

Punjab State Power Corporation Limited

Aggregate Revenue Requirement & Tariff Petition

**Up-to FY 2016-17 & MYT Petition for the Control Period from
FY 2017-18 to FY 2019-20**

Volume –II

Two Part Tariff Proposal

Submitted to

**Hon'ble Punjab State Electricity Regulatory Commission
Chandigarh**

Submitted by :

PUNJAB STATE POWER CORPORATION LIMITED

The Mall, Patiala – 147001

November 2016

PUNJAB STATE POWER CORPORATION LIMITED

***REPORT ON OUTCOME OF THE DETAILED
ANALYSIS FOR DESIGN OF TWO PART
TARIFF***

NOVEMBER, 2016

9

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1 BACKGROUND AND CONTEXT

In the Tariff Order for FY 2009-10, the Hon'ble Commission had issued a specific directive to the erstwhile PSEB for adoption of two-part tariff in the State of Punjab. In order to ensure compliance with the said directive, the Hon'ble Commission had directed the PSEB to submit a comprehensive proposal for implementation of two-part tariff in the State of Punjab.

The PSPCL had submitted a Proposal for implementation of Two Part Tariffs as part of the ARR filing for FY 2012-13. However, during the public hearing initiated by the Hon'ble Commission, the consumers of PSPCL expressed a number of Objections on the approach and methodology proposed by PSPCL.

Owing to the above objections and also to the difficulty in implementation of the proposal, PSPCL was forced to withdraw the same. Further, in view of the above opposition from the consumers, the Hon'ble Commission had stated in its Tariff Order for FY 2012-13 as under:

"The Commission while mindful of National Tariff Policy enjoining early introduction of Two Part Tariff is nevertheless of the considered view that Two Part Tariff should be introduced only after building a consensus amongst various stakeholders of the utility through public hearings and by critically analyzing the actual billing data to determine the impact on consumers as well as revenue of utility. PSPCL is, therefore, directed to examine the issues raised by the consumers / consumer organizations and submit detailed revised proposal within 3 months of this Order for introduction of Two Part Tariff addressing the concerns of the consumers/consumer organisations."

Subsequently, the PSPCL submitted a simplified proposal for Two Part Tariff for implementation from FY 2013-14. In the public hearing initiated by Hon'ble Commission, a number of divergent views were expressed by various stakeholders. The Hon'ble Commission in the Tariff Order for FY 2013-14 stated as under:

"The Commission, while mindful of Tariff Policy enjoining early introduction of Two Part Tariff, is nevertheless, of the considered view that Two Part Tariff should be introduced only after attending concerns of various stakeholders of the utility through public hearings and by critically analyzing the actual billing data, to determine the impact on consumers as well as revenue of utility. PSPCL is, therefore, directed to examine the issues raised by the consumers / consumer organizations, and conduct mock trial/ parallel run of the proposed Two Part Tariff system, at least in five selected Divisions of PSPCL for 6 months, and submit a detailed report along with a more refined proposal for introduction of Two Part Tariff, addressing the concerns of the consumers/ consumer organizations expressed during the processing of ARR for FY 2013-14 and also the observations made by PSPCL during the mock trial/ parallel run.."

In compliance with the aforesaid Directive and as per the performas received from the Hon'ble Commission vide *Letter No PSERC/Tariff/T/36/6156* dated 3rd October 2013, the PSPCL has conducted the mock trials of the proposed two part tariffs and submitted the Report to the Hon'ble Commission which included the approach followed for implementation of Two Part Tariffs, Tariffs used in the mock trials and the outcome of the mock trials.

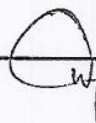
Hon'ble Commission in Tariff Order for FY 2014-15 stated as under:

"7.2.3

The Commission notes that there is considerable opposition from various categories of consumers for introduction of Two Part Tariff in the State. The various objectors have submitted their apprehensions and there is general fear in the minds of consumers that their bill amount will increase if the Two Part Tariff proposal submitted by PSPCL is introduced in the present form. PSPCL has tried to allay the apprehensions of the objectors in its reply to the objections raised by the various objectors. During the public hearing also, there was considerable opposition from the various categories of consumers. On examination of the proposal submitted by PSPCL, the Commission has also observed that the proposal will affect the majority of the consumers adversely, particularly the consumers having low consumption. There is a need for consensus building amongst various stakeholders before introduction of Two Part Tariff in the State. The Commission, therefore, directs PSPCL to re-examine the issues/objections raised by the consumers/consumer associations and even should discuss with the various categories of consumers/consumer associations, the issues raised by them, and thereafter resubmit the Two Part Tariff proposal, after addressing the concerns of the majority of the consumers/consumer associations."

Hon'ble Commission in Tariff Order for FY 2015-16 has directed PSPCL to discuss with the various categories of consumers/consumer associations the issues/objections raised by them (as brought out in the Tariff Order for FY 2014-15) and resubmit the Two Part Tariff proposal along with the ARR for FY 2016-17, after building consensus amongst various stakeholders. In compliance to the Hon'ble PSERC's directions in various tariff Orders, PSPCL had organised a meeting with various consumers/consumers associations at PSPCL, Patiala to discuss their objections/suggestions on the Two Part Tariff proposal. Further, PSPCL in its ARR Petition for FY 2016-17 submitted that the Public comments on the proposal will be submitted to Hon'ble Commission separately. Subsequently, PSPCL has submitted the Two Part Tariff proposal to the Hon'ble Commission vide letter no. 4811 dated 6 July, 2016 and revised proposal vide letter no. 4827 dated 13 July, 2016.

As regards the Two Part Tariff Proposal, Hon'ble Commission in Tariff Order for FY 2016-17 held as under:



"7.1.5 The Commission observes that instead of framing the proposal after building consensus among various stake-holders after discussing with the various categories of consumers/consumer organizations the issues/objections raised by them, as brought out in the Tariff Order for FY 2014-15 and then submitting the Two Part Tariff proposal, PSPCL invited the comments of Public/Stake-holders on its own proposal, which has further complicated the issue of introduction of Two Part Tariff instead of solving the same. However, since PSPCL has already invited comments from Public/Stake-holders on its own proposal and has submitted to the Commission Two Part Tariff proposal vide letter no. 4811 dated 06.07.2016 & revised Two Part Tariff proposal vide letter no. 4827 dated 13.07.2016, the Commission will examine the proposal submitted by PSPCL and take appropriate action before finalization of the same. "

Further, Hon'ble Commission vide letter No. 4646 dated August 19, 2016 had directed PSPCL to submit the comprehensive Two Part Tariff proposal after carrying out detailed analysis along with the supporting data and results obtained of the analysis.

In view of the above, PSPCL hereby submits the Report to the Hon'ble Commission which included the approach followed for implementation of Two Part Tariff and the same Tariffs is used in the analysis and the outcome of the detailed analysis.



2 APPROACH AND METHODOLOGY

In the erstwhile PSEB, now PSPCL, for all consumer categories, Single Part Tariff has been continuing since 1994. Keeping in view directives of Hon'ble Commission & provisions of Electricity Act 2003, PSPCL has designed Two Part Tariff by splitting existing Single Part tariff of various categories of consumers on the basis of Utilization Factor (U.F.) of these categories. The PSPCL bears fixed charges for generation of electricity & its distribution like Interest Charges, Depreciation, Operation and Maintenance expenses, Establishment expenses, and equity which is above approx. Rs. 11, 000 Crore per annum.

In order to split the Single Part Tariff into Two Part Tariff, the important parameter which needs to be decided is the Utilisation Factor of particular category. While studying the proposal for Two Part Tariff, the category of consumers has been kept same as that of Tariff Order as approved by Hon'ble Commission and Single Part Tariff of FY 2016-17 has been considered. The Utilisation Factor has been worked out based on the category wise energy consumption of total consumers of PSPCL for FY 2015-16 (being the recent for which full yearly data available and also as per the directives of the Hon'ble Commission).

Table 1 Actual Utilisation Factor for FY 2015-16

Category		Sanctioned Load (kW)	Contract demand (kVA)	Consumption (MU)	UF (%)	MMC recovered from Tariff (Rs. Crore)
Domestic Supply	0-2 Kw	38,92,554	-	5,904	17.31%	75.39
	2-10 kW	56,91,233	-	4,813	9.65%	
	10-50 kW	14,21,521	1,91,788	1,224	9.83%	
	50-100 kW	47,748	36,628	40	12.36%	
	>100 kW	1,53,361	1,57,446	128	9.25%	
	Total	1,12,06,418	-	12,108	12.33%	
Non-Residential Supply	0-10 kW	14,06,153	4,141	1,280	10.39%	176.39
	10-50 kW	10,18,644	79,923	1,244	13.94%	
	50-100 kW	3,06,120	2,40,728	282	13.36%	
	>100 kW	8,59,163	8,64,200	713	9.42%	
	Total	35,90,081	-	3,518	11.19%	
Small Power	0-20 kW	10,24,122	4,187	952	10.61%	40.24

Category		Sanctioned Load (kW)	Contract demand (kVA)	Consumption (MU)	UF (%)	MMC recovered from Tariff (Rs. Crore)
Medium Supply Industrial	20-100 kW	17,50,531	14,01,680	2,111	17.20%	58.35
LS General	100-500 kVA	16,54,049	15,87,393	2,072	14.90%	30.74
	500-1000 kVA	6,41,519	5,92,878	829	15.96%	
	1000-2500 kVA	10,44,175	9,25,497	1,795	22.14%	
	> 2500 kVA	13,35,883	10,02,870	2,348	26.72%	
	Total (a)	46,75,627	41,08,638	7,044	19.57%	
LS Power Intensive	100-500 KVA	1,40,461	1,41,723	158	12.70%	
	500-1000 KVA	91,270	88,577	138	17.77%	
	1000-2500 KVA	4,06,517	3,87,438	1,234	36.36%	
	> 2500 KVA	5,56,012	4,81,180	1,513	35.91%	
	Total (b)	11,94,260	10,98,917	3,043	31.61%	
	Grand Total (a+b)	58,69,887	52,07,555	10,087	22.11%	
Bulk Supply	LT	12,754	13,376	41	34.95%	3.17
	HT	3,22,792	3,56,562	620	19.86%	
	Total	3,35,546		661	22.49%	
Railway Traction		79,908	88,517	165	21.32%	13.36
Public Lighting		53,106	-	203	43.60%	0.45

2.1 Fixed Charges Payable by PSPCL

The estimated Fixed Charges in the Aggregate Revenue Requirement (ARR) in FY 2016-17 as approved by the Hon'ble Commission works out as under:

Table 2 Fixed Charges Payable by PSPCL for FY 2016-17 (Rs. Crore)

Sr. No.	Particulars	ARR	Apportion of ARR	
		Approved for FY 2016-17	Variable Cost	Fixed Cost
1	Cost of fuel	2397.56	2,397.56	-
2	Cost of power purchase	14697.41	8,179.60	6,517.81
3	Employee cost	4835.58	0.00	4835.58
4	R&M expenses	418.3	250.98	167.32
5	A&G expenses	138	82.8	55.2
6	Depreciation	1063.59	-	1,063.59
7	Interest charges	1503.74	0	1503.74
8	Return on Equity	942.62	-	942.62

Sr. No.	Particulars	ARR Approved for FY 2016-17	Apportionment of ARR Variable Cost	Fixed Cost
9	Transmission charges Payable to PSTCL	1151.01	0	1151.01
10	Charges payable to GoP on power from RSD	8.26	-	8.26
11	Provision for DSM fund	10	6	4
12	Recoverable O&M expenses on account of BBMB as per CERC Order	(191.09)	(133.76)	(57.33)
13	Aggregate Revenue Requirement	26975	10,783.18	16,191.80
14	Sales (MU)	44724.1	44724.07	44724.07
15	Per unit Cost (Rs. /unit)	6.03	2.41	3.62

As per above Table, the Fixed Charges per unit of energy sold works out to be Rs. 3.62/per unit of energy sold.

It may be observed that, at present, total MMC recovered from Tariff is amounting to Rs. 398.09 Crore (for FY 2015-16) which is 2.50% (approx.) of the fixed charges payable by PSPCL, which is very low.

Now, strictly going by the principle that the Fixed Charges should be fully recovered from Fixed Component of Retail tariff and variable charges to be recovered from variable component of Tariff, the payable Fixed Charges based on the Utilisation Factor of the specific category shall worked out to be as under:

Table 3 Fixed Charges for full recovery of Fixed Charges payable by PSPCL for FY 2016-17

Category		Utilisation Factor (%)	Fixed Charges per kW/kVA per month
Domestic Supply	0-2 kW	17.31%	458
	2-10 kW	9.65%	256
	10-50 kW	9.83%	260
	50-100 kW	12.36%	327
	>100 kW	9.25%	245
	Total	12.33%	326
Non-Residential Supply	0-10 kW	10.39%	275
	10-50 kW	13.94%	369
	50-100 kW	13.36%	354
	>100 kW	9.42%	249
	Total	11.19%	296

Category		Utilisation Factor (%)	Fixed Charges per kW/kVA per month
Small Power	0-20 kW	10.61%	281
Medium Supply Industrial	20-100 kW	17.20%	455
LS General	100-500 kVA	14.90%	394
	500-1000 kVA	15.96%	422
	1000-2500 kVA	22.14%	586
	> 2500 kVA	26.72%	707
	Total (a)	19.57%	518
LS Power Intensive	100-500 KVA	12.70%	336
	500-1000 KVA	17.77%	470
	1000-2500 KVA	36.36%	961
	> 2500 KVA	35.91%	949
	Total	31.61%	836
Bulk Supply	LT	34.95%	924
	HT	19.86%	525
	Total	22.49%	595
Railway Traction		21.32%	564
Public Lighting		43.60%	1153

For recovering these fixed charges from various categories of consumers the fixed charges recoverable per month comes as shown in the above Table. These Fixed Charges are much higher than the present Minimum Monthly Charges applicable for the respective category. The recovery of these Fixed Charges has not been proposed keeping in view paying capacity of various categories of consumers and this very principle has been followed in other States as well.

With the levy of these proposed fixed charges only a small percentage of total amount of fix charges shall be recovered & the balance automatically gets reflected in the rate of energy charges while designing Two Part Tariff or various categories of consumers.

For implementation of Two Part Tariff, the Fixed Charges have been proposed to be recovered as per Sanctioned Contract Demand in kVA for categories having Sanctioned Load above 50 kW for DS/NRS consumers and above 20 kW for Industrial Consumers and on the basis of Sanctioned Load in kW for consumers with sanctioned load less than 50 kW for DS/NRS consumers and less than 20 kW for Industrial Consumers (without rounding off). The billing shall continue on monthly

basis for all categories of consumer except for DS & NRS consumers having sanctioned load >10 KW.

Impact on Revenue: While designing Two Part Tariff, the revenue as available from various consumer categories under Single Part Tariff has been taken as the base & overall revenue neutrality of PSPCL has also been kept in view. Revenue from energy charges & MMC has been considered for revenue neutrality of PSPCL while designing Two Part Tariff.

Impact on Electricity Duty: In Two Part Tariff, both Fixed & Energy Charges shall comprise SOP & since ED is to be charged on SOP, the ED to be collected would be almost same as in Single Part Tariff.

Further regulations for implementation of Two Part Tariff have been proposed as under:-

In Two Part Tariff structure, the monthly billing shall comprise fixed charges plus energy charges for energy consumed during the month

Demand Surcharge: Demand surcharge for exceeding the sanctioned contract demand shall be charged @Rs.750/kVA as currently applicable.

Cold Stores, Ice Factories and Ice Candies: These consumers shall be billed on rates as applicable to General Industrial categories.

Seasonal Industry consumers: There should be no seasonal category and these shall be considered under General Industrial category.

Temporary supply: Consumers availing temporary supply shall be continued to be billed on currently applicable tariff.

Surcharge on Continuous Process industry: Continuous Process industry will be charged 10 paise/unit on pro-rata basis as here-to-fore.

Applicability of surcharges: Surcharges and rebates currently being levied/given and other terms & conditions given as per schedule of tariff & General conditions of tariff shall continue to be applicable

Discontinuation of MMC: Monthly Minimum Charges (MMC) being levied currently shall be discontinued.

Golden Temple Amritsar & Durgiana Temple Amritsar: The tariff currently applicable to these consumers is proposed to be continued.

Agriculture consumers and AP High Tech consumers: Agriculture pump set consumers and AP High Tech consumers shall be continued to be billed on currently applicable tariff.

2.2 EXAMPLE OF SPLITTING TWO PART TARIFF

2.2.1 Small Power Industrial Category:

Existing Single part tariff

(i) Energy Charges = 547 Paise/Unit

(ii) MMC = 157/kW

1) Sanctioned Load (ending March 2016) = 10,24,122 kW

2) Energy Sales (FY 2015-16) = 951.61 MU

3) Utilization Factor = 10.52%

4) Utilization Factor (For Two Part Tariff) = 12% (keeping in view future growth)

5) Electricity consumption /KW/month with 12% U.F. = 87.6 kWh (1x730x0.12)

6) (i) Fixed charges = Rs. 60/kW/Month

(ii) Reduction of energy charges
due to levy of fixed charges = 68 Paise (60/87.6)

(iii) Energy charges = 479 Paise/Unit (547-68)

7) Two Part Tariff Proposed:

(i) Fixed Charges = Rs.60/kW/Month

(ii) Energy Charges = 479 paise/unit

Note: Same method have been followed in respect of other categories of consumer for working out Two Part Tariff.

2.3 Utilisation Factors Considered for Different Categories

As discussed above, the consideration of Utilisation factor for designing the Two-Part Tariff is essential factor. The PSPCL has considered the Utilisation Factor as detailed above based on the provisional data for FY 2015-16 for PSPCL as a whole. As regards the Utilisation factor for Large Supply Category, PSPCL has considered that, since the Tariff is to be designed for the future years and there is certainly a growth expected in the energy sales for all categories. However, with the change of pattern of Open Access consumption in the State and various incentives to Industrial consumers, 10% increase in Utilisation Factor for LS Industry has been considered and the Utilisation Factors for various categories considered for splitting of Single Part Tariff to Two Part Tariff has been detailed in Table shown below:

Category	Sub-Category	Utilisation Factor (%)
Domestic Supply	0-2 KW	17.31%
	2-10 KW	9.65%
	10-50 KW	9.83%
	50-100 KW	12.36%
	>100 KW	9.25%
	TOTAL	12.33%
Non-residential Supply	0-10KW	10.39%
	10-50 KW	13.94%
	50-100	13.36%
	>100 KW	9.42%
	TOTAL	11.19%
Small Power	0-20 KW	10.61%
Medium Supply Industrial	20-100 KW	17.20%
Large Supply – General	100-500 KVA	16.39%
	500-1000 KVA	17.56%
	1000-2500 KVA	24.35%
	> 2500 KVA	29.40%
		16.39%

Category	Sub-Category	Utilisation Factor (%)
Large Supply – Power Intensive	100-500 KVA	13.97%
	500-1000 KVA	19.55%
	1000-2500 KVA	39.99%
	> 2500 KVA	39.50%
	Total	13.97%
Bulk Supply	LT	34.95%
	HT	19.86%
	TOTAL	22.49%
Railway Traction		21.32%
Public Lighting		43.60%

After considering the Utilisation Factor as given in above Table, PSPCL has computed Two Part Tariff for categories of consumer subsequently in this proposal.

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3 THE PROPOSED TWO PART TARIFF

Based on the analysis of consumer data i.e., Utilisation Factor, the Two Part Tariff for FY 2016-17 has been proposed for various consumer categories after splitting the existing Single Part Tariff as per the methodology prescribed above. Further, keeping in view the MMC being recovered from various categories of consumers, PSPCL has considered that it shall be at loss while recovering a fractional part of fixed charges and it has been assumed fairly that only 50% of MMC shall be covered in the splitted Two Part Tariff at the Utilisation factor and the remaining 50% will have to be recovered by increasing the energy charges to that proportion as given in the Table below.

Sr. No.	Category	Consumption (MU)	MMC (Rs. Crore)	Additional energy Charges (Paise/unit) to cover unrecovered MMC
1	Domestic Supply	12,108	75.39	4.00
2	Non-residential Supply	3,518	176.39	26.00
3	Small Power	952	40.24	22.00
4	Medium Industrial Supply	2,111	58.35	14.00
5	Large Supply	3,043	30.74	6.00
6	Bulk Supply	661	3.17	3.00
7	Railway Traction	165	13.36	41.00
8	Public Lighting	203	0.45	2.00

The proposed Two Part Tariff is submitted as under:

3.1 Domestic Category

3.1.1 Domestic Category consumers with connected load less than 50 kW

Sub-Category	U.F. considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
0-2 kW	17.31%	MMC = Rs. 52/kW	Fixed Charges = Rs. 25/kW	Fixed Charges = Rs. 25/kW
		Energy Charges 0-100 paise/kWh = 452	Energy Charges - 0-100 paise/kWh = 432	Energy Charges - 0-100 paise/kWh = 424
		100-300 paise/kWh = 614	100-300 paise/kWh = 594	100-300 paise/kWh = 586
		Above 300 paise/kWh = 656	Above 300 paise/kWh = 636	Above 300 paise/kWh = 628
2-10 kW	9.65%	MMC = Rs. 52/kW	Fixed Charges = Rs. 30/kW	Fixed Charges = Rs. 30/kW

Sub-Category	U.F. considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
		Energy Charges 0-100 = 452 paise/kWh 100-300 = 614 paise/kWh Above 300 = 656 paise/kWh	Energy Charges 0-100 = 409 paise/kWh 100-300 = 571 paise/kWh Above 300 = 613 paise/kWh	Energy Charges - 0-100 = 424 paise/kWh 100-300 = 586 paise/kWh Above 300 = 628 paise/kWh
10-50 kW	9.83%	MMC = Rs. 52/kW	Fixed Charges = Rs. 35/kW	Fixed Charges = Rs. 35/kW
		Energy Charges 0-100 = 452 paise/kWh 100-300 = 614 paise/kWh Above 300 = 656 paise/kWh	Energy Charges 0-100 = 403 paise/kWh 100-300 = 565 paise/kWh Above 300 = 607 paise/kWh	Energy Charges - 0-100 = 424 paise/kWh 100-300 = 586 paise/kWh Above 300 = 628 paise/kWh

Note: Since, as per Single Part Tariff, the Tariff is similar for all the above three (3) categories, the Proposed Two Part Tariff has been worked out as per weighted average of energy consumption of three sub-categories and adding 4 paise per unit with respect to MMC recovery.

3.1.2 Domestic Category consumers with connected load greater than 50 KW to 100 kW

Sub-Category	U.F. considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
50-100 kW	12.36%	MMC = Rs. 47/kVA	Fixed Charges = Rs. 40/kVA	Fixed Charges = Rs. 40/kVA
		Energy Charges 0-100 = 407 paise/kVAh 100-300 = 553 paise/kVAh Above 300 = 590 paise/kVAh	Energy Charges 0-100 = 363 paise/kVAh 100-300 = 509 paise/kVAh Above 300 = 546 paise/kVAh	Energy Charges 0-100 = 367 paise/kVAh 100-300 = 513 paise/kVAh Above 300 = 550 paise/kVAh

Note: The Proposed Two Part Tariff has been worked out by adding 4 paise per unit with respect to MMC recovery.

3.1.3 Domestic Category consumers with connected load above 100 KW

Sub-Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
Above 100 kW	9.25%	MMC = Rs. 47/kVA	Fixed Charges = Rs. 40/kVA	Fixed Charges = Rs. 40/kVA
		Energy Charges 0-100 = 416 paise/kVAh	Energy Charges (per kVAh) 0-100 = 357 paise/kVAh	Energy Charges 0-100 = 361 paise/kVAh
		100-300 = 565 paise/kVAh	100-300 = 506 paise/kVAh	100-300 = 510 paise/kVAh
		Above 300 = 604 paise/kVAh	Above 300 = 545 paise/kVAh	Above 300 = 549 paise/kVAh

Note: The Proposed Two Part Tariff has been worked out by adding 4 paise per unit with respect to MMC recovery.

3.2 NRS Category

3.2.1 NRS Category consumers with connected load less than 50 KW

Sub-Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
0-10 kW	10.39%	MMC = Rs. 190/kW	Fixed Charges = Rs. 60/kW	Fixed Charges = Rs. 60/kW
		Energy Charges Up to 100 = 653 paise/kWh	Energy Charges Up to 100 = 574 paise/kWh	Energy Charges Up to 100 = 600 paise/kWh
		Above 100 = 675 paise/kWh	Above 100 = 596 paise/kWh	Above 100 = 622 paise/kWh
10-50 KW	13.94%	MMC = Rs. 190/kW	Fixed Charges = Rs. 80/kW	Fixed Charges = Rs. 80/kW
		Energy Charges Up to 100 = 653 paise/kWh	Energy Charges Up to 100 = 574 paise/kWh	Energy Charges Up to 100 = 600 paise/kWh
		Above 100 = 675 paise/kWh	Above 100 = 596 paise/kWh	Above 100 = 622 paise/kWh

Note: The Proposed Two Part Tariff has been worked out by adding 26 paise per unit with respect to MMC recovery.

3.2.2 NRS Category consumers with connected load greater than 50 KW but up to 100 KW

Sub-Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
50 -100 kW	13.36%	MMC = Rs. 171/kVA	Fixed Charges = Rs. 100/kVA of Contract Demand	Fixed Charges = Rs. 100/kVA of Contract Demand
		Energy Charges Up to 100 = 588 paise/kVAh Above 100 = 608 paise/kVAh	Energy Charges Up to 100 = 485 paise/kVAh Above 100 = 505 paise/kVAh	Energy Charges Up to 100 = 511 paise/kVAh Above 100 = 531 paise/kVAh

Note: The Proposed Two Part Tariff has been worked out by adding 26 paise per unit with respect to MMC recovery.

3.2.3 NRS Category consumers with connected load above 100 KW

Sub-Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
Above 100 kW	9.42%	MMC = Rs. 171/kVA	Fixed Charges = Rs. 120/kVA of Contact Demand	Fixed Charges = Rs. 120/kVA of Contact Demand
		Energy Charges 0-100 = 601 paise/kVAh Above 100 = 621 paise/kVAh	Energy Charges 0-100 = 427 paise/kVAh Above 100 = 447 paise/kVAh	Energy Charges Up to 100 = 453 paise/kVAh Above 100 = 573 paise/kVAh

Note: The Proposed Two Part Tariff has been worked out by adding 26 paise per unit with respect to MMC recovery.

3.3 SP (Small Power Industrial) Category

Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
SP (up to 20 kW)	10.61%	MMC = Rs. 157/kW	Fixed Charges = Rs. 80/kW of Sanction Load	Fixed Charges = Rs. 80/kW of Sanction Load
		Energy Charges = 547 Paise/kWh	Energy Charges = 444 Paise/unit	Energy Charges = 466 Paise/unit

Note: The Proposed Two Part Tariff has been worked out by adding 22 paise per unit with respect to MMC recovery.

3.4 MS (Medium Supply Industrial) Category

Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
20-100 kW	17.20%	MMC = Rs. 188/kVA	Fixed Charges = Rs. 100/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 100/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
		Energy Charges = 551 Paise/kVAh	Energy Charges = 487 Paise/kVAh	Energy Charges = 501 Paise/kVAh

Note: The Proposed Two Part Tariff has been worked out by adding 14 paise per unit with respect to MMC recovery.

3.5 LS (Large Supply Industrial) Category General Industry

Category Slab	U.F considered	Single Part Tariff (MMC)	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
100-500 kVA	16.39%	MMC = Rs. 188/kVA	Fixed Charges = Rs. 100/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 100/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
500-1000 kVA	17.56%	MMC = Rs. 188/kVA	Fixed Charges = Rs. 120/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 120/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
1000-2500 kVA	24.35%	MMC = Rs. 188/kVA	Fixed Charges = Rs. 180/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 180/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
Above 2500 kVA	29.40%	MMC = Rs. 188/kVA	Fixed Charges = Rs. 200/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 200/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
Energy Charges		603 paise/kVAh	100-500 kVA- 536 paise/ kVAh 500-1000 kVA- 528 paise/ kVAh 1000-2500 kVA- 522 paise/ kVAh Above 2500 kVA- 528 paise/ kVAh	535 paise/kVAh

Note: Since, as per Single Part Tariff, the Tariff is similar for all the above four (4) categories, the Proposed Two Part Tariff has been worked out as per weighted average of energy consumption of these sub-categories and adding 6 paise per unit with respect to MMC recovery.

3.6 LS (Large Supply Industrial) (Power Intensive) Category General Industry

Category Slab	U.F considered	Single Part Tariff (MMC)	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
100-500 kVA	13.97%	MMC = Rs. 491/kVA	Fixed Charges = Rs. 100/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 100/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
500-1000 kVA	19.55%	MMC = Rs. 491/kVA	Fixed Charges = Rs. 120/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 120/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
1000-2500 kVA	39.99%	MMC = Rs. 491/kVA	Fixed Charges = Rs. 180/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 180/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
Above 2500 kVA	39.50%	MMC = Rs. 491/kVA	Fixed Charges = Rs. 200/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 200/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
Energy Charges		622 paise/kVAh	100-500 kVA- 544 paise/ kVAh 500-1000 kVA- 555 paise/ kVAh 1000-2500 kVA- 573 paise/ kVAh Above 2500 kVA- 567 paise/ kVAh	573 paise/kVAh

Note: Since, as per Single Part Tariff, the Tariff is similar for all the above four (4) categories, the Proposed Two Part Tariff has been worked out as per weighted average of energy consumption of these sub-categories and adding 6 paise per unit with respect to MMC recovery.

3.7 Bulk Supply Category

Sub- Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
LT SUPPLY	34.95%	MMC = Rs. 307/kVA	Fixed Charges = Rs. 125/KVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 125/KVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
		Energy Charges = 635 Paise/kVAh	Energy Charges = 596 Paise/kVAh	Energy Charges = 599 Paise/kVAh

Sub- Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
HT SUPPLY	19.86%	MMC = Rs. 307/kVA	Fixed Charges = Rs. 150/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 150/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
		Energy Charges = 609 Paise/kVAh	Energy Charges = 526 Paise/kVAh	Energy Charges = 529 Paise/kVAh

Note: The Proposed Two Part Tariff has been worked out by adding 3 paise per unit with respect to MMC recovery.

3.7.1 Railway Traction Category

Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
Railway Traction	21.32%	MMC = Rs. 314 /kVA	Fixed Charges = Rs. 200/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)	Fixed Charges = Rs. 200/kVA (to be charged at 80% of sanctioned CD or actual demand recorded whichever is higher)
		Energy Charges = 655 Paise/kVAh	Energy Charges = 552 Paise/kVAh	Energy Charges = 593 Paise/kVAh

Note: The Proposed Two Part Tariff has been worked out by adding 41 paise per unit with respect to MMC recovery.

3.8 Public Lighting Category

Category	U.F considered	Single Part Tariff	Two Part Tariff	Adjusted Two Part Tariff for MMC and Other Factors as per Note below
Public Lighting	43.60%	As per 8 Hrs/day	Fixed Charges = Rs. 80/kW	Fixed Charges = Rs. 80/kW
		Energy Charges = 669 paise/kWh	Energy Charges = 644 Paise/kWh	Energy Charges = 646 Paise/kWh

Note: The Proposed Two Part Tariff has been worked out by adding 2 paise per unit with respect to MMC recovery.

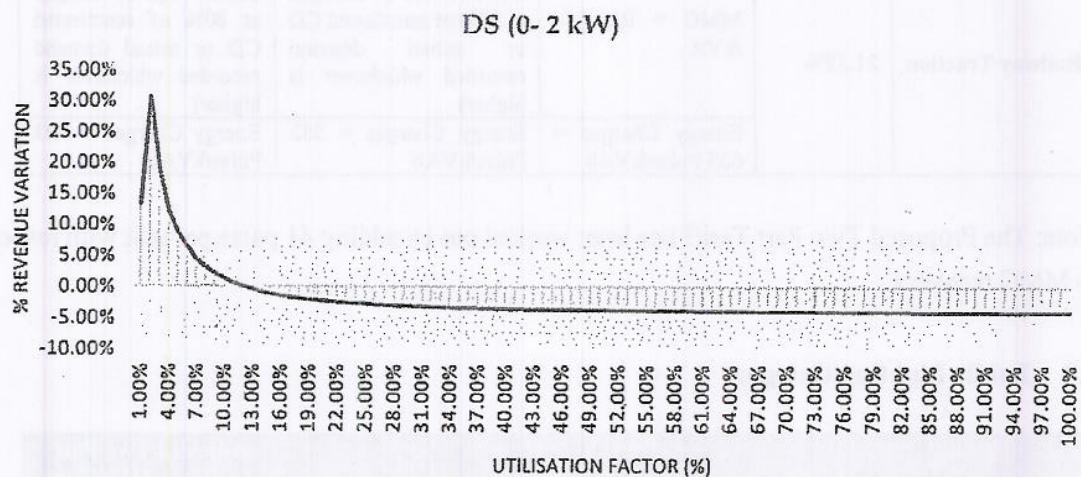
4 IMPACT ON REVENUE OF PROPOSED TWO PART TARIFF

In order to design the Two Part Tariff and to estimate the monetary impact of Two Part Tariff on different consumers and on PSPCL, billing data of sample consumers from each category has been analyzed, and the existing and proposed tariffs imposed on them to check the revenue neutrality.

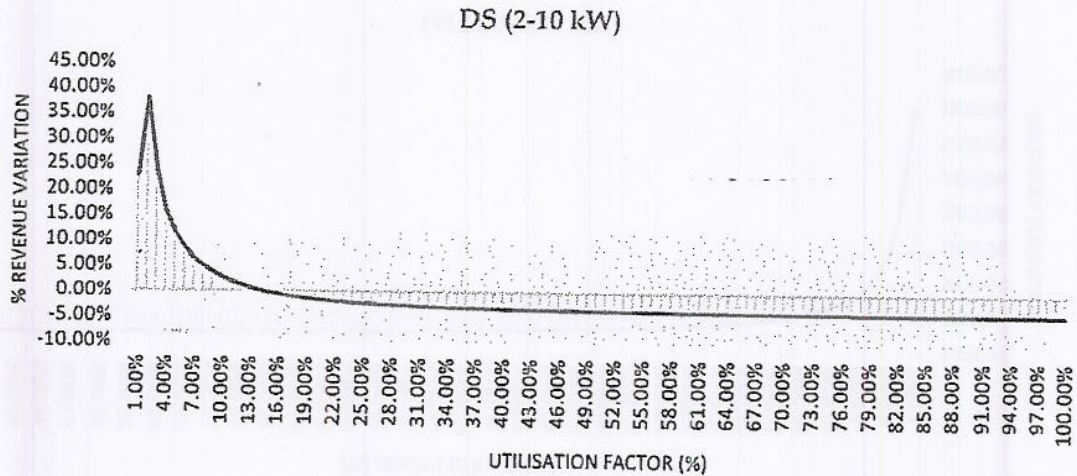
PSPCL has proposed Two Part Tariff after considering the Utilisation Factor for PSPCL as a whole. However, the actual Utilisation factor varies from consumer to consumer and according to the season. It may be noted that the variation in revenue realisation as per Single Part Tariff vis-à-vis Two Part Tariff depends upon the variability of the Utilisation Factor from consumer to consumer. The PSPCL has analysed the variability for such revenue realisation for per unit connected load/contract demand of respective consumer category as under:

4.1 Domestic Supply Category

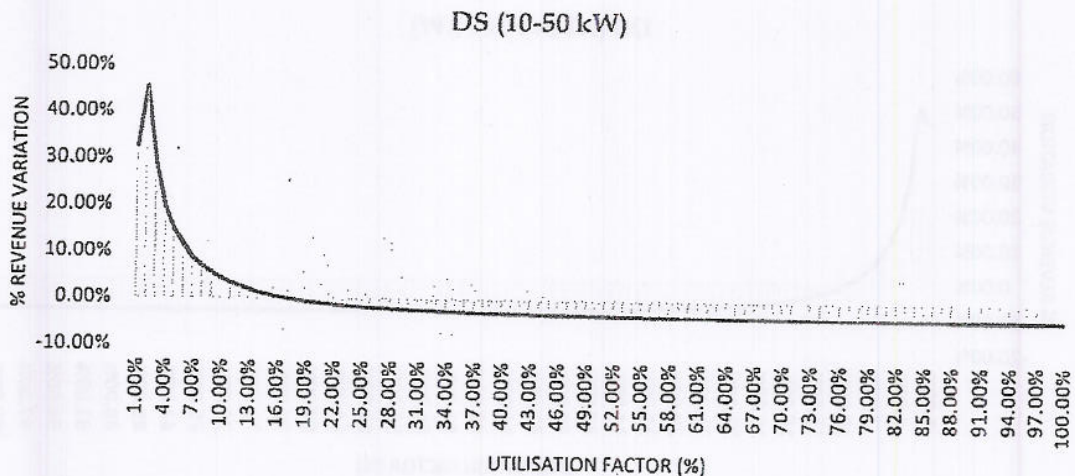
The variation in Utilisation Factor for the Domestic Category is shown as under:



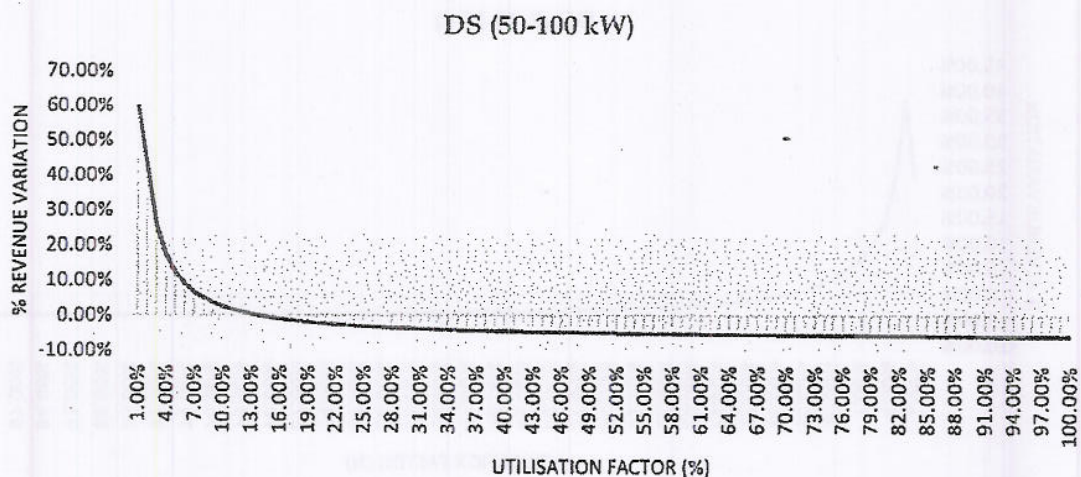
From the above figure, it is observed that, % revenue realisation for DS load 0-2 kW varies from 30.68% to -3.99%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL.



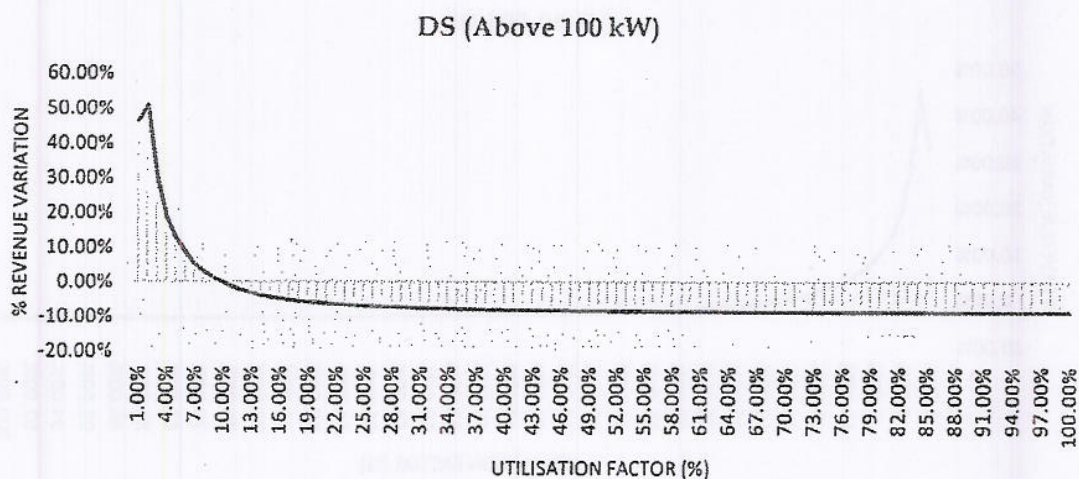
From the above figure, it is observed that, % revenue realisation for DS load 2-10 kW varies from 38.05% to -3.87%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL.



From the above figure, it is observed that, % revenue realisation for DS load 10-50 kW varies from 45.43% to -3.76%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL.

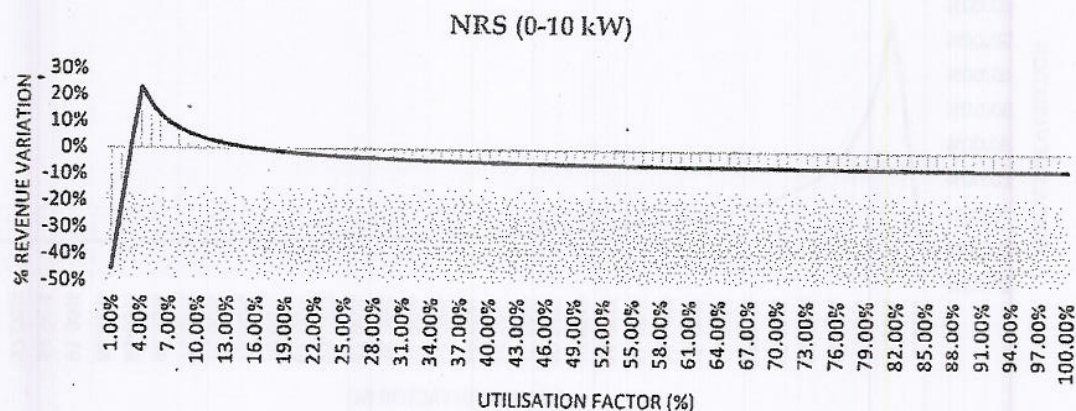


From the above figure, it is observed that, % revenue realisation for DS load 50-100 kW varies from 59.60% to -5.85%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL.

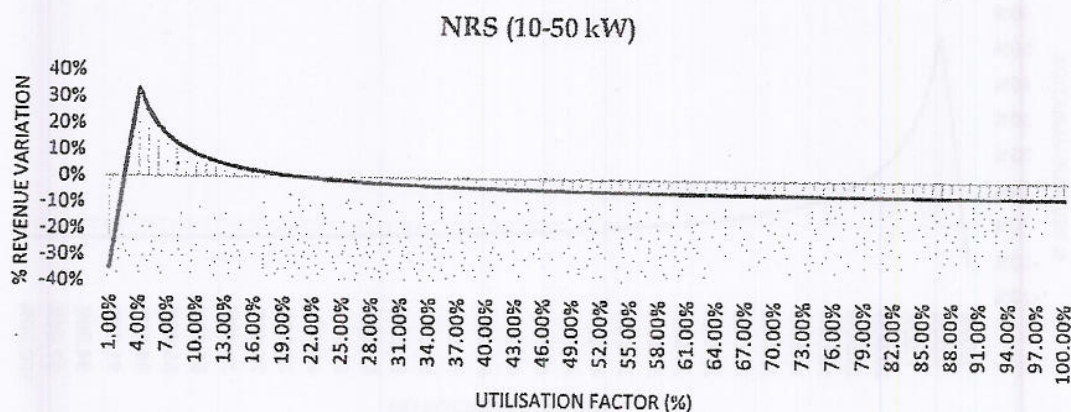


From the above figure, it is observed that, % revenue realisation for DS load above 100 kW varies from 50.88% to -8.73%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL.

4.2 NRS Category

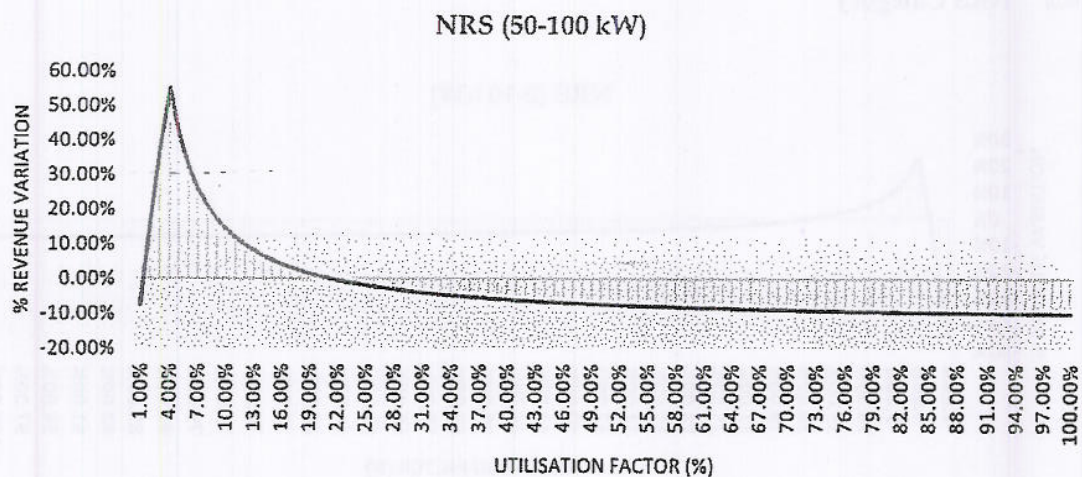


From the above figure, it is observed that, % revenue realisation for NRS load 0-10 kW varies from 22.24% to -45.37%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL. However, for the consumer having very low UF, there will be revenue loss to PSPCL because of difference between MMC Charges and proposed Fixed Charges.

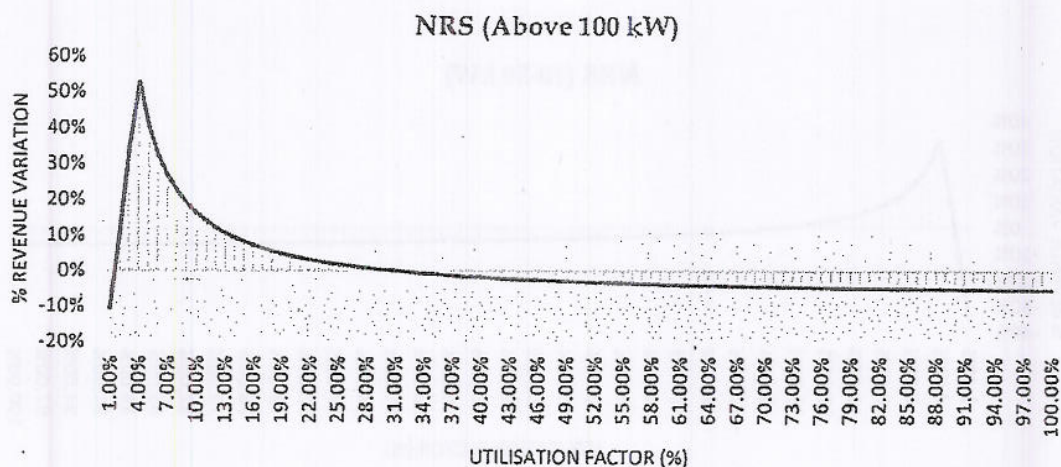


From the above figure, it is observed that, % revenue realisation for NRS load 10-50 kW varies from 33.11% to -34.84%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL. However, for the consumer having very low UF, there will be revenue loss to PSPCL because of difference between MMC Charges and proposed Fixed Charges.

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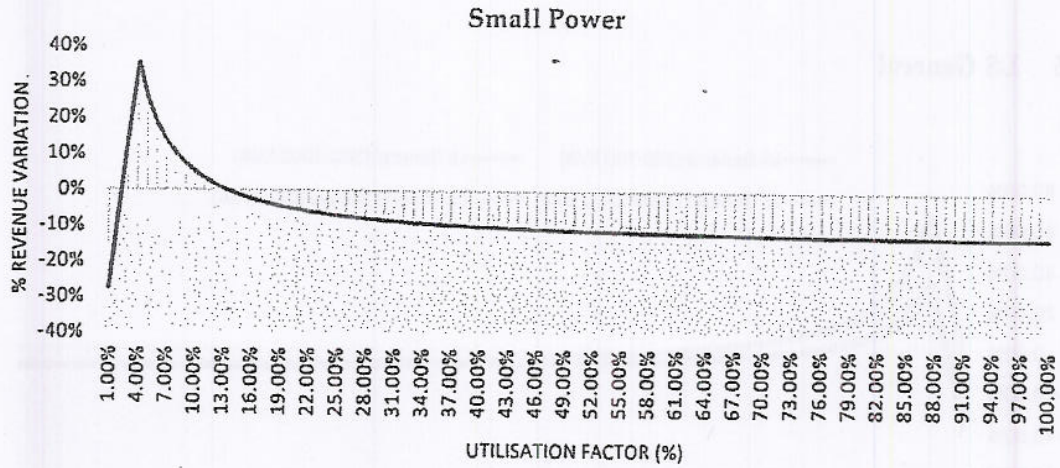


From the above figure, it is observed that, % revenue realisation for NRS load 10-50 kW varies from 55.02% to -9.96%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL. However, for the consumer having very low UF, there will be marginal revenue loss to PSPCL because of less difference between MMC Charges and proposed Fixed Charges.



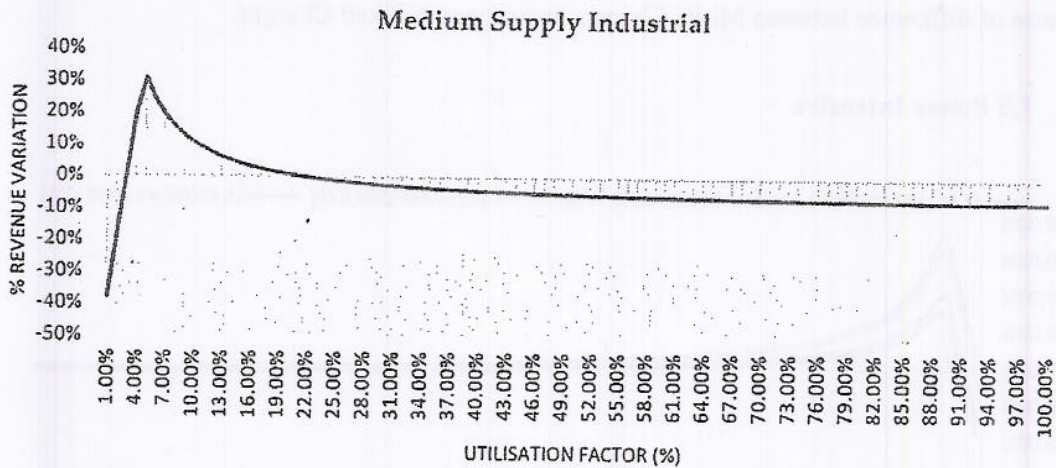
From the above figure, it is observed that, % revenue realisation for NRS load 10-50 kW varies from 55.52% to -10.49%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL. However, for the consumer having very low UF, there will be marginal revenue loss to PSPCL because of less difference between MMC Charges and proposed Fixed Charges.

4.3 Small Power



From the above figure, it is observed that, % revenue realisation for Small Power varies from 35.28% to -27.38%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL. However, for the consumer having very low UF, there will be revenue loss to PSPCL because of difference between MMC Charges and proposed Fixed Charges.

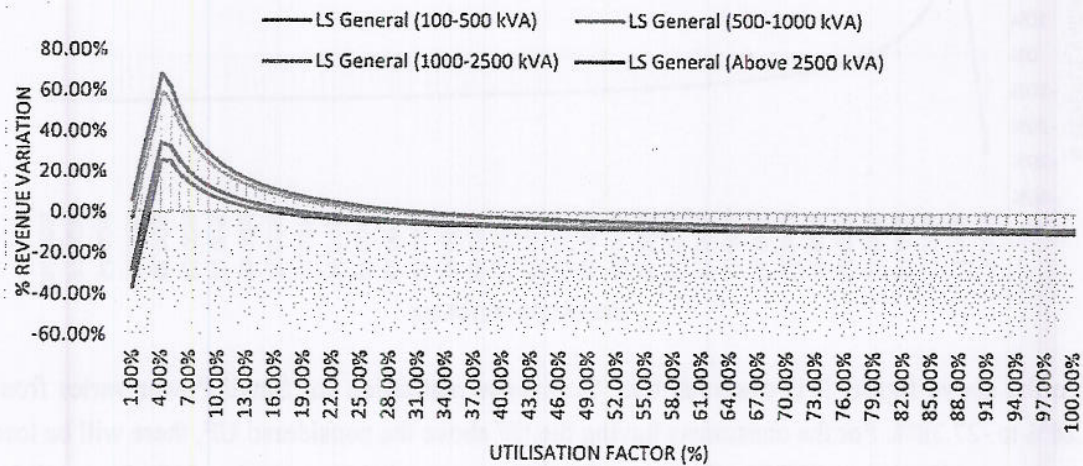
4.4 Medium Supply Industrial



From the above figure, it is observed that, % revenue realisation for Medium Supply Industrial varies from 30.70% to -37.99%. For the consumers having the UF above the considered UF, there will be loss in revenue realisation to PSPCL. However, for the consumer having very low UF,

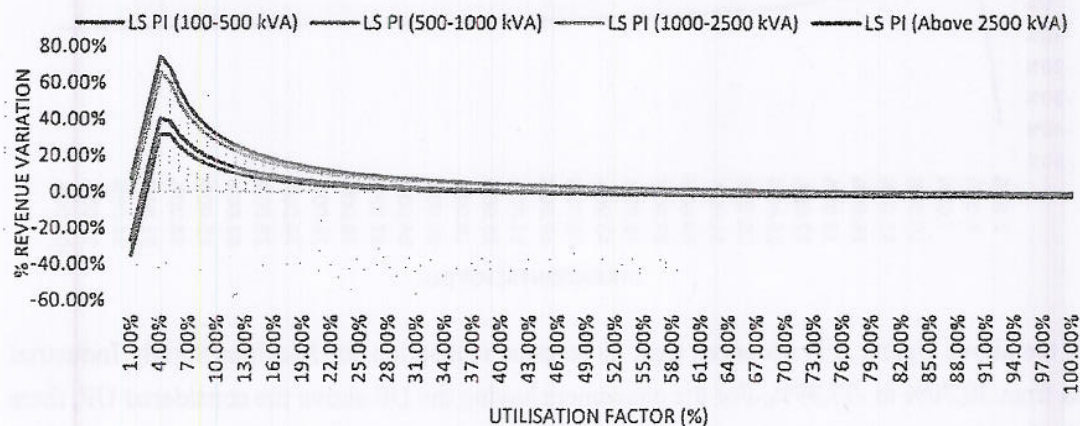
there will be revenue loss to PSPCL because of difference between MMC Charges and proposed Fixed Charges.

4.5 LS General



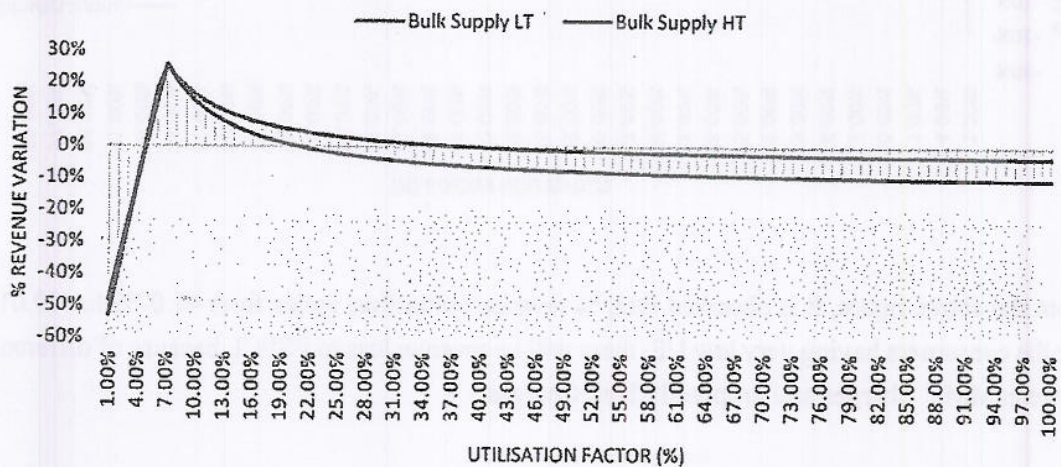
From the above figure, it is observed that, % revenue realisation for LS General varies from 25.65% to -36.67% for demand 0-500 kVA slab, 34.16% to -28.16% for demand 500-1000 kVA slab, 59.69% to -8.01% for demand 1000-2500 kVA slab and 68.20% to -7.64% for demand above 2500 kVA slab. For the consumers having very low UF, there will be revenue loss to PSPCL because of difference between MMC Charges and proposed Fixed Charges.

4.6 LS Power Intensive



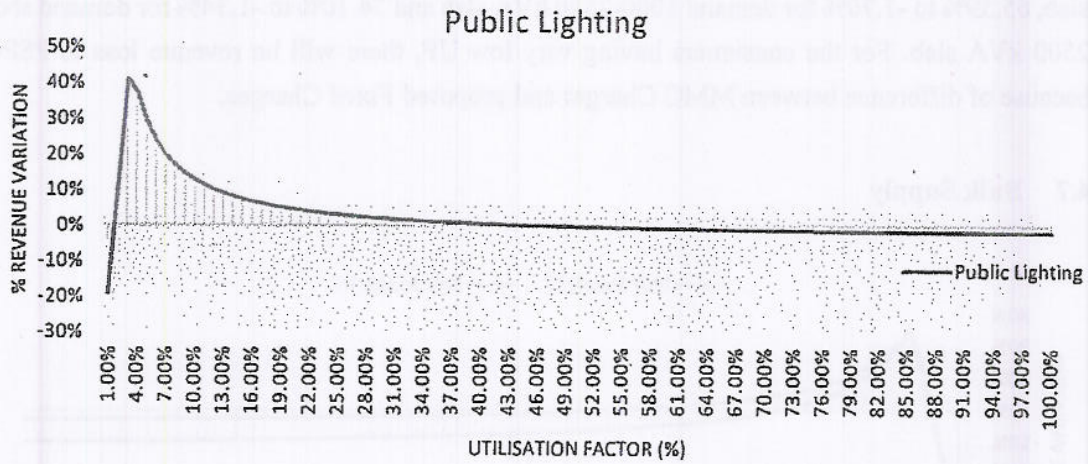
From the above figure, it is observed that, % revenue realisation for LS General varies from 31.55% to -35.20% for demand 0-500 kVA slab, 40.06% to -26.69% for demand 500-1000 kVA slab, 65.59% to -1.70% for demand 1000-2500 kVA slab and 74.10% to -1.34% for demand above 2500 kVA slab. For the consumers having very low UF, there will be revenue loss to PSPCL because of difference between MMC Charges and proposed Fixed Charges.

4.7 Bulk Supply



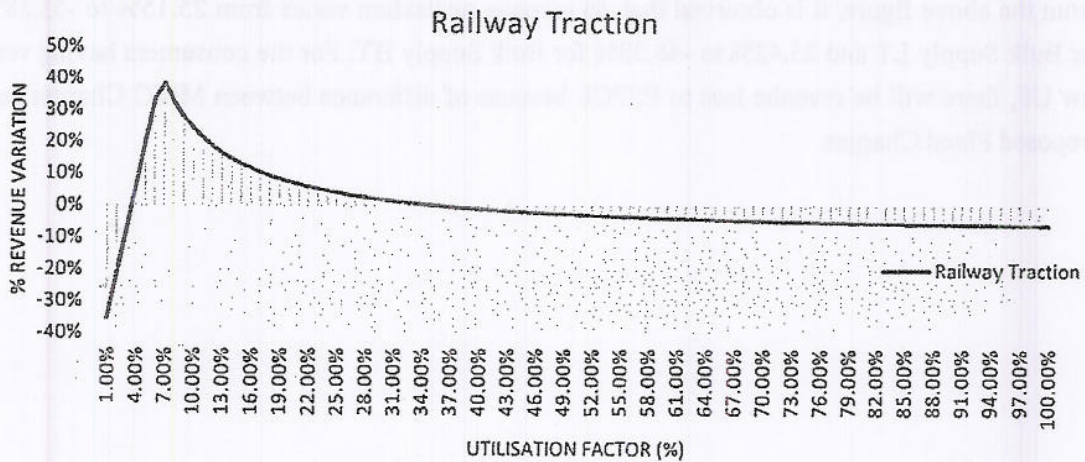
From the above figure, it is observed that, % revenue realisation varies from 25.15% to -53.58% for Bulk Supply LT and 25.42% to -48.33% for Bulk Supply HT. For the consumers having very low UF, there will be revenue loss to PSPCL because of difference between MMC Charges and proposed Fixed Charges.

4.8 Public Lighting



From the above figure, it is observed that, % revenue realisation varies from 41.07% to -19.01%. For the consumers having very low UF, there will be revenue loss to PSPCL because of difference between MMC Charges and proposed Fixed Charges.

4.9 Railway Traction



From the above figure, it is observed that, % revenue realisation varies from 38.33% to -35.25% For the consumers having very low UF, there will be revenue loss to PSPCL because of difference between MMC Charges and proposed Fixed Charges.

For validation of characteristics of the Two Part Tariff, the PSPCL has carried out the analysis of variation in revenue realisation for sample data for FY 2015-16. The Sample data is collected for the same five (5) divisions for which the earlier report has been submitted. The Impact on Revenue Neutrality for the sample data has been analysed as under:

4.10 Revenue from SOP for Domestic Categories

Sr. No	Sub-Category	Billing Cycle	Number of consumers	SOP with existing single part tariff (Rs.)	SOP with proposed Two Part Tariff (Rs.)	Variation in %age	UF for sample data (%)
1	Load 0-2 kW	Cycle 6	118771	13,16,41,783	12,82,66,382	-2.56%	24.00%
2	Load 2-10 kW	Cycle 2	24925	7,01,91,245	6,96,40,527	-0.78%	17.89%
		Cycle 3	25096	9,72,56,865	9,55,61,265	-1.74%	24.09%
		Cycle 4	25256	9,17,08,617	9,02,61,399	-1.58%	22.63%
		Cycle 5	23065	4,55,76,191	4,58,69,211	0.64%	13.03%
		Cycle 6	21989	3,29,60,031	3,36,75,708	2.17%	10.18%
3	Load 10-50 kW	Cycle 1	5,930	1,64,70,171	1,79,85,508	9.20%	4.54%
		Cycle 2	5,953	1,72,74,954	1,89,46,731	9.68%	4.81%
		Cycle 3	5,964	2,83,36,212	2,95,93,650	4.44%	7.72%
4	Load 50-100 kW	Cycle 1	21	6,47,248	6,78,199	4.78%	7.97%
		Cycle 2	21	7,05,831	7,28,859	3.26%	8.63%
		Cycle 3	21	9,59,337	9,64,521	0.54%	11.73%
5	Above 100 kW	Cycle 2	192	8,89,34,914	8,41,41,877	-5.39%	24.13%

4.11 Revenue from SOP for NRS Categories

Sr. No	Sub-Category	Billing Cycle	Number of consumers	SOP with existing single part tariff (Rs.)	SOP with proposed Two Part Tariff (Rs.)	Variation in %age	UF for Sample Data (%)
1	Load 0-10 kW	Cycle 2	13,072	1,92,02,178	1,84,50,500	-3.91%	19.63%
		Cycle 3	13,122	2,31,56,265	2,21,12,508	-4.51%	23.47%

Sr. No.	Sub-Category	Billing Cycle	Number of consumers	SOP with existing single part tariff (Rs.)	SOP with proposed Two Part Tariff (Rs.)	Variation in %age	UF for Sample Data (%)
		Cycle 4	13,326	2,23,27,515	2,13,50,207	-4.38%	22.00%
		Cycle 5	12,614	1,53,03,661	1,46,85,666	-4.04%	15.91%
		Cycle 6	12,372	1,24,47,500	1,18,66,285	-4.67%	12.85%
3	Load 10-50 kW	Cycle 1	2,796	2,53,57,538	2,52,42,625	-0.45%	9.02%
		Cycle 2	2,819	2,97,56,206	2,98,56,644	0.34%	10.90%
		Cycle 3	2,830	3,55,71,238	3,55,38,619	-0.09%	13.23%
4	Load 50-100 Kw	Cycle 1	185	42,99,208	48,06,985	11.81%	5.66%
		Cycle 2	186	49,47,000	54,75,384	10.68%	6.77%
		Cycle 3	187	66,69,262	70,46,824	5.66%	9.36%
5	Above 100 kW	Cycle 2	1364	27,28,79,812	27,98,69,249	2.56%	10.97%

4.12 Revenue from SOP for Small Power

Sr. No.	Category	Billing Cycle	Number of consumers	SOP with existing single part tariff (Rs.)	SOP with proposed Two Part Tariff (Rs.)	Variation in %age	UF for Sample Data (%)
1	Small Power	Cycle 1	5,531	2,66,11,294	2,60,25,737	-2.20%	8.95%
		Cycle 2	5,550	2,95,15,660	2,87,06,788	-2.74%	10.07%
		Cycle 3	5,558	3,16,92,383	3,07,60,337	-2.94%	10.94%

4.13 Revenue from SOP for Medium Supply Industrial

Sr. No.	Category	Billing Cycle	Number of consumers	SOP with existing single part tariff (Rs.)	SOP with proposed Two Part Tariff (Rs.)	Variation in %age	UF for Sample data (%)
1	Medium Supply Industrial	Cycle 1	3,364	10,74,48,532	11,11,66,983	3.46%	13.29%
		Cycle 2	3,114	12,49,31,508	12,73,51,804	1.94%	13.12%
		Cycle 3	3,117	12,34,05,856	12,59,07,612	2.03%	10.48%

4.14 Revenue from SOP for LS General and LS PIU

Sr. No.	Category	Sub-category	Number of consumers	SOP with existing single part tariff (Rs.)	SOP with proposed Two Part Tariff (Rs.)	Variation in %age	UF for Sample data (%)
1	LS General	100-500 kVA	4,563	84,20,46,819	83,42,97,622	-0.92%	15.87%
		500-1000 kVA	599	38,88,65,593	38,50,57,126	-0.98%	19.75%
		1000 -2500 kVA	457	84,30,67,774	85,71,48,497	1.67%	24.61%
		Above 2500 kVA	124	1,23,30,50,787	1,27,73,85,724	3.60%	24.44%
		Total	5,743	3,30,70,30,973	3,35,38,88,970	1.42%	21.02%
2	LS PIU	100-500 kVA	251	8,39,20,666	8,33,47,145	-0.68%	18.56%
		500-1000 kVA	86	5,76,92,531	5,83,43,787	1.13%	19.88%
		1000 -2500 kVA	155	48,24,88,285	49,02,53,271	1.61%	32.12%
		Above 2500 kVA	87	93,58,92,637	97,03,83,134	3.69%	30.11%
		Total	579	1,55,99,94,119	1,60,23,27,336	2.71%	29.17%

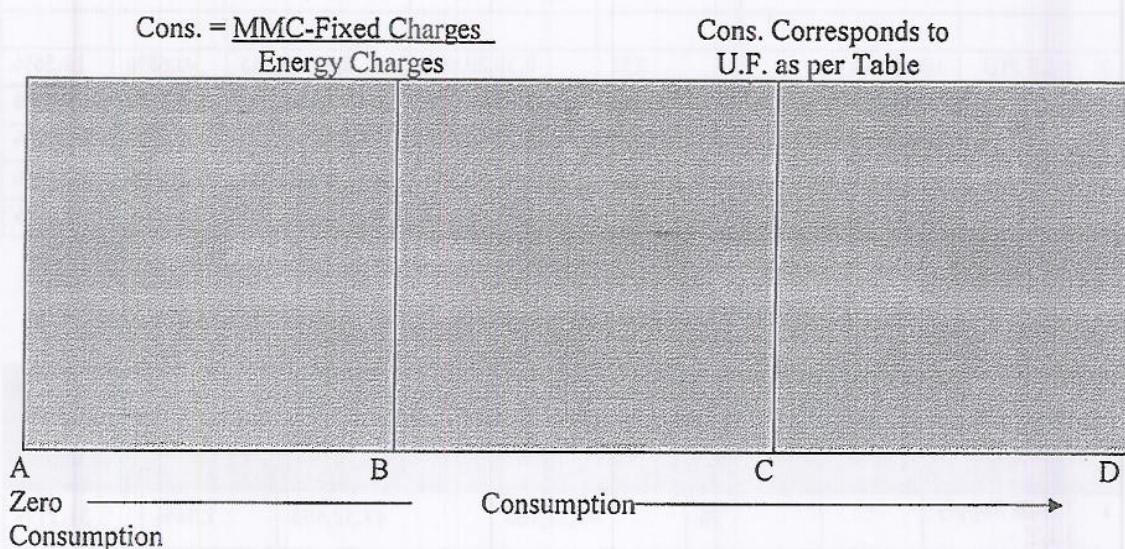
4.15 Revenue from SOP for other Categories

Sr. No.	Category	Billing Cycle	Number of consumers	SOP with existing single part tariff (Rs.)	SOP with proposed Two Part Tariff (Rs.)	Variation in %age	UF for Sample data (%)
1	Bulk Supply LT	-	76	46,71,166	47,52,403	1.74%	31.11%
2	Bulk Supply HT	-	118	17,71,01,009	17,61,97,107	-0.51%	25.35%
3	Railway Traction	-	9	7,70,42,549	8,20,01,233	6.44%	21.03%
4	Public Lighting	Cycle 1	503	79,45,558	80,35,925	1.14%	32.04%
		Cycle 2	504	74,80,482	75,57,752	1.03%	30.78%
		Cycle 3	507	71,61,801	72,50,932	1.24%	30.10%
		Cycle 4	514	77,98,720	78,83,463	1.09%	31.44%
		Cycle 5	516	77,99,553	78,68,200	0.88%	30.79%

From the above Tables, it has been observed that the detailed analysis taken on sample data is validated and the variation in revenue is on account of variation in UF of the sample data.

5 OBSERVATIONS

As per the results of the study, on considering the Two Part Tariff as proposed by PSPCL, the revenue of PSPCL remains almost neutral only when the UF of the consumer of the respective category matches with the proposed UF. However, it is reiterated that the Two Part Tariff has characteristics that the low consumption consumers pay more and the consumers having higher consumption pay less, which is also clear from the results obtained in the analysis & Impact of Two Part Tariff based on consumers' Consumption is clear from the following diagram:



From the above Table it is concluded that if a consumer is having the consumption in the range of A B & C D, the billing of consumer will be reduced in Two Part Tariff as compared to single part Tariff.

If the consumer is having its consumption in the range of B C, then the billing of the consumer will be increased as compared to single part Tariff, which is also essential requirement of revenue neutrality i.e. if some of the consumers are to gain then some other consumers shall have to loose.

PSPCL further submits that the proposed Two Part Tariff may be implemented and it shall enable PSPCL to recover the part of Fixed Charges payable during year. Any Gaps/(Surplus) in the revenue shall be adjusted by increasing or decreasing the Fixed Charges over the years, which shall also be required with the change of Utilisation Factor in the subsequent years.