Discussion paper on determination of tariff for waste to energy plants in the State of Karnataka.

Date: 31.12.2018

Discussion paper

on

"Determination of tariff for waste to energy plants in the State of Karnataka"

1. Bangalore MSW Limited (BMSWL), vide its OP No. 20/2016, had prayed the Commission for fixation of tariff for their MSW plant. The Commission, while disposing of the said Petition decided to fix generic tariff for the Municipal Solid Waste (MSW) based power plants and vide its Order dated 19th September, 2016, determined the tariff at Rs. 7.08 per unit, for the purchase of power by the ESCOMs from the MSW based power plants, for a period of twenty years from the date of their commercial operation.

2. The said Order was effective from 19th September, 2016 and applicable to all the MSW based power plants in the State that got commissioned, during the period from 19th September, 2016 to 31st March, 2018.

3. Meanwhile, Bangalore MSW Ltd who was the applicant in OP No. 20/2016, represented to the Commission, vide its letter dated 16th March, 2018 that, the BBMP is yet to hand over the alternative land required for establishing the project and hence, sought extension of the validity of the Order dated 19th September, 2016 for one year, i.e., up to 31.3.2019.

4. The Commission, noted that after the issue of the Order dated 19th September, 2016, no waste to energy plants have been established in the State, so far. The Commission, also noted that there is no significant change in the parameters considered for fixing the generic tariff vide its
Order dated 19th September, 2016. Hence, the Commission was of the view that no useful purpose would be served in initiating an exercise to determine the tariff of Waste to Energy projects, de novo. In view of the above facts, the Commission, decided to extend the validity of the Generic Tariff Order dated 19th September 2016, relating to Waste to Energy projects in the State, for a further period of one more year from 01.04.2018 up to 31.3.2019 with other contents of the Order remaining un-altered, vide its Order dated 11.04.2018.

5. Since the validity of the said Order dated 11.04.2018 expires on 31.03.2019, there is a need to determine the generic tariff for WTE power plants, that may get commissioned after 31.03.2019. Hence, the Commission decides to issue a Discussion paper to determine the generic tariff for the power generation using Municipal Solid Waste (MSW).

6. **Determination of Tariff:**

Following technical and financial parameters are proposed for determination of Tariff for the Power Plants using MSW:

- **a) Technical Parameters:**
  1. Useful life of the Plant
  2. Plant Load Factor
  3. Auxiliary Consumption

- **b) Financial Parameters:**
  1. Capital Cost
  2. Debt Equily Ratio
  3. O&M Expenses
  4. Depreciation
  5. Interest on Loan
  6. Interest on Working Capital
7. Return on Equity
8. Discount Rate
9. Other Income

i) Useful life of the plant:

In the Order dated 19.09.2016 and 11.04.2018, the Commission has considered the useful life of MSW plant as 20 years.

The Commission proposes to continue the same.

ii) Plant Load Factor (PLF):

The CERC in its Regulations dated 17.04.2017 has considered a PLF of 65% in the first year and 75% for the balance period of useful life and, the Commission also in its Orders dated 19.09.2016 and 11.04.2018 has adopted same.

The TNERC in its Order dated 28.03.2018 has considered 75% as the PLF.

The Commission proposes to continue PLF of 65%, in the first year and 75% for the balance period of useful life as the PLF.

iii) Auxiliary consumption:

Both the CERC in its Regulations dated 17.04.2017 and the TNERC in its Order dated 28.03.2018 have considered 15% Auxiliary Power consumption for MSW power projects. The Commission in its Orders dated 19.09.2016 and 11.04.2018, has allowed 12% as the Auxiliary consumption.

The Commission proposes to continue 12% as the Auxiliary Power consumption.
iv) Capital Cost:
The Commission in its Orders dated 19.09.2016 and 11.04.2018, has allowed capital cost of Rs.17.00 Crores per MW for determining the tariff. The TNERC has considered Rs.16 Crores per MW as capital cost in its Order dated 28.03.2017 and GERC in its Discussion Paper has considered capital cost of Rs. 15.50 Crores, whereas the CERC has decided to adopt project specific capital cost.

Considering the normal development of cost effective technology in the MSW power sector, the Commission proposes to consider Rs.15 Crores per MW as capital cost including the evacuation costs.

v) Debt Equity:
The CERC in its Regulations dated 17.04.2017 has considered 70:30 Debt Equity Ratio for determining generic tariff and the Commission also in its Orders dated 19.09.2016 and 11.04.2018 has allowed 70:30 Debt Equity Ratio for determining generic tariff.

The Commission proposes to continue the Debt Equity Ratio of 70:30.

vi) O & M Expenses:
In the Orders dated 19.09.2016 and 11.04.2018, the Commission has allowed O & M expenses at 6% of the capital cost, escalable at 5.72% annually.

The TNERC in its Order dated 28.03.2017 has allowed O&M expenses at 5.5% of the Capital cost escalable at 5.72% annually.

The Commission considering the current adoption of better and more efficient technology in the power sector proposes to consider O&M expenses at 5.0% of the Capital cost, escalable at 5.72% annually.
vii) Depreciation:

In the Orders dated 19.09.2016 and 11.04.2018 the Commission has allowed depreciation of 5.83% for the first 12 years and 2.50% for the balance period of 8 years.

The Commission proposes to consider the depreciable asset as 90% of the capital cost (excluding land cost). The depreciation is proposed to be worked out on the depreciable asset at a rate of 5.38% for the first 13 years, keeping in view the debt tenure of 13 years. The remaining depreciation would be spread equally over the balance useful life of the projects, with 10% of the depreciable asset as salvage value.

viii) Tenure of Loan Repayment:

In the Orders dated 19.09.2016 and 11.04.2018, the Commission has adopted loan repayment period of 12 years without moratorium.

The Commission proposes to consider the tenure of loans as 13 years as considered for other RE projects.

ix) Interest on Loan:

The Commission decided in the Orders dated 19.09.2016 and 11.04.18, to allow 12% as interest on loan which was 230 basis points more than the prevailing base rate to cover the additional rate that investors of MSW based power projects may have to bear.

The CERC has considered 200 basis points above the average SBI MCLR, one-year tenure, prevalent during the last six months. The TNERC has considered 11% as the interest rate for long term loans.
The Commission notes that, with effect from 22.01.2018, Indian Renewable Energy Development Agency (IREDA) has revised the interest rates, which vary from 10.10% to 11.25% for Co-generation, Hydro and CSP, Energy Efficiency, Energy Conservation & Solar Thermal /Solar PV Off-Grid, Biomass Power and other sector.

Similarly, PFC has revised the rates of interest with effect from 15.06.2018, which varies from 11.40% to 11.90% for State Sector and 11.90% to 13.15% for private sector with rating IR – 1 to IR-5 for RE sources other than Biomass Power Plants. As per the latest data, with effect from 01.05.2018, the MCLR of SBI is ranging between 8.50% to 8.55% for loan tenure varying from one year to three years. Considering 200 bps above MCLR, the maximum interest rate would be 10.55%.

The above trends indicate that the rate of interest on domestic loan for MSW projects would be in the range of 10% to 13.00%.

The Commission therefore proposes to adopt an interest rate of 11.00% per annum and consider the tenure of loans as 13 years.

x) Working Capital and Interest on Working Capital:

The Commission decided in the Orders dated 19.09.2016 and 11.04.18, to consider working capital equivalent to two months’ receivables for MSW based power plants. Considering, the prevailing rate of interest on short-term loans, the Commission allowed interest on such working capital at 12.50% per annum.

The Commission proposes to consider allowing working capital equivalent to two months’ receivables for MSW based power plants and interest on such working capital at 12.5% per annum (i.e. 1.5% above long-term interest rate as considered in previous Order).
xi) Return on Equity:

The Commission in the in the Orders dated 19.09.2016 and 11.04.18 has allowed RoE of 16%.

The CERC Regulations specify RoE of 14% and the TNERC has adopted ROE of 20% Pretax.

**The Commission proposes RoE of 14% as adopted in other generic Tariff Orders for RE sources.**

Income tax, if any, is proposed to be allowed as passed through, but limited to the RoE.

xii) Discount Rate:

The Commission has earlier allowed the cost of debt at 8.40% and Return on equity at 16%. Thereby, the weighted average cost of capital (WACC) worked out to 13.20%

**Accordingly, the Commission based on the proposed parameters, considers a discount factor of 11.9 % for the purpose of computing the levelized tariff.**

xiii) Other Income:

Income from tipping fee and other revenue as per the monthly receipts from Urban local bodies and other sources are proposed to be made passable to ESCOMs.
7. Parameters proposed for the Tariff:

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>PARTICULARS</th>
<th>Existing Parameters as per Commission’s Order dated 19.07.2016 and 11.04.2018</th>
<th>Parameters proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plant Load Factor</td>
<td>65% during first year and 75% for remaining plant life period</td>
<td>65% during first year and 75% for remaining plant life period</td>
</tr>
<tr>
<td>2</td>
<td>Auxiliary consumption for power plant in percentage of total generation</td>
<td>12% for the integrated plant and power plant</td>
<td>12% for the integrated plant and power plant</td>
</tr>
<tr>
<td>3</td>
<td>Useful life of the plant in years from the date of CoD</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Capital cost in Rs. Lakhs per MW</td>
<td>1700.00</td>
<td>1500.00</td>
</tr>
<tr>
<td>5</td>
<td>Debt Equity ratio</td>
<td>70:30</td>
<td>70:30</td>
</tr>
<tr>
<td>6</td>
<td>Loan repayment tenure in years</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>Interest on loan in percentage per annum</td>
<td>12%</td>
<td>11%</td>
</tr>
<tr>
<td>8</td>
<td>Working capital</td>
<td>Equivalent to 2 months receivables</td>
<td>Equivalent to 2 months’ receivables</td>
</tr>
<tr>
<td>9</td>
<td>Interest on working capital in percentage per annum</td>
<td>12.50%</td>
<td>12.50%</td>
</tr>
</tbody>
</table>
Discussion paper on determination of tariff for waste to energy plants in the State of Karnataka.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>O &amp; M expenses</td>
<td>5% of the capital cost escalated at 5.72% per annum</td>
<td>5% of the capital cost escalated at 5.72% per annum</td>
</tr>
<tr>
<td>11</td>
<td>Depreciation</td>
<td>5.83% p.a. for first 12 years and 2.50% for the balance period of 8 years</td>
<td>5.83% p.a. for first 13 years and remaining depreciation spread equally over balance years of the plant’s useful life</td>
</tr>
<tr>
<td>12</td>
<td>Return on Equity</td>
<td>16% per annum</td>
<td>14% per annum</td>
</tr>
<tr>
<td>13</td>
<td>Discount rate in percentage</td>
<td>13.20%</td>
<td>11.90%</td>
</tr>
<tr>
<td>14</td>
<td>Other Income</td>
<td>Income from tipping fee and other revenue as per the monthly receipts from BBMP and other Urban local bodies and other sources passable to the ESCOMs.</td>
<td>Income from tipping fee and other revenue as per the monthly receipts from BBMP and other Urban local bodies and other sources passable to the ESCOMs.</td>
</tr>
</tbody>
</table>

Based on the above parameters, in respect of MSW power plants the Commission proposes to consider a levelised tariff of Rs.5.65 per unit for a period of 20 years from the date of their commercial operation.

The Suggestions/Comments/Views by the stakeholders/interested persons shall be sent to the Secretary, KERC, No 16 C-1, Miller Tank Bed Area, Vasanthanagar, Bengaluru-52 or by email kerc-ko@nic.in on or before 28.01.2019.

Secretary
KERC