

## **Reply to Data Gaps on ARR Petition for FY 2016-17 and FY 2017-18 for JVVNL**

### ***Commission's Observation:***

1. Regulation 11(5) (f) of RERC Tariff Regulations, 2014 provides that distribution licensee, shall provide detailed calculations of voltage-wise cost of supply, exclusive of external subsidies and cross subsidies in respect of each category of consumer. Voltage wise cost of supply is required to be furnished as per orders of Hon'ble APTEL in Appeal no 102 of 2010.

### ***Petitioner's Reply:***

The Discom submits that as per the Commission's directive, Discom is required to furnish details of Voltage wise Cost of Supply in accordance to Hon'ble APTEL judgment in Appeal No 102 of 2010.

In the judgment referred above, the Tribunal had recognized the difficulty in determination of cost of supply to different categories of consumers. However, instead of waiting indefinitely for availability of the entire data, the Tribunal had suggested a simple method which would take into account the major cost element. The Tribunal had suggested determination of voltage-wise cost of supply taking into account the major cost element which would be applicable to all the consumers connected at a particular voltage level.

According to the said judgment, in the absence of segregated network costs, it would be prudent to work out voltage-wise cost of supply taking into account the distribution losses at different voltage levels. As power purchase cost is a major component of tariff, the power purchase cost can be apportioned at different voltage levels taking into account the distribution losses at the relevant voltage level and the upstream system.

The system study to determine voltage wise technical losses is under process and hence voltage wise technical losses are not available at the moment.

In the absence of voltage wise technical losses, the petitioner has considered the technical distribution losses in the distribution network approved by the Hon'ble Commission for 2006-07 in the order on determination of wheeling charges and cross subsidy surcharge for the year 2006-07 dated 19<sup>th</sup> September 2006 to work out voltage wise power purchase cost for 2006-07. For commercial losses, the APTEL judgement has suggested apportionment of difference of total and technical losses i.e. commercial losses across all voltage levels in proportion to the sales plus technical losses at the respective voltage levels. In this manner the total losses have been apportioned at different voltage levels.

The following table gives the details of apportionment of total losses for FY 2006-07

Voltage wise Energy Input for FY 2006-07								
Voltage Level	Sales (MU)	Voltage wise Tech Loss (%)	Transmission Loss	Sales + Tech Loss (MU)	Tech. Losses (MU)	Comm Losses (MU)	Total Loss (MU)	Energy Input (MU)
<b>132 KV</b>	537.01	0%	5.60%	568.86	31.86	101.39	133.25	670.25
<b>33 KV</b>	613.72	3.80%	5.60%	675.81	62.09	120.45	182.54	796.26
<b>11 KV</b>	1,150.73	8.80%	5.60%	1,389.41	238.68	247.64	486.32	1,637.05
<b>LT</b>	5,370.07	16.55%	5.60%	7,769.83	2,399.76	1,384.83	3,784.59	9,154.67
<b>Total</b>	<b>7,671.53</b>			<b>10,403.92</b>	<b>2,732.39</b>	<b>1,854.31</b>	<b>4,586.70</b>	<b>12,258.23</b>

As the sales mix has not changed significantly over the years, results of FY 2006-07 have been used to estimate voltage wise cost of supply for FY17 & FY18. It is important to mention that the Discom has taken a number of steps to reduce AT&C losses at each voltage level. As such in order to arrive at voltage wise input energy, the total loss of FY17& FY18 has been apportioned between the different voltage levels in the same ratio as the voltage wise losses in FY 2006-07. Accordingly input energy has been computed for different voltage levels for FY17 & FY18 and the total power purchase cost has been apportioned between different voltages on the basis of energy input required as shown below:

Voltage Wise Power Purchase Cost per Unit for FY 2016-17					
Voltage Level	Sales (MU)	Total Losses (MU)	Energy Input Required (MU)	Total Power Purchase Cost (Excluding Transmission Cost) (Rs Cr)	Cost per unit sold
	A	B	C = A+B	D	E=D/A*10
<b>132 KV</b>	1227.17	244.33	1471.50	565.53	4.61
<b>33 KV</b>	1402.48	334.72	1737.20	667.64	4.76
<b>11 KV</b>	2629.64	891.77	3521.42	1353.36	5.15
<b>LT</b>	14044.26	6939.86	20984.12	8064.65	5.74
<b>Total</b>	<b>19303.55</b>	<b>8410.69</b>	<b>27714.24</b>	<b>10651.18</b>	<b>5.52</b>

Voltage Wise Power Purchase Cost per Unit for FY 2017-18					
Voltage Level	Sales (MU)	Total Losses (MU)	Energy Input Required (MU)	Total Power Purchase Cost (Excluding Transmission Cost) (Rs Cr)	Cost per unit sold
	A	B	C = A+B	D	E=D/A*10
<b>132 KV</b>	1,198.30	214.54	1,412.84	581.67	4.85
<b>33 KV</b>	1,369.49	293.90	1,663.39	684.82	5.00
<b>11 KV</b>	2,567.79	783.02	3,350.81	1,379.53	5.37
<b>LT</b>	16209.89	6,093.54	22,303.43	9,182.33	5.66
<b>Total</b>	<b>21,345.47</b>	<b>7,385.00</b>	<b>28,730.47</b>	<b>11,828.34</b>	<b>5.54</b>

According to the Hon'ble Tribunal's Judgment, in absence of segregated network costs, all the other costs such as Return on Equity, Interest on loan, Depreciation, interest on working capital and O&M costs can be pooled and apportioned equitably to all categories to determine the cost of supply.

Various elements and computation of network cost per unit has been presented in the table below

Elements	Unit	FY 2017-18	FY 2017-18
O&M Cost	Rs. Cr.	1,520.21	1,658.63
Depreciation	Rs. Cr.	772.69	877.96
Interest and Finance Charges	Rs. Cr.	2,417.43	2,503.46
Interest on Working Capital	Rs. Cr.		
RoE	Rs. Cr.	0.00	0.00
Transmission Cost	Rs. Cr.	1,473.10	1,665.29
Contribution to Contingency Reserve	Rs. Cr.	0.00	0.00
Other Expenses	Rs. Cr.	0.00	0.00
Less: NTI	Rs. Cr.	317.10	332.95
Less: Income from wheeling charges	Rs. Cr.	141.67	223.67
Less: Income from Trading Activity	Rs. Cr.	515.84	970.27
Total Cost	Rs. Cr.	5,208.82	5,178.45
Units Sold	MU	19,303.55	21,345.47
<b>Network Cost per Unit</b>	<b>Rs./kWh</b>	<b>2.70</b>	<b>2.43</b>

Based on the methodology suggested by the Hon'ble Tribunal and details provided above, the voltage wise cost of supply for FY 2016-17 and 2017-18 has been computed and shown in the following tables

Voltage Wise Cost of Supply for FY 2016-17			
Voltage Level	Cost per unit sold	Network Cost per unit of sale	Cost of Supply per Unit
	F	G	H=F+G
<b>132 KV</b>	4.61	2.70	<b>7.31</b>
<b>33 KV</b>	4.76	2.70	<b>7.46</b>
<b>11 KV</b>	5.15	2.70	<b>7.84</b>
<b>LT</b>	5.74	2.70	<b>8.44</b>
<b>Total</b>	<b>5.52</b>	<b>2.70</b>	<b>8.22</b>

Voltage wise Cost of Supply for FY 2017-18			
Voltage Level	Cost per unit sold	Network Cost per unit of sale	Cost of Supply per Unit
	F	G	H=F+G
<b>132 KV</b>	4.85	2.43	<b>7.28</b>
<b>33 KV</b>	5.00	2.43	<b>7.43</b>
<b>11 KV</b>	5.37	2.43	<b>7.80</b>
<b>LT</b>	5.66	2.43	<b>8.09</b>
<b>Total</b>	<b>5.54</b>	<b>2.43</b>	<b>7.97</b>