

Further, Demand and Sales Assessment is not a one-time exercise but needs to be constantly monitored against actual demand and updated for any major development or changes in other external drivers like policies, regulatory developments, industrial growth, changes in specific industry segments etc.

4.1 Regulatory Provisions for Sales Forecast

4.1.1 The Commission in the Regulation 8 of JERC (Multi Year Tariff) Regulations, 2018 has mentioned the methodology to be adopted for sales forecast in business plan. The relevant provisions of the JERC MYT Tariff Regulations, 2018 are extracted for reference as under:

“6. Values for Base Year

6.1 The values for the Base Year of the Control Period shall be determined on the basis of the audited accounts or provisional accounts of last three (3) Years, and other factors considered relevant by the Commission:

Provided that, in absence of availability of audited accounts or provisional accounts of last three (3) Years, the Commission may benchmark the parameters with other similar utilities to establish the values for Base Year:

Provided further that the Commission may change the values for Base Year and consequently the trajectory of parameters for Control Period, considering the actual figures from audited accounts.

6.2 The Commission may revisit the performance targets for the Control Period during the Mid-term Review, carried out in accordance with the proviso to Regulation 5.2 (b).

.....

8.6 Sales Forecast

a) The Distribution Licensee shall forecast sales for each Consumer category and sub-categories, at different voltage levels, for each Year of the Control Period in their Business Plan filings, for the Commission’s review and approval;

b) The forecast shall be based on the actual demand of electricity in previous Years, anticipated growth in demand in coming Years, expected growth in the

number of Consumers, changes in the pattern of consumption, target distribution losses and other relevant factors;

c) The Licensee shall indicate separately the sale of electricity to traders or another Licensee and category wise sales to Open Access Consumers.”

4.2 Approach for forecast of No. of Consumers, Connected Load and Sales for the Control Period

4.2.1 The petitioner has adopted the methodology mentioned by the Commission and has taken the base year as FY 2018-19. The values for the base year have been taken on the basis of audited numbers of FY 2015-16 & FY 2016-17 and unaudited actuals of FY 2017-18. Further, compounded annual growth rate (CAGR) of past 3 years, 4 year and 5 years of each consumer category as per actual values has been forecasted to arrive at the figures for the control period FY2019-20 to FY2021-22.

4.3 Forecast of No. of Consumers, Connected Load and Sales

4.3.1 Based on the past data, the category wise data of audited numbers of FY 2015-16 & FY 2016-17 and unaudited actuals of FY 2017-18, the CAGR of past 3 years, 4 year and 5 years of each consumer category as per actual values are considered for the projections of no. of consumers for the control period is given in the table below:

Table 10: Summary of Category-wise No. of Consumers Growth Rate Considered for Projections

Consumer Category	Actuals					CAGR			
	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	3 year	4 year	5 year	CAGR considered
Domestic	272198	286495	306385	313367	325845	3.13%	4.38%	4.60%	4.60%
OHOB	35537	35539	35539	35539	35537	0.00%	0.00%	0.00%	0.00%
Commercial	45311	46938	51674	52087	53962	2.19%	4.76%	4.47%	4.47%
Agriculture	6810	6849	6854	6900	6940	0.63%	0.44%	0.47%	0.47%
Street lighting	49524	49893	50055	50250	50434	0.38%	0.36%	0.46%	0.46%
LT Industrial+Water tank	6338	6423	6556	6616	6668	0.85%	1.26%	1.28%	1.28%
HT-I	434	412	433	439	453	2.28%	3.21%	1.08%	2.28%
HT-II	49	53	53	60	61	7.28%	4.80%	5.63%	5.63%
HT-III	7	7	7	7	7	0.00%	0.00%	0.00%	0.00%
Total	416208	432609	457556	465265	479907				

Table 11: Summary of Category-wise Connected Load (kW) Growth Rate Considered for Projections

Connected Load (kW)	Actuals					CAGR			
Consumer Category	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	3 year	4 year	5 year	CAGR Considered
Domestic	481581	464613	484510	506829	530206	4.61%	4.50%	2.43%	4.61%
OHOB	2843	2843	2843	2843	2843	0.00%	0.00%	0.00%	0.00%
Commercial	94945	97345	102331	109627	119092	7.88%	6.95%	5.83%	7.88%
Agriculture	44654	44654	44654	44654	44654	0.00%	0.00%	0.00%	0.00%
Public lighting	5936	5971	5998	6058	6119	1.00%	0.82%	0.76%	1.00%
LT Industrial & water tank	115406	116954	120428	122804	125234	1.98%	2.31%	2.06%	1.98%
HT 1	290950	312731	322656	333098	344093	3.27%	3.24%	4.28%	3.27%
HT 2 - Government & water tank	18500	22918	25210	27731	30504	10.00%	10.00%	13.32%	10.00%
HT 3 – EHT	90500	104483	109695	115167	120912	4.99%	4.99%	7.51%	4.99%
Total	1145314	1172511	1218325	1268810	1323657				

Table 12: Summary of Category-wise Sales/Demand Growth Rate Considered for Projections

Sales(MU)	Actuals					CAGR			
	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	5 year	4 year	3 years	CAGR Considered
Domestic	600.00	635.22	675.00	699.82	723.3	4.78%	4.42%	3.51%	4.78%
OHOB	12.09	10.00	10.00	10.21	10.2	-4.07%	0.79%	1.19%	1.19%
Commercial	181.00	182.22	198.00	210.92	216.4	4.57%	5.90%	4.55%	4.57%
Agriculture	57.00	57.00	57.00	57.28	57.6	0.27%	0.36%	0.53%	0.27%
Street lighting	26.00	26.00	26.00	24.24	24.5	-1.49%	-1.99%	-2.97%	0.00%
LT Industries + Water tank	226.10	198.90	205.00	190.67	185.6	-4.81%	-2.28%	-4.85%	0.00%
Temporary	10.1	6.1	7.0	8.0	8.5	-4.28%	11.48%	10.06%	10.06%
HT-I	878.01	875.29	892.00	944.15	8.5	0.55%	0.83%	0.30%	2.50%
HT-II	48.77	55.96	60.00	62.03	897.3	19.19%	20.70%	28.07%	19.19%
HT-III	326.65	319.60	268.00	258.96	98.4	0.02%	0.76%	10.44%	2.50%
Total	2365.72	2366.31	2398.00	2466.27	326.9				

4.3.2 Domestic Consumers:

With the advent of technology, increasing purchasing power and influence of the tourists, the lifestyle of the people in Puducherry has been urbanised. The usage of electrical appliances in the households such as television, air conditioners, fans, washing machines, microwave ovens, computers, laptops, geysers/ electric water heaters, mixers, multiple mobile charging units etc have increased and is now

common in every household. Further, considering PED's constant efforts to provide last mile connectivity and 24x7 power supply has increased the no. of consumers in the network and the consumption and load of most of the households has also increased. Multi-storeyed apartments / buildings are being developed with 2- 3 BHK flats which again will have much increased load and consumption. Hence, based on the 5-yr CAGR, the growth rate of 4.78% in consumption and 4.60% for the number of consumers is considered for projection for the MYT control period.

4.3.3 Hut Services/ OHOB Consumers:

The number of consumers in the one house one bulb (OHOB) category is not expected to grow as PED plans on giving no new OHOB connections. So the number of consumers are kept the same for the MYT control period which is also in line with the calculation as considered by the Hon'ble Commission in the past tariff orders. However, the consumption has increasing due to increased no. of supply hours, hence the 3 year CAGR of 1.19% has been considered for forecasting the consumption.

4.3.4 Commercial Consumers:

Puducherry, being a tourist destination, is expected to attract tourists in the coming years as per the continuing trend and to cater to their demand more hotels, restaurants, shops and commercial establishments are expected to come up in near future. Based on the calculated CAGR, a growth rate of 4.47% (5-yr CAGR) for the number of consumers and 4.57% (5-yr CAGR) for consumption has been considered for projection for the MYT control period.

4.3.5 Agriculture Consumers:

It is expected that the consumption of this category to remain stagnant as it has remained in the past years. However, in the recent years, a very minimal increase in consumption has been observed. Therefore based on the calculated CAGR, a growth rate of 0.47% (5-yr CAGR) for the number of consumers and 0.27% (5-yr CAGR) for consumption has been considered for projection for the MYT control period.

4.3.6 Street Lighting:

The street lighting consumption has not grown and is expected to remain stagnant or rather decrease in future with replacement with LED lights, hence no increase has been considered for the MYT period.

4.3.7 LT Industrial and Water Tanks:

The no. of consumers have increased very slightly over the past, however the

consumption has seen a decreasing trend. Further, the same is expected to remain stagnant in future, hence no increase in consumption has been considered for the MYT period. The consumers are expected to grow at 1.28% during the MYT control period.

4.3.8 Temporary Supply:

PED has projected the sales from temporary supply at a 5 yr CAGR of 10.08% for the Control period from the existing connections, however as the temporary connections do not follow any particular pattern and it may increase or decrease on year on year basis.

4.3.9 HT-1 (Industrial & Commercial):

Due to economic slowdown in the country, most of the sectors have taken a hit and the consumption over the last couple of years by industries have decreased due to shutdown of few plants and running of plants at low operational levels. Considering the improvement in the present economic condition whereby IPP data and inflation data are favourable, the situation is expected to improve over the next few years. So the petitioner has considered the growth rate of 2.28 % in the number of consumers and a nominal growth rate of 2.5% in consumption is projected for the Control Period/

4.3.10 HT-2 (State and Central Govt. Establishments):

The HT-2 category of consumers is expected to grow at a rate of 5.63% based on the 5-yr CAGR of audited years. The consumption in this category is expected to grow with the infrastructure development such as water works and sewage treatment plants. So a nominal/ reasonable growth rate of 19% in sales is considered for this category of consumer for the control period.

4.3.11 HT-3 (Industrial Extra High Tension):

Considering the present economic situations, the petitioner on a conservative approach has not assumed any addition in no of consumer to be added to the system during the control period, however a nominal growth in consumption is considered at 2.5% against the CAGR of 10% (3-yr CAGR).

4.4 Projected No. of Consumers, Connected Load and Sales for the MYT Control Period

4.4.1 Based on the above assumptions of growth rate, the projection for the sales/ consumption and number of consumers during the control period is given below.

Table 13: Projection of Number of Consumers for the MYT Control Period

	Base Year	Projections
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Consumer Category	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Domestic	3,40,834	3,56,512	3,72,911	3,90,065
OHOB	35,537	35,537	35,537	35,537
Commercial	56,371	58,888	61,518	64,265
Agriculture	6,973	7,006	7,039	7,072
Street lighting	50,664	50,895	51,127	51,361
LT Industrial+Water tank	6,753	6,839	6,927	7,015
HT 1	463	474	485	496
HT 2 - Government & water tank	64	68	72	76
HT 3 – EHT	7	7	7	7
Total	497667	516227	535623	555894

Table 14: Projection of Connected Load during the MYT Control Period

Connected Load (kW)	Base Year	Projections		
Consumer Category	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Domestic	554691	580259	607006	634986
OHOB	2843	2843	2843	2843
Commercial	130876	141188	152312	164313
Agriculture	44654	44654	44654	44654
Public lighting	6181	6243	6306	6369
LT Industrial & water tank	127718	130242	132815	135439
HT 1	361298	373107	385302	397896
HT 2 - Government & water tank	32029	35232	38755	42630
HT 3 – EHT	126958	133291	139940	146921
Total	1387248	1447059	1509934	1576052

Table 15: Projection of Consumption during the MYT Control Period

Sales(MU)	Base Year	Projections		
	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Domestic	757.87	794.12	832.09	871.89
OHOB	10.36	10.49	10.61	10.74
Commercial	226.30	236.63	247.44	258.75
Agriculture	57.76	57.92	58.07	58.23
Street lighting	24.48	12.24	12.24	12.24
LT Industries + Water tank	185.61	185.61	185.61	185.61
Temp LT	9.33	10.27	11.31	12.44
HT 1	919.77	942.77	966.34	990.50
HT 2 - Government & water tank	117.29	139.79	166.61	198.58
HT 3 – EHT	335.07	343.45	352.04	360.84
Total	2643.85	2733.29	2842.36	2959.80

4.4.2 Based on the above projections of the growth rate for the respective categories, the

overall sales during the control period are expected to grow at a CAGR of 3.73%.

4.5 Sale of Electricity

- 4.5.1 The petitioner due to recent developments and introduction of additional surcharge has observed that industries are curbing their open access consumption and increasing their consumption from PED. Accordingly, PED anticipates no sales to Open Access Consumers.

4.6 Distribution Loss Target

- 4.6.1 The distribution loss trajectory has proposed by PED considering that the optimal distribution loss levels of PED, it finds it technically difficult to further reduce the transmission and distribution loss.

Table 16: Actual Distribution Losses

FY 2015-16	FY 2016-17	FY 2017-18
13.67%	13.78%	13.75%

- 4.6.2 Efforts are being taken to reduce these losses further and implementation of JICA schemes is anticipated to reduce the losses accordingly the proposed distribution loss reduction trajectory proposed by PED for the control period is mentioned below.

Table 17: Distribution Loss Reduction (%) Trajectory for the Control Period

Base Year	Projections		
FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
13.00%	12.50%	12.00%	11.75%

5. POWER PURCHASE PLAN

The petitioner has to arrange the power requirement of its distribution license area. In the previous section the projected sales and the demand requirement for the license area has been arrived at and based on the same, the power requirement for the control period has been discussed in this chapter.

5.1 Energy Requirement

5.1.1 Based on the energy sales and distribution loss trajectory forecasted for the control period, the petitioner requests the Hon'ble Commission to approve the proposed energy balance for the control period based on the above projections.

Table 18: Energy Balance for the MYT Control Period

Energy Requirement (MU)	Projections			
	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
Total Sales within the UT	2,644	2,733	2,842	2,960
Loss(%)	13.00%	12.50%	12.00%	11.75%
Loss (MU)	395	390	388	394
Sales- UI/ Export to Exchange	-	-	-	-
Total Energy Requirement at UT Periphery (MU)	3,039	3,124	3,230	3,354

5.2 Power Purchase Plan

5.2.1 In this section, the petitioner has presented the total power purchase cost arising out of the power procurement plan being proposed for the control period. The power requirement for the control period would be met from the following sources:

- Central Generating Stations
- PPCL

5.2.2 Following assumptions have been considered for projecting the quantum and cost of power purchase:

5.2.2.1 **Power Purchase from New Stations:** The petitioner envisages supply from a new generating station NLC New TS-1, expected to achieve COD in FY 19-20. The petitioner has proposed the total share of 57.24 MW (allocated + unallocated) and has envisaged supply to start in FY 19-20 and then for the complete Control period. Since, the generator has not filed the tariff order, PED has considered the cost of Rs.3.50/unit (fixed+variable) for the control period.

Further, the petitioner has also considered the power purchase of 150 MUs from TNEB Karaikal for the base year FY 2018-19 only.

5.2.2.2 **Share Allocation:** The petitioner has considered the firm allocation and allocation from the unallocated quota from the above stations as per the notification of the Southern Region Power Committee vide SRPC Order No:No. SRPC/SE-1/4(REA)/2018/dated 24.08.2018. Refer Annexure has been considered for calculation of revised projections of base year FY 2018-19. The same has been considered for the entire control period without any variations.

5.2.2.3 **Plant Load Factor for Stations:**

Since the present scenario for the conventional power stations is very volatile and competitive, hence, the past data cannot be relied upon for the correct picture. Accordingly, the petitioner has consider the present PLF for FY 2018-19 as per the notification of the Southern Region Power Committee vide SRPC Order No:No. SRPC/SE-1/4(REA)/2018/ dated 24.08.2018. Refer Annexure. The same PLF has been considered for the entire control period.

For PPCL, the PLF as approved in the Tariff Order for FY 2018-19 has been considered for the entire control period.

5.2.2.4 **Fixed Charges:**

The draft Tariff Regulations for the tariff period FY 2019-22 have recently been notified by CERC and comments invited. However, CERC regulations and tariff orders the period FY 2020-24 for the central generating stations is not present. In absence of the tariff orders for FY 2019-24 of the central generating station, the Fixed costs of FY 2018-19, as approved by the Commission in tariff order for FY 2018-19 has been considered for calculation of revised projections of base year FY 2018-19 for respective Central Generating Stations, and projections has been done with an escalation of 4% for purpose of estimation of the fixed charges for the control period.

For PPCL, the fixed charges approved for FY 2018-19 in tariff order has been considered and escalated by 4% during the Control Period.

5.2.2.5 **Variable Charges:** The petitioner has considered the per unit variable costs of FY 2018-19, as approved by the Commission in tariff order for FY 2018-19 and has calculated the revised projections of base year FY 2018-19 w.r.t to power purchase projections for respective Central Generating Stations. Further, y-o-y escalation of 4% has been considered during the control period. For PPCL, the same approach has been taken.

For TNEB karaikal, the petitioner has considered the actual per unit variable cost of FY 2016-17 for base year FY 2018-19 and the same has been escalated by 4% y-o-y for the entire control period.

- 5.2.2.6 **Principles of MoD:** The Petitioner has considered the nuclear plants as must run and has not subjected them to merit order dispatch. Also, TNEB (Karaikal) and PPCL have been considered as must run and not subject to merit order principles.

For determining the power purchase cost, merit order dispatch principles have been applied. The must-run stations have been assumed at the top of the merit order and variable cost incurred for meeting the energy requirement within the UT has been calculated from the plants at the top of the merit order.

Fixed Charges from all the generating stations (irrespective of the merit order) have been considered for arriving at the power purchase cost.

- 5.2.2.7 **UI Over-drawal/ Under-drawal:**As per the merit order principles adopted for estimating the energy requirement for the control period, no surplus sale of power has been considered for the control period and power purchase corresponding to meeting the requirement. The UI over-drawal has not been considered for the control period. Further, the UI over-drawal/under-drawal quantum and amount would be submitted at the time of true-up based on the actual performance during the year based on the actual UI bills.

- 5.2.2.8 **PGCIL losses:**The actual losses of FY 2017-18 i.e. 4.07% have been considered for the base year and the entire control period without any escalation i.e. 4.07%. Weighted avg. For PPCL and KSEB the external losses have been considered as nil as they are within the periphery of the licensee area.

- 5.2.2.9 **Transmission Charges:**The petitioner has considered the transmission charges approved by the commission for FY2018-19 in tariff order and has accordingly calculated the transmission charges per unit for PGCIL and has considered the same per unit charges for the entire control period without any escalations.

5.3 Renewable Purchase Obligations

- 5.3.1 As per JERC (Procurement of Renewable Energy) Regulations, 2010 clause 1 sub clause (1):

"Each distribution licensee shall purchase electricity (in kWh) from renewable energy sources, at a defined minimum percentage of the total consumption of all the

consumers in its area during a year.”

5.3.2 The RPO requirements as per the JERC (Procurement of Renewable Energy) third Amendment Regulations dated 22nd August 2016 has been considered for the control period.

5.3.3 The Petitioner has to purchase a certain percentage of total energy purchase for sale to the consumers in its area from renewable energy sources with specific solar and non-solar RPO content.

5.3.4 The RPO so far is provided in the table below.

Table 19: RPO Obligation

S.No	Description	Unit	Base Year (Projections)		Projections					
			FY 2018-19		FY 2019-20		FY 2020-21		FY 2021-22	
			Physical	REC	Physical	REC	Physical	REC	Physical	REC
1	Sales Within State	MUs	2,643.85		2,733.29		2,842.36		2,959.80	
2	RPO Obligation	%	5.40%		11.50%		14.10%		17.00%	
	- Solar	%	3.60%		4.70%		6.10%		8.00%	
	- Non Solar	%	5.40%		6.80%		8.00%		9.00%	
3	RPO Obligation	MUs	237.95		314.33		400.77		503.17	
	- Solar	MUs	95.18		128.46		173.78		236.78	
	- Non Solar	MUs	142.77		185.86		227.39		266.38	
4	RPO Purchase	MUs								
	- Solar	MUs	0.00		71.61		69.50		100.00	
	- Non Solar	MUs	0.00	237.95	0.00	342.72	0.00	331.28	98.69	304.48

5.3.5 It is submitted that PED will consider opting all the options available to meet the RPO by way of procuring power from renewable sources, tying up with the renewable generators or buying REC.

5.3.6 For the purpose of the business plan, it is considered that for FY 2018-19 and FY 2019-20 the petitioner will fulfil the RPO obligation through the purchase of REC certificates. For FY 2020-21 and FY 2021-22, the petitioner has planned to buy physical power of 124.24 MU and 244.91 MU respectively and the remaining from the REC certificates.

5.3.7 Looking at the current market conditions and decreasing trend of RE power, the petitioner has considered the rate of physical solar and wind@ Rs. 3/unit. Further, the floor price of Rs. 1000/unit (plus 12% GST) for both solar and non-solar RECs. i.e.

Rs. 1.12/unit for the Control period.

5.3.8 The RPO compliance cost for the control period is shown below.

Table 20: RPO Compliance Cost

Source	Power Purchase (MUs)				Total Power Purchase Cost - (Rs.Cr)			
	Base Year Projections	Projections			Base Year Projections	Projections		
	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
Solar	-	71.61	69.50	100.00	-	21.48	20.85	30.00
Non-Solar	-			98.69	-	-	-	29.61
RECs	237.95	242.72	331.28	304.48	26.65	27.18	37.10	34.10
	237.95	314.33	400.77	503.17	26.65	48.67	57.95	93.71

5.3.9 The petitioner would like to bring to the notice of the Commission that in respect of the obligation for purchase of solar energy, PED plans to purchase the energy generated from the following solar PV projects envisaged to be setup under various Government/ private/ NGO sectors, to meet its RPO under solar category.

- PED is envisaging upcoming rooftop solar plants of capacity 5 MW, which may provide 8 MUs annually each have been synchronised with the distribution grid in Puducherry.
- Considering the vast potential for setting up of solar PV plants in the UT of Puducherry, PED has planned to set-up its own ground mounted solar PV plants of capacity 25 MW.

5.3.10 PED has not considered the quantum and the cost of purchase of power from these plants as these are still at nascent stage. The purchase of power from these plants will be included in the ARR of the subsequent years, once the plants are commissioned and start supplying power to PED and the same will be adjusted against the proposed REC certificates. .

5.3.11 The Petitioner requests Hon'ble Commission to approve the purchase of RECs and the request as discussed above for the purpose of meeting the RPO requirement for the control period.

The petitioner requests the Hon'ble Commission to approve the total quantum and cost of power purchase for the control period based on merit order principles as summarised below.

Business Plan for the Control Period FY 2019-20 to FY 2021-22

Table 21: Quantum and Cost of Power Purchase for the MYT Control Period

Sr. No.	Source	Capacity (MW)	Firm allocation to Licensee		Avail. / PLF (in %)	Gross Generation (MU)	Aux consumption (%)	Net Generation (MU)	Purchase (MU) Base Year (FY 2018-19)
			%	MW					
1	2	3	4		5	6	7	8	9
A	Central Sector Power Stations								
I	NTPC	5,600.00		175.91	-			-	1,150.03
	KSTPS								
	RSTPS Stage I & II	2,100	3.49	73.33	81%	14,842.08	7%	13,850.63	483.66
	RSTPS Stage -III	500	3.72	18.61	89%	3,878.27	6%	3,655.27	136.01
	Talcher Stage- II	2,000	3.23	64.68	81%	14,156.51	6%	13,342.51	431.50
	Simhadri Stage- II	1,000	1.93	19.29	62%	5,408.77	5%	5,124.81	98.86
II	NLC	3,390.00		176.23		-		-	952.80
	NLC TPS II Stage I	630	12.11	76.31	78%	4,307.53	10%	3,876.78	469.56
	NLC TPS II Stage II	840	3.61	30.30	75%	5,526.45	10%	4,973.81	179.41
	NLC TPS I (Expn)	420	3.94	16.54	67%	2,453.00	9%	2,244.49	88.39
	NLC TPS II (Expn)	500	4.07	20.36	28%	1,224.12	10%	1,101.71	44.85
	NTPL	1,000	3.27	32.72	63%	5,561.46	6%	5,213.87	170.60
						-		-	
III	NPCIL	3,320.00		117.79		-		-	595.67
	MAPS	440	1.91	8.40	71%	2,720.90	10%	2,448.81	46.77
	KAPS Stage I	440	4.66	20.50	85%	3,283.18	10%	2,954.86	137.70
	KAPS Stage II	440	4.20	18.48	86%	3,322.80	10%	2,990.52	125.60
	Kudankulam U1	1,000	3.69	36.90	44%	3,828.12	10%	3,445.31	127.13
	Kudankulam U2	1,000	3.35	33.50	60%	5,256.00	10%	4,730.40	158.47
IV	Others	2,500.00		87.57		-		-	307.08
	TNEB (Karaikal)			-		-		-	150.00
	Vallur Thermal Project	1,500	2.02	30.33	63%	8,325.50	7%	7,768.53	157.08
	New NLC TS-I	1,000		57.24	50%	4,380.00	10%	3,942.00	0.00

Business Plan for the Control Period FY 2019-20 to FY 2021-22

Sr. No.	Source	Capacity	Firm allocation to		Avail. /	Gross	Aux	Net	Purchase
V	Renewable Sources								
	Solar								
	Non-Solar								
	RECs								
B	Within State Generations								216.37
I	PPCL	32.50	100	33	80%	227.76	5%	216.37	216.37
									-
C	OTHER CHARGES								-
	<i>PGCIL Transmission Charges, Wheeling & Other Charges</i>								-
	<i>POSOCO</i>								-
	<i>PCKL</i>								
D	<i>UI</i>								
	<i>Sale of Surplus power open access</i>								(54.02)
E	Total	14,842.50	-	589.98	-			-	3,167.93

Business Plan for the Control Period FY 2019-20 to FY 2021-22

Table 22: Quantum and Cost of Power Purchase for the MYT Control Period

Sr. No	Source	Power Purchase (MUs)				Power Purchase Cost - Variable Cost (VC) (Rs.Cr)				Power Purchase Cost - Fixed Cost Cost (FC) (Rs.Cr)				Total Power Purchase Cost - (Rs.Cr)			
		Base Year Project ions	Projections			Base Year Projecti ons	Projections			Base Year Projecti ons	Projections			Base Year Projecti ons	Projections		
		2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
A	Central Sector Power Stations																
I	NTPC	1,150.03	1,150.03	1,150.03	1,150.03	247.38	257.28	267.56	278.26	95.49	99.32	103.28	107.42	342.87	356.58	370.84	385.68
	RSTPS Stage I & II	483.66	483.66	483.66	483.66	116.08	120.72	125.55	130.57	37.14	38.63	40.17	41.78	153.22	159.35	165.72	172.35
	RSTPS Stage -III	136.01	136.01	136.01	136.01	31.89	33.17	34.49	35.87	10.14	10.55	10.97	11.41	42.03	43.71	45.46	47.28
	Talcher Stage-II	431.50	431.50	431.50	431.50	70.66	73.49	76.43	79.48	31.63	32.90	34.21	35.58	102.29	106.38	110.64	115.06
	Simhadri Stage-II	98.86	98.86	98.86	98.86	28.75	29.90	31.09	32.34	16.58	17.24	17.93	18.65	45.33	47.14	49.02	50.99
		-												-			
II	NLC	952.80	952.80	952.80	952.80	282.16	293.45	305.18	317.39	87.57	91.07	94.72	98.50	369.73	384.52	399.90	415.89
	NLC TPS II Stage I	469.56	469.56	469.56	469.56	141.25	146.90	152.77	158.88	33.79	35.14	36.55	38.01	175.04	182.04	189.32	196.89
	NLC TPS II Stage II	179.41	179.41	179.41	179.41	53.81	55.96	58.20	60.53	13.43	13.97	14.53	15.11	67.24	69.93	72.73	75.63
	NLC TPS I (Expn)	88.39	88.39	88.39	88.39	24.54	25.52	26.54	27.60	10.91	11.35	11.80	12.27	35.45	36.86	38.34	39.87
	NLC TPS II (Expn)	44.85	44.85	44.85	44.85	12.48	12.98	13.50	14.04	4.26	4.43	4.61	4.79	16.74	17.41	18.11	18.83
	NTPL	170.60	170.60	170.60	170.60	50.08	52.09	54.17	56.34	25.18	26.19	27.23	28.32	75.26	78.27	81.41	84.66
		-												-			
III	NPCIL	595.67	595.67	595.67	595.67	189.49	197.07	204.96	213.15					189.49	197.07	204.96	213.15
	MAPS	46.77	46.77	46.77	46.77	9.70	10.08	10.49	10.91					9.70	10.08	10.49	10.91
	KAPS Stage I	137.70	137.70	137.70	137.70	78.56	81.70	84.97	88.37					78.56	81.70	84.97	88.37
	KAPS Stage II	125.60	125.60	125.60	125.60												
	Kudankulam U1	127.13	127.13	127.13	127.13	101.24	105.29	109.50	113.88					101.24	105.29	109.50	113.88
	Kudankulam U2	158.47	158.47	158.47	158.47												

Business Plan for the Control Period FY 2019-20 to FY 2021-22

Sr. No	Source	Power Purchase (MUs)				Power Purchase Cost - Variable Cost (VC) (Rs.Cr)				Power Purchase Cost - Fixed Cost Cost (FC) (Rs.Cr)				Total Power Purchase Cost - (Rs.Cr)			
		Base Year Projections	Projections			Base Year Projections	Projections			Base Year Projections	Projections			Base Year Projections	Projections		
		2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
IV	Others	307.08	269.90	382.72	382.72	132.31	83.30	86.63	90.10	23.16	24.09	25.05	26.05	155.47	146.87	190.66	195.12
	TNEB (Karaikal)	150.00	-	-	-	52.21	-	-	-	-	-	-	-	52.21	-	-	-
	Vallur Thermal Project	157.08	157.08	157.08	157.08	80.10	83.30	86.63	90.10	23.16	24.09	25.05	26.05	103.26	107.39	111.68	116.15
	New NLC TS-I	-	112.82	225.64	225.64									-	39.49	78.97	78.97
V	Renewable Sources	-	71.61	69.50	198.69	-	21.48	20.85	59.61	26.65	27.18	37.10	34.10	26.65	48.67	57.95	93.71
	Solar	-	71.61	69.50	100.00		21.48	20.85	30.00					-	21.48	20.85	30.00
	Non-Solar	-			98.69				29.61					-	-	-	29.61
	RECs	-	-	-	-	-	-	-	-	26.65	27.18	37.10	34.10	26.65	27.18	37.10	34.10
B	Within State Generations	216.37	216.37	216.37	216.37	51.50	53.56	55.71	57.93	35.54	36.96	38.44	39.98	87.04	90.53	94.15	97.91
1	PPCL	216.37	216.37	216.37	216.37	51.50	53.56	55.71	57.93	35.54	36.96	38.44	39.98	87.04	90.53	94.15	97.91
		-												-			
C	OTHER CHARGES	-															
	PGCIL Transmission Charges, Wheeling & Other Charges	-												71.15	73.13	75.62	78.52
	POSO	-												-			
	PCKL	-												-			
D	UI	-												-			
	Sale of Surplus power	(54.02)	-			(16.21)	-			-				(16.21)	-	-	-
	open access	-												-			
		-												-			
E	Total	3,167.9	3,256.38	3,367.09	3,496.28	886.64	906.14	940.89	1,016.45	241.76	251.43	261.49	271.95	1,226.20	1,297.3	1,394.07	1,479.9

Business Plan for the Control Period FY 2019-20 to FY 2021-22

Sr. No	Source	Power Purchase (MUs)				Power Purchase Cost - Variable Cost (VC) (Rs.Cr)				Power Purchase Cost - Fixed Cost Cost (FC) (Rs.Cr)				Total Power Purchase Cost - (Rs.Cr)			
		Base Year Projections	Projections			Base Year Projections	Projections			Base Year Projections	Projections			Base Year Projections	Projections		
		2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22	2018-19	2019-20	2020-21	2021-22
		3													7		9

6. CAPITAL EXPENDITURE

The distribution network of PED is old and it has been continuously upgrading and strengthening its network to cater quality and reliable power services to its increasing consumer base.

The distribution network of PED needs to be developed and strengthened in such a way that demand of such rising consumers can be met. The majority of the capital expenditure during the control period is required to address this demand requirement. This section discusses the scheme wise capital expenditure and funding of the same to be carried out by PED for the MYT control period.

6.1 Details of Capital Expenditure

6.1.1 PED plans to carry out the capital expenditure during the control period for augmentation and expansion of its capacity and to reduce the transmission and distribution loss in the system. The works to be carried out are with an intention to maintain a reliable and efficient system.

6.1.2 The following are the proposed capital expenditure to be carried out in the upcoming years of the control period.

Table23: Proposed Capital Expenditure for Control Period

Sr. No.	Particulars	Capital Expenditure		
		Projections		
		FY 2019-20	FY 2020-21	FY 2021-22
A	Transmission Schemes			
1	Establishment of New Substations	9.85	38.03	23.86
2	Augmentation of System Capacity	11.73	6.86	6.86
3	Renovation and Mordenization Works of Existing Capacity	4.76	14.30	17.53
4	Replacement of Capacitor Banks	4.00		
	Land acquisition			
5	Erection/ establishment/ upgradation of 230kV and 110kV Substations	85.00	69.44	58.42
	Total Transmission	115.34	128.63	106.67
B	Distribution Schemes			
1	R-APDRP Part-A Works			
2	R-APDRP Part-B Works	9.73		
3	System Strenghtning Schemes	5.52	97.47	95.51
4	Normal Development Schemes	15.00	15.00	15.00
5	Rural Electrification (BNP)			
6	100% Metering Programme			
7	Conversion of HT Overhead lines into UG cables			
8	Reliable communication	4.00	1.60	
9	IPDS	10.65		
10	DDUGJY	10.15		
11	PSDF	10.06		
	Total Distribution	65.11	114.07	110.51
C	Generation			
1	Solar Power Generation		42.63	77.71
A+B+C	Total Capitalization	180.45	285.33	294.89

6.1.3 Detailed scheme wise capital expenditure is given inAnnexure 4, Annexure 5 and Annexure 6.

6.1.4 As seen from the table above, majority of capital expenditure is diverted towards establishment of new substations and system strengthening schemes under R-APDRP, IPDS, DDUGJY and PSDF. Also significant amount of capital expenditure is towards renovation and modernization / augmentation of system capacity. The proposed capital expenditure will definitely be helpful to achieve the loss targets set by PED in its distribution loss trajectory and to meet any additional load surging due to increase in demand.

6.2 Brief overview of various schemes planned by PED

6.2.1 *R-APDRP Scheme*

6.2.1.1 The Ministry of Power/Government of India, in its 11th five year plan had launched the Restructured APDRP scheme. The objective of the Restructured APDRP Scheme is to provide quality and reliable power supply to the consumers and to bring down the AT&C losses.

6.2.1.2 Restructured Accelerated Power Development and Reforms Programme (R-APDRP) focuses on:

- Actual demonstrable performance in loss reduction;
- Establishment of reliable and automated systems for sustained collection of accurate base line Data and
- Adoption of information Technology in the areas of Accounting and auditing which will enable objective evaluation of the programme of utility before and after Implementation of the programme.

6.2.1.3 It is a centrally sponsored scheme. Under the programme, the Government of India has sanctioned projects that aim at establishment of reliable and automated systems for sustained collection of accurate base line data and the adoption of information technology in the area of energy accounting. The Power Finance Corporation has been nominated as the nodal agency to make the above program operational.

6.2.1.4 The project is being carried out in two parts where
PART A: will cover preparation of base-line data for the project area covering consumer indexing, GIS mapping, metering of distribution transformers and feeders and automatic data logging for all distribution transformers and feeders. It will also include adoption of IT applications for meter reading, billing and collection, energy accounting and auditing.

PART B: covers renovation, modernisation and strengthening of 11kV Sub Station and distribution systems.

6.2.1.5 Puducherry will be sharing Data Centre and Data Recovery Centre with Tamil Nadu as suggested by PFC and has appointed M/s ITI, Bangalore in consortium with M/s Navayuga Infotech Pvt. Ltd as the IT implementing agency (ITIA).

6.2.1.6 Present Status of the Programme:

- Survey of consumer indexing, Preparation of Design document for installation

of hardware and peripherals, Finalisation of Network Service Provider, Supply of Hardware were completed

- Currently, the scheme is stalled due to litigation between M/s Navayuga, ITIA and TANGEDCO
- The time line for completion of the project has been extended upto 31-12-2018 for R-APDRP (Part-A) and upto March 2019 for R-APDRP (Part-B)

6.2.2 *Loan from JICA Loan*

6.2.2.1 PED is planning on availing loan from Japan International Cooperation Agency (JICA) for upgrading/ carrying out significant improvement in the transmission and distribution network in the UT of Puducherry with a long term goal to meet the growing demand in the years to come and to design a system with lower T&D loss.

6.2.2.2 Snapshot of the proposed JICA loan:

- A cost estimate for executing various transmission and distribution works amounting to Rs. 983.43 Cr.
- The cost of works in the transmission system is estimated at Rs. 377.413 Cr primarily focusing on provision of new substations, augmentation of substations, renovation and modernization of existing substations including new transmission lines, EHV cable system and capacitor banks.
- The works for distribution system strengthening is estimated at Rs. 369.125 Cr covering provision of new HT Feeders, HT and LT cables, high voltage distribution system (HVDS), automatic power factor controller (APFC panels) in distribution transformer's (DT's), new DT's and replacement of aged transformers with energy efficient DT's and AMR/AMI Metering System.
- The works for solar power distribution is estimated at Rs. 236.90 Cr
- The above improvement works are planned for long term and the works are to be planned accordingly.

6.2.2.3 Benefits of the Project:

- T&D loss reduction and thereby ensuring financial viability of operation.
- Meet the load growth due to strengthening of the system.
- Quality and reliable power supply to the consumers at affordable cost.
- Efficient and transparent billing system.
- Better services.
- Procurement of renewable power without significant financial burden

Table 24: Benefits from the scheme

S.No	Name of the Scheme	Estimated Cost of Scheme	Commission Approval if the cost of scheme is more than 10 Crores	Scheme Start date	Duration of the Work	Expected CoD	Benefits expected to incur	Savings in Power Purchase/ reduction in loss (MUs/MW)
1	Transmission improvement works under loan from JICA	254.62 Crs (includes additional 10% esc, 1% interest and 0.5% consultancy costs)	No (as loan yet to be approved by cabinet)		5 yrs		• T&D loss reduction and thereby ensuring financial viability of operation. • Meet the load growth due to strengthening of the system. • Quality and reliable power supply to the consumers at affordable cost. • Efficient and transparent billing system. • Better services.	Loss reduction in FY 2018-19 = 11.8MU; FY 2019-20 = 23.6 MU

6.2.2.4 Present Status of the proposal:

- The CEA accorded the Technical clearance for all three parts of the DPR. Action is being taken to obtain the requisite clearance/ sanction of the Puducherry Government including the Cabinet approval in order to approach JICA, through DEA, GOI, for sanctioning of the loan.
- Implementation period for the proposed schemes under JICA loan is 5 years

6.2.3 Integrated Power Development Scheme

6.2.3.1 The Integrated Power Development Scheme is one of the flagship schemes of Ministry of Power to ensure 24x7 power for all. The scheme was launched by GoI with the following objective:

- Strengthening of sub-transmission and distribution network in urban areas.
- Metering of DTRs/ feeders/consumers in urban areas and provisioning of solar panels.
- IT enablement of distribution sector and strengthening of distribution network as per CCEA approval dated 21.06.2013.
- Completion of on-going works of R-APDRP.

6.2.3.2 A brief overview of the scheme:

- The scheme is to be executed within a period of 24 months from date of LoA by utility.
- A grant of 60% (maximum of 75% on achievement of milestone) can be availed from GoI.

- Power Finance Corporation (PFC) has been appointed as the nodal agency for the scheme.

6.2.3.3 In line with the guidelines for the scheme, a detailed project report (DPR) has been prepared for Rs. 22.05 Crs and submitted to the nodal agency, PFC.

6.2.3.4 Benefits of the Scheme:

- Reduction in AT&C losses.
- Line loss reduction.
- Ensuring better accounting
- Better voltage profile
- Decrease in DT failure.
- Curbing the theft/ pilferage and unaccounted usage.

6.2.3.5 In line with the guidelines for the scheme, a Detailed Project Report (DPR) has been prepared for Rs. 22.05 Crs and submitted to the nodal agency, PFC.

6.2.3.6 Present status of IPDS:

- The administrative approval of Government of Puducherry has been obtained based on the approval accorded by Ministry of Power
- Tenders have been floated for various works under this scheme and entire works are proposed to be completed in the year FY 2019-20.

6.2.4 Deendayal Upadhyaya Gram Jyoti

6.2.4.1 The Government of India has launched the programme Deena Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) with aim of strengthening of Sub-transmission & Distribution network & Metering in rural areas

6.2.4.2 Brief overview of the project:

- Project to be implemented in UT of Puducherry with a total proposed project cost of Rs.20.15 Crs
- Out of the total project cost, 75% of the project cost will be received as grant from the Govt. of India and the balance 25% amount will be availed as loan from REC
- Under this scheme, various distribution transformers and associated spur lines, LT overhead lines and 22 kV and 11 kV feeders are proposed for system strengthening

6.2.4.3 Present status of the project:

- The administrative approval of Government of Puducherry has been obtained based on the approval accorded by Ministry of Power
- Tenders have been floated for various works under this scheme and entire works are proposed to be completed in the year FY 2019-20.

6.2.5 Power system Development Fund

6.2.5.1 Renovation and Modernisation of indoor and outdoor equipment in Villianur and Bahour 230/110KV Auto Sub Stations at an estimated cost of Rs. 10.56 Crores is being executed under Power System Development Fund of Government of India. Out of sanctioned project cost, Rs.9.50 Crores is grant from Gol and balance amount will be met from the Puducherry State Plan Funds

6.2.5.2 Present Status of the project:

- The Battery Bank in the sub-station have been installed during 2017-18.
- Tenders for erection of indoor equipment for an amount of Rs.4.474 Crores had been finalized and approval of the Government of Puducherry to be accorded in July 2018. Work to be completed during 2018-19.
- Tenders for erection of outdoor equipment for an estimated cost of Rs.5.83 Crores have been floated. Work to be completed during 2019.

6.2.6 Smart Grid Project

6.2.6.1 The details of the smart grid initiative to install smart meters on pilot basis in Puducherry Town area has been discussed in Chapter 2 under *“Initiatives to improve the System”*.

6.2.6.2 Brief overview of the project:

- Project to be implemented in Town I area of Puducherry region.
- 34000 consumers (domestic/ commercial) and 1400 LT CT operated services in all four regions of Puducherry to be covered.
- 50% of the project limited to 25 Crs to be funded from Gol grant.
- Remaining 50% to be borne by the utility/ PED.

6.2.6.3 Benefits of the Project:

- Complete elimination of all billing errors and manual meter reading, thereby the department staff can be effectively utilised for other works.
- Increased accuracy in billing, theft detection, targeting energy efficiency/ demand response programme.

- Improved customer services such as billing accuracy and early detection of meter failures, thereby, reducing the revenue loss to the department.
- Disconnection and reconnection of service connection, and load management is possible from the control centre.
- Financial benefit to the department by way of reduction in distribution losses thereby increase in revenue generation.

6.2.6.4 Present Status of the project:

- Works regarding replacement of smart meters are in progress and the program is expected to be completed in FY 2018-19.

6.3 Funding of Capital Expenditure

6.3.1 PED plans on funding majority of its capital expenditure through a mix of budgetary allocation and loan from Japan International Co-Operation Agency (JICA). The works carried out under R-APDRP (Part A&B) is funded by Power Finance Corporation.

6.3.2 The funding pattern of PED for its proposed capital expenditure plan is submitted as follows.

Table 25: Funding for Proposed Capital Expenditure for Control Period(Rs. Crs)

Sr. No.	Sources of Funds	FY 2019-20	FY 2020-21	FY 2021-22
1	Japan International Co-Operation Agency (JICA)	116.15	254.45	262.36
2	Power Finance Corporation (PFC)	18.45		
A	Total Debt (1+2)	134.6	254.45	262.36
3	EDP Funding from Budgetary Allocation	22.07	22.95	23.77
B	Total Equity (3)	22.07	22.95	23.77
C	Grant from Central Govt Schemes	23.83	7.95	8.77
D	Consumer Contributions			
E	Total Capital Expenditure (A+B+C+D)	180.50	285.35	294.90
F	Debt	86%	92%	92%
G	Equity	14%	8%	8%

6.3.3 With respect to JICA loan, the process of availing the loan is still at a nascent stage and therefore the loan profile at present cannot be determined. However, it is expected that the servicing of the JICA loan including the hedging and interest cost will be ~6%. Therefore, PED submits that the details about the JICA loan and the servicing of the same will be submitted to the Hon'ble Commission once the details are finalized.

6.3.4 The disbursement from PFC has been availed against the scheme under R-APDRP Part A and B. As per the Central Government scheme the same may be converted into grant if the operational targets are achieved. In case of non-achievement of those operational targets the same disbursements will be considered as loan which may have an interest rate of 12% - 13%. Therefore this is an early stage at present to consider the PFC disbursement as loan or grant.

6.3.5 Apart from the above loan there is an additional loan from REC availed in the previous financial year which will be serviced during the control period. The details of the loan are as follows.

- Loan drawn from REC: Rs. 35.74 Crs
- Moratorium period for loan repayment period is 3 years which ends on 31.03.2016.
- Repayment period: 13 years from the date of disbursement of first loan.
- Accordingly loan repayment starts from 30.03.2013 with Rs 3.57 Crs every year for the next 10 years.
- Interest rate of ~12% - 13%.

6.4 Gross Fixed Assets

6.4.1 The capitalization plan for transmission projects is projected based on completed schedule of the project. In respect of system improvement and normal development works, 2/3rd of the investment proposed in the financial year is proposed to be capitalized in the same year and the balance 1/3rd is carried forward to next financial year.

6.4.2 With respect to central funding schemes, the capitalization is proposed based on schedule of completion of works.

6.4.3 Based on above proposed capitalisation, the proposed GFA for the control period is as follows.

Table 26: Proposed GFA during the Control Period

(Rs. Cr)

Particulars*	Projections		
	FY 2019-20	FY 2020-21	FY 2021-22
GFA at the beginning of the year	794.97	881.34	1001.95
Add: Additions during the year	86.37	120.61	315.66
Closing GFA	881.34	1001.95	1317.61

- 6.4.4 The petitioner requests the Hon'ble Commission to approve the capital expenditure, source-wise funding and capitalization for the control period.

7. NO. OF EMPLOYEES

As per Regulation 8 of the new MYT Regulations 2018 for the Control Period FY 2019-20 to FY 2021-22, the Business Plan shall cover as under:

Quote

"8.4 The Business Plan filed by Distribution Licensee shall inter-alia contain;

a) Capital Investment Plan for each Year of the Control Period commensurate with load growth, distribution loss reduction trajectory and quality improvement measures proposed in the Business Plan in accordance with Regulation 8.5;

b) Capital Structure of each scheme proposed and cost of financing (interest on debt and return on equity), terms of the existing loan agreements, etc;

c) Sales Forecast for each customer category and sub-categories for each Year of the Control Period in accordance with Regulation 8.6;

d) Power Procurement Plan based on the Sales Forecast and distribution loss trajectory for each Year of the Control Period in accordance the Regulation 8.7;

e) Targets for distribution loss for each Year of the Control Period consistent with the Capital Investment Plan proposed by the Licensee;

f) Projections for number of employees during each Year of the Control Period based on proposed recruitments and retirement;

g) Proposals in respect of income from Other Business for each Year of the Control Period.

Unquote

7.1 No. of Employees

7.1.1 PED has forecasted the no. of employees on the basis of the retirements and recruitments in the control period.

Table 27: Proposed No. of Employees during the Control Period

Sr.No	Particulars	Actuals			Projections		
		FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
1	Number of employees as on 1st April	2179	2265	2233	2203	237	2242
2	Employees on deputation/ foreign service as on 1st April						
3	Total number of employees (1+2)	2179	2265	2233	2203	237	2242
4	Number of employees retired/ retiring during the year	53	62	110	106	95	93
5	Net transfers [In / (Out)]						
6	Recruitment	139	30	80	40	200	150
7	Number of employees at the end of the year (3-4+5+6)	2265	2233	2203	2137	2242	2299

7.1.2 The employee expenses shall be covered in the MYT petition in terms of the MYT Regulations 2018.

8. DISTRIBUTION WIRE BUSINESS & RETAIL SUPPLY BUSINESS

The Commission has come with the new MYT Regulations 2018 and as per Regulation 8 of the new MYT Regulations 2018 for the Control Period FY 2019-20 to FY 2021-22, the Business Plan shall cover as under:

Quote

"8 Business Plan

8.1 The Transmission Licensee and Distribution Licensee shall file for the Commission's approval a Business Plan for the entire Control Period, approved by its authorized signatory by August 31, 2018:

Provided that the Generation Company shall not be required to file a Business Plan for the Control Period.

8.2 The Business Plan filed by the Distribution Licensee shall contain separate sections on Distribution Wires Business and Retail Supply Business.

Further, Regulation 48 of the MYT Regulations 2018 for the Control Period FY 2019-20 to FY 2021-22, provides for the allocation statement for segregation between the for Distribution Wires Business and Retail Supply Business as under:

"48 Separation of Accounts of Distribution Licensee

48.1 Every Distribution Licensee shall segregate accounts for Distribution Wires Business and Retail Supply Business and shall prepare an Allocation Statement. The wheeling charges pertaining to Distribution Wires Business of the Distribution Licensee shall be determined by the Commission on the basis of these segregated accounts:

Provided that in case complete accounting segregation has not been done, the following Allocation Statement shall be applicable:

Table 28 : Wire and Supply business allocation

Particulars	Wires business	Supply business
Power purchase expenses	0%	100%
Inter-state transmission charges	0%	100%
Intra-state transmission charges	0%	100%
Employee expenses	40%	60%
A&G expenses	50%	50%
R&M expenses	90%	10%
Capital cost	90%	10%
Depreciation	90%	10%
Interest on long-term loan	90%	10%
Interest on working capital and consumer deposit	10%	90%
Bad debts written off	0%	100%
Income tax	90%	10%
Non-tariff income	10%	90%
Income from other business	50%	50%

Accordingly, PED has prepared the Business plan for Distribution Wires Business and Retail Supply Business separately using the allocation statement provided by the Commission. Since the Business Plan only covers a few elements of the ARR, here only Power Purchase Expenses and Capital Investment Plan forecasted for the Control period can be segregated and covered, all other components shall be discussed in detail in the MYT Petition.

8.1 Business Plan for Distribution Wire Business

8.1.1 Power Purchase Expenses:

No power purchase expenses shall be incurred for the Wire Business.

8.1.2 Capital Expenditure, Capital Cost:

90% of the Capital cost, depreciation shall be for the Distribution Wire Business. Accordingly, the following table shows the project Capital Expenditure and Capitalization during the Control Period

Table 29: Proposed Capital Expenditure for the Distribution Wire Business during the Control Period (Rs. Cr)

Projections		
FY 2019-20	FY 2020-21	FY 2021-22
162.41	256.80	265.40

Table 30: Proposed GFA for the Distribution Wire Business during the Control Period (Rs. Cr)

Particulars*	Projections		
	FY 2019-20	FY 2020-21	FY 2021-22
GFA at the beginning of the year	715.47	787.02	895.57
Add: Additions during the year/Capitalization	71.55	108.549	284.094
Closing GFA	787.02	895.57	1179.66

8.2 Business Plan for Retail Supply Business

8.2.1 Power Purchase Expenses:

All the power purchase expenses (100%) shall be incurred for the Distribution Supply Business. The power Purchase expenses for the control period are as under:

Table 31: Power Purchase Expenses for the Distribution Supply Business during the Control Period (Rs. Cr)

Projections		
2019-20	2020-21	2021-22
1,297.37	1,394.07	1,479.99

8.2.2 Capital Expenditure, Capital Cost:

10% of the Capital cost, depreciation shall be for the Distribution Wire Business. Accordingly, the following table shows the project Capital Expenditure and Capitalization during the Control Period

Table 32: Proposed Capital Expenditure for the Distribution Supply Business during the Control Period (Rs. Cr)

Projections		
FY 2019-20	FY 2020-21	FY 2021-22
18.05	28.53	29.49

Table 33: Proposed GFA for the Distribution Supply Business during the Control Period (Rs. Cr)

Particulars*	Projections		
	FY 2019-20	FY 2020-21	FY 2021-22
GFA at the beginning of the year	79.50	87.45	99.51
Add: Additions during the year/Capitalization	7.95	12.061	31.566
Closing GFA	87.45	99.51	131.07

8.2.3 Based on the above projections the petitioner requests the Hon'ble Commission to approve the Business Plan filed for Distribution Wires Business and Retail Supply Business for the control period.

9. PRAYERS TO COMMISSION

The Electricity Department, Government of Puducherry (PED) respectfully prays to the Hon'ble Commission to:

- 9.1.1 Admit the Business plan of PED for the Control Period FY 2019-20 to FY 2021-22 in accordance with Regulation 8 and Regulation 16 of JERC (GENERATION, TRANSMISSION AND DISTRIBUTION MULTI YEAR TARIFF) Regulations, 2018.
- 9.1.2 Approve the Business plan of PED for the Control Period FY 2019-20 to FY 2021-22 in accordance with Regulation 8 and Regulation 16 of JERC (GENERATION, TRANSMISSION AND DISTRIBUTION MULTI YEAR TARIFF) Regulations, 2018.
- 9.1.3 Approve the principles and methodology proposed by PED in the Business Plan.
- 9.1.4 Approve the capital expenditure and source of funding as proposed by PED in the Business Plan.
- 9.1.5 Pass any other Order as the Hon'ble Commission may deem fit and appropriate under the circumstances of the case and in the interest of justice.
- 9.1.6 Grant any other relief as the Hon'ble Commission may consider appropriate.
- 9.1.7 Condone any error/omission and to give opportunity to rectify the same.
- 9.1.8 Permit PED to make further submissions, addition and alteration to this Business Plan as may be necessary from time to time.

Annexures

Annexure 1: AUDITED ANNUAL ACCOUNTS OF PED FOR FY 2014-15

Annexure 2: AUDITED ANNUAL ACCOUNTS OF PED FOR FY 2015-16

Annexure 3: AUDITED ANNUAL ACCOUNTS OF PED FOR FY 2016-17

Annexure4: SRPC Regional Energy Account for the month of July,2018