

GUJARAT ELECTRICITY REGULATORY COMMISSION

Gandhinagar

Order No.4 of 2016

In the matter of: Determination of Tariff and other terms & conditions for Procurement of Power by Distribution Licensees from Municipal Solid Waste to Energy Projects in the State of Gujarat.

In exercise of the power conferred under the Sections 3(1), 61(h), 62(1)(a), and 86(1)(e) of the Electricity Act 2003, guidelines of the National Electricity Policy-2005, Tariff Policy-2016 and all other powers enabling it in this behalf, the Gujarat Electricity Regulatory Commission (hereinafter referred as the "Commission") determines generic tariff and other terms and conditions for procurement of power by Distribution Licensees from Municipal Solid Waste to energy projects.

This generic tariff order on Municipal Solid Waste to Energy projects is the culmination of an elaborate consultative process after considering the suggestion received from all the stakeholders.

1. Background

Due to rapid development and urbanization, the problem of disposal of Municipal Solid Waste (MSW) has assumed alarming proportion. This is creating pressure on the environment, human health and also management of MSW. The sources of MSW are primarily classified into residential, institutional and commercial waste. The characteristics and composition of MSW depends on the topography of the area, season, food habits and commercialization of the city. In order to monitor and control the environmental and health hazards, there is a need to have a proper waste management and disposal system.

It is pertinent to note that Hon'ble Supreme Court of India had given a judgment in Public Interest Litigation (PIL) filed by Almitra H.Patel in special leave petition No. 888 of 1996 that the Govt. of India and all the State Governments including several municipal authorities failed to discharge their obligatory duties to manage municipal solid waste appropriately. Hon'ble Supreme Court set up an expert committee which deliberated on the issue and submitted their report and recommendations. Considering these recommendations, Hon'ble Supreme Court directed the Government to frame the rules in this regard. To ensure compliance of the directives of Hon'ble Supreme Court, Municipal Solid Waste (Management and Handling) Rules,

2000 were notified by Ministry of Environment and Forest in September 2000. There are seven directives which includes the following two major directives;

- (i) Treatment of bio-degradable waste using composting or waste to energy technology meeting the standards laid down.
- (ii) Minimize the waste going to the landfill and dispose of only rejects from the treatment plants and inert material at the landfills as per the standards laid down in the rules.

The Municipal Solid Waste (Management and Handling) Rules, 2000 have subsequently been amended by notification of the Solid Waste Management Rules, 2016 by the Central Government.

The State Government has also notified the Waste to Energy Policy, 2016 for conversion of Municipal Solid Waste into energy which is to be purchased by the nodal agency namely GUVNL at a tariff to be decided by the Gujarat Electricity Regulatory Commission.

The Commission, constituted under the Electricity Act, 2003 is mandated to promote the environmental benign policy as provided in the preamble of the Act and also mandated to promote the renewable energy based consumption in the State.

In view of these, it is incumbent upon the Commission to decide the generic tariff for waste to energy projects. Accordingly, the Commission issued a discussion paper on 9th September, 2016 inviting comments and suggestions from the stakeholders. A public hearing in this regard was held on 13 October, 2016.

1.1 Potential for Waste to Energy in Gujarat

The Central Pollution Control Board (CPCB), in its Annual Report for FY 2013-14 published in February 2015, highlighted that around 9227 TPD of waste is generated in the State out of which 1354 TPD waste is treated.

The National Master Plan for Development of Waste to Energy projects prepared by MNRE and the Gujarat Waste to Energy Policy – 2016 notified by the Govt. of Gujarat, has reported the potential for waste to energy projects in the state equal to 104 MW and 100 MW respectively. The Gujarat Waste to Energy Policy-2016 recognizes that utilization of MSW for generation of electricity could increase the waste collection efficiency and help in more environmental friendly disposal of MSW.

1.2 Government of Gujarat Waste to Energy Policy 2016

Government of Gujarat has notified the 'Waste to Energy Policy 2016' on 28 March, 2016. Salient features of the policy are given below;

- The operative period of this policy is five years from the date of notification of the policy.
- Projects based on generation of energy from MSW that are commissioned during the operative period shall become eligible for the benefits and incentives declared under this Policy for a period of 25 years from their date of commercial operation or for the life span of such projects, whichever is less.
- Any individual, company or corporate body or association or body of individuals, Urban Local Bodies / Urban Development Authorities whether incorporated or not, or artificial judicial person will be eligible for setting up the projects for the purpose of self-consumption (captive use) or sale to obligated entities i.e. distribution licensees or to any other third party, including Urban Local Bodies / Urban Development Authorities.
- The developer may select suitable site in proximity to the landfill sites or any other suitable land in consultation with the concerned authorities like Urban Development and Urban Housing Department, Gujarat Urban Development Company, Municipal Corporations, Urban Development Authorities, Municipalities etc. For this purpose, concerned authorities shall provide land at a token lease rent of Rs. one (1) per annum for setting up the power project.
- The developer may prepare and submit the Pre-feasibility reports / Detailed Project Report (DPR) to concerned Urban Body for its techno-commercial appraisals / approvals. Alternatively, UDD / ULB may have the DPR prepared for a particular MSW power project. Based on such DPR, UDD / ULB may have Request for Proposal (RFP) prepared for the purpose of inviting competitive bids for selection of developer by following relevant provisions of Gujarat Infrastructure Development (GID) Act, 1999.
- ULBs shall provide MSW to the power plant developer at power plant site without charging any cost.
- For determination of tariff in respect of such projects, GERC shall fix a generic tariff for Waste to Energy projects in the state. While fixing such tariff, GERC will take into account the fact that the land will be made available to the project developer at token lease rent of Rs. one (1) per annum and MSW to be used as fuel shall be delivered by the ULB / concerned authority free of cost at the project site.
- Based on the generic tariff fixed by GERC, competitive bids shall be invited by UDD / ULBs for Viability Gap Funding (VGF) to be quoted by the bidders per unit of electricity (kWh) to be supplied to the buyer. The basis of selection shall be the lowest VGF per

kWh. The VGF subsidy shall be paid to the developer within 30 days from the date of receipt of monthly invoice. Provided that if any subsidy / VGF / financial support in any form is sanctioned by UDD or ULB to Waste to Energy project after determination of project specific tariff by the GERC, the project developer shall file revised petition to GERC for redetermination of tariff taking into account such financial benefits. Further that the VGF related clauses shall not be applicable for projects which are already awarded to developers by UDD / ULB based on competitive bids before notification of this policy.

- The project developer may use power for self-consumption or sell power to third party or to obligated entities for meeting their RPO.
- In case of sale to Distribution Licensees as obligated entities, the project developer shall sell power to the Government Nominated Agency (namely, Gujarat Urja Vikas Nigam Limited) on long term basis. The Nominated Agency shall purchase power either at the rate determined by GERC or at the rate determined through competitive bidding process. The costs and the renewable attributes of the power purchased by Nominated Agency shall be apportioned to all Distribution Licensees (including private distribution licensees) in the State in proportion to their power consumption of previous year. Detailed procedure for implementation of proportionate apportionment of power shall be as follows:
 - a. The Long Term Power Purchase Agreement shall be executed by Government Nominated Agency, namely, Gujarat Urja Vikas Nigam Limited (GUVNL). The project developer shall deal with GUVNL and payment towards bill shall be settled by GUVNL.
 - b. The electrical component of power shall be utilized by local distribution company where the MSW based plant is located. Such power shall be charged to local Distribution Company at Average Power Purchase Pooled Cost (APPC) of GUVNL for the year of commissioning of the MSW based power project. APPC means power purchased at generator bus excluding renewable power purchase, transmission cost and power purchased for sale other than consumers.
 - c. The difference between the power purchase rate (either at the rate determined by GERC or at the rate determined through competitive bidding process) from MSW power project as mentioned in the PPA and APPC charged to Local Distribution Company shall be considered as cost of Renewable Attribute. On payment of this cost, the Distribution Company shall be eligible for allotment of equivalent number of units of Renewable Attribute.
 - d. On monthly basis such Renewable Attribute units and their cost shall be apportioned by nominated agency to all Distribution Companies (including Private Distribution Licensees, Distribution Licensees/Deemed Distribution Licensees supplying power in SEZs area etc.) in proportion to their power consumption of previous year. GUVNL

- will raise two separate bills to Distribution Companies (i) for supply of electrical component of power as mentioned at point – b above, & (ii) for renewable attributes as mentioned in point-c above. Distribution Companies are required to make payment to GUVNL within 7 days from issuance of bill failing which distribution company shall be liable to pay delayed payment charges as per the terms of Power Purchase Agreement.
- e. So apportioned Renewable Attribute units shall be considered for meeting RPO for the respective distribution company.
 - f. Transmission charges and losses, wheeling charges and losses shall be borne by the concerned local distribution company which uses the electrical component.
- For entering into PPA with obligated entities (entities obligated to fulfill the RPO as prescribed by GERC from time to time), the Developer of Power Projects based on MSW shall be required to provide a Bank Guarantee of Rs. 5 lakhs per MW or part thereof. The bank guarantee shall be refunded, if the developer achieves commercial operation within time period mentioned in Power Purchase Agreement. In case Developers fails to achieve commercial operation as specified in the PPA, the bank guarantee shall be forfeited.
 - Gujarat Energy Development Agency (GEDA) shall be the nodal agency for implementation of the policy for Waste to Energy projects utilizing MSW. The nodal agency will facilitate and assist the project developers to undertake the activities like registration, responding to the queries and problems of developers etc.
 - CEA (Technical Standards for Connectivity to the Grid) Amendment Regulations, 2013 and provisions of Grid Code shall be binding to the Project Developers. Interconnection voltage shall be governed by Gujarat Electricity Grid Code-2013 and GERC orders.
 - The evacuation facility shall be approved by GETCO / DISCOM after conducting the system studies. The developer shall establish the dedicated transmission lines for evacuation of power up to the nearest GETCO sub-station/ DISCOM network at their own cost. Electricity generated from such projects shall be metered on 15-minute time block at the receiving end of GETCO – STU sub-station / 11 kV system of distribution licensee as the case may be. ABT compliant meter shall be installed at interface points.
 - For entering the PPA, the developer shall be required to furnish a bank guarantee of Rs 5 lakh per MW or part thereof.
 - The open access charges have been specified in the policy.
 - Electricity generated from MSW to Energy projects is exempted from payment of Electricity Duty in case of captive and third party sale. Exemption is given from demand cut to the extent of 50% of installed capacity of MSW to Energy project in case of captive and third party sale within the state.

- The MSW to Energy projects shall give their forecast and schedule for day to day operation.

1.3 GERC Multi-Year Tariff Regulations, 2016

The Commission has notified GERC (Multi-Year Tariff) Regulations, 2016 on 29 March, 2016, which is applicable for determination of tariff for all existing and future Generating Companies, Transmission Licensees, Distribution Licensees, and their successors, if any. It is through the framework of these Regulations, the Commission determines tariffs for various cases including supply of electricity by a Generating Company to a Distribution licensee, intra-state transmission of electricity, intra-state wheeling of electricity, retail supply of electricity, etc. The objectives of MYT Regulations are:

- Provide regulatory certainty to the utilities, investors and consumers.
- Address the risk sharing mechanism between utilities and consumers based on controllable and uncontrollable factors.
- Ensure financial viability of the sector to attract investment, ensure growth and safeguard the interest of the consumers.
- Review operational norms for generation, transmission, distribution and supply.
- Promote operational efficiency and through its improvement in long term, rationalize tariffs.

The Commission within the framework of these regulations and the broad principles outlined in the Tariff Policy of Central Government has determined the tariff for procurement of power by distribution licensees and others from MSW to energy projects in the state.

1.4 Renewable Purchase Obligation (RPO) in Gujarat

The Commission has amended the Principal GERC (Procurement of Energy from Renewable Sources) Regulations, 2010 on 4 March, 2014 as GERC (Procurement of Energy from Renewable Sources) (First Amendment) Regulations, 2014 (Notification No. 2 of 2014) and specified the RE technology specific RPO targets for FY 2013-14 to FY 2016-17. The Regulations specify the RPO target of 0.5% out of total 10% for the obligated entities to be met from procurement of energy generated from other renewable energy sources which includes the energy generated from MSW projects during FY 2016-17. The Regulations recognise the certificates issued within the scope of Central Electricity Regulatory Commission's (CERC) Notification No. L-1/12/2010-CERC

dated 14 January, 2010 as the valid instruments for discharge of the mandatory obligations set out in these Regulations for the obligated entities to purchase electricity from renewable energy sources termed as Renewable Energy Certificates (REC). The RPO targets specified under these Regulations are applicable to distribution licensees and any other captive and open-access users consuming electricity (i) generated from conventional captive generating plant having capacity of 5 MW and above for their own use and/or (ii) procured from conventional generation through open access and third-party sale.

1.5 GERC Discussion Paper on Determination of Tariff for Municipal Solid Waste to Energy Projects

The Commission issued a discussion paper on “Determination of Tariff for Procurement of Power by Distribution Licensees and Others from Municipal Solid Waste to Energy Projects in the State of Gujarat” during the control period starting from date of issue of the tariff order on the subject. The discussion paper was placed on the website of the Commission on 09 September, 2016 for inviting comments and suggestions from the stakeholders. The list of stakeholders who have filed written objections and suggestions is provided as Annexure-I of this order.

1.6 Public Hearing

A public hearing was held on 13 October, 2016 at the office of the Commission to hear the stakeholders’ views/suggestions/objections on the discussion paper. The list of those who participated in the hearing and made oral submission during the hearing is provided as Annexure-II of this order.

2. Determination of Tariff for Procurement of Power by Distribution Licensees from Municipal Solid Waste to Energy Projects

2.1 Tariff Determination Methodology

The Commission has determined the MSW to Energy tariff based on the broad principles contained in the (i) GERC (Multi-Year Tariff) Regulations, 2016, (ii) GERC (Procurement of Energy from Renewable Sources) Regulations, 2010, GERC (Procurement of Energy from Renewable Sources) (First Amendment) Regulations, 2014 and (iii) CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012.

2.2 Tariff Determination Approach

The Tariff Policy dated 28 January 2016, notified by the Central Government in pursuance of the Section 3 of the Electricity Act 2003 has stipulated that the Appropriate Commission may determine tariff for procurement of power by the distribution licensees from waste to energy plants under Section 62 of the Act. The relevant extract of para 6.4 of the Tariff Policy is given below.

“.....(2) States shall endeavor to procure power from renewable energy sources through competitive bidding to keep the tariff low, except from the waste to energy plants. Procurement of power by Distribution Licensee from renewable energy sources from projects above the notified capacity, shall be done through competitive bidding process, from the date to be notified by the Central Government.

However, till such notification, any such procurement of power from renewable energy sources projects, may be done under Section 62 of the Electricity Act, 2003. While determining the tariff from such sources, the Appropriate Commission shall take into account the solar radiation and wind intensity which may differ from area to area to ensure that the benefits are passed on to the consumers.

(3) The Central Commission should lay down guidelines for pricing intermittent power, especially from renewable energy sources, where such procurement is not through competitive bidding. The tariff stipulated by CERC shall act as a ceiling for that category.”

In view of above provision given in the Tariff Policy, 2016, and the Gujarat Waste to Energy Policy 2016, the Commission determines the tariff for MSW to Energy projects on cost-plus basis under Section 62 of EA, 2003. While determining the tariff for MSW to Energy projects, the Commission has recognized the benefit of such projects in terms of utilizing the Municipal Solid Waste which otherwise would create negative externalities to environment and human life as well as put considerable stress on the precious land resource.

2.3 Tariff Structure and Design

The Commission in the discussion paper proposed a generic ‘single part ‘ levellized tariff with fixed component for municipal solid waste to energy projects utilizing non processed waste such as in case of mass incineration /direct incineration type projects. Whereas, a single part tariff including fixed and variable components was proposed for municipal solid waste projects based on processed waste such as Refused Derived Fuel (RDF). A project specific tariff on case

to case basis was proposed for Municipal Solid Waste to Energy project based on biomethanation and gasification based technology.

Suggestions of the Objectors

Essel Infra Projects Ltd. submitted that waste to energy projects are in nascent stage of development and therefore instead of generic tariff, project specific norms on individual project basis should be considered.

Commission's Decision

The Commission has noted that word wide sufficient number of Municipal Solid Waste to Energy projects are in operation. The Central Electricity Regulatory Commission (CERC) has specified norms for generic tariff determination for incineration and RDF based municipal solid waste to energy projects. State Electricity Regulatory Commissions of few other states have also specified generic tariff for municipal solid waste to energy projects. Moreover, Gujarat Waste to Energy Policy, 2016 also envisages determination of generic tariff by the Commission.

In view of above, the Commission determines generic tariff for the municipal solid waste to energy project based on mass incineration technology as well as RDF technology for a period of 20 years.

2.4 Computation of Tariff

2.4.1 General Principles

a. Control Period

The Commission in the discussion paper has proposed the control period from date of issue of order to 31 March, 2019.

Suggestions of the Objectors

No suggestions were received from the stakeholders on the control period.

Commission's Decision

The Commission decides to retain the control period as proposed in the discussion paper i.e. from the date of issue of this order to 31 March,.2019.

b. Useful Life of Plant and Tariff Period

The Commission in the discussion paper has proposed useful life and tariff period equal to 20 years for the MSW to energy projects to be commissioned during the control period starting from date of issue of the order.

Suggestions of the Objectors

Abellon Clean Energy Ltd submitted that useful plant life could be 18-20 years or life could be shorter also considering the corrosive nature of MSW and higher ash/inert content. There is no long term operational reference for India yet.

One of the objectors submitted to consider the useful life of plant of at least 25 years considering the higher capital cost allowed and higher O & M expenses granted to such plant. Further, the Commission has considered life of project as 25 years in its two orders for MSW based project.

Commission's Decision

The Commission in its earlier orders on MSW to energy projects, based on RDF incineration and mass incineration technology, has considered the project life as 20-25 years. The Central Electricity Regulatory Commission in CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) (Fourth Amendment) Regulations, 2015 has considered useful life of 20 years for determination of generic tariff for MSW and RDF projects for FY 2015-16.

The MSW is heterogeneous in nature and produces highly corrosive flue gases which affects the life of the plant. Moreover, there is no plant in the country which has successfully completed the life of 20 years or more, however, we note that there are few plants set up in the country which are operating at either partial capacity or they are not operating at present due to various reasons. In view of this it cannot be concluded that the life of such project is 25 years.

Considering the above reasons, the Commission decides to consider the useful life of plant as 20 years for tariff determination purpose.

c. Eligibility Criteria

The Commission in its discussion paper has specified that the municipal solid waste to energy project based on rankine cycle technology, utilizing municipal solid waste and refused derived fuels as fuel, using new plant and machinery and commissioned after the issue of this tariff order will be eligible to sell power to distribution licensees of Gujarat at tariff determined by the Commission under the tariff order during the control period. The MSW to Energy projects to be set up in the cities having 500 TPD or more waste generation, shall establish MSW to

Energy projects based on mass incineration technology. The projects to be commissioned during the control period should meet the norms as specified in the Solid Waste Management Rules, 2016.

Suggestions of the Objectors

Abellon Clean Energy Ltd has requested the Commission to remove the minimum capacity requirement of 500 TPD or more waste generation and leave it to the market dynamics for capacity selection to enable potential solutions for incineration/combustion based waste to energy projects. JITF Urban Infrastructure Limited submitted that the SWM Rules, 2016 provide that RDF based technology may be deployed for generation of electricity for MSW based project. The mass incineration/combustion technology based project are not allowed by SWM Rules, 2016.

Commission's Decision

The Commission has noted that the municipal solid waste to energy projects can be set up by adopting a cluster approach wherein, waste /RDF can be collected from adjoining towns /areas to the plant location. The Commission has taken note of the request and has decided to remove the limiting criteria of 500 TPD or more to establish MSW to Energy projects.

As regards the suggestions of JITF Urban Infrastructure Limited that the SWM Rules, 2016 provide that only RDF based technology may be deployed for generation of electricity for MSW based project, we note that the other developers did not agree to this contention and categorically mentioned that there is no such restriction provided in the said Rules. As per the practice followed by CERC and other SERCs, we decide that the project of mass incineration/combustion technology based project or RDF based project are qualified for the generic tariff if they meet environmental norms as prescribed by statutory bodies.

d. Scheduling of Power and applicability of Intra-State ABT

The Commission in the discussion paper proposed that the MSW to Energy projects shall be governed by provisions of Intra-state ABT Orders of the Commission and such projects need to schedule power.

Suggestions of the Objectors

Smart Utilities Pvt. Ltd. requested the Commission not to make compulsion of giving and maintaining schedule for MSW to energy projects.

JITF Urban Infrastructure Ltd submitted that waste to energy plants should be kept out of purview of scheduling procedure and respective UI implication for any deviation until and unless power is sold to any third party under open access, since the characteristics/ composition /GCV of MSW fuel vary widely and thus it is uncertain to predict power generation possibility precisely.

Commission's Decision

The Commission is of the opinion that the generation from MSW to energy projects is predictable and hence, can be scheduled in accordance with the intra-state ABT guidelines. Gujarat Waste to Energy Policy 2016 also specified that the projects based on MSW shall give their forecast and schedule for day to day operation. The Commission also noted that the sector is new and the state has no operational experience of MSW to energy plants. The Commission decides to relax the provisions of intra state ABT orders for the MSW to energy projects commissioned during the control period of this order. The MSW to energy project developer should forecast their generation to the load despatcher as per the standard provision under the intra-state ABT orders of the Commission, however there will be no commercial impact in case of deviation from the scheduled power for a period of one year from the date of the commissioning of the project. Thereafter, the commercial implications of ABT order shall be applicable to such projects.

e. Applicability of merit order dispatch principle

The MSW to energy projects irrespective of the plant capacity shall be treated as 'MUST RUN' power plants and shall not be subjected to merit order despatch principles.

Suggestions of the Objectors

No suggestions were received from the stakeholders on the applicability of Merit Order Despatch specified in the discussion paper.

Commission's Decision

Like other RE technologies the MSW to energy projects are provided with MUST RUN status and exempted from the principle of Merit Order Despatch. However, the project operator should follow the instructions of the grid operator in view of overall security of the grid.

f. Interconnection point and Metering point

In the discussion paper it was proposed that the interconnection point will be at the nearest GETCO sub-station/11 kV system of distribution licensee, as the case may be and the metering point will be at the line isolator on outgoing feeder on HV side of generator transformer.

Suggestions of the Objectors

GUVNL in their submission requested the Commission to consider metering of energy generation at the receiving end of GETCO-STU sub-station / 11 KV system of Distribution Licensee as the case may be as provided in the Gujarat Waste to Energy Policy, 2016.

Commission's Decision

The Commission accepted the submission of GUVNL and decides that the interconnection and metering point will be at the nearest GETCO sub-station/ system of distribution licensee, as the case may be.

2.4.2 Operational and Financial Parameters

The following operational and financial parameters have been considered while determining tariff for MSW to energy projects under the cost-plus approach;

- a. Capital cost
- b. Operations & Maintenance Charges
- c. Plant Load Factor (PLF)
- d. Auxiliary Consumption
- e. Station Heat Rate
- f. Gross Calorific Value (GCV) (in case of RDF based project)
- g. Cost of Fuel
- h. Debt-Equity Ratio
- i. Loan Tenure and Rate of Interest on Term Loan
- j. Depreciation

- k. Working Capital and Interest on Working Capital
- l. Return on Equity
- m. Discount Rate
- n. MAT and Corporate Tax (Income Tax)

a. Capital Cost

In order to arrive at benchmark capital cost for the MSW to energy projects to be commissioned during the control period, the Commission has analyzed the capital cost data of the projects commissioned in the State of Gujarat, approach followed by the CERC and other SERCs under their tariff Regulations and tariff orders. The Commission has noted the recommendation provided in the 'Report of the Task Force on Waste to Energy', 2014 by the Planning Commission.

The Commission has noticed that the capital cost for MSW to energy projects primarily depends on the process / technology adopted for conversion of waste to energy. The Commission noted that most of the projects commissioned and under pipeline in the country for which the concession agreements are signed between the developers and Urban Local Bodies are either based on mass incineration technology or RDF based incineration technology. The capital cost of MSW to energy projects based on incineration technology generally varies in the range Rs. 7 Cr/MW to Rs. 18 Cr/MW depending on whether RDF or MSW is used as fuel. Due to limited experience of MSW to energy projects based on biomethanation and gasification process/technology, the Commission decided not to specify the generic tariff for such projects. In case any developer approaches the Commission for determination of tariff for MSW to energy project based on biomethanation /gasification process, the Commission will determine the 'project specific tariff' after scrutiny of the techno-economic aspects and cost parameters of such projects. With regard to MSW to energy projects based on Incineration technology, the Commission in its discussion paper proposed following capital cost benchmark for determination of generic tariff for the control period.

- Mass Incineration technology – Rs. 15.5 Cr/MW
- RDF based Incineration – Rs. 8.5 Cr/MW

Suggestions of the Objectors

JITF Urban Infrastructure Ltd submitted that capital cost nothing less than Rs 10 Crore/MW would be appropriate for RDF based power generating stations considering the stringent

emission standards of waste to energy power plants need additional capital investment on pollution control measures like installation of sophisticated flue gas cleaning system. It is also stated that they have been allocated project under competitive bidding by AMC. In the bid they agreed not to claim any VGF. Therefore, no VGF support is available to them.

Essel Infra Projects Limited submitted that they have been declared as successful bidder and issued Letter of Intent by AMC to set up MSW based project. The bid submitted by them was on the basis that the tariff determination by CERC or GERC in Surat project will make the project viable. Thus, the tariff quoted in bid was Rs. 7.35/kWh.

Utility Users Welfare Association submitted that capital cost considered for incineration based projects is exorbitantly high and is about 3 to 4 times higher than similar conventional plants of biomass, bagasse or coal and therefore the cost of MSW to energy plants requires to be reduced to the tune of Rs.7 to 8 Cr/MW.

Abellon Clean Energy Ltd submitted to revise the benchmark capital cost to Rs. 16.5 Cr/MW and Rs. 10-10.5 Cr/MW for MSW and RDF based projects respectively considering the stringent emission standards in SWM Rules, 2016 and its inevitable impact on CAPEX. Further, erection of dedicated transmission lines by developer upto nearest GETCO sub-station may not be feasible. The Hon'ble Commission may direct GETCO/DISCOM/transmission licensee to provide LILO connection to existing available line and cost of overhead transmission line/LILO line upto 2 Kms should be kept in the scope of developer and any requirement beyond 2 Kms in the scope of GETCO/DISCOM/transmission licensee.

Dynagreen Environmental Protection Group Co. Ltd submitted that project cost of Rs. 150 Million/MW considered is too low and it is not enough to establish an environmentally friendly plant. Considering past experience, project cost should be around Rs. 450 Million / MW.

GUVNL in its submission requested to the Commission to fix the generic tariff at a minimum level based on least capital cost as the project developer can meet the differential cost and expenses in terms of VGF / Financial Assistance from UDD.

Another objector requested the Commission to consider the norms individually for Plant & Machinery, Civil construction cost, cost of scientific landfill sites, evacuation infrastructure, soft costs, etc. and fix a capital cost at Rs. 1950- 2300 Lakh/MW in case of generic tariff.

Commission's Decision

The Commission has noted the submissions made by the stakeholders regarding the capital cost of MSW to energy project. Worldwide four technologies are commonly used for conversion of

MSW to energy in MW scale, viz., Biomethanation, Gasification, Mass Incineration and Refused Derived Fuel based incineration technology. The main cost components of MSW to energy project can be broadly grouped into six important categories i.e. (i) plant and machinery (including pre-processing equipment), (ii) land cost (iii) civil works, (iv) evacuation infrastructure and (v) associated miscellaneous expenses and (vi) cost towards restricting the emissions from the plant within the permissible limits specified in the Solid Waste Management Rules, 2016 (in case of incineration technology).

In order to arrive at benchmark capital cost for the MSW to energy projects to be commissioned in the control period, the Commission has examined the MSW to energy project capital cost data of the projects commissioned in Gujarat. Under the regulatory approach, the Commission has studied the approach followed by CERC and other SERCs while fixing benchmark capital cost for MSW to energy projects under their recent regulations/tariff orders. The recommendations provided in the 'Report of the Task Force on Waste to Energy', 2014 by Planning Commission had also been referred. The Commission has also noted the provisions under the Gujarat Waste to Energy Policy, 2016 which provides that land for the project will be provided to the project developer at a token lease rent of Rs. 1 per annum for 25 years by the concerned authorities. Further, Urban local body shall not charge any tax, cess, royalty, levies or any other charges such as stamp duty, land allotment charges etc. on MSW to Energy projects. Stamp duty payable to government, if any, on the lease/development agreement will have to be borne by the ULB concerned. Moreover, a provision of VGF and the criteria for selection of developers for setting up MSW to energy projects has been specified in the Policy.

In view of the above considerations, the Commission decides to adopt capital cost for MSW to energy using mass incineration technology and RDF based MSW to energy projects which have to confirm that the technology deployed for the project complies with the SWM Rules 2016. The aforesaid compliance shall be substantiated by the project developer with a certificate of OEM of the project stating that the technology/equipment provided for the project comply with the environmental norms as stipulated under SWM Rules, 2016 specified under Environmental Protection Act, 1986. Following benchmark price of the project during the control period is decided in this order. :

Technology	Mass Incineration Technology	RDF based Incineration
Capital Cost (Rs Crore/MW)	16.00	9.00

The developers of MSW to energy projects shall be responsible to construct the power evacuation line up to the interconnection point.

The Commission further decides that if the project developer receives any benefit of capital subsidy or any capital financial assistance towards the cost of project, in such case either purchaser of energy or the project developer or UDD/ULB/Municipal Corporation shall approach the Commission for re-determination of tariff so as to pass on the benefit to the consumers.

b. Operations & Maintenance Charges

In the discussion paper, for MSW projects using mass incineration technology, the Commission had proposed, O&M charges equivalent to 7% of capital cost with an annual escalation of 5.72% every year from second year onwards.; whereas for MSW projects based on RDF technology, the O&M charges were proposed at 5% of the capital cost with an annual escalation of 5.72% per annum.

Suggestions of the Objectors

JITF Urban Infrastructure Ltd submitted that the Commission may consider near to 6.5% of the capital cost for RDF based technologies, due to higher maintenance and consumables required for operation and maintenance. Utility Users Welfare Association submitted that O&M cost should be reduced to 3 % so that the overall levelized tariff will be reduced.

Abellon Clean Energy Ltd submitted to revise O&M cost to 7% of capital cost for RDF based projects with escalation of 5.72% per annum in order to comply with the environmental standards and emission control limits specified in the SWM Rules 2016. Abellon Clean Energy Ltd submitted that in order to comply the provisions of SWM Rules 2016, they have to incur more expenses on account of consumables, wear and tear of the emission control equipments, etc. GUVNL in its submission requested the Commission to restrict O&M cost at the most at 6% of capital cost in line with O&M cost allowed by Hon'ble CERC.

Another objector requested the Commission to consider O&M costs (including emission control cost) at 8% of capital cost with 5.72% escalation per annum for Waste-to-Energy projects.

Commission's Decision

The Commission observed that Operations and Maintenance (O&M) cost consists of the statutory charges, spares, employee cost, administrative and general expense, consumables, repairs and maintenance and insurance expenses, etc. The Commission has noted the O&M expenses considered by the CERC and other SERCs in their tariff orders /regulations on MSW to energy projects. The Commission also noted the submission of the stakeholders regarding environmental standard and emission control requirements specified under Solid Waste

Management Rules, 2016 and its impact on O&M cost. The Commission has noted that the CERC in its generic MSW to Energy tariff order for FY 2015-16 has considered 6% of capital cost as operation and maintenance expenditure in the first year with an annual escalation at the rate of 5.72% per annum. Considering the heterogeneous nature of MSW and the process involved in conversion of MSW to energy as well as emission control norms specified in SWM Rules 2016, the Commission decides to fix the O&M cost equal to 6% and 5% of capital cost in case of mass incineration and RDF based MSW to energy projects respectively. Further, as per provisions under GERC (MYT) Regulation 2016, the commission decides to fix the annual O&M cost escalation @ of 5.72% per annum for both mass incineration and RDF based MSW to energy projects.

c. Plant Load Factor (PLF)

In the Discussion paper, the Commission has considered PLF of 65% during first year of operation including stabilization period and 75% during subsequent year of operation for MSW to energy projects using mass incineration technology, whereas, for RDF based MSW to Energy projects, the Commission proposed the PLF of 65% during the first year of operation including stabilization period and 80% from second year onwards.

Suggestions of the Objectors

JITF Urban Infrastructure Ltd submitted that since mass incineration is not allowed as per Solid Waste Management Rules 2016, PLF proposed for mass incineration may be suitable. Utility Users Welfare Association submitted that PLF should be considered as 85 % citing similar projects, where tariff is already determined by the Commission.

Abellon Clean Energy Ltd submitted that the Commission may consider 60% PLF for the first year and 75% PLF from second year onwards for MSW and RDF based projects. GUVNL in its submission requested the Commission to consider PLF of 65% for first year and 85% from second year onwards for both type of Waste-to-Energy Projects i.e. based on mass incineration as well as RDF.

Commission's Decision

The Commission noted that the MSW for the power project is to be supplied by the ULB/UDD free of cost at the site of the project as stated in the Gujarat Waste to Energy Policy 2016. Thus, the requisite quantum of MSW and quality of MSW which is important factor for the PLF of the plant is dependent on the MSW provided by these authorities. The Commission observed that PLF in case of MSW to energy project is dependent on factors like availability of MSW, number

of operating hours, moisture content in the municipal solid waste etc. Variation in supply and quality of MSW at project site affects the plant load factor of the project. The quality of MSW varies from season to season. It also depends on geographical area from where the MSW is collected and supplied at the project. Moreover, the project needs some stabilization period till there is certainty about the quality and quantum of the MSW during first year of operation of the plant.

The CERC in its amendment to RE Tariff regulation 2012 has considered 65% PLF for a MSW to energy plant during stabilization period and during the remaining period of first year after stabilization. However, from 2nd year onwards, CERC has specified PLF of 75% for MSW to energy projects based on mass incineration technology and 80% for the projects based on RDF. The Commission has also examined the PLF considered by other SERCs in their MSW to energy Tariff orders/Regulations.

In view of the above, the Commission decides the PLF for MSW to energy projects using mass incineration technology as 65% during first year of commissioning and 75% thereafter during its life period, whereas, for RDF based MSW to Energy projects, the Commission decides the PLF as 65% during the first year and 80% from second year onwards.

d. Auxiliary Consumption

The Commission in the discussion paper proposed auxiliary consumption at 12% of gross generation for RDF based MSW projects and 16% of gross generation for MSW projects based on mass incineration technology.

Suggestions of the Objectors

Abellon Clean Energy Ltd requested to allow 15% auxiliary consumption for RDF based projects considering additional environment control equipments required to keep the emission from the plant within the permissible limits specified in SWM Rules 2016.

GUVNL in its submission requested the Commission to consider auxiliary consumption at the most at 11.5% for both, RDF and mass incineration based Waste-to-Energy projects. Another objector requested the Commission to consider the total auxiliary consumption at 18%.

Commission's Decision

The Commission has noted that the Rankine cycle based incineration plants utilizing MSW as input require MSW handling facilities as well as other pollution control equipments that require higher electricity. The Commission has also examined the auxiliary consumption specified by

the CERC and other SERCs in their MSW to energy project tariff orders. The Commission noted that the auxiliary consumption varies depending on the technology chosen for conversion of the waste to energy. RDF based MSW to energy projects have comparatively lower auxiliary consumption than the MSW to energy projects based on mass incineration due to the availability of processed fuel like RDF and therefore require few auxiliary equipments for processing the fuel.

In view of the above, the Commission decides the auxiliary consumption at 12% of gross generation for RDF based MSW projects whereas, for MSW projects based on mass incineration, the Commission decides the auxiliary consumption at 16% of gross generation.

e. Station Heat Rate

In the Discussion paper, the Commission proposed the station heat rate as 4100 kCal/kWh for the MSW to energy power projects.

Suggestions of the Objectors

JITF Urban Infrastructure Ltd submitted that the waste to energy plants are mostly set up under 15 MW where SHR of 4100 Kcal/kWh is technically not possible to achieve and hence requested to consider SHR as 4200 Kcal/kWh as adopted by CERC. Utility Users Welfare Association submitted that station heat rate should be less in case of RDF based plant.

Commission's Decision

The Commission noted that MSW fuel is abrasive and having heterogeneous characteristics. It has poor physical and chemical characteristics and is an inferior fuel even when it is compared with Paddy straw. The boiler has low thermal efficiency and the efficiency of the boiler will further decrease due to corrosion in furnace by the chloride content deposited on furnace, super heater & boiler tubes. As per data available with the MoUD, which was submitted to CERC, Station Heat Rate of MSW projects ranges from 3500 kCal/kWh to 4200 kCal/kWh. As the Commission is considering the higher capital cost of the power project and also allowing reasonable O & M cost to operate the plant in efficient manner, the Commission is of view that the benefit of above must be passed on to the consumers by the project developer by deploying efficient technology for the project to process higher quantum of the waste. In view of the above, the Commission decides to retain the station heat rate of 4100 kCal/kWh for both the projects.

f. Gross Calorific Value (GCV)

In the Discussion paper the Commission proposed the Gross Calorific Value of RDF as 2250 kCal/kg.

Suggestions of the Objectors

Utility Users Welfare Association submitted that the GCV of RDF should be considered as 2800 kCal/kg. JITF Urban Infrastructure Ltd in their submission mentioned that the GCV of RDF proposed by the Commission is in order and achievable in practice. Rochem Green Energy Pvt Ltd in its oral submission, citing their experience of operating RDF plant in Pune, submitted that GCV of RDF should be in range of 2500 - 3000 kCal / kg.

Commission's Decision

The Commission noted the suggestion of the stakeholders. The Commission has noticed that the CERC in its RE tariff regulations (fourth amendment) has considered Gross Calorific Value of 2500 kCal/kg for RDF based waste to energy power projects. M/s. Rochem Green Energy Pvt. Ltd. during the hearing admitted that they are the manufacturer of RDF in Maharashtra and supplying to some of the industries nearby the plant. They admitted that the GCV of RDF should be in range of 2500 kCal/Kg to 3000 kCal/Kg. After considering the submission of the stakeholders, the Commission decides the GCV of RDF as 2500 kCal/kg for the purpose of determination of generic tariff for RDF based MSW to energy projects.

g. Cost of Fuel

In the Discussion paper, the Commission proposed the RDF fuel cost as Rs 1600 /Tonne with 3% annual escalation from the second year onwards for entire life of the project.

Suggestions of the Objectors

JITF Urban Infrastructure Ltd submitted that the Commission may consider Rs 1890/MT including escalation for RDF for FY 2016-17 as adopted by CERC. Utility Users Welfare Association submitted that considering the downward trend of the prices of the petroleum products, the cost of RDF should be considered as Rs.1200 per MT. It is submitted that blending of RDF with MSW be allowed citing similar projects.

Abellon Clean Energy Ltd in their submission cited the cost of RDF considered by the GERC in its previous MSW to energy tariff order and by applying 5% escalation factor requested the Commission to consider cost of RDF as Rs 1857 /MT with escalation of 5% in subsequent years of the control period.

M/s. Rochem Green Energy Pvt. Ltd. submitted that the price of RDF varies based on the GCV of the RDF and it is ranging between Rs. 1600/tonne to Rs. 2000/tonne.

GUVNL in its submission requested the Commission to determine least capital cost for RDF based project including cost associated with preparation of RDF since RDF preparation is integral part of Waste-to-Energy Project. GUVNL also pointed out that as per provisions of Gujarat Waste to Energy policy, the local bodies shall supply MSW free of cost at the project site and hence no need to allow fuel cost. Another objector requested the Commission to allow supplementary fuel cost as one of the components in tariff computation.

Commission's Decision

The Commission noted that RDF preparation involves pre-processing of raw MSW. The Commission has not considered the cost associated with RDF preparation equipment as part of capital cost while proposing generic tariff for RDF based MSW to energy projects. The Commission in the discussion paper has proposed single part two component tariff for RDF based MSW to energy projects; first component representing the fixed cost and second component representing the fuel cost. The Commission also record that the MSW is provided at the site of project free of cost by the ULB/UDD. Therefore, there is only processing cost for RDF at the plant level. Moreover, if the RDF needs transportation, it is to be transported at a lesser distance than the conventional fuel.

In view of above, the Commission decides to retain the RDF (fuel) cost as proposed in the discussion paper, i.e. Rs. 1600 /MT with 3% annual escalation from the second year onwards during the subsequent years of the control period.

h. Debt-Equity Ratio

GERC Multi Year Tariff (MYT) Regulations 2016 provides for the normative debt-equity ratio of 70:30 for Generating Company/Licensees. The Commission proposed the debt equity ratio as 70:30 in the discussion paper as considered in case of other RE tariff orders.

Suggestions of the Objectors

No suggestions were received from the stakeholders about the debt-equity ratio.

Commission's Decision

The Tariff Policy formulated by the Ministry of Power, Govt. of India, stipulates debt-equity ratio of 70:30 for power projects. GERC (Multi-Year Tariff) Regulations, 2016 also provide that the debt-equity ratio as 70:30. Hence, the Commission decides to retain the debt-equity ratio as 70:30 for the new control period starting from the date of order.

i. Loan Tenure and Rate of Interest on Term Loan

The Commission in its discussion paper proposed to consider loan tenure equal to 10 years for determining the generic tariff for MSW to energy projects during the control period. The Commission in its recent tariff order on wind energy have considered 10 years as loan repayment tenure.

While considering the interest rate of loan, the Commission noted the trend of SBI base rate from March 2013 to June 2016 and considered the interest on term loan as existing SBI base rate of 9.3% with a spread of 250 basis points for tariff determination purpose. Hence, the interest rate on term loan for tariff determination was proposed as 11.8%.

Suggestions of the Objectors

JITF Urban Infrastructure Ltd submitted that the interest on Term Loan should not be lesser than 15% or atleast at par with CERC norms for waste to energy projects, as financial institutions sanction projects with higher lending rate which varies from 15% to 18%.

GUVNL in its submission requested to the Commission consider the rate of Interest on Term Loan at 11.30 % i.e. SBI Base Rate plus 200 basis points in line with MYT Regulations, 2016.

Smart Utilities Power Ltd. requested the Commission to consider loan tenure of 14 years and consider the rate of Interest on Term Loan at 12.75 % as per CERC norms for MSW projects. However, during the hearing they admitted the loan available with interest rate at 11.80% per annum as per their discussion with IREDA for their project at Surat.

Commission's Decision

The Commission, in its previous waste to energy project specific tariff orders had stipulated the loan tenure of 10 years. It has been noticed that investors did not face any problems in repaying the loan with 10-year repayment period. Therefore, the Commission decides to keep loan repayment period equal to 10 years while determining the MSW to energy tariff during the control period.

The Commission has noted that the project financing interest rates are linked to SBI base Rate. The Commission further noted the trend of SBI base rate from March 2013 to June 2016 and observed that SBI base rate has been reducing from April 2015 but from October 2015, the SBI base rate is constant at 9.3%. In view of the submission of the stakeholders, the Commission decides to retain the interest rate on term loan as proposed in the discussion paper, i.e. 11.80% per annum for the purpose of MSW to energy Tariff determination.

j. Depreciation

CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012 consider the capital cost of the asset admitted by the Commission as value base for the purpose of determination of depreciation. Further, the salvage value of the asset is considered as 10% and depreciation is allowed up to a maximum of 90% of the capital cost of the asset. Depreciation per annum shall be based on 'Differential Depreciation Approach' over loan tenure. Beyond loan tenure the depreciation is allowed as per 'Straight Line Method' over the remaining useful life of plant.

The Commission in its previous MSW to energy project tariff orders had considered a higher rate of depreciation than the SLM as a promotional measure during the loan tenure. In view of the above, the Commission had proposed depreciation rate of 7% per annum for the first 10 years, and 2% from 11th year to 20th year for tariff determination purpose.

Suggestions of the Objectors

JITF Urban Infrastructure Ltd submitted that depreciation may be considered as per industry practice and as recommended by CERC, i.e. 5.83% per annum for first 12 years and 2.51% from 13th year onwards. Accordingly, the loan tenure may also be extended to 12 years for tariff calculation.

Smart Utilities Power Ltd requested the Commission to consider depreciation of 5.83% for first 12 years and 2.51% from 13th year, as per CERC norms.

Commission's Decision

GERC (Multi-Year Tariff) Regulations, 2016 notified by the Commission specify that depreciation should be calculated based on the Straight Line Method. The MYT Regulations further lay down that asset is to be depreciated up to 90% of its initial value (considering residual value as 10% of its initial value) over the entire asset life. In order to facilitate the loan repayment, the Commission has considered depreciation rate at 7% per annum during the loan repayment period of 10 years. The Commission decides to keep the depreciation rate as 7% per annum for the first 10 years and beyond loan tenure, the depreciation is allowed as per 'Straight Line Method' over remaining useful life of plant i.e. depreciation @ 2% from 11th year to 20th year for the purpose of tariff determination for control period starting from date of this order.

k. Working Capital and Interest Rate on Working Capital

The Commission in its discussion paper on MSW to Energy projects had considered the components of working capital as follows:

For Refused Derived Fuel based MSW to Energy Projects

- 1) Fuel stock for 30 days,
- 2) O&M expenses for one month,
- 3) Receivables of one month charges for sale of electricity,
- 4) Maintenance spares at 1% of the capital cost escalated at 5% per annum.

For mass incineration based MSW to Energy projects

- 1) O&M expenses for one month,
- 2) Receivables of one month charges for sale of electricity,
- 3) Maintenance spares at 1% of the capital cost escalated at 5% per annum.

The Commission had proposed the interest on working capital equal to the SBI base rate plus 250 basis points i.e. 11.80% for the purpose of tariff determination for control period starting from the date of order.

Suggestions of the Objectors

JITF Urban Infrastructure Ltd submitted that the Commission may consider the CERC norms for RDF based projects for determination of working capital and interest on working capital and it should be in the range of 15% to 16%.

Smart Utilities Power Ltd requested the Commission to consider the following components for computation of working capital

1. Fuel cost for four months equivalent to normative PLF
2. O&M expenses for one month
3. Receivables equivalent to 2 months for fixed and variable charges for sale of electricity calculated on the target PLF
4. Maintenance spares @ 15% of O&M expenses.

Smart Utilities Power Ltd also requested the Commission to consider Interest on working capital at 12.5% as per CERC norms for MSW projects.

Commission's Decision

The Commission noted the submission of the stakeholders and decides to retain components of the working capital as proposed in the discussion paper. Therefore, the components of working capital for the purpose of determination of MSW to Energy project tariff will be as detailed below:

For Refused Derived Fuel based projects:

- 1) Fuel stock for 30 days,
- 2) O&M expenses for one month,
- 3) Receivables of one month charges for sale of electricity,
- 4) Maintenance spares at 1% of the capital cost escalated at 5% per annum.

For mass incineration projects:

- 1) O&M expenses for one month,
- 2) Receivables of one month charges for sale of electricity,
- 3) Maintenance spares at 1% of the capital cost escalated at 5% per annum.

The Commission decides to retain the interest on working capital at 11.80% per annum as per the discussion paper for the purpose of generic tariff determination of mass incineration and RDF based MSW to Energy projects during the control period.

I. Return on Equity (RoE)

The Commission in the discussion paper proposed 14% RoE. The GERC (Multi-Year Tariff) Regulations, 2016, provide the RoE as 14% per annum. Also the tax payment in the form of MAT @ of 21.34% for first 10 years and corporate tax @ of 34.61% for the next 10 years has been considered as cost in tariff calculation.

Suggestions of the Objectors

JITF Urban Infrastructure Ltd submitted that the Commission may consider the Pre-tax ROE in line with CERC and the same may be computed to average of 16% post-tax basis in tariff calculation.

Smart Utilities Power Ltd requested the Commission to consider RoE of 20% for first 10 years and 24% from 11th year onwards as per CERC norms.

Commission's Decision

GERC (Multi Year Tariff) Regulations, 2016 notified by the Commission specify the RoE of 14% and the same was proposed by the Commission in its discussion paper. The Commission follows the principle of allowing 14% RoE plus the actual tax payment for conventional and renewable power projects. During the hearing, the developers indicated that the MSW projects would be set up through SPVs and as such they will not be able to avail benefit of accelerated depreciation as no taxation liability will accrue on them. In view of this the Commission decides to consider RoE of 14% and MAT @ of 20.389% for first 10 years and corporate tax @ of

33.063% for the next 10 years as a cost for the purpose of computing the tariff for the control period starting from date of this order.

m. Discount Rate

The Commission in the discussion paper had calculated the annual levelized tariff based on the discount rate of 10.15% for MSW to energy. As per the standard methodology followed by CERC and other SERCs, the discount rate is proposed as weighted average cost of capital (WACC) for the purpose of levelized tariff calculation.

Suggestions from Objectors:

GUVNL has requested to revise the discount factor considering the rate of interest on loan at 11.30%.

Commission's Decision

The discount rate has been considered by CERC and other SERCs as weighted average cost of capital (WACC). The formula for computation of WACC is given below.

WACC = Cost of Debt + Cost of Equity

Where, Cost of Debt (For first 10 Years) = $0.70 \times (\text{Market Rate of Interest}) \times (1 - \text{MAT})$

Cost of Debt (11th Year to 20th Year) = $0.70 \times (\text{Market Rate of Interest}) \times (1 - \text{Corporate tax})$

Cost of Equity = $0.30 \times \text{Return on Equity (i.e. 14\%)}$

Resulting WACC = $\{(\text{WACC for first 10 Years} \times 10) + (\text{WACC 11th Year to 20th Year} \times 10)\} / (10 + 10)$

Cost of Debt (For first 10 Years) = $0.70 \times 11.80\% \times (1 - 20.389\%) = 6.58\%$

Cost of Debt (11th Year to 20th Year) = $0.70 \times 11.80\% \times (1 - 33.063\%) = 5.53\%$

Cost of Equity = $0.30 \times 14\% = 4.2\%$

In view of the above, the Commission decides the discount rate of 10.25% for determination of generic tariff for MSW to energy projects based on RDF and mass incineration technology over life of 20 years.

n. Benefit due to Accelerated Depreciation:

The Commission noted that presently, MSW to energy project developers can avail accelerated depreciation at the rate of 80% in the first year on a written-down value (WDV) basis. In addition, the amendment in the Finance Act has allowed an additional depreciation of 20% to the power projects during first year of project commissioning. Therefore, the MSW power projects developers can avail 100% depreciation in the first year of commissioning. The

Commission has considered above depreciation rate while calculating per unit AD benefit in the discussion paper.

Suggestions from Objectors:

The Commission received comments from Essel Infra & Utilities stating that they have been issued Letter of Intent by the Ahmedabad Municipal Corporation for setting up the MSW based project. The project will be set up by the Special Purpose Vehicle (SPV) which will not have any tax liability. Therefore, no benefit of accelerated depreciation will be available to such SPV. Therefore, while deciding the tariff the Commission may issue the tariff with consideration of the project who are not availing the benefit of accelerated depreciation. If the Commission does not issue the tariff separately mentioning the accelerated depreciation benefit, in that case the Commission may keep the provision that the project developers who are not availing the accelerated depreciation benefit are eligible to approach the Commission for determination of project specific tariff and the distribution licensee shall purchase such energy at the tariff determined by the Commission.

Commission's Decision

Following assumptions have been made for ascertaining the Income Tax benefit on account of accelerated depreciation for the purpose of tariff determination:

- a. The benefit based on normative Capital Cost, accelerated depreciation rate as per the relevant provisions of the Income Tax Act and the Corporate Income Tax rate;
- b. Capitalisation of MSW to energy projects for the full financial year;
- c. Per-unit benefit derived on levelized basis at a discounting factor equivalent to the post-tax weighted average cost of capital.

The Commission notes that there are some project developers who have been issued Lol by the ULB/Municipal Corporation after following the competitive bidding process in which the bidders quoted the tariff for the projects to be set up by them through SPVs and it will not have any tax liability. Therefore, such projects will not get the benefit of accelerated depreciation. Therefore, if AD benefit is factored in the tariff, in such case the project developer may receive lower tariff. The Commission also notes that there may be some project developers who are having tax liability and are able to avail the benefit of accelerated depreciation. Therefore, the Commission decides two different levelised single part tariff i.e. with the benefit of accelerated depreciation and without the benefit of accelerated depreciation.

In view of above, the Commission decides the tariff for the projects availing the AD benefit and not availing the AD benefit and the tariff shall be paid accordingly.

o. Subsidy or Incentive by State or Central Government

In its discussion paper, the Commission had proposed that while calculating the tariff, the Commission shall take into account any incentive or subsidy offered by the Central and State Government. The State Nodal Agency shall inform the Distribution Licensee regarding any such grant /subsidy received by a project developer. Further that such grant /subsidy, availed by a project developer, shall be deducted by the Distribution Licensee in subsequent bills raised by the particular project developer towards sale of electricity in suitable installments or within such period as may be stipulated by the Commission.

Suggestions of the Objectors

No suggestions were received from the stakeholders on the treatment of subsidy or incentive from Central and State Government.

Commission's Decision

If any benefit/support/assistance is received by the project developer from Central Government/State Government/ULB/UDD/Municipal Corporations/any other agency, the same shall be passed on to the purchaser of electricity. The project developer or distribution licensee shall approach to the Commission for re-determination of the tariff.

p. Financial Assistance in the form of Viability Gap Funding (VGF)

The Commission in its discussion paper had mentioned that as per the Government of Gujarat Waste to Energy Policy 2016, the selection of the MSW to energy project will be done on the basis of Viability Gap Funding (VGF). The VGF, as per Waste to Energy Policy, 2016, if availed, will be over and above the tariff decided by the Commission and hence will be retained by the MSW to energy project developers.

Suggestions from Objectors:

Utility Users Welfare Association submitted that VGF (Viability Gap Funding) should be passed on to the consumers. It seems that the tariff so derived in the discussion paper is an attempt to get the VGF from the GoI which is provided from the clean cess of 0.5 % recovered from the citizens of India. Further, they requested that the Commission should give more importance to

prudence financial check, technical parameters check, competitive bidding whether carried out ethically and honestly, the selection of suppliers of plants and machinery, selection of technology, etc.

Energy & Petrochemicals Department, Govt. of Gujarat submitted that VGF support will be provided as per State Government Waste to Energy Policy 2016 and shall be paid by UDD/ULB. Suitable budgetary provision in this regards will be made at an appropriate time. Moreover, if the VGF quoted is negative, then the entire benefit should be passed on to GUVNL in the PPA, i.e. PPA shall be done at generic tariff plus VGF.

Commission's Decision

As per the Government of Gujarat, Waste to Energy Policy 2016, the selection of the MSW to energy projects will be done on the basis of Viability Gap Funding (VGF). Based on generic tariff fixed by the Commission, the Urban Development Department/ULBs will conduct competitive bidding, and selection of developer shall be done on the basis of VGF quoted by the bidder in terms of per unit of electricity (kWh) to be supplied to the buyer. The VGF will be decided by the project developers by considering the generic tariff determined by the Commission. The VGF, as per Waste to Energy Policy, 2016, if availed, will be over and above the tariff decided by the Commission and hence will be retained by the MSW to energy project developers. The PPA will be executed at generic tariff as determined by the Commission in this order with state designated agency, GUVNL. As per the submission of the Energy & Petrochemicals Dept, Government of Gujarat, in case any developer quotes negative VGF, same will be passed on to GUVNL. So, in case of negative VGF quoted by the selected developer, GUVNL shall execute the PPA with such developer at a generic tariff determined by the Commission plus negative VGF.

The Commission further decides that the VGF benefit as and when is provided by the Government, the same shall be in addition to the tariff determined in this order. In case the VGF benefit is quoted negative by the project developer, in that case the entire benefit should be passed on to GUVNL/Distribution Licensees.

Further, any grant, capital subsidy, benefit of any tax or any other financial benefit is granted to the project developer, the project developer/ distribution licensee shall approach the Commission for re-determination of tariff by factoring such benefit in the generic tariff decided in the present order.

3. Computation of Tariff for MSW to Energy Projects

Suggestions from Objectors:

Essel Infra & Utilities Ltd. submitted that they have been allocated Lol by AMC based on tariff quoted by them as Rs. 7.35/kWh for generation of electricity. JITF Urban Infrastructure Ltd. submitted that they have quoted Rs. 7.17/kWh tariff for the project set up by them in the bidding process carried out by AMC. M/s. Abellon Clean Energy Ltd. submitted that they agreed to supply the electricity from the project set up by them at the tariff decided by CERC in its tariff order which is more than Rs. 7/kWh in the bids submitted to AMC where they are selected as a successful bidder.

Commission’s decision:

The Commission has determined the generic tariff in the present order after considering the various normative technical and financial parameters and after hearing the all stakeholders. The tariff is decided by the Commission in the present order in pursuance of Section 62 read with 86 (1) (a)/(e) of the Electricity Act, 2003. Hence, the tariff quoted by the objectors in the bids invited by AMC has no relevance in this order as it is quoted by them based on their own assumptions. Therefore, the Commission decides that the tariff and terms and conditions determined in this order shall be the basis on which the distribution licensees will purchase the electricity from the project developers.

The benchmark parameters for tariff determination during the control period starting from the date of order are tabulated below.

Table No. 3. Benchmark parameters for waste to energy projects to be commissioned in next control period

Parameters	Mass Incineration	RDF based Incineration
	Project Cost and O&M	
Total Project Cost (including Evacuation Infrastructure Cost up to Interconnection Point) (Rs. Lakh/MW)	1600	900
Normative O&M Cost for first year (% of project cost)	6%	5%
Escalation in O&M (per annum from 2nd year)	5.72%	5.72%
	Performance Parameters	
PLF	65% for 1st year & 75% from 2nd year Onwards	65% for 1st year & 80% from 2nd year Onwards

Parameters	Mass Incineration	RDF based Incineration
Auxiliary Consumption	16%	12%
Project Life in Years	20	20
Station Heat Rate kCal/kWh	NA	4100
Gross Calorific Value of Fuel kCal/kg	NA	2500
Cost of Fuel	NA	Rs. 1600 per MT
Fuel Cost Escalation	NA	3%
	Financial Parameters	
Debt-Equity ratio	70:30	70:30
Tenure of Loan in Years	10	10
Interest on Term Loan	11.80% p.a.	11.80% p.a.
Interest on Working Capital	11.80% p.a.	11.80% p.a.
Depreciation	7% (up to 10 years) 2% (11 to 20 years)	7% (up to 10 years) 2% (11 to 20 years)
Minimum Alternate Tax	20.389%	20.389%
Corporate Income Tax	33.063%	33.063%
Return on Equity	14%	14%
Discount Rate	10.25%	10.25%
Levellized Tariff for 20 years	Tariff Rs.7.03/kWh for the projects not availing the AD benefit. Tariff Rs. 6.31/kWh for the projects availing AD benefit	Tariff Rs. 7.07/kWh for the projects not availing the AD benefit. Tariff Rs. 6.67/kWh for the projects availing AD benefit

Detailed calculations are Annexed as Annexure – III to VI.

Based on the above, we decide the tariff receivable by the project developers from GUVNL/Distribution Licensees as under:

Tariff (Rs/kWh)	Mass Incineration (Rs./kWh)	RDF based Incineration (Rs./kWh)
With Accelerated Depreciation	6.31	6.67
Without Accelerated Depreciation	7.03	7.07

While allowing the aforesaid tariff to the WtE project the Commission also decides that the project developer shall be required to confirm that the project is complying with the environmental norms

specified in the Solid Waste Management Rules, 2016 and subsequent amendment made in it as well as the emission norms stipulated by CPCB/GPCB during the life of the projects. In case of failure of the project developer to comply with the stipulated norms, he is liable to pay the compensation to the licensee for shortfall of RPO if any, occurring due to non-generation of contracted power.

Monitoring of Environmental norms:

The Commission expects GPCB to monitor the emissions from such Waste to Energy power projects so as to ensure that there is no lapse on the part of project developers in meeting the specified environmental norms.

The project developer shall provide the data of emissions from the plant as well as different types of pollutants produced during the process to the concerned statutory authority as per their requirement.

4. Other Commercial Issues

4.1 Transmission and Wheeling Charges

The Commission in its discussion paper had specified the Open access charges and losses for wheeling energy generated from MSW to energy projects for captive use and third-party sale during the control period. Wheeling of power for third-party sale from MSW to energy generator was proposed on payment of normal open access charges. For captive transaction, wheeling of power to consumption site at 66 kV voltage level and above was proposed on payment of normal open access charges and losses, whereas wheeling of power to consumption site below 66 kV voltage level was proposed on the basis of concessional wheeling charges and wheeling losses.

In the discussion paper, it was proposed that wind energy generators, who decide to wheel electricity for captive use / third-party sale, to more than one location, shall pay 5 paisa/kWh on energy fed into the grid to the distribution company concerned in whose area power is consumed in addition to above mentioned transmission charges and losses, as applicable. In the discussion paper it was proposed that no Cross Subsidy Surcharge and Additional Surcharge shall be applicable in case of third party sale.

It was also proposed that MSW to energy projects availing open access for captive use/third-party sale and willing to register under REC mechanism should be governed as per CERC REC Regulations in force. Renewable Energy projects installed for captive use will have to meet the eligibility criteria specified in CERC REC Regulations (Fourth Amendment), 2016 for availing RECs on total generation including self-consumption. Provided that such projects have to forego the concessional transmission and wheeling charges/losses and banking benefit.

Suggestions from Objectors

GUVNL requested to make a provision for applicability of Fixed/Demand Charges, peak Charges, other charges / penalty etc. to recipient unit of Waste-to-Energy Project after giving set off of wheeled energy as provided in Gujarat Waste-to-Energy Policy 2016.

Smart Utilities Pvt. Ltd requested the Commission to waive off Transmission and Wheeling charges.

Commission's Decision

The Commission recognizes the fact that the cost of transmission/distribution assets created for evacuation of power from any generating project should be recovered to, a reasonable extent, from such generators. Otherwise, it will amount to cross-subsidizing such generators by other consumers. The category of consumer who generally source power through open access can afford to pay normal transmission and wheeling charges from the savings made through such transactions. Considering the open access charges applicable for the other renewable energy projects, following norms are proposed for the open access transaction for wheeling of power from MSW to Energy projects for third party sale and captive use during new control period.

- i. **Wheeling of power to consumption site at 66 kV voltage level and above:** Wheeling of power for third party sale / captive consumption from MSW to Energy projects shall be allowed on payment of transmission charges, transmission losses, wheeling charges and losses of the energy fed into grid, as applicable to normal open access consumer.
- ii. **Wheeling of Power to consumption site below 66 kV voltage level:** In case the injection or drawal of power is at 66 kV and drawal or injection is at 11 kV, wheeling of electricity generated from MSW to Energy projects to the desired location(s) within the State, shall be allowed on payment of transmission charges and transmission losses applicable to normal open access consumers and 50% of wheeling charges and 50% of distribution losses of the energy fed into the grid as applicable to normal open access consumers.
- iii. **Wheeling of electricity for injection at 11 kV and drawal at 11 kV and below voltage level:**
 - (a) When the point of injection and drawal at 11 kV or below voltage level lies within the same distribution area, the user shall pay 50% of wheeling charges and 50% of wheeling losses of the energy fed to the grid as applicable to normal open access consumers.

- (b) When the point of injection and drawal at 11 kV or below voltage level lies in area of different distribution licensee, the user shall pay 50% of wheeling charges and 50% of wheeling losses of the energy fed to the grid as applicable to normal open access consumers for each distribution licensee. In addition, transmission charges and transmission losses as applicable to normal open access consumer shall be payable.
- iv. **Wheeling of power to more than one locations:** MSW to Energy project owners, who desire to wheel electricity for captive use / third party sale, to two or more locations, shall pay 5 Paisa/kWh on energy fed into the grid to the distribution company concerned in whose area power is consumed in addition to above mentioned transmission charges and losses, as applicable.
- v. **Cross Subsidy Surcharge:** Considering the nascent stage of development of MSW to energy projects, no Cross Subsidy Surcharge and Additional Surcharge shall be applicable in case of third party sale.

4.2 State Energy Metering

In the discussion paper it was proposed that, the developers of MSW to energy projects shall provide energy metering and communication facility in accordance with the 1) Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2014 and its subsequent amendments, 2) Gujarat Electricity Grid Code 2004 and its subsequent amendments, 3) GERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011 and its subsequent amendments, and 4) GERC Distribution Code 2004 and its subsequent amendments for the purpose of energy accounting. It was also proposed in the discussion paper that such projects shall have to provide ABT compliant meters at generators and if the power is to be wheeled to consumer's premises, then ABT compliant meter is to be installed at the consumer premises also.

Suggestions from Objectors

No suggestions were received from the stakeholders on energy metering.

Commission's Decision

The Commission decides to retain the provisions related to Energy Metering as proposed in the discussion paper. The Commission has already defined the interconnection point and metering point in para 2.4.1 (f) of this order. In order to have uniformity in metering standards irrespective of the installed capacity of power generation projects, the Commission directs that the MSW to energy projects shall install ABT compliant meters at the point of metering. The

ABT meters shall conform to the Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2010 and its subsequent amendments. The project developers shall also install Remote Terminal Unit (RTU) for transferring the real time data to SLDC for monitoring purpose. The MSW to energy projects shall provide energy metering and communication facility in accordance with the following:

- 1) Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2014 and its subsequent amendments,
- 2) Gujarat Electricity Grid Code 2013 and its subsequent amendments,
- 3) GERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011 and its subsequent amendments, and
- 4) GERC Distribution Code 2004 and its subsequent amendments

4.3 Pricing of Reactive Power

In the discussion paper it was proposed that MSW to energy projects shall have reactive energy charges at par with that of other renewable energy generation sources. Hence, the reactive energy tariff approved by the Commission for the RE technologies like wind and solar shall be applicable to MSW to energy projects.

Suggestions from Objectors

Smart Utilities Pvt. Ltd has requested to waive off the reactive power charges.

Commission's Decision

In the earlier tariff orders on renewable energy projects, the Commission had decided that the reactive energy pricing should be uniform for all types of renewable sources.

The Commission specifies the present rate of the reactive energy charges which shall be applicable for MSW to energy projects as follows:

“10 paise/kVARh – For the drawl of reactive energy at 10% or less of the net energy exported.

50paise/kVARh – For the drawl of reactive energy at more than 10% of the net active energy exported”.

4.4 Sharing of Clean Development Mechanism (CDM) Benefits

In the discussion paper, the Commission proposed to retain the provisions for sharing of CDM benefits in line with the recommendations made by the Working Group on Renewable Energy

Generation constituted by the Forum of Regulators for the next control period. However, such projects availing CDM benefit shall share the net CDM proceeds annually, by 31 March of every year with an affidavit stating the annual energy generation (date of commissioning as starting point of the first year), CER generated, gross receipts, and net receipts.

Suggestions from Objectors

No comments have been received from the Objectors.

Commission's Decision

Considering the initial cost of registering CDM projects and long time frame taken to realize the CDM benefits, the Commission decides that the sharing of net proceeds on account of CDM benefits realized through sale of CER generated from corresponding annual energy generation from MSW to energy projects shall be as follows:

- 100% of net proceeds through sale of CER generated from the energy generation in the first year after the date of commercial operation of the project shall be retained by the beneficiary/developer.
- In the second year, the share of the beneficiary shall be 10% which shall be progressively increased by 10% every year till it reaches 50% in the sixth year; thereafter the proceeds shall be shared in equal proportion by the power generating company and the beneficiary.

MSW to energy projects availing CDM benefit shall share the net CDM proceeds annually as per above, by 31 March of every year with affidavit stating the annual energy generation (date of commissioning as starting point of the first year), CER generated, gross receipts, and net receipts.

4.5 Banking of Surplus Energy and Purchase of Surplus Power from Projects Opting for Captive Use and Third Party Sale under Open Access (Non REC projects)

In the Discussion paper, the Commission proposed that energy generated from MSW power projects, established for captive purpose / third party sale, can set-off against the consumption during the consumers' billing cycle. Surplus power, after giving set off, shall be purchased by DISCOM at Average Pooled Purchase Cost (APPC) of the year of commissioning of the MSW to Energy project. The entire generation shall be considered for fulfilling RPO of Distribution Licensees.

For consumers who take renewable attribute of projects to fulfil their RPO, energy accounting shall be based on 15 minutes' time block. Surplus power, after giving set off, shall be purchased by DISCOM at Average Pooled Purchase Cost (APPC) of the year of commissioning of the project. The surplus energy purchased shall be considered for fulfilling RPO of Distribution Licensees.

Suggestions from Objectors

No comments have been received from the Objectors.

Commission's Decision

The Commission decides to provide banking of surplus energy and purchase of surplus power from projects opting for captive use and third party sale under Open Access and not registered under REC as shown below.

Case 1: The consumer does not take renewable attribute of waste to energy for meeting its RPO – Energy generated from MSW power projects, set up for captive purpose / third party, can set off against the consumption during the consumers' billing cycle. Surplus power, after giving set off, shall be purchased by DISCOM at Average Pooled Purchase Cost (APPC) of the year of commissioning of the MSW to Energy project. The entire generation shall be considered for fulfilling the RPO of Distribution Licensees.

Case 2: The Consumer takes renewable attribute of waste to energy for meeting its RPO – In this case, energy accounting shall be based on 15 minutes' time block. Surplus power, after giving set off, shall be purchased by DISCOM at Average Pooled Purchase Cost (APPC) of the year of commissioning of the project. The surplus energy purchased shall be considered for fulfilling the RPO of Distribution Licensees

4.6 Renewable Energy Certificates for Third Party Sale and Captive Use of Electricity Generated from MSW to energy Projects

In the discussion paper it was proposed that, Power generated from MSW to energy projects if wheeled to third party or for captive use will be eligible for availing the Renewable Energy Certificates as per qualification criteria specified under the CERC REC Regulations and its subsequent amendments.

Suggestions from Objectors

GUVNL submitted to make a provision regarding applicability of Cross Subsidy Surcharge and Additional Surcharge to the project set up under REC Mechanism as provided in Gujarat Waste-to-Energy Policy 2016.

Commission's Decision

Power generated from MSW to Energy projects if wheeled to third party or for captive use will be eligible for availing the Renewable Energy Certificates under the CERC REC mechanism. Qualification of such projects preferring open access for sale of electricity / captive use and availing REC benefit shall be governed by the CERC (Terms and Conditions for Recognition and Issuance of REC for Renewable Energy Generation) Regulations, 2010 and the subsequent amendments . Provided further that a Captive Power Producer (CPP) based on RE sources shall be eligible for the entire energy generated from such plant, including self-consumption for participating in the REC scheme, if eligible as per CERC REC Regulations (Fourth amendment) dated 28.03.2016, subject to the condition that such CPP has not availed or does not propose to avail any benefit in the form of concessional/promotional transmission or wheeling charges and banking facility benefit. It is decided that such projects set up under REC mechanism will be given set off in the 15 minutes time block basis. Also, the surplus power available after set off for such projects will be purchased by the distribution licensee at 85% of Average Pooled Purchase Cost (APPC) applicable for year of commissioning of the project. Fixed / demand charge, peak charge, penalty etc. as applicable to normal consumer will be applicable in this case also. Further, cross subsidy surcharge and additional surcharge shall be applicable as per normal open access consumers.

4.7 Security Deposit

In the discussion paper the Commission had proposed that in order to assure about the project developer's seriousness, the project developers are required to furnish bank guarantee of Rs. 5 Lakh/MW as a security deposit in the form of bank guarantee after entering into PPA with obligated entities (entities obliged to fulfil the RPO). Project developers are required to commission the project within the time period mentioned in the power purchase agreement. In case of default, bank guarantee shall be forfeited.

Suggestions from Objectors

No comments have been received from the objectors on Security deposit.

Commission's Decision

The Commission decides to retain the provision regarding furnishing of Bank Guarantee of Rs 5 Lakh/MW by the project developers with obligated entities (entities obliged to fulfil the RPO).

Bank Guarantee shall be returned if the developer achieves commercial operation within the time period mentioned in the PPA. The bank guarantee shall be encashed if the project is not commissioned within a specified time period as mentioned in the PPA.

4.8 Other Issues

(i) Power sale arrangement beyond 20 years

Suggestions from Objectors

JITF Urban Infrastructure Ltd has submitted there should be a provision in the tariff order that power sale arrangement remain enforced with valid PPA till entire concession period w.r.t project concession period, since, tariff period is for 20 Years and concession period for MSW projects is generally 25-30 Years.

Commission's Decision

The power sale arrangement shall be governed by the provisions of PPA.

(ii) Sale of Power to Obligated Entities

Suggestions from Objectors

GUVNL submitted that the Commission may incorporate a mechanism regarding sale of electricity generated from Waste-to-Energy projects to the obligated entities through the Government Nominated Agency (namely Gujarat Urja Vikas Nigam Limited) on long term basis and requested the Commission to implement the following mechanism in this regard:

The Nominated Agency shall purchase power either at the rate determined by GERC or at the rate determined through competitive bidding process. The costs and the renewable attributes of the power purchased by Nominated agency shall be apportioned to all Distribution Licensees (including private distribution licensees) in the State in proportion to their power consumption of previous year. Detailed procedure for implementation of proportionate apportionment of power shall be as follows:

- a. The Long Term Power Purchase Agreement shall be executed by Government Nominated Agency namely, Gujarat Urja Vikas Nigam Limited(GUVNL). The project developer shall deal with GUVNL and payment towards bill shall be settled by GUVNL.

- b. The electrical component of power shall be utilized by local distribution company where the MSW based power plant is located. Such power shall be charged to Local Distribution Company at Average Power Purchase Pooled Cost (APPC) of GUVNL for the year of commissioning of the MSW based power project. APPC means power purchased at generator bus excluding renewable power purchase, transmission cost and power purchased for sale other than consumers.
- c. The difference between the power purchase rate (either at the rate determined by GERC or at the rate determined through competitive bidding process) from MSW power project as mentioned in the PPA and APPC charged to Local Distribution Company shall be considered as cost of Renewable Attribute. On payment of this cost, the Distribution Company shall be eligible for allotment of equivalent number of units of Renewable Attribute.
- d. On monthly basis such Renewable Attributes units and their cost shall be apportioned by nominated agency to all Distribution companies (including private Distribution Licensees, Distribution Licensees / Deemed Distribution Licensees supplying power in SEZs area etc.) in proportion to their power consumption of previous year. GUVNL will raise two separate bills to Distribution Companies (i) for supply of electrical component of power as mentioned at point-b above, & (ii) for renewable attributes as mentioned in point-c above. Distribution Companies are required to make payment to GUVNL within 7 days from issuance of bill failing which Distribution Company shall be liable to pay delayed payment charges as per terms of the Power Purchase Agreement.
- e. So apportioned Renewable Attribute units shall be considered for meeting the RPO of the respective distribution company.
- f. Transmission Charges and losses, wheeling charges and losses shall be borne by the concerned local distribution company which uses the electrical component.

MPSEZ Utilities Pvt Ltd and Torrent Power Ltd submitted that Transaction of RECs is governed as per the provisions specified in CERC Regulations. The CERC Regulations specify limits for renewable energy attribute i.e. REC in terms of floor price and forbearance price. MSW to energy being non solar technology, the ceiling limit of Rs 1.50/kWh (floor price) and Rs 3.50/kWh (forbearance price) would be applicable. As GUVNL opted to become nodal agency, distribution licensee can pay RE attribute cost linked to REC rate prevailing in the market. The distribution licensee should not be mandated to fulfil RPO by paying more to GUVNL which would be in contravention to the provisions of the RPO Regulations notified by the Commission read with the REC regulations notified by CERC.

Commission's Decision

The Commission examined the submission of the stakeholder with regard to the pricing of renewable attribute. The Tariff Policy dated 28 January 2016 under clause 6.4 (1)(ii) recommends that the distribution licensees shall compulsorily procure 100% power produced from all waste to energy plant in the State in the ratio of their procurement of power from all sources including their own at the tariff determined by the appropriate Commission under Section 62 of the Act.

The Commission approves the mechanism proposed by GUVNL for apportioning the renewable attribute units and their cost to all distribution licensees in the state in proportion to their power consumption of previous year.

The Commission recognized the importance of promoting MSW power projects from environmental and public health point of view and therefore decides to relax the provisions specified under GERC (Procurement of energy from Renewable Energy Sources) Regulations 2010 to the extent of pricing the renewable attribute of the electricity generated from MSW to energy projects in light of the clause 6.4(1)(iv) of the Tariff Policy. The Commission directs the obligated distribution licensees to make payment of electrical and renewable attribute component of energy generated from MSW to energy projects as per the methodology specified in para 14 of Government of Gujarat Waste to Energy Policy, 2016.

4.9 Applicability of the Order

The provisions under this order shall be applicable to the MSW to energy projects to be installed and commissioned on or after the date of issuance of this order for which PPAs would be signed with GUVNL on or after the date of this order.

Sd/-
[P. J. Thakkar]
Member

Sd/-
[K. M. Shringarpure]
Member

Sd/-
[Anand Kumar]
Chairman

Place: Gandhinagar

Date: 10/11/2016

Annexure I

List of Entities that have submitted written comments on the Discussion Paper on Determination of tariff for procurement of power by distribution licensees and others, from MSW to energy in the state of Gujarat- September, 2016

Sr. No	Name of Stakeholder
1.	JITF Urban Infrastructure Ltd
2.	Utility Users Welfare Association
3.	Abellon Clean Energy Limited
4.	Dynagreen Environmental Protection Group Co. Ltd
5.	Gujarat UrjaVikas Nigam Ltd
6.	Smart Utilities Pvt. Ltd

Annexure II

List of stakeholders, who have attended the public hearing on 13 October 2016.

Sr. No	Name of Stakeholder
1.	JITF Urban Infrastructure Limited
2.	Utility Users Welfare Association
3.	Abellon Clean Energy Limited
4.	Dynagreen Environmental Protection Group Co. Limited
5.	Gujarat Urja Vikas Nigam Limited
6.	RGE Surat Private Limited
7.	Rochem Green Energy Private Limited

Annexure III

Tariff for MSW to Energy projects based on Mass Incineration Technology

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Net Energy sold (lakh kWhs)	47.83	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19
Costs																				
O&M	96.00	101.49	107.30	113.43	119.92	126.78	134.03	141.70	149.81	158.37	167.43	177.01	187.14	197.84	209.16	221.12	233.77	247.14	261.28	276.22
Insurance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation (SLM)	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00
Advance Against Depreciation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on term loan	125.55	112.34	99.12	85.90	72.69	59.47	46.26	33.04	19.82	6.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	7.01	7.09	7.19	7.30	7.42	7.55	7.70	7.86	8.04	8.24	7.83	8.19	8.56	8.96	9.38	9.82	10.29	10.78	11.30	11.84
Return on Equity	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20	67.20
Tax on equity	13.70	13.70	13.70	13.70	13.70	13.70	13.70	13.70	13.70	13.70	22.22	22.22	22.22	22.22	22.22	22.22	22.22	22.22	22.22	22.22
Fuel cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cost (Rs lakh)	421.46	413.82	406.51	399.54	392.93	386.71	380.89	375.50	370.57	366.12	296.68	306.61	317.12	328.22	339.95	352.36	365.47	379.34	393.99	409.48
Fixed cost (Rs lakh)	421.46	413.82	406.51	399.54	392.93	386.71	380.89	375.50	370.57	366.12	296.68	306.61	317.12	328.22	339.95	352.36	365.47	379.34	393.99	409.48
Fuel cost (Rs lakh)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fixed tariff (Rs / kWh)	8.81	7.50	7.37	7.24	7.12	7.01	6.90	6.80	6.71	6.63	5.38	5.56	5.75	5.95	6.16	6.38	6.62	6.87	7.14	7.42
Variable tariff (Rs / kWh)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tariff (Rs/kWh)	8.81	7.50	7.37	7.24	7.12	7.01	6.90	6.80	6.71	6.63	5.38	5.56	5.75	5.95	6.16	6.38	6.62	6.87	7.14	7.42
Discount Rate	10.25%																			
Levelized Fixed Tariff (Rs / kWh)	7.03																			

Annexure-IV
Depreciation benefit calculations for MSW to Energy projects based on Mass Incineration Technology

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation																				
Book depreciation Rate	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%
Amount of book depreciation (Rs lakh)	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	84.48	3.84	0.00	0.00
Accelerated depreciation																				
Opening	100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Allowed during the year	100.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Amount of accelerated depreciation (Rs lakh)	1600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net depreciation benefit (Rs lakh)	1515.52	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-84.48	-3.84	0.00	0.00
Tax Benefit (Rs lakh)	501.08	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-27.93	-1.27	0.00	0.00
Net energy Generation (lakh Units)	47.83	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19
Accelerated depreciation benefit per unit (Rs / kWh)	10.48	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.51	-0.02	0.00	0.00
Discount factor	1.00	0.91	0.82	0.75	0.68	0.61	0.56	0.50	0.46	0.42	0.38	0.34	0.31	0.28	0.26	0.23	0.21	0.19	0.17	0.16
Levellised benefit of accelerated depreciation (Rs / kWh)	0.71																			

Annexure V

Tariff for MSW to Energy Project based on RDF Technology

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Net Energy sold (lakh kWhs)	50.11	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67
Costs																				
O&M	45.00	47.57	50.30	53.17	56.21	59.43	62.83	66.42	70.22	74.24	78.48	82.97	87.72	92.74	98.04	103.65	109.58	115.85	122.47	129.48
Insurance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation (SLM)	63.00	63.00	63.00	63.00	63.00	63.00	63.00	63.00	63.00	63.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Advance Against Depreciation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on term loan	70.62	63.19	55.76	48.32	40.89	33.45	26.02	18.59	11.15	3.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	6.72	7.58	7.74	7.91	8.08	8.27	8.47	8.68	8.89	9.13	9.03	9.36	9.70	10.06	10.43	10.82	11.22	11.64	12.08	12.54
Return on Equity	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80	37.80
Tax on equity	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Fuel cost	149.41	189.41	195.09	200.94	206.97	213.18	219.57	226.16	232.95	239.93	247.13	254.55	262.18	270.05	278.15	286.49	295.09	303.94	313.06	322.45
Total Cost (Rs lakh)	380.26	416.26	417.39	418.85	420.66	422.84	425.40	428.35	431.72	435.52	402.95	415.18	427.90	441.14	454.92	469.26	484.19	499.73	515.91	532.77
Fixed cost (Rs lakh)	230.85	226.85	222.30	217.91	213.69	209.66	205.82	202.19	198.77	195.59	155.81	160.63	165.72	171.09	176.77	182.76	189.10	195.79	202.85	210.32
Fuel cost (Rs lakh)	149.41	189.41	195.09	200.94	206.97	213.18	219.57	226.16	232.95	239.93	247.13	254.55	262.18	270.05	278.15	286.49	295.09	303.94	313.06	322.45
Fixed tariff (Rs / kWh)	4.61	3.68	3.60	3.53	3.47	3.40	3.34	3.28	3.22	3.17	2.53	2.60	2.69	2.77	2.87	2.96	3.07	3.17	3.29	3.41
Variable tariff (Rs / kWh)	2.98	3.07	3.16	3.26	3.36	3.46	3.56	3.67	3.78	3.89	4.01	4.13	4.25	4.38	4.51	4.65	4.78	4.93	5.08	5.23
Tariff (Rs/kWh)	7.59	6.75	6.77	6.79	6.82	6.86	6.90	6.95	7.00	7.06	6.53	6.73	6.94	7.15	7.38	7.61	7.85	8.10	8.37	8.64
Discount Rate	10.25%																			
Levelized Tariff (Rs / kWh)	7.07																			

Annexure-VI
Depreciation benefit calculations for MSW to Energy Project based on RDF Technology

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Book Depreciation																					
Book depreciation Rate	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%	
Amount of book depreciation (Rs lakh)	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	47.52	2.16	0.00	0.00
Accelerated depreciation																					
Opening	100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Allowed during the year	100.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Closing	0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Amount of accelerated depreciation (Rs lakh)	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Net depreciation benefit (Rs lakh)	852.48	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-47.52	-2.16	0.00	0.00
Tax Benefit (Rs lakh)	281.86	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-15.71	-0.71	0.00	0.00
Net energy Generation (lakh Units)	50.11	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	61.67	
Accelerated depreciation benefit per unit (Rs / kWh)	5.63	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.01	0.00	0.00
Discount factor	1.00	0.91	0.82	0.75	0.68	0.61	0.56	0.50	0.46	0.42	0.38	0.34	0.31	0.28	0.26	0.23	0.21	0.19	0.17	0.16	
Levellised benefit of accelerated depreciation (Rs / kWh)	0.40																				