



**APPROACH PAPER:  
Support to Maharashtra Electricity  
Regulatory Commission**

**FY 2006-07 - Review of MSEDCL Tariff**

**July 2006**



**This Approach Paper has been prepared by  
PricewaterhouseCoopers, Consultant for the MERC**

**Contents**

**A1: INTRODUCTION ..... 3**

**A2: FACTUAL TARIFF INCREASE..... 4**

**A3: IMPLEMENTATION OF WILLINGNESS TO PAY ..... 6**

    SCENARIO 1 ..... 7

    SCENARIO 2 ..... 9

    SCENARIO 3 ..... 10

**A4: DETERMINATION OF WHEELING CHARGES ..... 12**

**A1: INTRODUCTION**

- 1.1 Maharashtra Electricity Regulatory Commission (hereinafter referred as “the Commission”) has issued three (FY 2001, FY 2002 and FY 2004) Tariff Orders for the erstwhile Maharashtra State Electricity Board (MSEB).
- 1.2 With the enactment and to achieve the objectives of Electricity Act 2003 (hereinafter referred as “Act”), Government of Maharashtra (GoM) vide its GR dated January 24<sup>th</sup> 2005 with effect from June 6<sup>th</sup> 2005 has restructured the erstwhile MSEB into four companies namely MSEB Holding Company, Maharashtra State Power Generation Company Ltd (MSPGCL - MahaGenco), Maharashtra State Electricity Transmission Company Ltd (MSETCL - MahaTransco) and Maharashtra State Electricity Distribution Company Ltd.(MSEDCL - MahaDiscom).
- 1.3 MSEDCL in the capacity of distribution and retail supply licensee has filed for Aggregate Revenue Requirement (ARR) and Tariff Petition on February 28<sup>th</sup> 2006 and May 26<sup>th</sup> 2006 respectively as per Section 61, 62 and 64 of the Act and as per the MERC (Terms and Conditions of Tariff), 2005 for FY 2006-07. In the Tariff Petition, MSEDCL has also made certain modifications to the ARR. The utility projected revenue gap of about Rs 5462 Crores and proposed an average tariff increase of 28.8% to meet the revenue gap.
- 1.4 The Commission has appointed PricewaterhouseCoopers (PwC) as the consultants for review of MSEDCL’s ARR and Tariff filings. From the preliminary review of the filings, it was found that some of the key issues have not been emphasised by MSEDCL accurately in the tariff application despite the serious impact that these issues have on consumers, quality of supply and tariffs. Hence it was felt appropriate to circulate an approach paper highlighting the key issues for public consultation. The key issues include
  - (a) Factual increase in Retail Supply Tariffs
  - (b) Implementation of “willingness to pay” concept
  - (c) Determination of wheeling charges
- 1.5 PwC is involved in reviewing the ARR and Tariff petition, for the purpose of approach note it has limited the source of information to the filed numbers instead of review numbers, as a result, PwC has mostly used the information (including additional information) filed by MSEDCL as part of FY 2006-07 tariff review. This will also facilitate the public to relate the information submitted in the filings. The analysis presented in the document is only to facilitate better understanding of the issues and is prepared for general guidance on matters of interest only.

**A2: FACTUAL TARIFF INCREASE**

- 2.1 In the tariff petition, MSEDCL has projected a revenue gap of Rs. 5462 Crore for FY 2006-07 based on the aggregate revenue requirement projections and revenue from existing tariffs. For computing the revenue gap, MSEDCL has also included the financial losses pertaining to the previous years of FY 2004-05 and FY 2005-06. MSEDCL has included financial loss of Rs 513 Crores for FY 2005 and Rs 1401 Crores for FY 2006. The consolidated gap for FY 2005, FY 2006 and FY 2007 which MSEDCL intend to recover from tariff increase is Rs 5462 Crores.
- 2.2 For FY 2006-07, MSEDCL has projected the revenue from existing tariff including Regulatory Liability charges at Rs. 18942 Crores. Based on the existing tariff revenue estimates and the revenue gap, MSEDCL has proposed an average tariff increase of 28.8%. This tariff increase would result in increasing the revenues from Rs 18,942 Crores to Rs 24,405 Crores and thereby addressing the entire revenue gap. The details are presented below:

Particulars	Rs/ Kwh	Revenue (Rs Crores)
Revenue at existing tariffs as proposed by MSEDCL	3.56 <sup>1</sup>	18,942
Revenue from the proposed tariff	4.58	24,405
<b>Average Increase In Tariff Proposed</b>		<b>28.8%</b>

- 2.3 In their representation, MSEDCL have combined the regulatory liability charges (50 ps / unit) and fuel adjustment charges (96ps/unit) to the existing energy tariffs. While RLC is a constant tariff charged by MSEDCL to the subsidising consumers, the FAC charge is not a constant tariff and it depends on the fuel cost variations for a particular month or quarter, etc.
- 2.4 The Commission has approved FAC of 96 ps / unit only for the month of February'06 where as MSEDCL has combined the FAC with the existing energy tariffs and applied the same for the entire year of FY 2006-07. The average FAC approved by the Commission in FY 2005-06 has been 49 paisa/kWh and hence it would be appropriate to assume 49 ps / unit as part of existing tariffs instead of 96 ps /unit. With this correction in the existing energy tariff, the average tariff increase required would be 43% and not 28.8% as presented by MSEDCL.

---

<sup>1</sup> Rs 3.56 per unit is the average realization for MSEDCL as a whole i.e. revenue from all category of consumers divided by sales to all category of consumers

Particulars	Rs/ Kwh	Revenue (Rs Crores)
Revenue from existing tariff excluding FAC	2.71	14,449
Revenue from FAC based on Avg FAC	0.49	2,601
Revenue at existing tariff including FAC	3.20	17,050
Revenue at proposed Tariff	4.58	24,405
<b>Factual Increase in tariffs</b>		<b>43%</b>

- 2.5 The public has to take the above facts into consideration while responding to the ARR and tariff petition filed by the licensee.

**A3: IMPLEMENTATION OF WILLINGNESS TO PAY**

- 3.1 The average cost of supply has increased from Rs 3.07 per unit in FY 2003-04 tariff order to Rs 4.58 per unit in FY 2006-07 petition of MSEDCL. The utility has proposed tariff increase of 43% (factual tariff increase) from the consumers. One of the significant reasons for such cost and tariff increases is the dependence of MSEDCL on costly power generating stations viz. traded power, RGPPL etc to address the load deficit situation in the state.
- 3.2 It is felt appropriate that the consumers should be aware of the implications of supplying quality power i.e. with reduced or no load shedding. Currently, MSEDCL faces a demand supply gap with the present capacity available from State generation and Central generating stations. To address this deficit, MSEDCL is sourcing power from traders and other costly generating stations thereby increasing the cost of supply and tariff increase required.
- 3.3 From the interactions with different consumer organisations it was understood that all the consumers would not be willing to pay for reduction in load shedding and hence only those consumers who are willing to pay for reduced load shedding have to be subjected to such purchase cost and tariff increases. National Tariff Policy also specifies that consumers, particularly those who are ready to pay a tariff which reflects efficient costs have the right to get uninterrupted 24 hours supply of quality power.
- 3.4 Recently, the Commission has conceptualised and applied the principle of “willingness to pay” for supply of uninterrupted power in Pune urban circles with support from MSEDCL and Confederation of Indian Industry (CII). To understand the implications of purchase from costly sources, few scenarios have been presented highlighting the impact of additional power purchase on reduction in hours of load shedding and tariff increase required. These are indicative results and are based on the data submitted by the licensee.
- 3.5 The Commission has stipulated load shedding protocol, wherein the divisions are categorized as urban and industrial agglomerations, agricultural dominated regions, and other regions, and classified as A, B, C or D group, depending on the distribution and collection loss in the division. The grouping is presented below:

	Group	Weighted average loss and collection efficiency level	
		Urban	Rural
1	Group A	0% to 25%	0% to 28%
2	Group B	> 25% to 35%	> 28% to 38%
3	Group C	> 35% to 50%	> 38% to 53%
4	Group D	Above 50%	Above 53%

3.6 Commission in its order in the matter of Revision in the Principles and Protocol for Load Shedding by MSEDCL dated 10 Jan 2006 has also revised the Load shedding protocol for a demand-supply gap level of 4500 MW as follows.

Region	Urban & industrial Agglomerations	Other Regions	Agriculture dominated regions	Anticipated Load Relief in Evening Peak Hours
Group	Hours	Hours	Hours	MW
A	2.5	4.5	11.0	4000-4500
B	3.0	5.0	11.5	
C	3.5	5.5	12.0	
D	4.0	6.0	12.0	

3.7 The scenarios are based on the above groupings and the load shedding protocols discussed.

**Scenario 1**

3.8 This scenario is the base case scenario where MSEDCL’s power purchase includes the costly power acquired from RGPPL, traders etc. This scenario is as per the present filing where in MSEDCL has assumed purchases from costly stations to reduce the load shedding hours.

3.9 The amount of Load Shedding for Scenario 1 as per the protocol in the months of October’06 and December’06 is as follows. Two months load shedding information has been provided to demonstrate that there would be change in the load shedding hours based on the actual demand of the system.

Month	Region	Urban & industrial Agglomerations	Other Regions	Agriculture dominated regions
Oct'06	A	2.25	4.25	7.50
	B	2.75	4.75	8.00
	C	3.25	5.25	8.50
	D	3.75	5.75	9.00
Dec' 06	A	2.50	4.50	11.00
	B	3.00	5.00	11.50
	C	3.50	5.50	12.00
	D	4.00	6.00	12.00

3.10 In this scenario, the hours of load shedding ranges from 2.25 hours to 12 hours based on the group and category that the division belongs to. The maximum load shedding is for D category agricultural dominated region, at 12 hours daily, while the least load shedding is for A category urban and industrial agglomerations, at 2.5 hours per day.

3.11 The tariff impact of the Scenario 1 has been presented in the following table.

Scenario 1 (2006-07)	2006-07	Revenue Gap (Corrected Tariff)	With costly power
ARR (In Rs. Cr)	24405		
Projected Sales	53,254		
Revenue from Existing Tariff (In Rs. Cr)	18942	17050	
Cumulative Revenue Gap (In Rs. Cr)	5462	7355	
	<b>Existing tariff (as filed)</b>	<b>Existing Tariff (Corrected)</b>	<b>New tariff</b>
Average Tariff for MSEDCL	<b>3.56</b>	<b>3.20</b>	<b>4.58</b>
Percentage Inc/Dec in Tariffs from existing tariffs (as Filed)			<b>28.8%</b>
Percentage Inc/Dec in tariffs from existing (corrected) tariffs			<b>43%</b>

3.12 From the above table it is evident that to meet the increased costs, especially purchases from costly sources, MSEDCL requires an overall tariff increase of 43%.

**Scenario 2**

- 3.13 This scenario assumes that MSEDCL does not purchase any power from the costly sources such as RGPPL, traders etc. Given below are the Load Shedding details in case power is not procured from the costly sources.

Month	Region	Urban & industrial Agglomerations	Other Regions	Agriculture dominated regions
OCT.06	A	4.00	6.00	12.50
	B	4.50	6.50	13.00
	C	5.00	7.00	13.50
	D	5.50	7.50	13.50
Dec 06	A	6.50	9.00	15.50
	B	7.00	9.50	16.00
	C	7.50	10.00	16.50
	D	8.00	10.50	16.50

- 3.14 The Load shedding hours have been increased due to effect of non-procurement of power from the costly sources. Load shedding which was in the range of 2.25-12 hrs when power was purchased from costly sources has gone up to the range of 4.00 – 16.50 hrs across the different categories mentioned.
- 3.15 In this scenario, the load shedding hours would exceed the ceiling limit of 12 hours specified by the Commission.
- 3.16 The tariff impact of scenario 2 is presented in the following table.

Scenario 2 (2006-07)	Filed Tariff	Corrected Tariff	Without costly power
ARR (In Rs. Cr)	20312	20312	
Revised Projected Sales	47,497	47,497	
<b>Total Revenue from Sales (Without Costly Power) -</b>	17236	15472	
Revenue Gap (In Rs. Cr)	3077	4840	
			<b>New Tariff</b>
Average Tariff for MSEDCL			<b>4.28</b>
Percentage Inc/Dec in Tariffs from existing tariffs (as Filed)			<b>18%</b>
Percentage Inc/Dec in tariffs from existing (corrected) tariffs			<b>31%</b>

- 3.17 In Scenario 2, as MSEDCL would not be procuring the additional power from costly sources there would be reduction in the power purchase cost. There shall be reduction in the revenue also as the sales for the categories would reduce based on the revised load shedding requirement. The net impact of not purchasing from costly sources would be a tariff increase of 31% instead of 43%.
- 3.18 From the analysis of Scenario 1 and 2 it can be interpreted that to avoid extra load shedding of 1.75-4.5 hours the consumers have to pay higher tariffs to the extent of additional 12% tariff hike.

### Scenario 3

- 3.19 In Scenario 1 and Scenario 2, the costly power purchase is allocated to all the consumer categories in the state. In Scenario 3, it is assumed that the costly power purchase from Traders and RGPPL would be reserved for the urban and industrial agglomerations that may be willing to pay a higher rate for assurance of uninterrupted power. The following table presents the financial implications of reducing or eliminating the load shedding hours for the urban and industrial agglomerations.

Particulars	Aurang abad	Thane	Vashi	Nagpur	Nashik
Daily load requirement to avoid load shedding (MU)	0.69	2.42	0.98	1.16	0.63
Monthly load requirement (MU)	20.58	72.45	29.40	34.86	18.90
Cost of additional power procurement (Crores)	8.93	31.44	12.76	15.13	8.20
Indicative Tariff impact per unit Rs/unit	1.34	2.08	0.57	1.56	1.04

- 3.20 The tariff impact indicated in the above table is over and above the energy tariff and this charge is only to ensure uninterrupted power supply to urban and industrial agglomerations if they are willing to pay for such power.
- 3.21 For costing the additional power procurement for the urban and industrial agglomerations, an average rate of power purchased from traders and RGPPL which is about Rs 4.34 per unit has been adopted. The above financial implication table is to eliminate the load shedding of 7 hours. If uniformity principles are adopted for all the consumers, then the applicable load shedding hours would be in the range of 5 hours to 8 hours. For the analysis, 7 hours load shedding has been used. The tariff impact would be further increased on account of adjustment for losses.

**A4: DETERMINATION OF WHEELING CHARGES**

- 4.1 Section 62 of the Electricity Act requires State Electricity Regulatory Commission to determine tariffs for Transmission, *Wheeling and Retail sale of electricity*.
- 4.2 Section 42 of the Act requires the Commission to introduce Open Access in a phased manner for distribution network and specifies that the duties of the distribution licensee with respect to such supply shall be of a common carrier *providing non-discriminatory open access*.
- 4.3 Section 9 of the Act requires the captive consumers using distribution network to pay only wheeling charges and they are not required to pay the cross-subsidy surcharge, implying that the wheeling charges determined must be free from any kind of hidden cross-subsidies.
- 4.4 National Tariff Policy (NTP) notified on 6<sup>th</sup> January 2006 specifies in clause 8.5.5, that ‘Wheeling charges should be determined on the basis of same principles as laid down for intra-state transmission charges and in addition would include *average loss compensation of the relevant voltage level*’. Clause 7.1(7) on intra-state transmission pricing specifies that the factors to be considered are ‘*voltage, distance, direction and quantum of flow*’.
- 4.5 MERC regulation on Terms and Conditions of Tariff mandates every Distribution Licensee to make a separate application for determination of tariff for wheeling and retail sale of electricity. It also provides that every distribution licensee needs to maintain separate records for Distribution Business and prepare an Allocation Statement to enable the Commission determine the tariff pursuant to each such application made by the distribution licensee.
- 4.6 However, MSEDCL has not proposed any tariff for wheeling separately in the ARR and filing petition. Only after the technical validation, MSEDCL has proposed a mechanism to allocate the costs between wheeling business and retail supply business. Though MSEDCL doesn’t have separate accounts for wheeling and retail supply, separation of wheeling costs and retail supply costs based on certain assumptions would be required for determination of wheeling charges. The Commission has already issued the open access phasing regulations and for effective implementation of open access a separate cost based wheeling charge would be required.

4.7 In case a consumer opts to take supply from a person other than MSEDCL through open access, the consumer has to pay wheeling charges to MSEDCL for use of network. The consumer opting for an alternate supply through open access shall use the network of MSEDCL to wheel the power procured and hence has to pay the cost related to network. At present MSEDCL is managing both distribution wires business and retail supply business. As the open access consumers would be using only the network assets / service of MSEDCL, he has to pay only for such services / assets through the wheeling charges and not required to pay for the retail supply costs. Hence, there is a requirement for MSEDCL to separate the wheeling costs and retail supply costs so that wheeling charges would be linked to the costs incurred by MSEDCL on network business only.

4.8 The following table present the unbundled costs incurred by MSEDCL to serve an industrial consumer say HT 1 consumer.

<b>Cost / Tariff particulars</b>	<b>Rate (Rs/unit)</b>
Transmission Cost	0.35
Distribution (network) costs	0.57
Retail Supply (Power purchase including losses plus retail) costs	3.67
Cross-subsidy	1.45
Average Tariff	6.03

4.9 The above allocation and numbers are only indicative and are based on the average cost of supply methodology. In case, a voltage based cost methodology or any other alternate approach is adopted the numbers shall undergo a change. The above table is only to demonstrate the type of costs/tariff incurred/charged by a distribution licensee. From the above table, it is evident that the wheeling cost incurred (based on the average cost methodology) by the distribution licensee would be about 57 ps/unit and hence each consumer has to pay the same for using the wheeling services of MSEDCL.

4.10 The wheeling services of MSEDCL are not only used by open access consumers but also all other consumers supplied by MSEDCL i.e. domestic, street lighting, commercial, agriculture, industrial etc. To promote competition the open access tariffs, terms and conditions need to be non-discriminatory. Non-discriminatory open access tariffs would mean that MSEDCL should charge the same tariff for any consumer irrespective of the supplier. The supplier may be MSEDCL itself or a captive generating station or a generating station / trader / other distribution licensee.

- 4.11 For effective implementation of non-discriminatory tariffs it would be required to unbundle costs and tariffs.
- 4.12 Consumers or interested parties may have to look into the allocation proposed by the utility and come forward with relevant suggestions, comments for determination of wheeling charges.