Summary of Petition No 94 of 2015 filed by Elephant Energy Private Limited

Subject: - Petition under Section 86 (1) (e) read with Sections 61, 62, 64 and other applicable provisions of the Electricity Act, 2003 seeking the determination of a feed in tariff by the Hon'ble Commission for sale of power from Municipal Solid Waste to the New Delhi Municipal Council.

1. The Petitioner is a Generating Company as defined under Section 2 (28) of the Electricity Act, 2003. The Petitioner is engaged in the business of municipal solid waste management and operating a generating plant for treatment of Municipal Solid Waste and generation of renewable power there from, a Non-Conventional/Renewable Energy Project falling under Section 86(1) (e) of the Electricity Act, 2003 and recognised under the Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012 notified by the Central Commission and the Delhi Electricity Regulatory Commission (Renewable Purchase Obligation and Renewable Energy Certificate Framework Implementation) Regulations, 2011 notified by the Hon'ble Commission. The Petitioner would crave leave to refer to the said Regulations at the time of the hearing. The Petitioner has set-up a 70 MT per day Municipal Solid Waste to power (1.7 MW) project by installing plant and equipment having installed capacity capable of exporting minimum 1.4 MW of power, situated at Raj Nagar, New Delhi, based on Municipal Solid Waste (herein after referred to as this Project) is able to operate as a decentralized model, enabling further environmental and costs savings from the reduced transport requirements of the Municipal Solid Waste.
2. Petitioner has stated that Indian Municipal Solid Waste can be tackled with appropriate selection of technology and careful planning and execution. The NDMC will save significant money from reduced waste disposal, reduced transportation costs and reduced electricity network

charges. Society is gaining enormous benefits on account of the following:

i. **Environment Benefits of the project:**
   - Reducing greenhouse gas emissions
   - Avoids a nominal one ton of CO2 equivalent for each ton of waste processed
   - Provides sustainable waste disposal practices as part of an integrated waste management system
   - Global community recognizes Waste to energy (WtE) as a preferred disposal alternative to landfills
   - WtE compliments recycling and recovers metals and energy from residual waste
   - Reduces volume of waste by 90%
   - Reduces long haul trucking of waste to distant landfills
   - Doesn't shift the waste burden to distant communities or future generations

ii. **Social Benefits of the project:**
   - Reduced toxicity in the system
   - Less land requirement compare to any other waste management technology.
   - No odour problem associated as storage and processing is in an enclosed environment.
   - Prevent the ground water contamination problem associated with other technologies.
   - Reuse of the residue. Ash can be used for Road pavement/Brick manufacturing or as Daily cover to Landfill.
   - Enable waste destruction near source.

iii. **Economic Benefits of the project:**
   - Employment of approximately 60 people in the local economy
   - WtE offers predictable waste disposal cost
   - Exporting to distant landfills exposes communities to price uncertainty
   - Local solutions for local waste management challenges
   - Green jobs to construct, operate and maintain

- High paid permanent jobs for local workforce
- Employment of scavenger / waste pickers
- Goods and Services purchased locally
- Competitively priced as compared to other renewable energy source.

3. In May/ June 2014, the NDMC ran a global Request for Tender (RFT) to develop 3 x mini waste-to-energy projects in the NDMC region, with each project to process 70 tonnes of waste per day (combined total of 210 tonnes per day). Each plant is to produce a minimum of 1.4 MWh.
4. On July 17th 2014, Elephant Energy Private Limited (Elephant Energy) was declared the winner of the three projects and was issued with a Letter of Award to start work as soon as possible on the first project - to be located at the Arjun Das Camp Waste Transfer Station, Raj Nagar, New Delhi.
5. The Plant utilizes gasification techniques that can destruct any carbon based waste streams and recover the energy contained within this waste. The harvested energy is then converted to electricity and sold into the electricity grid. The emissions have been tested against strict EPA standard and technology has been rated environmentally sound with emissions comfortably exceeding these strict international standards. The emissions of the Plant predominately consist of water vapor and carbon dioxide, whilst the residual solid by-product of the process is non-toxic which can be safely disposed of in landfills or utilized in construction (e.g. as a road base, bricks or used as a concrete aggregate).
6. The Project is being set up at a dumping site of the Municipality thereby utilizing the dumping site in the most efficient and environmentally friendly manner.
7. This Renewable Energy Technology is not only relatively cost effective but is also simultaneously solves the burgeoning problem of increasing

Municipal Solid Waste. The NDMC had forsight in regards to these benefits and proposed a tariff of Rs. 8.00 per KW to be applied to this project, increasing with inflation. In terms of the recent CERC draft tariff determination, rates for waste to energy processes have been determined at Rs.7.90 KW. Summary of financial data (Tariff Design) submitted by the Petitioner is at Annexure –I.

8. Further Section 61(h) and Section86(1)(e) of the Electricity Act, 2003 enjoin the Central Electricity Regulatory Commission and State Electricity Regulatory Commissions respectively to promote cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution license.
9. Swachh Bharat calls for investment, behavioural changes, expertise and scientific knowledge. Swachh Bharat primarily looks at sanitation and solid waste. Waste management is therefore one of the most pressing of issues.
10. Prayers of the Petitioner:-

(a) the Hon'ble Commission may initiate a proceeding for determination of tariff for Waste to Energy Projects consistent with the provisions of Section 86 (1) (e) and Section 61 (h) of the Electricity Act, 2003 and also the aforementioned Regulations of the Central Commission and the Hon'ble Commission and determine the tariff applicable as promotional tariff for the Project Developers to sell electricity to the Distribution Licensees;

(b) direct Respondent to fulfil the Letter of Award for the waste to energy tender by the purchase of electricity generated from Waste to Power Projects such as the one established by the Petitioner;

Annexure -I

Summary of financial data (Tariff Design) submitted by the Petitioner

1. Power Generation

1) Installed Capacity

The plant shall consist of 5 x Internal Combustion Engines each rated at 550KWe. Therefore, the Total Standing Capacity is 2.75 MW

There is no Auxilary consumption assumed as the plant has a dedictaed power source onsite that supplies the auxilary load of the plant. With respect to this we also confirm that the installed capacity of the Auxilary load plant is not factored into the total standing capacity of 2.75MW as nominated above.

2) Plant Load Factor

It is assumed that the plant shall operate at 67% of its installed capacity. (averaging output of 1.8425MW per hour.

3) Useful life

It is assumed that the plant shall have an economic life of 20 years.

2. Project Costs

Audited contracts and financial record have been provided confirming the total project cost of INR 3,536 Lac. Which based on a standing capcity of 2.75MW equates to INR 12.95 Crore / MW.

The CENTRAL ELECTRICITY REGULATORY COMMISSION (Petition No. SM/004/2015(Suo-Motu) Dated 07.10.2015) nominates a benchmark of INR 9-15 Crore / MW as acceptable.

3. Financing Assumptions

4) Equity

The project is currently 100% equity financed.

5) Debt

Upon execution of the PPA, the project shall be leveraged at a ratio of 30% Equity and 70% Debt.

Annual payments will consist of interest and principal repayments for the term of the loan with a residual loan balance of zero.

4. Financial Assumptions

6) Income Tax
33.99%

7) Depreciation
Standard

Elephant Energy Private

5. Working Capital

1) O&M Charge
1 Month

2) Maintenance Spare
15% O&M Expenses

Annual Escalation 5% as per the CENTRAL ELECTRICITY REGULATORY COMMISSION (Petition No. SM/004/2015(Suo-Motu) Dated 07.10.2015)

3) Receivables for Debtors
2 Month

Annual Escalation 5% as per the CENTRAL ELECTRICITY REGULATORY COMMISSION (Petition No. SM/004/2015(Suo-Motu) Dated 07.10.2015)

4) Variable Cost
Not applicable.

As per CENTRAL ELECTRICITY REGULATORY COMMISSION (Petition No. SM/004/2015(Suo-Motu) Dated 07.10.2015), variable cost is relates excluvisly to purchased RDF.

In contrast Elephant Energy shall produce its own RDF internally

5) Interest on Working Capital
13.5%.

6. Fuel Related Assumptions

The CERC has confirmed that this section is only applicable when the waste to energy plant is purchasing RDF as a fuel stock for the power generation plant

Elephant Energy shall receive MSW and produce its own RDF internally. As such this section (being RDF Price, RDF heating rate, station heat rate and RDF escalation) is not applicable to Elephant Energy.

However it must be noted at this point that all costs of making this RDF are therefore included in the total plant operational budget outlined in Section 7 below.

7. Operational Budget

1) Labour Costs

The plant has a forecast annual labour cost of (previously INR 15,303,112)

This is includes the estimated cost of the local unskilled labour, semi skilled labour, skilled labour and the Specialist labour that shall be required to run the plant.

2) Energy Costs

The plant requires Piped Natural Gas, Oxygen, Nitrogen and Diesel fuel to operate, all of which are procured locally.

The estimated annual cost of these items is INR7,439,285.

3) Repairs and Maintenance Costs

The plant has a forecast annual repairs and maintenance costs of INR 17,094,468]

.

This is includes the estimated cost of the replacement parts, technicians and consumable items.

4) Management and Administration Costs

The plant has a forecast annual management and administration cost of INR 15,264,081

5) Total Operating Cost

Elephant Energy confirms that the estimated annual cost to run the pant is INR 55,100,948 per annum (551 lakh INR per annum).

This Includes all operating and maintenance costs for overheads, labour, fuel gases, repairs and maintenance, management and administration (ie all costs related to running the cost of the plant and related to producing our own RDF) and equates to INR 3.41 per kilowatt

The CENTRAL ELECTRICITY REGULATORY COMMISSION (Petition No. SM/004/2015(Suo-Motu) Dated 07.10.2015) nominates an acceptable variable cost (ie cost of only RDF purhases) of INR 3.56 / Kwh.

8. Generation and Sale of Electricity

1) Working Hours per day

The plant shall operate 24 per day

2) No of Days per Annum

The plant shall operate 365 per annum.

This is consistent with The CENTRAL ELECTRICITY REGULATORY COMMISSION (Petition No. SM/004/2015(Suo-Motu) Dated 07.10.2015) view that "The Municipal Solid Waste and Refuse Derived Fuel based power projects shall be treated as „MUST RUN" power plants and shall not be subjected to „merit order despatch" principles."

Auditor Certificate Annexure -II

NAGAR GOEL & CHAWLA

Chartered Accountants

To,

Delhi Electricity Regulatory Commission

Viniyamak Bhawan, C - Block,
Maharshi Dayanand Marg,
Jahanpanah Monument, Malviya Nagar,
New Delhi, Delhi 110017

Subject: Certification of capital cost to be incurred by Elephant Energy Private Limited for their Municipal Solid Waste (MSW) located at NDMC Khatta, Arjun Das Camp, Raj Nagar, New Delhi - 110023

We have examined the purchase agreement in between supplier of the equipment and Elephant Energy Private Limited, D-605, Safisar, Plot - 6, Sector - 7, Dwarka Delhi - 110075 ("the Company") vide Contract reference : EEPL(India) 0001Rev1.0.

On the basis of agreement, we hereby certify that the Capital cost to be incurred by the Company would be as under

S.No.	Component of Capital Cost	Amount in USD
1	Energy Generation Plant	1,113,000
2	Gasifier	1,735,000
3	RDF Plant	433,125
4	Building, office and workshop	341,500
5	Freight	79,850
6	Duties and taxes	999,668
7	Custom clearing charges	30,000
8	Local Content	158,000
9	Engineering, Integration and Commission	1,338,988
	Total	**6,229,131**

Above figures are based on extracts of the aforesaid contract.

This certificate has been issued on request of management of the Company to be submitted to Delhi Electricity Regulatory Commission and not meant for general circulation.

For Nagar Goel & Chawla
Chartered Accountants
Firm Regn. No. - 009933N

Raman Chawla
Partner
M. No. 088805

Place: New Delhi
Date: 12.09.2015

Tariff Computation

Annexure -III

1	Power Generation				As per Annexure
	Capacity	Installed Power Generation Capacity	MW	2.75	*
		Auxiliary Consumption During Stabilisation	%	0	
		Auxiliary Consumption During Stabilisation	%	0	**
		PLF (stabilisation for 6 months)	%	67%	
		PLF (During first year after stabilization)	%	67%	
		Useful Life	Years	20	
	Net Electrical Output	Per annum	Kwh	16,206,000	
2	Project Cost				
	Total	Total Project Cost	Rs	347,131,754	
	Capital Cost / MW	Power Plant Cost	Rs / MW	126,229,729	
			Rs Crore / MW	12.62	***
3	Financial Assumptions				
	Debt Equity	Debt	%	70%	
		Equity	%	30%	
		Total Debt Amount	Rs	242,992,227.76	
		Total Equity Amount	Rs	104,139,526	
	Debt Component	Loan Amount	Rs	242,992,228	
		Moratorium Period	years	0	
		Repayment Period	years	15	
		Interest Rate	%	13.0%	
	Equity Component	Equity Amount	Rs	104,139,526	
		Return on Equity for first 10 years	% p.a.	20%	
		Return on Equity after 10 years	% p.a.	24%	
		Weighted Average ROE	%	22%	
		Discount Rate (equivalent to WACC)	%	15.70%	
4	Financial Assumptions				
	Fiscal Assumptions	Income Tax	%	33.9%	
	Depreciation	Depreciation Rate (Power Plant)	%	5.83%	
		Depreciation Rate (13th year onwards)	%	2.51%	
5	Working Capital				
	For fixed Charges	O&M Charges	Months	1	
		Maintenance Spare	(% of O&M Expenses)	15%	
		Receivables and debtors	Months	1	
	For Variable Charges	MSW Stock	Months	N/A	
		Interest on Working Capital	%	13.50%	
6	Fuel Related Assumptons				
	Heat Rate	After Stabilisation period	Kcal /Kwh	0	
		During Stabilisation period	Kcal /Kwh	0	
	MSW	MSW Price	Rs / T	0	
		GCV	Kcal / Kg	0	
		MSW Price Escalation Factor	%	0	
7	Operation and Maintenance				
	O&M Expenses	2015-16	Rs	55,100,948	****
	O&M Expense Escalation	%	%	As per Indian CPI	*****
8	Tarrif Rate Determination				
		Variable COG	Rs/ KWh	- ₹	
		O&M Expenditure	Rs/ KWh	3.40 ₹	****
		Depreciation	Rs/ KWh	1.25 ₹	
		Interest on Term loan	Rs/ KWh	1.95 ₹	
		Interest on Working Capital	Rs/ KWh	0.04 ₹	
		Return on Equity	Rs/ KWh	1.41 ₹	
		Total	Rs/ KWh	8.05 ₹	******
		Indexation of Feed in Tarrif		As per Indian CPI	*******

Footnotes

*	The waste-to-energy plant contains 5 x 550KWe internal combustion engines
**	The plant is connected to the grid in Island Mode, not in a Parallel mode. Additional energy is generated onsite to supply the auxiliary load of the plant, this separate energy generation plant operates in its own island mode and does not draw energy from the waste-to-energy plant. Therefore the auxiliary load should be considered as zero when calculating net annual output in this instance.
***	CENTRAL ELECTRICITY REGULATORY COMMISSION (Petition No. SM/004/2015(Suo-Motu) Dated 07.10.2015) nominates a benchmark of 9-15 Crore / MW. Yet, it is also noted that the data provided by Ministry of Urban Development was for an average Capital Cost / MW is 16.72 Cr per MW. With respect to this EEPL also notes that the EEPL plant is a decentralised plant whilst the CERC figures consider much larger centralised plants.
****	This includes all operating and maintenance costs for overheads, labour, repairs and maintenance, management and administration and equates to Rs 3.40 per kilowatt The CENTRAL ELECTRICITY REGULATORY COMMISSION (Petition No. SM/004/2015(Suo-Motu) Dated 07.10.2015) nominates INR 3.56 / Kwh as acceptable
*****	All operational and maintenance costs (overheads, labour, repairs and maintenance, management and administration) are exclusively domestic and reflect the items considered by the Reserve Bank of India when calculating Consummer Price Index (CPI) Therefore it is to be assumed that annual costs will increase at the same rate as the CPI as announced by the Reserve Bank of India.
******	CENTRAL ELECTRICITY REGULATORY COMMISSION (Petition No. SM/004/2015(Suo-Motu) Dated 07.10.2015) nominates a price of Rs 7.90 / Kwh. With respect to this EEPL also notes that the EEPL plant is a decentralised plant whilst the CERC figures consider much larger centralised plants.
*******	If annual costs increase at a faster rate than annual income then this denotes a declining terms of trade. Therefore annual incomes must also increase at the same rate as the CPI to avoid a declining terms of trade and maintain the Return on Equity Invested by EEPL.