BEFORE THE HARYANA ELECTRICITY REGULATORY COMMISSION AT PANCHKULA

Case No. HERC/PRO- 68 of 2019

Date of Hearing	**:**	**01.10.2020**
Date of Order	**:**	**26.10.2020**

In the Matter of

Application for determination of tariff for Biomass based Renewable Energy Project under Sections 62, 86(a), 86(e) and 94(f) of the Electricity Act, 2003 read with Haryana Electricity Regulatory Commission (terms and conditions for determination of Tariff for Renewable Energy Sources, Renewable Purchase Obligations and Renewable Energy Certificates) Regulations, 2017 as amended from time to time.

Petitioner
M/s. Sainsons Paper Industries Private Limited

Respondents
Haryana Power Purchase Centre, Panchkula (HPPC)

Present On behalf of the Petitioner through Video Conferencing
1. Shri R.K. Jain

Present on behalf of the Respondent through Video Conferencing
1. Smt. Sonia Madan, Advocate, HPPC
2. Shri Aditya Grover, Advocate for HAREDA

Quorum

Shri Pravindra Singh Chauhan **Member (in Chair)**
Shri Naresh Sardana **Member**

ORDER

Brief Background

1. M/s. Sainsons Paper Industries Private Limited has filed the present petition seeking project specific determination of tariff for sale of 3.5 MW power from its 5 MW Biomass based Power plant in Village Bakhli (Pehowa), under section 62 of the Electricity Act, 2003, as directed by the Commission in its Order dated 30.04.2019 (HERC/PRO-20 of 2019).
2. The Petitioner has submitted as under:-

a) That the Petitioner is primarily in the business of manufacturing Semi Craft Paper located in Vill. Bakhli (Pehowa) in the State of Haryana. The Petitioner Company has installed a 5 MW biomass-based power plant along with Extraction cum condensing turbine.

b) That the above 5 MW Biomass based power plant was commissioned in July 2017. This is a Combined Heat & Power (CHP) Power Plant which operates round the year. The Petitioner had offered to sell 3.5 MW power from this Power Plant to the State Power Utilities in the year 2017.

c) That the Petitioner submitted the Detailed Project Report (DPR) of the Project to HAREDA seeking approval from the Technical Appraisal Committee (TAC). However, certain technical observations were made by TAC relating to the Station Heat Rate, Specific Fuel Consumption, and other key financial

parameters of the Project. Accordingly, a Revised DPR was submitted to HAREDA after attending to the observations of the TAC in Nov. 2017.

d) That some of the important parameters of the Project are as under,

a) Installed Capacity:	5 MW
b) Type of Project:	Biomass based power project
c) Fuel to be used:	Rice straw & Rice Husk available in plenty
d) Boiler:	Capacity of 50,000 kg/hr. with steam pressure of 65 kg/cm2 and Temperature of 4600 C
e) Turbine:	5 MW Extraction cum condensing turbine.
f) Construction of Plant:	Through EPC Contractor
g) Raw Water:	From nearby Irrigation Stream and underground submersible pump
h) Ash Disposal:	Stored in Ash Dump and used for land filling, brick making and road construction, etc.
i) Type of Boiler:	Travelling Grate, Water Cooled Condensers
j) Project Connectivity:	The project has yet to get formal connectivity for which discussions has already been initiated with HPPC / HVPN although the Petitioner Company is already connected to the Grid through an independent 33 kV feeder emanating from 220 KV Substation, Pehowa.

e) That the DPR of the Petitioner Company was approved by HAREDA vide letter DNRE/HAREDA/2018/4782 dated 02.01.18 and an Implementation Agreement was signed on 13.03.18.

f) That the Commission notified the Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2010 (1st Amendment) Regulations, 2011 on 05.09.2011 which reads as under,

"*Reg. 64(3) In case the renewable energy generating company offers to sell energy generated by it from its renewable energy generating station located in Haryana to the distribution licensee at the rates determined by the Commission, the distribution licensee shall not refuse to purchase power from such generating company, without prior approval of the Commission*."

g) That having accepted the offer given by the Petitioner Company for sale of surplus RE power to the State Power Utilities, the Respondents filed Petition No. HERC/PRO-20 of 2019 before the Commission seeking necessary source approval for purchase of power from four of the identified RE Biomass Projects including that of the Petitioner Company.

h) That Commission, vide its Order dated 30.04.2019, while approving the proposal for purchase of power ordered as under:-

a) Tariff shall be decided on the separate petition to be filed by the Respondents under section 62 of the Electricity Act, 2003. The tariff petition shall include DPR approved by HAREDA and all other relevant

documents to arrive at the reasonable capital cost and all other tariff components.

b) HPPC is directed to recast the PPA on the basis of the amendment approved in the Order dated 03.04.2019 in case no. HERC/PRO-44 of 2018. HPPC is further directed to ensure that the terms of the PPA are strictly as per the provisions contained in the Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2017."

i) That the Petitioner and the Respondent signed a long-term Power Purchase Agreement (PPA) on 01.07.19. Clause 2.1.2 of this PPA reads as under:-

"2.1.2 The applicable tariff shall be the lowest tariff amongst the offered tariff, HERC generic tariff and the project specific tariff to be determined by HERC under section 62 of Electricity Act-2003 on the tariff petition filed by the Seller. Such tariff shall be applicable and payable by the Discoms/HPPC to the Seller.

Provided that till the determination of tariff by the Commission, interim tariff @ Average Power Purchase Cost (APPC) of that particular year, as determined by the Commission, shall be payable as an interim measure subject to adjustment thereafter, however, without any interest liability on such adjustment.

Provided further that energy supplied by the Seller over and above the normative Plant Load Factor (PLF), as considered by the Commission for determination of tariff, shall be paid @ 50% of the applicable tariff."

j) That clause 10.5 of the PPA provides for submission of Performance Bank Guarantee @ Rs.30 lac/MW of the contracted capacity.

k) That the petitioner submitted the requite Bank Guarantee amounting to Rs. 1.05 Crore.

l) That the project being a purely Biomass based Power Project, following broad parameters may be considered, for determination of tariff:-

A. **Capital Cost**:

The actual cost of the project is Rs. 31.52 Crore or Rs.6.34 Crore/MW, which is far below the HERC/CERC approved norms.

B. **Debt : Equity Ratio:**

The Petitioner contributed Equity of Rs.16.77 Cr. and obtained project loan of Rs.14.75 Cr.

C. **Plant Load Factor:**

Since commissioning of the plant the Plant Load Factor achieved has been as follows:-

2017-18	(July 17 to March 18)	65.0 %
2018-19	(April 18 to March 19)	80.0 %
2019-20	(April 19 to September 19)	80.0 %

D. **Auxiliary Consumption**:

The Auxiliary Consumption for the project has been assumed as 10% although the actual figures are much higher;

2017-18	(July 17 to March 18)	16.5%
2018-19	(April 18 to March 19)	13.9%
2019-20	(April 19 to September 19)	13.4%

E. **Fuel used**:

The project is using purely Rice Straw as fuel and there is no shortage of such fuel in the vicinity of the Project.

F. **Calorific Value of Biomass Fuel:**

Calorific Value of the fuel used at the Plant has been recorded as under:-

2017-18	(July 17 to March 18)	2,750 kcal/MT
2018-19	(April 18 to March 19)	2,700 kcal/MT
2019-20	(April 19 to September 19)	2,600 kcal/MT

It would be noted that the actual GCV of the available fuel is much lower than the norms of 3100 kCal/kg approved by HERC/CERC for Biomass Projects.

G. **Cost of Fuel:**

The average cost of fuel has been recorded as Rs.3300/MT for the base year which has been escalated with annual escalation of 5%.

H. **Station Heat Rate/Fuel Consumption**:

The actual fuel consumption recorded at the power plant has been as follows over the years:-

2017-18	(July 17 to March 18)	47,830 M.T
2018-19	(April 18 to March 19)	58,867 M.T
2019-20	(April 19 to September 19)	29,433 M.T

Thus the Station Heat Rate recorded at the power plant has been as follows:-

2017-18	(July 17 to March 18)	5829 kcal/kWh
2018-19	(April 18 to March 19)	4938 kcal/kWh
2019-20	(April 19 to September 19)	4724 kcal/kWh

Thus it would be observed that the actual SHR has been much higher compared to the normative SHR adopted in HERC/CERC Regulations as 4200 kcal/kWh.

I. **Interest on Term Loan and repayment terms:**

The Term Loan was negotiated with State Bank of India at an annual interest rate of 11.45%. The loan was negotiated for 6 years repayment period with moratorium of 1 year.

J. **Interest on Working Capital:**

The rate of interest on Working Capital has been adopted as 11.41% i.e. lower than approved norms of HERC.

K. **Operation & Maintenance Expenses:**

O&M Expenses have been recorded as Rs.38 lac/MW which is comparable to the norms of @ Rs.40 lac/MW for base year as 2017-18 with 5.72% escalation per year lower than the norms approved by HERC/CERC for Biomass Projects using Travelling Grate boilers and Water Cooled Condensers.

L. **Depreciation:**

The depreciation has been worked out at 5.38% for the first 13 years and 4.29% for the remaining period with the Residual Value as the base.

M. **Return on Equity:**

ROE of 14% has been assumed as per approved norms.

N. **Other Important parameters**:

All other parameters have been adopted as approved by HERC/CERC for Biomass based Projects.

m) That the Commission may consider the above factual parameters of the Project and determine the project specific tariff for the Biomass based Power Project. As the Power Plant is already functional, the power can start flowing from day one the Commission approves the tariff for such sale of power.

n) That the Petitioner has already requested HVPN to grant formal connectivity for pumping the RE power into the grid. Although the Petitioner is already connected to the grid on 33 kV through an independent feeder from 220 kV substation, Pehowa. Hence the connectivity will not be any hurdle in pumping power to the grid once the commercial arrangements are finalized and final tariff is determined/approved by the Commission.

o) The following prayer has been made;

a) The petition may kindly be accepted in present form.
b) The Project specific tariff for the proposed project may kindly be determined/ approved.
c) Any other relief to which the Petitioner Company is found entitled may also kindly be granted.

Proceedings in the Case

3. The case was first heard on 26.02.2020. The Commission vide its Interim Order dated 26.02.2020, directed the Petitioner to provide certain additional information with copy to the Respondent. During the next hearing held on 01.09.2020, the Commission took cognizance of the matter under consideration of Hon'ble Supreme Court regarding health hazards of stubble burning and the consequent affidavit dated 08.08.2020 filed by Chief Secretary, Haryana, submitting the current status report on position of paddy straw burning including the efforts made by the Government of Haryana to containl the same. The Commission further decided that correct determination of fuel cost & GCV are important issues in this Petition and obtain expert opinion from HAREDA.

4. In response to the Interim Orders of the Commission, the Petitioner filed its reply vide affidavit dated 14.07.2020, submitting as under:-

i) An affidavit in support of the capital cost incurred on the power plant including Land and other Machinery, certifying that capital cost of Rs. 3076 lacs claimed in the Tariff calculation has actually been incurred on the Power Plant, which includes Rs. 324 lacs towards the cost of land used for power plant and Rs. 2752 lac towards cost of Plant & Machinery. It has been further certified that it is the cost of power plant only and not shared cost of the main production plant.

ii) Details of Plant Load Factor (PLF), Heat Rate, Gross Calorific Value (GCV), and actual Fuel Cost of the Power Plant. The details are based on actual power plant data. The norms given in the order of the Commission dated 20.12.2019 are on general assumed data without factual figures whereas the data being submitted is the actual figures recorded at the power plant. All parameters like fuel cost, GCV and Heat Rate etc., are project specific and cannot be generalized. These would largely depend on the specific quality of fuel available and demand/supply of fuel in the area.

iii) The PLF of the power plant is also based on actual performance of the power plant in the past.

iv) Copies of loan agreements signed with the banks for Project loan and the Working Capital Loans.

v) All the data used in computation of tariff is based on ground realities and actuals. Future projections are based on the normative escalations approved

by the Commission. The Complete supporting data for the power plant is attached as under: -

a) Financial facts / Assumptions
b) Detailed Financial sheet
c) Details of Cost of Project and means of Finance
d) Land Details with copy of Sale Deeds
e) List of Machinery installed
f) Summary of Loans with sanction letters from Bank
g) Plant Load Factor, Auxiliary Consumption
h) Calculation of Station Heat Rate
i) Gross Calorific Value (GCV)
j) Production Capacity
k) Fuel Consumption Per Unit
l) Detail of Fuel Cost
m) Detail of Operation and Maintenance Cost
n) Depreciation on Assets
o) Interest on term Loans
p) Interest on working capital
q) Affidavit for Capital cost of Rs. 3076 Lacs

5. The Petitioner has further filed its reply dated 31.08.2020 in response to the written submissions filed by the Respondents dated 27.08.2020. The issues raised and the response thereto is as under: -

i) That all the contents of the written submission are denied save and except any specific averments therein which are expressly admitted in this Reply. Further the Petitioner has already filed all the information/documents asked for in the Interim Order of the Commission and the instant reply is limited to the present written submissions filed by the Respondent.

ii) That the Petitioner Company is operating a 5 MW non-fossil fuel Biomass (non-bagasse) based cogeneration power plant which was commissioned in July 2017. The Petitioner is committed to supply upto 3.5 MW power to the Respondent as per tariff to be approved by the Commission. The power plant is based on Rankine Cycle with High Pressure Travelling Grate Boiler and water-cooled condensers. The fuel used is Paddy Straw only, which is procured locally through large number of Collectors (50-60 Nos.). This fuel being seasonal in nature, is available only for 40-45 days in a year and hence the fuel has to be stored for the whole year in advance.

iii) That the statement made by Respondent that data furnished is not supported by documentary evidence is totally incorrect as all the data furnished is based on actuals and duly certified by the Chartered Accountants. It has to be appreciated that the instant petition is not a claim but an application for determination of tariff. Therefore, each and every information/data furnished by the Petitioner is based on facts and record.

iv) That the total submission made by Petitioner is supported by an affidavit with affirmation/swearing duly attested by Notary.

v) That total cost of Rs. 3,076 lac has been incurred on the power plant including the cost of land and the Plant & Machinery.

vi) That the cost of Land shown by Respondent is without the incidence of Stamp Duty, which is an essential part of the cost of land. Petitioner reiterates that this is the cost of land used for power plant and has nothing to do with the land used for main industry or production of paper. There is no denying the fact that the power plant is 5 MW and respondent is to be given up to 3.5 MW power only. The total land under the generation project is 14 acres for which the documentary evidence has already been given. In addition, approx. 85 acres land is partly owned by the company and partly taken on lease for storage of fuel. The manufacturing plant is located on a separate approx. 7 acres land which is owned by the company. The total land for the manufacturing process, power plant and fuel storage is approx. 100 acres. The power plant is using Paddy Straw, which is available only for 40-45 days in a year and accordingly, the fuel has to be stored considering the requirement for the whole year. The fuel handling and storage constitutes a substantial part of the project Land.

vii) That the Respondent has probably overlooked the components of the total cost of plant & machinery. It is not only the supply and erection of main Boiler, Turbine and Generator but it has a large portion of Civil Works and auxiliary systems like raw water system, Demineralized Water system, fuel handling and storage systems, electrical switchyard, etc. While the main supply and erection of main generating equipment was entrusted to EPC contractor, but other connected auxiliary activities were undertaken by the Petitioner by itself. The loan was taken for limited activities as majority of cost was borne by Petitioner as Equity. The Respondent is not aware about the transmission system for the project. The power generation is at 11 kV but transmission is on 33 kV through 220 kV substation, Pehowa.

viii) That while determining project tariff, entire costs are accounted for and the ultimate tariff is worked out on per unit basis. As regards loan amount utilization and repayment of loan, Petitioner has clearly mentioned this fact through the data submitted to the Commission.

ix) That the Fuel Cost given in the submissions is the average of the cost of fuel purchased through over 50 private collectors/cutters. Petitioner has submitted valid certificate from Chartered Accountants about the Fuel Cost.

x) That the figures of expenses are based on record and facts relating to the project. The fuel handling cost is a part of the fuel cost and does not form a part of the overall O&M cost of the project. This would be substantiated by a certificate from the Chartered Accountants.

xi) That the figures of O&M expenses are based on fact on record. The actual cost on ground is totally different than the normative figures assumed in the Generic Tariff orders. This would largely depend on site specific factors.

xii) That the figures of Auxiliary Consumption are as recorded on the project. It is totally baseless to say that the figures are exaggerated. This being a technical data it cannot be certified by the Chartered Accountants but if the Commission

so feels, Petitioner can submit a certificate to this effect from the Chartered Engineer.

xiii) That the Station Heat Rate reported includes the heat used for process steam as well and apparently sounds more than the normative figures. Regarding the GCV of the fuel, it has to be appreciated that the fuel being available for only 40-45 days in year but remaining stored for the year as a whole, the GCV varies over different seasons. The fuel also deteriorates with time. It has been noted that the GCV of fuel varies from 2200 kCal/kg to 3200 kCal/kg and the figures given are average for the year as a whole. If the Petitioner is to submit the supporting sheets, these are compiled on daily basis and will make a very bulky pack of documents.

xiv) That the PLF/CUF of any biomass-based power plant varies largely on the quality of fuel and greatly affected by atmospheric temperatures and rains. It is not guaranteed that if the power plant achieves 81.6% in one year, it would continue to achieve the same every year. Year to year performance would depend on various operational factors.

xv) That the Petitioner has accounted for 4 months' fuel cost and 2 months receivables towards working capital but in reality, it is much more, because of fuel which has to be procured/stored for 12 months due to limited seasonal availability. In fact, the annual fuel requirement has to be procured/stored in 40-45 days and as such much larger Working Capital is required for the project.

xvi) That the interest on Loan for Project and Working Capital is based on the actual loans negotiated with the lending banks. Petitioner has attached copies of loan agreements. The falling rate of interest, as applicable today, cannot be the basis for the project which has been in operation since the year 2017. It is a pure pass through cost and todays' rate of interest cannot be the basis for calculation of tariff.

xvii) That the Petitioner has neither taken into account the benefit of accelerated depreciation in its tariff computation nor asked for it.

xviii) That the observation of the Respondent regarding sharing of residual of generation process between the generator and the licensee in the ratio of 50:50, has no relevance to the project specific tariff determination. This provision is for the licensees who are required to get their Annual Revenue Requirements (ARR) approved from the Commission on annual basis and the ARRs, approved for the previous years, are to be trued up based on actual performance.

6. The Petitioner has further filed its written submission on affidavit dated 07.09.2020, pursuant to the hearing held on 01.09.2020, submitting as under: -

i) That 'Cogeneration', also known as combined heat and power, distributed generation, or recycled energy, is the simultaneous production of two or more forms of energy from a single fuel source. In practical terms, what cogeneration usually entails is the use of what would otherwise be wasted heat. 'Cogeneration' has been defined under S.2(12) of the Electricity Act, 2003, which reads as under: -

S.2(12) "Cogeneration" means a process which simultaneously produces two or more forms of useful energy (including electricity).

ii) That in India 'Cogeneration' has all along been associated with the Sugar Mills where Bagasse is produced as a by-product after crushing of sugar-cane. This view has been carried forward not only in various generic tariff orders issued by the State Commission but the Hon'ble Central Commission as well. The Petitioner would like to quote from the latest Generic Tariff Order of CERC dated 19.03.2019 which reads as under: -

"The Commission notes that bagasse produced from sugar cane crushing is a waste material. Bagasse as fuel which is generally used by co-gen plants and it is available within the premises of a sugar mill and thus, there is no transportation cost incurred on the procurement of bagasse. The data on cost of bagasse for February 2019 submitted by one of the stakeholders has been studied and it is found that it varies widely during the month. Moreover, data for one month does not substantiate the fuel price to be valid for the entire year. Further comments extending support for reduction in price of bagasse have been received suggesting that bagasse is a by-product of cane processing and its associated costs already included in the cost of sugar. In view of the above, the Commission has decided to retain the proposed fuel prices for Bagasse based cogeneration plants for the purpose of tariff determination."

iii) That the above basic mindset of Hon'ble Central Commission needs to be kept in view while considering project specific tariff for a non-bagasse-based cogeneration project. For Sugar Mills, cogeneration has direct impact on the following parameters used for tariff determination of such projects i.e.,

a) Capital Cost of the project, (Rs.49.25 Mn/MW against Rs.61.08 Mn/MW)
b) O&M cost, (1.67 lac/MW against 4 lac/MW)
c) Aux. consumption, (8.5% against 10%)
d) Fuel Cost, (Rs.729.3/MT against Rs. 2789/MT)
e) GCV of fuel, (2250 kCal/kg against 3100 kCal/kg), and
f) Ultimate levellised tariff (Rs.4.2 against Rs.8.69/kWh)

However, in a non-bagasse-based cogeneration projects, all these parameters would be more aligned to those for the conventional biomass-based projects. More so the Government of India is highly concerned about the environmental impact of Paddy Straw burning in Rice producing States. Accordingly, RE power projects using Paddy Straw as fuel should be given higher incentive.

iv) That even the Commission has been pursuing similar mind set as that of the Hon'ble Central Commission which is reflected in successive Generic Tariff orders issued from time to time. To quote a few: -

Generic Tariff order of 15.05.07 dealt with Biomass and Bagasse Cogeneration only. While Biomass fuel cost was taken as Rs. 1.60/kg, the Bagasse cost was taken as Rs. 0.90/kg. Cost of project was almost similar i.e. 42.9 Mn/MW for Biomass against 39.5 Mn/MW for Bagasse cogeneration. Tariff determined was Rs.3.74/kWh for Bagasse based cogeneration against Rs.4/kWh for biomass projects.

Consequential Order dated 27.05.11 revised the tariff for Biomass based projects from 2011-12 to 2015-16 but no such revision was done for other projects. Cogeneration remained with Bagasse only as fuel.

Generic Tariff order dated 25.01.12 issued for FY 2011-12 retained the basic difference in Biomass and Bagasse based projects with reduced Aux. Cons. & O&M cost, and Fuel cost being just 25% of Biomass cost. The comparative tariffs were Rs. 3.74/kWh for Bagasse based cogeneration and Rs. 6.04/kWh for Biomass based projects.

Generic Tariff order dated 20.11.13 determined tariff for FY 2013-14 but continued with similar assumptions and resultant tariff of Rs. 4.15/kWh for Bagasse Cogeneration and Rs. 7.05/ kWh for Biomass projects. However, while considering the tariff for Multiple Fuel Generation Projects, the Commission observed as under: -

"The Commission has considered the submission of HPPC that they are receiving offers from the power project developers whose projects would be using in – house available bagasse during the cane - crushing season and for the remaining days (off season) the same would be using biomass purchased from outside. Since the tariff approved by the Commission has no provision for renewable energy power projects using multiple fuels, the same may be included in the Generic Tariff order for FY 2013-14.

On the above submission the Commission is of the view that project cost of biomass-based projects and co-generation projects are not significantly different. However, fuel cost, GCV, SHR is considerably different in two cases thus the tariff in the case of co-generation projects vis – a – vis biomass project is considerably lower. Consequently, subject to regulation 41 of RE regulations, 2010, beyond the sugarcane crushing period, HPPC at their own discretion and in order to meet their RPO obligation, may procure power from co-generation projects at the tariff determined for biomass fuel-based generation projects in Haryana.

In such cases the generating company shall certify and HPPC / Discoms shall verify that the generation is from biomass and not bagasse. However, it is made clear that procuring such power shall not be binding on HPPC / Discoms."

Generic Tariff order dated 13.08.14 determined tariff for FY 2014-15 & FY 2015-16 with similar assumptions for Bagasse cogeneration and Biomass. While dealing with the cost of fuel for cogeneration projects, the Commission observed as under:-

"As far as cost of bagasse is concerned no data was submitted by the nodal agency i.e. HAREDA. The Commission reiterates that bagasse is available on site for generation. Hence no additional expenses are incurred in collection, storing, handling etc.

Hence, in this order as well the bagasse fuel cost was retained as almost 25% of the Biomass cost i.e. Rs. 695/MT for Bagasse compared to Rs. 3,055/MT for Biomass.

Consequential order of 09.10.15 pursuant to 4th Amendment of RE Regulations, the tariff for Biomass projects was revised but no such revision was done for the Cogeneration Projects.

Tariff order dated 03.10.17 also followed the same assumptions for 2017-18, whereas the cost of the project was kept much lower i.e. Rs. 49.25 Mn/MW for cogeneration compared to Rs. 65.22 Mn/MW for Biomass based projects and O&M cost was taken as Rs. 2.1 lac/MW for cogeneration projects against Rs. 40 lac/MW for Biomass.

Tariff order dated 20.12.19 continued with similar assumptions however, for the first time it was recognized that there could be Non-Bagasse based Cogeneration Projects. However, the basic concept of bagasse-based cogeneration did prevail and hence the adoption of much lower parameters such as Project Cost, O&M Cost, Auxiliary Consumption, etc. The O&M cost for non-bagasse cogeneration projects was inadvertently taken as Rs. 2.3 lac./MW (instead of Rs. 23.62 lac/MW in CERC order of 19.03.19) against Rs. 44.7 lac/MW for Biomass.

It needs to be appreciated that in Biomass (non-bagasse) based cogeneration projects, there is no difference in project cost, Aux. consumption, O&M cost, etc. compared to other biomass-based power projects. Thus, the benefits assumed for bagasse-based cogeneration are not available to non-bagasse based cogeneration projects. Therefore, cogeneration projects using paddy straw need to be treated are at par with other biomass-based projects and have to be given the same tariff as observed by the Commission in its Generic Tariff order of 20.11.2013.

v) The steam from the Boiler at the entry of Turbine is with 65 kg/cm2 pressure and 450 degree Celsius and when it leaves the Turbine the steam parameters undergo major change i.e. steam pressure and temperature drop to 1.5 kg/cm^2 and 118.4 degree Celsius. Part of the low-pressure exhaust steam from turbine is used for paper manufacturing process i.e. Paper Pulp cooking, Liquor extractions/evaporation and drying of Kraft Paper. The balance low pressure steam is condensed through water cooled condensers and condensed water used again in Boiler. Ash from the plant is used by farmers as fertilizer. Thus, it helps in checking unhealthy burning of paddy straw which is highly injurious to health/ environment, and used for power generation.

vi) That Petitioner is having its paper manufacturing operations since the year 1993. The total land being used by the Petitioner is around 100 acres which includes nearly 40-41 acres self-owned and rest taken on lease. The 5 MW Cogeneration Power Plant of Company is erected on 14 acres land which was acquired at a cost of Rs. 324 lac. The main manufacturing plant of the Company is on a separate 17 acres land. Almost 70 acres of land is used for storage of fuel for the entire year.

vii) That the Petitioner uses nearly 1.25 lakh MT of fuel (Paddy Straw) every year. For the procurement of such a huge quantity of Paddy Straw, the Petitioner uses services of a large number of private collectors/integrators. These contractors have to deploy lot of machinery for various operations involved in fuel procurement. The fuel being very light in weight and having large volume, its procurement, handling, transportation and storage have very serious

associated problems. Moreover, the fuel being purely seasonal in nature, it is available only for 40-45 days in a year and hence the fuel has to be aggregated and stored for the whole year in advance. There being no organized market for this fuel, the procurement varies from season to season and place to place.

viii) That after paddy crop is harvested, paddy straw is chopped from roots with mechanical choppers, then converted in bales weighing nearly 25 kg each using mechanized rappers and balers. Thus, more than 50 lakh bales are collected and transported from fields to plant site through trucks/tractor-trolleys and after weighing the fuel at site these are kept in different storage areas. Before use of the fuel in Boiler, it has to be cut in small pieces using large milling machines where the fuel is cut in ½" size and then fed to Boiler through Belt-conveyors.

ix) That as the fuel procurement is to be done through large number of contractors, it will not be prudent to submit copies of all the bills (which may be thousands in number) but sample bills, and monthly abstracts are being submitted for favour of reference of the Commission. A certificate from Chartered Accountant for fuel cost has already been submitted by Petitioner.

x) That the Petitioner conducts test for the GCV of fuel on random basis. As the fuel is lying in open it is affected by seasonal factors like, rains, storms, frost, etc. While during rains the fuel acquires moisture and gets wet, in extreme summer season, it has to be protected from fire incidence. Even the GCV of the fuel varies with season. For reference of the Commission GCV recorded during each month on the project is being submitted. The variation in the GCV may kindly be appreciated.

xi) That it would be appreciated that the Station Heat Rate (SHR) largely varies with the quality of fuel. Moisture content in fuel is a major factor which impacts the quantum of fuel used and the ultimate SHR. The Petitioner maintains record of the fuel used. Copies of such records are being submitted for reference purposes.

xii) The biomass-based cogeneration projects have to undertake all activities as that of the conventional biomass-based projects and hence the O&M expenses have to be similar to the normal biomass project. The assumption of a lower O&M cost for bagasse cogeneration projects has no relevance to the non-bagasse-based cogeneration projects. The cost of fuel storage, transportation, handling and cutting/milling is much higher compared to the bagasse-based cogeneration projects. While bagasse is generated in the Bagasse based cogeneration projects, but the non-bagasse Paddy straw-based projects have to procure Paddy straw annual requirement in advance, adding to the O&M cost. The Petitioner Company has given the actual O&M cost recorded on the project since commissioning duly certified by the Chartered Accountant. Although the record pertaining to the O&M cost at the plant is very voluminous, but sample compilation is being submitted for reference of the Commission.

xiii) The Auxiliary Consumption in a non-bagasse cogeneration project is in no way different than the other biomass-based projects. The fuel is procured from outside sources and multiple expenses are to be incurred for handling of fuel

and other operations of the power plant. Although the Petitioner has already submitted certificate from Chartered Accountant for the actual Aux. Consumption recorded at the power plant but to substantiate the figures, figures of actual Aux. consumption on monthly basis are also attached for favour of reference.

7. The Petitioner has filed rejoinder to the 'comprehensive submission on Fuel Cost and GCV of Biomass Fuel (Paddy Straw)' filed by HPPC, on affidavit dated 29.09.2020, submitting as under: -

i) That suggestions given by the Respondent are neither based on own experience on the subject matter nor supported by any latest study/report from a reliable source. Any reference to a study of a decade ago has no relevance.

ii) That the data furnished by the Petitioner is the ground reality and based on facts on record duly certified by the Chartered Accountants. As regards the suggestion of devising and maintaining an efficient Fuel Handling System, it is submitted that the power plant being run by the Petitioner is primarily for captive consumption and it is only the surplus power which has been offered for sale to the Respondent.

iii) That coming to the specifics of the Respondents submissions, Petitioner would like to submit as under: -

a) It is incorrect to presume that the fuel handling cost of Rs. 165/- is included in the O&M cost. We need to understand the complete cycle of fuel procurement and its unloading at the project fuel storage yard. There is complete demarcation of the activities undertaken by the fuel supply contractors and those pursued by the Petitioner at its power plant. These could be broadly grouped as under,

Activities handled by Fuel Supply Contractors	Activity done by the Petitioner
1. Collection and purchase of Paddy straw from the farmers; 2. Chopping off the paddy straw; 3. Rapping of paddy straw in the field; 4. Making bales of straw; 5. Storage of bales in the field or contractor's sub stores; 6. Loading of bales in transport vehicles; 7. Transportation of bales to the fuel store of the Petitioner.	1. Weighing of transport vehicles, with paddy straw bales and after unloading; 2. Stacking of bales in the fuel storage yards, which are located over nearly 70 acres of land; 3. Reorientation of the bales to minimize decay of fuel; 4. Frequent spraying of water on the bales to minimize loss of fuel from the winds and fire prevention; 5. Loading, Transportation and unloading of bales from stock yard to the fuel handling system near the boiler; 6. Milling of the straw into ½" pieces before feeding to the boiler;

It would be noted that there are distinct activities handled by the fuel supply contractors and those undertaken by the Petitioner. The cost associated with the activities undertaken by the Fuel Supply Contractors as well as other activities handled by the Petitioner are an essential part of the Fuel Cost. Thus, the entire fuel handling cost is an integral part of the fuel cost.

b) It would be noticed from the data already furnished by the Petitioner that there is no rigid trend of biomass fuel cost. While it depends more on the extent of crop (depending on the climate conditions) in a particular year and largely affected by the demand and supply scenario. The observation/suggestion of taking a CAGR of 3.29% is just absurd. What

happens if the increase in one year is 21.75% (in 2018-19 over 2017-18)? In fact, it should be pass through. Petitioner would be too happy to claim the actual fuel cost instead of assuming any cost escalation factor.

c) The Petitioner appreciates the remarks of the Respondent about the reliability and creditability of the fuel cost, compared to the data submitted by HAREDA. As already said, the data furnished by the Petitioner is totally authentic and 100% correct.

d) That the Petitioner is running the power plant primarily for its captive use and will take all measures to optimize the power plant.

e) That the submission of the Respondent regarding procurement of fuel from cost-effective and through competitive process is unrealistic. It is an admitted fact that procurement of Paddy straw is totally through an undeveloped/unregulated market. This item is not sold in any competitive market. The Petitioner and other similarly placed generators have to deal with so many private contractors who have to deploy lot of machinery and labour for the collection and supply of fuel.

f) That the Respondent has referred to Electricity Act, 2003 while emphasising the tariff determination on commercial principles, but ignored the fact that the Electricity Act/Tariff Policy talk of proper safeguarding the interests of the generators as well. The commercial interest of generators can't be made subservient to the interest of the distribution company.

g) The Respondent has referred to the report of Committee of Experts constituted by CERC in the year 2012. There is apparent contradiction between the contents mentioned therein. While in Para-11, there is recommendation of fixing a target of 1.65%-2% of fuel losses during biomass storage, in para-18 the losses are indicated as 7-10% for the entire year. Further, the recommendations under Para-11 are, (i) to level the ground and provide proper drainage system, (ii) to cover the biomass with tarpaulin, etc. are unrealistic. Probably the Committee making recommendations did not visualize the land used for storage of such fuel and the area over which the paddy straw is stored. In the case of Petitioner, it is over 70 acres of land and over 50 lac bales of 25 kg each. This is not food-grain which could be stored in silos or covered with tarpaulin.

h) That with reference to Haryana Government incentive mentioned by the Respondent, it is submitted that the cost of fuel given by the Petitioner is based on net price paid to the contractors and nothing could be more authentic than these figures.

i) That any reference to the figures mentioned in the DPR needs to be understood with due diligence. The figures assumed in the DPR are more indicative and estimated. These could be far from realities. Figures indicated by Sukhbir Agro or Hind Samachar are estimated/assumed for establishing the viability of the project and not based on ground reality. Figures given by the Petitioner are the actual ground realities and hence more reliable and acceptable.

j) The normative figures assumed for determination of generic tariffs are again based on sampling done for estimation. But while determining project specific tariff there could be nothing more realistic or reliable than the experience of the Petitioner in dealing with RE Generation using Paddy Straw as fuel. This does not need any support or authentication from normative figures/standards.

k) Any reference to the Hon'ble APTEL order of 04.05.2016 is not relevant to Petitioner's case as firstly the decision pertains to the State of Madhya Pradesh and based on data furnished by Deputy Commissioner, NRED, Bhopal. Every State has its own peculiarities and there is no sweeping reference which could be relied for every State.

8. The Petitioner has further filed its written submission on affidavit dated 06.10.2020, pursuant to the hearing held on 01.10.2020, submitting as under: -

i) That the instant written submissions are being made to place on record Petitioner's arguments preferred during hearing held on 01.10.2020 and those on the comments filed by HAREDA with regard to Fuel Cost of various Biomass material including that of Paddy Straw. These submissions may kindly be read as a part and parcel of the main Petition and the subsequent submissions made by the Petitioner, orally or in writing, while determining the project specific tariff.

ii) That the comments sent by HAREDA are too sketchy to be relied upon. The figures given are simply based on general data collected from their field officers without any scientific method of sampling/collection of such important data. No period of reference for the data has been mentioned. Even HAREDA has very candidly admitted in last Paragraph of the report that if the directed, they could get a formal study done through some reputed technical agency such as TERI / Agriculture University, Hisar or any other agency as deemed fit. Therefore, the comments received from HAREDA cannot be used as a reference point for a serious matter like that of the present determination of tariff.

iii) That even the rough data furnished by HAREDA does not differ much from the actual figures (duly certified by the Chartered Accountants) submitted by the Petitioner through 'Written Submissions' dated 31.08.2020. Petitioner has placed on record the Fuel Cost as recorded during the operation of the power plant since July 2017 upto date. There can't be anything more authentic than these figures based on the past period of over 3 years. Even the Petitioner had furnished audited figures of fuel cost to HAREDA vide mail dated 10.09.20 which has been annexed by HAREDA alongwith the report. The relative figures are:-

Source	2017-18	2018-19	2019-20	2020-21	2021-22
Sainsons	1985	2416	1983	2083	2187
HAREDA	1925 (Minimum) to 2567 (Maximum) or average of 2246				

(Figures in Rs./MT)

iv) That the Petitioner has requested the Commission to keep in view the distinct peculiarities/ similarities between 'Paddy Straw based Cogeneration Power Plant' and 'Bagasse based Cogeneration Power Plant' and the conventional 'Biomass based Power Plants'. Some of the prominent ones are:-

Parameter	Conventional Biomass	Paddy Straw based cogen.	Bagasse based cogen.
Capital Cost	Full-fledged fuel storage, handling and processing system needed	Full-fledged fuel storage, handling and processing system needed	Very skeleton fuel storage, handling and processing infrastructure needed as fuel (bagasse) being available locally.
-do-	Elaborate arrangement needed for ash handling as the quantity and quality of ash is important.	Elaborate arrangement needed for ash handling as the quantity and quality of ash is important.	Very scanty ash handling & disposal system required.
-do-	Very large land area needed for fuel storage as it has large volume and is available for a few months in a year.	Very large land area needed for fuel storage as it has large volume and is available for a few months in a year.	Hardly any storage needed as bagasse is used directly and instantly.
Cost of Fuel	Fuel has to be procured through an unregulated market.	Fuel has to be procured through an unregulated market.	Fuel procurement is no problem as it is a by-product of cane crushing.
-do-	Repeated loading, unloading, transportation and stacking needed.	Repeated loading, unloading, transportation and stacking needed.	No such requirement.
-do-	Fire-fighting system is needed as the fuel is highly inflammable.	Fire-fighting system is needed as the fuel is highly inflammable.	No such requirement.
Loss of Fuel	Very high fuel losses due to high winds/ rains and summer season being light in weight & bio-gradable.	Very high fuel losses due to high winds/ rains and summer season being light in weight & bio-gradable.	No such problem as it is used within a short time of being available.
Future scenario of Availability of Fuel over the years	Availability of fuel on long run is not certain as farmers are bound to become aware of the commercial value of biomass.	Availability of fuel on long run is not certain as farmers are bound to become aware of the commercial value of biomass.	No such problem as fuel is by-product of sugarcane crushing and sugar production process.
Gross Calorific Value	GCV of fuel is highly affected by high moisture content and degradation/ decay of bio-mass over long storage time. Hence very large variation in GCV over the year.	GCV of fuel is highly affected by high moisture content and degradation/ decay of bio-mass over long storage time. Hence very large variation in GCV over the year.	GCV is not affected as fuel is used immediately on production.
Auxiliary consumption	Very elaborate auxiliaries equip. required i.e. fuel storage/handling system, ash handling system, fuel milling/ chopping system, steam condensers, etc.	Very elaborate auxiliaries equip. required i.e. fuel storage/handling system, ash handling system, fuel milling/ chopping system, steam condensers, etc.	Relatively very few auxiliaries needed.
Operation & Maintenance expenses	Huge O&M expenses needed due to operation of very large auxiliaries. Very large input of men & machinery for fuel handling and storage system.	Huge O&M expenses needed due to operation of very large auxiliaries. Very large input of men & machinery for fuel handling and storage system.	Relatively much less O&M expenses.

v) Non-Fossil Fuel Biomass (Non-Bagasse) based Cogeneration Power Plant:

In the foregoing submissions Petitioner has tried to deal with the peculiarities of Paddy Straw based cogeneration power plant compared to the Bagasse based cogeneration power plant. It has to be appreciated that Paddy Straw is a big nuisance for the environment and the general health of the public at large. The Central/State Governments are very serious about tackling this problem and high penalties have been imposed to prevent stubble burning.

While considering the normative parameters for determination of project specific tariff, the similarities of Paddy Straw Biomass (non-bagasse) based cogeneration may be kept in view. There is need for change in mind set about cogeneration power plants, which have been for ages clubbed with Bagasse based cogeneration plants. The observations made by Hon'ble CERC in its latest order dated 19.03.2019 and that of the Hon'ble HERC in Generic Tariff Order dated 13.08.2014 are very relevant to this effect.

CERC Generic Tariff order dated 19.03.2019 reads as under,

"The Commission notes that bagasse produced from sugar cane crushing is a waste material. Bagasse as fuel which is generally used by co-gen plants and it is available within the premises of a sugar mill and thus, there is no transportation cost incurred on the procurement of bagasse.

HERC Generic Tariff order dated 13.08.2014 read as under,

"As far as cost of bagasse is concerned no data was submitted by the nodal agency i.e. HAREDA. The Commission reiterates that bagasse is available on site for generation. Hence no additional expenses are incurred in collection, storing, handling etc.

vi) Land Use for the Project:

Out of the total area of 100 acres being used for various operations of the power plant and the paper production unit, there is vast area of nearly 70 acres of land which is used for fuel storage. More than 60% of this land is on leasehold basis. The actual lease rent paid was shown in the Chartered Accountants' Certificate submitted with Written Submissions dated 31.08.2020. It would kindly be observed that the lease rental component is very small compared to the overall cost of the fuel. Moreover, it will not be prudent to imagine a captive power plant would not have any part of the incidence of land cost.

vii) Capital Cost:

In support of the capital cost and the cost of land, copies of sale deeds have been submitted. A comprehensive Affidavit was submitted with the 'Reply of the Petitioner' dated 31.08.2020. A Chartered Accountants' Certificate was also filed, which is an undisputed document and even admitted by Tax Authorities.

The Petitioner has given detailed calculations of the depreciation in the original application dated 14.07.2020 in the 'Detailed Financial Sheet'. While the Norms provide for a Depreciation of 5.38% for first 13 years which is calculated on the capital cost of the project, but as per the Companies Act, 2013, depreciation is applied on the 'Written Down Value' of the project cost. Thus the Petitioner has computed tariff as per method allowed under the Companies Act.

viii) Operation & Maintenance Cost:

The Petitioner has tried to place all the factual record of the actual operation of the power plant since its commissioning in July 2017 duly certified by Chartered Accountants and nothing could be more authentic than these figures.

ix) Auxiliary Consumption:

Petitioner has placed the factual data on record for scrutiny of the Commission. The Licensees have the benefit to submit application for Review/True up of

earlier year ARRs under the MYT Regulations whereby the Utilities get to claim all variations whether those fall under the category of 'Controllable or uncontrollable' item but similar facility is not available to the RE Generators. The Commission may kindly consider if similar facility could be given to the Generators who are allowed project specific tariff.

x) Station Heat Rate:

The Petitioner has already placed total factual data of the project for kind consideration of the Commission. The Application submitted on 14.07.2020 contained all the details of the SHR, which were duly supported by the data submitted on 31.08.2020, 14.09.2020 and 29.09.2020.

xi) Plant Load Factor:

The Petitioner has already placed the actual PLF achieved since the commissioning of the power plant through Application dated 14.07.2020. There was large variation in the PLF, which depends on multiple ingredients. The PLF recorded in first 3 years was 66.10%, 75.20% and 81.61% during FY 2017-18, FY 2018-19 and FY 2019-20. There are many parameters which directly affect the final PLF like, quantity & quality of fuel received, extent of impact of degradation/loss on the GCV of duel, etc.

xii) Working Capital & Interest on WC:

There is apparent omission on the part of the Respondents while stating that the fuel cost of 6 months has been taken in computation of WC by the Petitioner. The fact is that in all the calculations, fuel cost of only 4 months requirement has been accounted for.

As regards the interest on Term Loan and that of the WC, Petitioner has already placed copies of the loan agreements signed with State Bank of India. It may kindly be kept in view that the loan negotiation depends on so many factors i.e. the year when it was negotiated and interest rates prevalent at that time, the credit rating of the borrower, repayment period, profitability of the project, etc. However, the Petitioner always endeavoured to negotiate the best rates and the actual rates paid in the past / being paid as of now have been assumed in the tariff computations. It would not be prudent to go by the theoretical interest rates suggested by the Respondents, which are totally impractical.

9. HPPC, through an affidavit dated 27.08.2020, filed written submissions/objections to the reply filed by the Petitioner, submitting as under:-

i) That the Petitioner has failed to provide any documentary evidence to the parameters claimed in the Petition.

ii) That the present reply, exposing the hollowness in parameters submitted by the Petitioner and refuting the contentions made in the Original Petition, is just and necessary for proper adjudication of the matter.

iii) That, any bald information provided by the Petitioner without any documentary evidence in support has no credence in the eye of law. In response to documents/ information sought by the Commission, the Petitioner, at many places, has made bald averments in the form of self-serving tabular statements/ figures/ data without placing on record any evidence to prove the

same. Reliance on self-serving and fanciful tabular statements in this regard is no substitute for cogent evidence. It is a well-settled rule of law that a claim which is not supported by evidence is not payable. No evidence has been placed on record about the figures in the tabular statements and hence, no credence can be given to the same. On the contrary, in view of the well-established principles of Evidence Act governing the legal framework of our country, in the absence of any cogent evidence, adverse inference has to be drawn against the Petitioner. Considering the said position of law, the submissions made hereunder on various parameters of the Petitioner's Plant may be considered for effective determination of tariff.

iv) **Capital Cost**

a. The Petitioner has placed on record an Affidavit for Capital Cost of Rs. 3076 lacs, which is only a statement made by the Petitioner on a blank paper as the same has not been attested. An affidavit is a solemn and voluntary declaration or statement of facts in writing, relating to matters in question or at issue, and sworn or affirmed and signed by the deponent before a person or officer duly authorised to administer such oath or affirmation. An affidavit constitutes evidence, where so provided or agreed. It was for this reason that the Commission, vide Order dated 26.02.2020, has specifically ordered Petitioner to certify capital cost on the 'affidavit'. In certain facts and circumstance, the Courts are required to determine disputes or causes and make orders or give judgments, acting on statements made in affidavits. In the absence of due 'affirmation' or 'swearing', an affidavit has no value and in fact is not valid.

b. Without prejudice to the foregoing objection, It is submitted that the Petitioner has stated that it has incurred a total capital cost of Rs. 3076 Lac on the power plant, the components of which are as under –

Particulars	Capital Cost
Cost of Land	Rs. 324 Lacs
Cost of Plant and Machinery	Rs. 2752 Lacs
Total Capital Cost	Rs. 3076 Lacs

c. As regards the cost of land claimed by the Petitioner for Rs. 324 Lacs, the Petitioner has placed on record, the following Sale deed :-

Date of Sale Deed	Amount of Sale Deed
14.11.2011	24,50,000/-
14.07.2015	1,45,12,500/-
24.07.2015	46,97,500/-
19.05.2016	30,56,000/-
07.10.2016	61,12,000/-
Total amount of Sale deeds	3,08,28,000/-

The aforesaid cost, however, cannot be accounted for in instant tariff determination process. The Plant of the Petitioner was intended to be set up to meet the future demand of the paper manufacturing business. Section-3 of the Detailed Project Report (DPR) provides as under –

"*M/s. Sainsons Paper Industries Pvt. Ltd. is an existing company incorporated vides certificate on incorporation no. 05-30667 on 05-09-1989 by register of companies, Delhi and Haryana as a private limited*

company. Subsequently it has been converted into limited company w.e.f.29th July, 1995, 1995 vide on order 1997 of ROC, Delhi and Haryana. The company has been promoted by Mr. Randheer Singh Saini, Mr. Ramesh Kumar Saini, Mr. Bal Krishan Saini, Mr. Sandhu Ram Saini and Mr. Pradeep Kumar Saini who are engaged in the manufacture of Semi Kraft paper of 120 GSM to 250 GSM with an installed capacity on 150 TPD at plot no.5, Village Bakhli, Pehowa, Distt. Kurukshetra.

Now mill is planning to increase production from 150 TPD to 200 TPD by installing double wire in existing double wire in existing paper machine and by adding additional dryer cylinder. ***To meet the power & steam requirement for additional production it is required to install captive power plant of 5.0 MW to run the 5.0 MW turbine mill is planning to install 50 TPH boiler operating at 65 kg/cm2 & 460 deg C. To meet the steam requirement, mill is planning to install 5.0 MW fully back pressure turbine****."*

(Emphasis Supplied)

d. In view of the specific declaration in the DPR as regards intention of setting up a co-generation plant for captive use, the land acquired for the said purpose, cannot be included in the tariff claimed from the Respondents for energy sold from said Plant. The plant is set up for captive usage and the incidental power over and above its captive requirement has been offered for sale. Even if there was no sale of energy to the Respondents, the Land had to be acquired by the Petitioner for setting up of Plant for its own use to meet its own energy requirement and substitute the costly generation from alternate sources. Moreover, the Petitioner has installed Plant as per its own layouts and designs. The land so purchased for said purpose, was as per its own requirement and convenience. No proportion of huge land cost be passed on to the consumers of the State for sale of surplus incidental energy from the Plant of the Petitioner.

e. As regards the Cost of Plant and machinery claimed by the Petitioner amounting to Rs. 2752 lacs, no bills/invoices/ proof of payments/ Purchase Orders etc. have been placed on record. The Petitioner has only relied upon a tabular statement, which mentions that Turbine 5MWGWT (Constructed in-house) and Boiler 50 MT (Constructed in-house) has been installed, the value of which is Rs. 2752 Lacs. Further, summary of Loan has been provided, which mentions that 2 no. Loans amounting to Rs. 850 Lacs and 625 Lacs, totalling to Rs. 1475 Lacs were taken for installation of Boiler and Turbine. In support thereof, Petitioner has appended following Loan Sanction documents –

Date of Loan Sanction	**Purpose**	**Amount**	**Duration**
22.03.2013	Installation of an additional Stand By Boiler of capacity 50 TPH. 65 kg/cm square	850 Lacs	6 years 1 month Repayment till 31.03.2019
30.03.2016	Installation of 5MW Turbine,	625 Lacs	6 years

	Setting up of 11 kV power transmission line and related equipment/ machinery		Repayment till 31.03.2023

f. The Loan for an amount of Rs. 625 Lacs was availed by the petitioner for several works including installation of turbine, setting up of 11 KV transmission line and other equipment. The cost of transmission infrastructure cannot be considered a pass-through expense as the same, if required for evacuation of power, falls in scope of power utilities as per Regulations in vogue and may be treated accordingly. The details of the utilization of loan have not been provided by the Petitioner. The whole amount of Loan cannot be taken into account in the instant Petition in absence of utilization details of said loan.

g. It is pertinent to note that the Loan for installation of Boiler referred in table above has already been repaid by the Petitioner. Similarly, payment for Loan for installation of Turbine and 11 KV line and other equipment's are being made. A portion of the cost of such Loan has been recovered by the Petitioner from the energy consumed from the Plant. The complete value of said Loans cannot be accounted for in the Capital Cost.

h. The alleged Capital Cost cannot be taken into merely on the statements of the Petitioner. Thus, the details of the Capital Cost submitted by the Petitioner in instant Application are exaggerated, irrelevant and not worthy of any consideration.

v) **Fuel Cost**

a. In the instant application, Petitioner has claimed the fuel cost ranging from Rs. 1985 per MT to Rs. 2416 per MT from FY 2017-18 to FY 2023-24 as against Rs. 3300/MT with 5% escalation each year claimed in the Original Petition. The said cost has been claimed relying on a tabular statement. However, no fuel bills/proof of payment has been placed on record despite the specific objection of the Respondent in the reply to the Original Petition to the effect that since the Petitioner had been operating plant for self-consumption, the recent fuel bills ought to have been placed on record. The tabular statements fail to establish that the plant is run with cost-effective fuel available from a competitive market.

b. The alleged fuel cost comprises of fuel purchase cost, loading and unloading cost, handling cost, labour cost and storage cost, however not supported by relevant bills/invoices. It is imperative upon the Petitioner to establish that all such components legitimate and have not been included in the O&M costs specifically. The Petitioner has miserably failed to put forth any justified cost of fuel. In absence of any cogent evidence in support of the fuel cost claimed by the Petitioner, reasonable fuel cost with a ceiling of fuel cost of Rs. 1971/- per MT (i.e. Rs. 2083/- claimed by the Petitioner minus handling cost of Rs. 112/- which is included in the O&M cost) may be considered by the Commission for FY 2020-21. Further, from the perusal of fuel cost trend during FY 2017-18 to FY 2023-24 as claimed by the Petitioner, it is evident that the fuel cost has

increased with CAGR of 3.29% against the normative value of 5%. As such fuel cost escalation may be considered at the rate of 3.29% considering the trend projected by the Petitioner.

vi) **O&M Cost**

The Petitioner has claimed O&M cost ranging from Rs. 275 Lacs to Rs. 351 Lacs from FY 2017-18 to FY 2024-25. The reliance in this regard is on a tabular statement placed on record as Annexure-8. Such high O&M does not seem justified especially in absence of any proof. It is therefore, imperative that actual details of O&M cost be put forth by the Petitioner for effective determination of tariff. However, without prejudice to foregoing, it is submitted that in absence of any cogent evidence in support of the O&M cost claimed by the Petitioner, reasonable O&M cost with ceiling of normative fuel cost for fossil fuel-based co-generation plant for FY 2020-21 i.e. Rs. 24.81 Lacs per MW, may be considered by the Hon'ble Commission.

vii) **Auxiliary Consumption**

The Petitioner by way of instant Application has stated the Auxiliary Consumption as high as 16.61% as against 10% claimed in the Original Petition. There is no evidence in support of the exaggerated increase in the Claim. The Petitioner has only relied upon the tabular statement. There is no basis to accept the Auxiliary Consumption as high as 16.61%, which is even beyond the normative parameter. On the contrary, Petitioner has claimed huge capital cost, which shall mean that a Plant of superior specifications should have been installed by the Petitioner. In that event, the figures of Auxiliary consumption, Station heat Rate and associated O&M cost ought to have been favourable than the normative figures. However, Petitioner, in its desperate attempt to bag as much as tariff as possible has claimed exaggerated figures, for which, no cogent evidence has been placed on record for obvious reasons. Without prejudice to foregoing, it is however, submitted that in absence of any cogent evidence in support of the Auxiliary Consumption claimed by the Petitioner, reasonable figure with ceiling of normative parameter may be considered by the Commission.

viii) **Station Heat Rate (SHR) and Gross Calorific Value (GCV)**

The Petitioner by way of instant Application has stated SHR as high as 5925.25 as against normative parameter of 3600. Similarly, GCV has been stated as low as 2787 kCal/kg of fuel, contrary to the GCV of 3500 kCal/kg envisaged in the DPR. Needless to say, there is nothing on record to establish the efficiency of the Plant equipment. Mere reliance of the Petitioner is on a tabular statement. It is reiterated that on the contrary, Petitioner has claimed huge capital cost, which shall mean that a Plant of superior specifications should have been installed by the Petitioner. In that event, the figures of Auxiliary consumption, Station Heat Rate and associated O&M cost ought to have been favourable than the normative figures. The exaggerated figures claimed by the Petitioner are not worthy of any credence. Without prejudice to foregoing, it is however, submitted that in absence of any cogent evidence in support of the

SHR claimed by the Petitioner, reasonable figures with ceiling of normative parameter may be considered by the Commission. GCV of fuel shall be considered at least to the level of 3500 kCal/kg of fuel as envisaged in the project DPR.

ix) **Plant Load Factor (PLF)**

The Petitioner has contended the PLF of the Plant as 81.6% during FY 2019-20. Needless to say that the said figure is unsubstantiated like other parameters submitted by the Petitioner. However, since the actual PLF is better than the normative value of PLF of 80%, the actual PLF of 81.6% may be considered by the Commission for determination of tariff.

x) **Working Capital: -**

In this regard it is submitted that the Petitioner has claimed exaggerated Working Capital to the tune of Rs. 2 crores/MW without substantiating the said figures. In absence of any proof and reasoning in support of exaggerated figure of Working Capital, the same shall be restricted to actual figures based on other parameters considered by the Commission for tariff determination for the project.

xi) **Interest on Loan and Working Capital**

Petitioner has relied on tabular statements in support of the claim for Interest on term loan and working capital. These tabular statements are not of any avail and cannot be considered. In absence of actual substantiated figures, the Commission may assume reasonable values restricted to normative parameters provided in the Regulations i.e. MCLR plus margin. The current MCLR of SBI is pegged at 6.65%, as such, the Commission may consider interest on Term Loan and Working Capital as 8.65% and 7.65% respectively in line with the Regulations.

xii) **Accelerated Depreciation**

A perusal of Annexure-9 evinces that Petitioner has not availed the benefit of accelerated depreciation. Hence, the same does not call for any further submission in the matter.

xiii) In addition to the foregoing, it is submitted that Clause 12.4 of the MYT Regulations provides for item wise gain to be shared between the generating company and the licensee in the ratio of 50:50. Considering the same, it was imperative that informative be provided regarding any residual of generation process. The sale value of same has to be taken into account for determination of tariff.

10. HPPC, has filed comprehensive submissions dated 24.09.2020 on Fuel Cost and GCV of Biomass Fuel (Paddy Straw), which is common for similarly placed petitions under consideration of the Commission, for determination of Tariff. HPPC has submitted as under: -

i) During the course of hearings of the above mentioned Petitions regarding determination of tariff for Plants fed on biomass fuel; it was observed that determination of cost of agricultural residue/biomass to be used as fuel in Power Plants is a critical factor. The majority of Biomass fuel considered in the instant Petitions is the Paddy Straw/ Rice Straw. The Generators like M/s

Sainsons Power Industries located at Kurukshetra and M/s Naraingarh Sugar Mills (NSML) located at Ambala has claimed fuel cost which is highly varied. Another important determining factor of tariff determination is Gross Calorific Value (GCV) of Biomass fuel, for which also the Generators have made varying submissions. In an attempt to address these two relevant issues, HPPC is hereby filing comprehensive submissions analysing trend of Cost and GCV of Paddy Straw.

ii) The cultivation of paddy has increased tremendously over the years and is expected to increase in the future in response to the growing population. It is noticeable that this will lead to significant amounts of agricultural wastes annually, particularly rice straw. After harvesting the paddy crop, the paddy straw remains stranded in the field which require further labour and resources to remove from the field. As the paddy straw has very less commercial value, farmers instead used to burn the same to clear their field for next crop. The paddy straw has least commercial value amongst other biomass however, it requires machines such as balers to get it removed from the fields for further use as fuel. The Biomass fuel procurement industry is highly unregulated and therefore, the averments made by the generators regarding cost of biomass fuel could not be relied upon in absence of cogent evidence in support. The best method before us was to analyse the data provided by M/s Sainsons Industries Ltd. as they had been operating Power Plant on Paddy Straw for over 3 years now.

iii) It is pertinent to highlight here that as per data given by Department of Agriculture, Haryana published in International Journal of Science, Engineering and Technology Research (IJSETR), Volume 4, Issue 5, May 2015, the availability of paddy straw in various districts of Haryana was depicted as under-

Haryana (2013) Sr. No.	**District /Parameter**	**Paddy Area ('000 ha.)***	**Straw Burning Area ('000 ha.)**	**% of Paddy Area**
1	Ambala	79	12.27	15.54
2	Fatehabad	93	32.68	35.14
3	Jind	118	4.17	3.54
4	Kaithal	158	41.42	26.21
5	Karnal	162	54.33	33.54
6	Kurukshetra	118	39.82	33.75
7	Panipat	62	0.81	1.31
8	Sirsa	68	19.61	28.84
9	Sonipat	100	1.23	1.23
10	Yamunanagar	69	1.98	2.87
Total		**1027**	**208.34**	**20.29**

As depicted above, the top 5 contiguous districts comprising Karnal, Kurukshetra, Fatehabad, Kaithal and Ambala contribute nearly 60% of the Paddy area. The Power Plants in question in instant Petitions before this Commission are also based in these top 5 districts of Haryana. Meaning thereby the availability of paddy in near vicinity to these plants is not of much concern.

iv) M/s Sainsons Industries has been operating plant on paddy straw for last 3-4 years. They have claimed actual fuel cost as ranging from Rs. 1985 per MT to Rs. 2416 per MT from FY 2017-18 to FY 2023-24. This cost comprises of fuel purchase cost, loading and unloading cost, handling cost, labour cost and storage cost. In line with the actual cost of paddy straw fuel admitted by M/s Sainsons Industries, HAREDA has also submitted an average rate of Rs. 1924.61/MT for the paddy straw. It is apparent that the fuel cost submitted by M/s Sainsons Industries is of vital consideration for this Commission as this appears to be the most reasonable cost quoted by the already operational power plant and all other power plants are still at nascent stage of setting up an efficient fuel procurement channel. In view thereof, the Commission shall consider reasonable fuel cost with a ceiling of fuel cost of Rs. 1917/- per MT (i.e. Rs. 2083/- claimed by M/s Sainsons Industries minus handling cost of Rs. 165/- which is included in the O&M cost) for all power plants in the instant petitions. Further, from the perusal of fuel cost trend during FY 2017-18 to FY 2023-24 as claimed by M/s Sainsons Industries, it is evident that the fuel cost has increased with CAGR of 3.29% against the normative value of 5%. As such fuel cost escalation may be considered at the rate of 3.29% considering the trend projected by the M/s Sainsons Industries.

v) That the large variance in fuel cost quoted by NSML is towards the fuel transportation, storage and handling cost. The break-up of said cost is provided as under –

Components	**Rate per MT (In Rs.)**
Collection Charges of Fuel	1800
Storage Charges	400
Storage Losses	325
Transportation Charges	550-1000
Chopping	600
Total	**3775**

It is pertinent to note that the actual fuel collection cost has been admitted by the NSML as Rs. 1800 per MT, which is close to the fuel cost claimed by M/s Sainsons Industries. Evidently, NSML, contrary to the scheme of Regulations, is procuring paddy straw from far off areas leading to mismanagement and hence inefficiency in procurement of fuel. The inefficiencies on the part of generators cannot be loaded in the generation tariff which ultimately is to be borne by end consumers of electricity at large. Logically speaking, considering the law of economies of scale, the fuel cost of in case of NSML should be on lower side in comparison to M/s Sainsons Industries.

vi) It is pertinent to highlight that M/s Sainsons Industries in its Rejoinder dated 07.09.2020 has placed on record certain fuel slips, which evince that the paddy straw was procured for Rs. 1250/- per MT on 14.09.2019 and 15.09.2019. The said Bills are placed on page nos. 11/6 and 11/7 of the Rejoinder dated 07.09.2020. Meaning thereby the paddy straw procurement is evidently unregulated and the prices of paddy straw shall be taken on average yearly procurement price basis for the tariff determination. The year-wise comparison of cost of paddy straw, handling, storage and transportation cost is depicted hereunder for the ready reference of the Commission :-

Components	**2017-2018** (in Rs.)	**2018-2019** (in Rs.)	**2019-2020** (in Rs.)	**2020-2021** (in Rs.)
Cost of Paddy Straw	1575.6	1987.64	1554.82	1632.56
Loading and Unloading Cost	12.41	14.68	109.31	114.77
Material Handling cost	196.97	224.49	157.83	165.72
Direct labour cost	197.56	183.18	150.78	158.32
Lease Rent for Storage of Paddy Straw	1.98	6.15	10.74	11.28
Total	1984.54	2416.16	1983.5	2082.67

In view of the foregoing data submitted by M/s Sainsons industries, it would be safe to assume that fuel cost for the FY 2020-21 works out to be Rs. 2082.67 minus material handling cost of Rs. 165.72 and lease rent of Rs. 11.28, which comes to Rs. 1905.66 per MT.

vii) In the present petitions, HAREDA had also submitted a short reply by way of affidavit dated 14.09.2020, vide which they have submitted a survey report depicting retail cost of biomass fuel including paddy straw for various district of Haryana. Based on said data, it was submitted that average retail price of the paddy straw for the FY 2020-21 comes to Rs. 1924.61 per MT and the maximum procurement price comes to Rs. 2566.77. It is relevant here to note that the figures quoted by HAREDA are the retail fuel prices. The wholesale fuel purchase, as is done by the Generators, has to be evidently at lesser prices. Even though the criteria, area surveyed, methods adopted, factors taken in consideration have not been placed before this Commission so as to determine the efficacy of the survey report yet the figures depicted by HAREDA gives an estimate of the average retail paddy straw price in the State. It is submitted that the cost of paddy straw claimed by M/s Sainsons Industries is in fact more credible information available for consideration of this Commission as they have been procuring paddy straw for over 3 years now.

viii) The cost expended by the Generators towards fuel transportation, storage and handling largely depends on the efficacy of its fuel management channel. It is against the Regulations of this Commission to permit different Generators located in near vicinity to claim highly variable storage, handling and transportation cost. This only points to the inefficiencies of the Generator to be able to set up an effective fuel management channel. Admittedly, the inefficiencies of the Generators cannot fasten on to the consumers of Haryana in terms of additional cost.

ix) It is worthwhile here to note Regulation 35 of Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2017, which an obligation on the generator to procure fuel from the nearby areas and set up an effective fuel management plan. The said regulation reads as under –

*" **35. Fuel Mix**. –*

(1) The biomass power plant shall be designed in such a way that it uses different types of non-fossil fuels available within the vicinity of biomass power project such as crop residues, agro-industrial residues, forest residues etc. and other biomass fuels as may be approved by MNRE.

(2) The Biomass Power Generating Companies shall ensure fuel management plan to ensure adequate availability of fuel to meet the respective project requirements."

NSML has claimed fuel transportation cost in the range of Rs. 480/- to Rs. 575/- per MT. It becomes relevant to assess the availability of the fuel in the near vicinity of the Plant to NSML so as to ensure that the fuel need not be procured from farther places. Also NSML has included a portion of fuel handling and carrying cost in the O&M expenses claimed by them. It is imperative to ensure that if landed fuel cost is taken into account, the handling and carrying cost of fuel is to be excluded from the O&M cost. The Plant of NSML, as claimed in the DPR, has been design to handle fuel of all kinds for firing into the boiler. The Hon'ble Commission may consider taking into account reasonable landed fuel cost for determination of tariff.

x) The data provided by NSML fails to establish that the plant is run with cost-effective fuel available from a competitive market. Generation of electricity is a regulated business and it is therefore, the obligation of the Generator to procure fuel at competitive prices and ensure optimization of generation cost. The weighted average cost of Rs. 3800 per MT is highly exaggerated and far from being reasonable. The Electricity Act, 2003 clearly stipulates that the tariff determination has to be based on commercial principles besides safeguarding the interest of consumers and at the same time recovery of cost of electricity in a reasonable manner.

xi) That it is relevant here to refer to the report of Committee of Experts constituted by the CERC on "Performance/Viability of Biomass based plants operating in the Country including the prevailing biomass prices". In the said report, the Committee analysed the fuel loss during transportation and on account of other factors and observed as under –

" 2.3.7. There are other losses which are being encountered during the storage and handling of biomass, as per survey carried out by Dalkia Energy services limited under mandate from Rajasthan Renewable Energy Corporation Ltd. (RREC) to assess such losses. Findings on various losses being encountered during storage of biomass in the power plant are shown in the table below.

Sr. No.	***Type of Losses***	***Description***	***Expected Losses (%)***	***Targeted Losses (%)***	***Remarks***
1	*Land Settlement*	*Grounded MCR cannot be lifted due to mixing with dust*	*0.7-1.0*	*0.4-0.5*	*MCR at bottom of heap gets mixed with sand and cannot be used in boiler. However, with leveling of ground and proper drainage system, land settlement loss can*

					be reduced to about 0.4% - 0.5%.
2	*Loss of Fuel during Sand Storm*	*Due to high velocity sand storm, MCR spreads out in nearby area up to half a KM and cannot be collected*	*0.5*	*0*	*This loss can be completely eliminated by covering the biomass with tarpaulin.*
3	*GCV Loss due to decayi ng of biomas s*	*In rainfall, biomass gets wet and suffers from GCV loss due to decaying and release of methane gas in the atmosphere.*	*2*	*1.25-1.5*	*Decaying loss can be reduced to about 1.5% by covering the biomass with tarpaulin and proper drainage system in storage yard.*
Total Losses during Fuel Storage		***3.2-3.5%***		***1.65- 2.0%***	

2.3.8. The Ministry also considering the above report, further submitted that with better fuel management techniques such as proper leveling of ground for storage, proper drainage system and covering of fuel with tarpaulin, the total fuel losses during biomass storage can be targeted at about 1.65%-2%. Thus, there should be provision of loss of fuel during storage at around 2% in the tariff order of various states for biomass based power plants……"

The above mentioned extract of report emphasise that the Generators can minimize losses by better fuel management techniques. The Commission shall encourage and ensure that the Generators have better fuel management channels by taking into account only reasonable losses and reasonable storage, handling and transportation cost for computing total fuel cost for tariff determination.

xii) It is also relevant to bring to the kind notice of the Commission that NSML in its submissions dated 10.09.2020 has stated that the blending ratio of the biomass fuel is 70:30. However, as per order of Government of Haryana dated 08.10.2019 granting must run status to NSML specified that the mandatory usage of paddy straw shall be 75% of total fuel. Thus, keeping into account fuel blending ratio of 75:25, the cost of fuel has to be adjusted as per the respective prices of different kinds of fuel.

xiii) The Government of Haryana during FY 2019-20 had announced an additional Rs. 1000 per MT incentive for custom hiring centres and straw balers units to support operational costs. This factor may be considered before considering any bald averments of generators claiming huge fuel operational costs. Thus, the cost of generation shall be determined by using realistic figures in the interest of overall welfare of the State.

xiv) M/s Sukhbir Agro Industries Ltd. has recently placed on record of this Commission a report of analysis of Rice Straw as fuel. The said report indicates GCV of Rice straw as 3472 kcal/kg with moisture of 9.6%. Further, the Test Certificate of paddy straw evinces GCV of 4058 kcal/kg with moisture of 4.75%.

In view of the admitted case of the generator, it defies all logic to consider GCV of Paddy straw lesser than 3472 kcal/kg.

xv) It cannot be lost sight of that the Detailed Project Report submitted by M/s Sainsons Industries states GCV of 3500 kCal/kg. With sharp contrast to the figures claimed in the DPR, M/s Sainsons Industries and M/s Naraingarh Sugar Mills have now claimed GCV as low as 2787 kCal/kg and 2400 kCal/kg. Similarly, DPR of M/s Sukhbir Agro and M/s Hind Samachar specifies GCV for Dry paddy having 20% moisture as 2800 kcal/kg, which comes to 3239 kcal/kg with 10% moisture. As per Ministry of Renewable Energy, the GCV of Paddy Straw has to be decided based taking into account 10% moisture levels. Therefore, the GCV of paddy straw shall be considered not below 3239 kcal/kg, which is also fortified by the fuel test certificate appended by M/s Sukhbir Agro Ltd.

xvi) It is widely presumed that the higher the capacity of the plant, more effective will be the parameters of the Plant. However, M/s Naraingarh Sugar Mills has blatantly quoted parameters to their favour without any cogent evidence in support of the same. Such practice ought to be viewed strictly by the Hon'ble Commission.

xvii) Without prejudice to foregoing, it is submitted that the Central Electricity Regulatory Commission (CERC) constituted a Committee on 11th October, 2012 under the Chairmanship of the Secretary, CERC to undertake a detailed study on the "Performance/Viability of Biomass based plants operating in the Country including the prevailing biomass prices". The Committee recommended following normative parameters for determination of generic tariff:

ii. Gross Calorific Value (GCV): 3100 kcal/kg
iii. O&M expenses:Rs. 40 Lakh/MW
iv. Auxiliary Consumption:
a. 10% with water cooled condenser, and
b. 12% for air cooled condenser
v. Capital Cost (excluding evacuation cost and cost of water cooled condenser
considered):
a. For project with water cooled condenser: Rs. 540 Lakh/MW
b. For project with air cooled condenser: Rs. 580 lakh /MW
c. For rice straw based project: Rs. 630 lakh/ MW
vi. Biomass Price: to be decided annually by a committee to be formed at State level representing State Commission, Nodal Agency, Government.

It is pertinent to mention here that the objective behind constitution of Committee and its role was defined as under :-

i. Assessment and evaluation of technical parameters like: Heat rate, Auxiliary Consumption, through performance assessment biomass plants commissioned in various states of India;

ii. Fuel analysis (both Proximate and ultimate analysis) of different biomass fuel by taking fuel and ash sample collected from different plants to arrive at representative value of GCV and moisture variation for different fuel;

iii. Analysis of losses in calorific value of fuel during storage;

iv. Evaluation of trend in the biomass power plant operation like break-up of fuel consumption (biomass types usage trends), generation v/s specific fuel consumption, PLF v/s Auxiliary Consumption;

v. Analysis of O &M expenses of the commissioned plants;

vi. Analysis of the Capital cost of the commissioned plants;

vii. Surplus biomass available for energy production;

viii. Study on prevailing Biomass prices and price trend in various states;

ix. Measures for viability of biomass plants.

x. Recommendation for removing the present hurdles coming in the sector for promoting the growth of the Biomass sector.

xviii) Subsequent to recommendations of the Committee, Comments were invited from all stakeholders for finalizing CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) (First Amendment) Regulations, 2014. After considering objections of all stakeholders as regards GCV of Biomass Fuel, CERC held as under –

" The Committee collected GCV details of various fuels used from the project developers located in the States of Hyderabad, Rajasthan, Gujarat and Punjab and based on the same recommended GCV in its Report. Some of the stakeholders are also in agreement with Commission's proposal which was based on the Committee Report. Some of the stakeholders have suggested further reduction in GCV in the range of 2300 to 3000 kcal/kg. The Committee also recognised that the plants are keeping minimum inventory of various types of biomass for three to four months and in this duration there is reduction in GCV due to various reasons like mixing of sand, mud and foreign materials, losses in handling, exposure to wind and rain etc. Such losses are between 7-10% for the entire year. Based on the above factors, the Committee recommended the normative GCV value for the Biomass Plants for determination of generic tariff as 3100 kcal/kg for mustard husk, rice husk and other kinds of biomass fuel under as fired condition. Considering the same, the Commission has decided to retain the norm as proposed in the draft Regulations which is also in line with the recommendation received from MNRE (Given vide its letter dated 30th September, 2011) and as recommended in the CEA Report."

xix) The Commission while notifying HERC (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate Regulation, 2010 (4th Amendment, 2015) took due note of the exhaustive study carried out by CERC and held as under

" In view of the exhaustive study done by the CERC including analysis of the comments filed by different stakeholder, this Commission consider it appropriate to adopt GCV of biomass fuel as 3100 kcal / Kg. for the purpose of tariff determination in the present case instead of repeating the entire exhaustive exercise already conducted by the Central Commission."

xx) Further, MNRE vide its letter dated 30.09.2011 was of considered view that with better fuel management techniques such as proper leveling of ground for storage, proper drainage system and covering of fuel with tarpaulin, the total fuel losses during biomass storage can be targeted at about 1.65%-2%. Thus, there should be provision of loss of fuel during storage at around 2% in the tariff order of various states for biomass based power plants. The Ministry finally suggested that the following general principles can be adopted for the GCV value:

Biomass	**GCV (kCal / kg)**
Rice husk	3200
Straw / Stalks/ Other husks	3300
Plantation	2800

xxi) It is further relevant to note here that the Hon'ble APTEL in an Appeal filed by M.P. Biomass Developer Association, i.e. Appeal no. 211 of 2015 decided on 04.05.2016 made detailed analysis on the GCV of various Biomass fuels and considering the actual test results submitted by Deputy Commissioner, NRED, Bhopal and the report of the Committee discussed above decide the Gross Calorific Value (GCV) of Biomass fuels as 3100 kCal/kg. The said figures have been adopted by the Hon'ble APTEL on the same rationale in recent order dated 18.02.2020 passed in Appeal No. 170 of 2016 titled as Biomass Power Producers Association, Tamil Nadu v TNERC and Anr.

xxii) It is the responsibility of Generators to devise and maintain an efficient Fuel handling System. The GCV of the fuel depends on the effective storage of the fuel. It is therefore, incumbent upon the Generators to ensure that the fuel is effectively stored to achieve the requisite GCV.

11. HPPC, through an email dated 28.09.2020, filed additional submissions on various parameters of the Plant, except cost of Fuel and GCV. HPPC has submitted as under: -

i) That the Petitioner has filed 'Reply' dated 31.08.2020 and 'Rejoinder' dated 07.09.2020 to the Written Submissions of the Respondent commenting on various parameters for tariff determination. In the so-called 'Reply' and 'Rejoinder', Petitioner has made certain new averments necessitating the filing of present submissions.

ii) That at the outset it is submitted that the process of determination of tariff aims to bring about a balance between the competing objectives. Significant among them is the need to ensure to consumers the availability of electricity at reasonable and competitive rates at the same time reasonable recovery of cost of electricity. While determining tariff the Hon'ble Commission has to encourage competition, efficiency, economical use of resources, good performance and optimum investments besides safeguarding the interest of the consumers. Financially sustainable of electricity sector is an important facet of the overall regulatory framework. However the same has to be ensured along with promotion of competition, efficiency in operations and improvements in the quality of supply that fosters the sharing of gains of efficiency in operations with consumers. To ensure the same operating parameters in tariff determination are required to be pegged at the "lower of normative and actuals". The

operating norms must be designed to promote efficiency and to ensure that the gains which accrue on account of efficient operations are shared with the consumers of electricity.

iii) That in view of the foregoing and keeping in consideration the scope and objective of the tariff determination process, the Respondent makes following additional submissions for the kind consideration of the Commission. The respondent had separately filed Comprehensive Submissions on cost of Biomass fuel and GCV in all the matters pertaining to tariff determination of Biomass based Power Plants and the same are applicable to the case of the petitioner as well. Thus, in the instant submissions, submissions on cost of fuel and GCV are not reiterated for the sake of brevity. In the instant reply, submissions are being made hereunder on various other parameters of the Plant.

iv) The Petitioner has correctly submitted that they are 'operating a 5MW non-fossil fuel Biomass (non-bagasse) based cogeneration power plant which was commissioned in July 2017.' It is however, incorrectly stated in the 'Rejoinder' dated 07.09.2020 that cogeneration projects using paddy straw need to be treated at par with other Biomass based projects and have to be given the same tariff as observed by the Commission in its Generic Tariff Order of 20.11.2013. In that context, reference is made to Regulation 2(27) of Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2017. (hereinafter to be referred as 'RE Regulations, 2017'), wherein the definition of non-fossil fuel based cogeneration plant is provided as under –

'*Non fossil fuel based co-generation' means the process in which more than one form of energy (such as steam and electricity) are produced in a sequential manner by use of biomass including Bagasse.*

Whereas the definition of 'Biomass' as provided in Regulation 2(3) of RE Regulations, 2017 specify Paddy straw as Biomass fuel as under –

'Biomass' means wastes produced during agricultural and forestry operations (for example straws and stalks) or produced as a by-product of processing operations of agricultural produce (e.g., husks, shells, deoiled cakes, etc); wood produced in dedicated energy plantations or recovered from wild bushes/weeds whichever permissible; and the wood waste produced in some industrial operations;

v) Further, Section 2(12) of the Electricity Act, 2003 defines 'Cogeneration' as under –

"Cogeneration" means a process which simultaneously produces two or more forms of useful energy (including electricity).

The use of a particular kind of fuel has no impact on the co-generation process of the Plant. Thus, no presumption ulterior to the statutory provision or regulation can be made to hold that the use of paddy straw by the Petitioner in

a cogeneration plant will entitle him to the parameters considered by this Commission for a pure Biomass based Project.

vi) A perusal of the RE Regulations, 2017 in entirety evince that the parameters contained in Chapter-7 are applicable to the case of the Petitioner. The tariff for Petitioner's Project is mandated to be determined as per the relevant provisions of RE Regulations for non-fossil fuel based co-generation projects.

vii) Wherever the actual parameters are unsubstantiated by the petitioner, exaggerated or not capable to be determined with exactitude, the reference has been made to normative parameters specified non-fossil fuel Biomass (non-bagasse) based cogeneration power plant for under RE Regulations, 2017.

viii) That Regulation Clause 6(2) of HERC RE Regulations, 2017, specifically provides that for assessment of project specific tariff, the lower of the actual or normative parameter has to be taken into account as the normative parameters except for capital cost are the ceiling parameters. The regulation reads as under –

"Determination of Project specific Tariff for generation of electricity from such renewable energy sources shall be in accordance with such terms and conditions as stipulated by the Commission.

Provided that the financial norms as specified under Chapter-3 of these Regulations, except for capital cost, shall be ceiling norms while determining the project specific tariff."

(Emphasis Supplied)

ix) The Petitioner has submitted that the total land under the generation project is 14 acres and an additional 85 acres is partly owned by Company and partly taken on lease for storage of fuel. The manufacturing plant is located on separate approx. 17 acres of land owned by the Company. It is worthwhile to note that despite owning a huge proportion of land and Plant being set up on generous area of 14 acres, the Petitioner has stated to have taken additional land on lease for storage of fuel. The said lease rental has been accounted for by the Petitioner in fuel cost. Without prejudice to above, it is submitted that there is no lease agreement or proof of payment of such rentals on record. Moreover, there is huge variation on lease rental from FY 2017-18 to 2022-23. The figures stated by the petitioner fail to inspire confidence for considering them in tariff determination. Even otherwise cost of land required for the Project should not be considered as the power generated is incidental and resultant of manufacturing process. Further admittedly, the Plant of the Petitioner was intended to be set up to meet the future demand of the paper manufacturing business. The objective of setting up a co-generation plant for captive use is spelled out clearly in the DPR. The plant is set up for captive usage and the incidental power over and above its captive requirement has been offered for sale. It is reiterated no proportion of huge land cost be passed on to the consumers of the State for sale of surplus incidental energy from the Plant of the Petitioner.

x) The Petitioner stated that it has incurred a total capital cost of Rs. 3076 Lac on the power plant, which includes Rs. 324 Lacs towards cost of land. It is reiterated at the outset that cost of land cannot be accounted for in instant tariff determination process as the plant has been set up as a part of industrial process. The Plant of the Petitioner was intended to be set up to meet the future demand of the paper manufacturing business. In view of the specific declaration in the DPR as regards intention of setting up a cogeneration plant for captive use, the land acquired for the said purpose, cannot be included in the tariff claimed from the Respondents for energy sold from said Plant. The plant is set up for captive usage and the incidental power over and above its captive requirement has been offered for sale. Even if there was no sale of energy to the Respondents, the Land had to be acquired by the Petitioner for setting up of Plant for its own use to meet its own energy requirement and substitute the costly generation from alternate sources. Moreover, the Petitioner has installed Plant as per its own layouts and designs. The land so purchased for said purpose, was as per its own requirement and convenience. No proportion of huge land cost be passed on to the consumers of the State for sale of surplus incidental energy from the Plant of the Petitioner.

xi) As regards the Cost of Plant and machinery, it was submitted by the Respondent that the Petitioner has only relied upon the tabular statement depicted in Annexure-2, which mentions that Turbine 5 MW GWT (Constructed in-house) and Boiler 50 MT (Constructed in-house) has been installed, the value of which is Rs. 2752 Lacs. Further, summary of Loan has been provided under Anexure-3, which mentions that 2 no. Loans amounting to Rs. 850 Lacs and 625 Lacs, totalling to Rs. 1475 Lacs were taken for installation of Boiler and Turbine. In support thereof, Petitioner has appended following Loan Sanction documents –

Date of Loan Sanction	Purpose	Amount	Duration
22.03.2013	Installation of an additional Stand By Boiler of capacity 50 TPH. 65 kg/cm square	850 Lacs	6 years 1 month Repayment till 31.03.2019
30.03.2016	Installation of 5MW Turbine, Setting up of 11 kV power transmission line and related equipment/ machinery	625 Lacs	6 years Repayment till 31.03.2023

xii) The Loan for an amount of Rs. 625 Lacs was availed by the petitioner for several works including installation of turbine, setting up of 11 KV transmission line and other equipment. In Para 9 of the Reply, the Petitioner has failed to address as to whether works of setting up of any transmission line and other transmission infrastructure were undertaken by the Petitioner is either for his own requirement or to meet the obligations under the PPA. As per understanding of HPPC the power transmission line was constructed for getting power supply from the Discom i.e. UHBVN and is therefore, now an asset of the Discom. Therefore, the cost of transmission infrastructure cannot be considered a pass through expense. Further, the details of the utilization of loan have not been provided by the Petitioner. Thus, the Hon'ble Commission

may consider reducing the amount of Loan reasonably for consideration as Capital Cost in tariff determination.

xiii) It is further reiterated that the Loan for installation of Boiler referred in table above has already been repaid by the Petitioner. Similarly, payment for Loan for installation of Turbine and even for 11 KV line and other equipment's are being made. A portion of the cost of such Loan has been recovered by the Petitioner from the energy consumed from the Plant. The complete value of said Loans cannot be accounted for in the Capital Cost. The alleged Capital Cost cannot be taken into merely on the statements of the Petitioner.

xiv) The Hon'ble Commission may also consider that the Plant of the Petitioner was commissioned in the year 2017 and the Plant must have depreciated over the years. The Petitioner has not placed on record audited Balance Sheets so to enable assessment of actual depreciation recorded in the books of the petitioner. Nevertheless, 'depreciation' is an essential component of tariff. The Hon'ble commission may allow benefit of reduced tariff to the consumer after taking into account depreciation of power plant uptill now. Thus, the details of the Capital Cost submitted by the Petitioner in instant Application are exaggerated, irrelevant and not worthy of any consideration.

xv) The Petitioner has incorrectly and vaguely stated that the actual cost on ground is totally different from the normative figures assumed in the Generic tariff. Whereas in the original petition, it was the case of the Petitioner that the normative figures as provided in the Regulations may be considered for tariff determination. It was only on the objection raised by the Respondent that the petitioner had submitted certain documents on record. Even otherwise, the normative figures provided in Regulations are the ceiling parameters. Since the Petitioner has failed to substantiate O&M figures with any evidence, the tabular statement placed on record as Annexure-8 cannot be considered. The Hon'ble Commission may therefore consider normative figure for O&M expenses, i.e. Rs. 24.91Lacs/MW for FY 2020-21. The parameters specified by the Hon'ble Commission in the Re Regulations amended from time to time takes into account holistic view of state specific factors vis-à-vis requirement of different nature of power plants. The Generator envisages setting up of a power plant considering the parameters specified in such Regulations. Allowing a generator more than the normative parameters specified in the RE Regulations would thus, tantamount to promoting inefficient generation of electricity.

xvi) The Petitioner in Para 16 of 'reply' dated 31.08.2020 has simply denied that the figure of Auxiliary Consumption claimed in his application was exaggerated. The fact of the matter remains that the figure is not substantiated. Further, it has been wrongly stated by the petitioner in para 17 of the 'Rejoinder' dated 07.09.2020 that Auxiliary consumption in non-bagasse cogeneration project is in no way different from pure biomass based project. Petitioner had claimed Auxiliary Consumption as 10% in the Original Petition. There is no basis to accept the Auxiliary Consumption as high as 16.61%, which is even beyond the normative parameter. The Auxiliary Consumption shall therefore be restricted the normative parameter as specified in the HERC Regulations for non-fossil

fuel based cogeneration Plant. Allowing a generator more than the normative parameters specified in the RE Regulations would tantamount to promoting inefficient generation of electricity.

xvii) The Petitioner has claimed SHR as high as 5925.25 as against normative parameter of 3600. Needless to say there is nothing on record to establish the efficiency of the Plant equipment. Mere reliance of the Petitioner is on a tabular statement contained in Annexure-4. It is reiterated that on the contrary, Petitioner has claimed huge capital cost, which shall mean that a Plant of superior specifications should have been installed by the Petitioner. The inefficiencies on part of the generator cannot be loaded in tariff. This shall not only burden the electricity consumers at large but also promote inefficient generation against the very spirit of the Electricity Act, 2003. In that event, the figures of Auxiliary consumption, Station heat Rate and associated O&M cost ought to have been favourable than the normative figures. The exaggerated figures claimed by the Petitioner are not worthy of any credence. It is submitted that normative parameter specified by the Hon'ble Commission in RE Regulations has to be considered as ceiling parameters for the purpose of tariff determination.

xviii) The Petitioner has contended the PLF of the Plant as 81.6% during FY 2019-20. Needless to say that the said figure is unsubstantiated like other parameters submitted by the Petitioner. However, since the actual PLF is better than the normative value of PLF of 80%, the actual PLF of 81.6% may be considered by the Hon'ble Commission for determination of tariff.

xix) That the Petitioner in para 19 of the 'Reply' dated 31.08.2020 has vaguely attempted to justify demand for consideration of huge Working Capital. The fact remains that the figure averred is unsubstantiated. In absence of any proof and reasoning in support of exaggerated figure of Working Capital, the same has to be restricted to figures based on other parameters considered by the Commission for tariff determination for the project.

xx) The 'Reply' of the Petitioner under para 20 fails to substantiate the rate of interest claimed by the Petitioner. In absence of actual substantiated figures, the Hon'ble Commission may assume reasonable values restricted to normative parameters provided in the Regulations i.e. MCLR plus margin. The current MCLR of SBI is pegged at 6.65%, as such; Hon'ble Commission may consider interest on Term Loan and Working Capital as 8.65% and 7.65% respectively in line with the Regulations.

xxi) Considering the aforesaid submissions, the Respondent has made a tabular depiction of value of various parameters including Cost of fuel and GCV (for which separate comprehensive submissions have been filed by the Respondent) for the Plant of the Petitioner only for the ease of reference of this Commission, as reproduced hereunder:-

Parameters	As Claimed by the Petitioner	Normative Figures as per HERC RE Regulations	Considered by the Commission for Tariff Determination
Depreciation Rate	5.38%	5.38%	5.38%
PLF	81.6%	80%	Actual PLF up to FY 2019-20 and 80% thereafter
Station Heat Rate (SHR) (in kCal/kWh)	5952	3600	3600
O&M Expenses (In lacs per MW)	67.16	24.81	24.81
Gross Calorific Value (GCV) (in kCal/kg)	2800	3100	3100
Fuel Cost (in Rs. /MT)	2083	3785	1983 (2019-20)
Auxiliary Consumption	16.61%	8.5%	8.5%
Working Capital	Fuel cost of 6 months	Fuel cost of 4 months	Fuel cost of 4 months as per HERC RE Regulations
Interest on Working Capital	10%	MCLR of SBI prevailing during last six months plus max margin of up to 200 basis points.	10.17%
Interest on Loan	9.5% & 11.45%		10.17%
Cost of Land (in Lacs)	324	-	Nil
Capital Cost excluding Land Cost (in Lacs)	2752	-	Depreciation as claimed by petitioner for FY 2017-18 to FY 2020-21 i.e. Rs. 631.06 Lacs needs to be deducted from the capital cost. As such, Depreciated capital cost i.e. Rs. 2121 Lacs may be considered on ascertaining that the same is exclusive of cost of power transmission line.

12. HAREDA, in compliance to the directions of the Commission in the Interim Order dated 01.09.2020, filed its comments with regard to determination of fuel cost in the instant matter. HAREDA submitted as under: -

i) That HAREDA is responsible for formulating policies and programmes necessary for popularizing the applications of various renewable sources of energy in the State. It is the agency empowered for implementation of various schemes concerning utilization of Solar Energy, Biogas, Micro Hydel, Biomass Energy etc. The State Govt. has set up Haryana Renewable Energy Development Agency (HAREDA) in May, 1997 to act as nodal agency to implement various centrally and State sponsored schemes/ projects in the area of renewable energy in the State. HAREDA is implementing programmes on promotion of generation of power from renewable energy sources with an objective to meet the increasing demand for power through renewable energy sources. Various projects and schemes are being implemented by Department/ HAREDA to increase the penetration of renewable energy and energy efficient devices in the State.

ii) That HAREDA has been successfully implementing the renewable energy programmes in the state of Haryana and has been successful in bringing

private investment in the State for encouraging renewable energy programmes in the State by implementing RE projects.

iii) That HAREDA in compliance to the order dated 01.09.2020 passed by this Commission with regard to determination of fuel cost has got carried out a sample survey through its field officers, who have collected data from various districts across the State with respect to various biomass resources used as fuel for generating RE power, which inter-alia includes paddy straw.

iv) That as per survey conducted by the field officials of HAREDA, it has transpired that the minimum average procurement price of paddy straw for the year 2020-21 comes out to Rs. 1924.61 per Metric ton, however the maximum average procurement price of paddy straw comes out to Rs. 2566.77 per Metric ton.

v) That HAREDA has also sought information with regard to the fuel cost, from the petitioner, who is using biomass paddy straw as fuel for its existing Co-Gen RE facility of 3 MW, has inter-alia informed that the fuel cost while using paddy straw as fuel, after carrying out the entire process, comes out to Rs. 2187/- per metric ton.

vi) That HAREDA humbly submits that for the compliance of the order dated 01.09.2020 passed by this Commission, HAREDA has made its best efforts to collect information with regard to cost of paddy straw for being used as RE fuel and has gathered the aforesaid information.

vii) That HAREDA humbly submits that in case HAREDA is directed, a formal study from some reputed technical agency such as TERI / Agriculture University Hisar or any other agency as deemed fit by this Commission in this regard can be got carried out, if directed by this Commission.

Commission's Analysis and Order

13. The Commission heard the arguments of the parties at length as well as perused the application/reply filed in the matter. The Commission has carefully examined the Regulations occupying the field & its Orders dated 30.06.2018 and 20.12.2019, regarding determination of levelized tariff for renewable power projects commissioned during the FY 2017-18 and FY 2019-20/FY 2020-21, respectively, on the basis of the parameters provided in the Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2017 (hereinafter referred to as 'HERC RE Regulations, 2017').

At the onset, the Commission took cognizance of the matter under consideration of Hon'ble Supreme Court regarding menace of stubble burning and consequent affidavit dated 08.08.2020 filed by Chief Secretary, Haryana, submitting the current status report on position of paddy straw burning including the efforts taken by the Government of Haryana to curtail the same. The Commission has considered the serious environmental issues arising from burning of paddy stubble in the State and NCR and power project of the Petitioner using paddy straw as a fuel can meet the social objectives and concerns of the National Green Tribunal as well as the Haryana Government.

The Commission observes that the Power Plant of the Petitioner was commissioned in July, 2017. The PPA dated 01.07.2019, signed between the Petitioner and HPPC, specifies the project as 'Biomass based co-generation power project' and that the agreement to remain in force for twenty (20) years from the date of the PPA, which can be further extended by another ten (10) years through mutual agreement subject to prior approval of the Commission. Whereas, Regulation clause 2 (1) (35) has specified the useful life of the project as 20 years, as reproduced hereunder: -

"(35) Useful Life' in relation to a unit of a generating station including evacuation system shall mean the following duration from the date of commercial operation (COD) of such generation facility, namely:

(a) Wind energy power project 25 years
(b) Biomass power project, non-fossil fuel cogeneration 20 years
xxxxxxxxxx"

Accordingly, the useful life of the project should be 20 years starting from July, 2017. Therefore, the Commission decides that agreement shall remain in force for 20 years starting from July, 2017 and will determine tariff for 20 years starting from the year of CoD of the project i.e. FY 2017-18. The agreement can be further extended through mutual agreement between the Petitioner and HPPC, subject to prior approval of the Commission. Further, the power plant is for 5 MW, however, the PPA has been signed for 3.5 MW power. Therefore, the Petitioner can not be allowed the benefit of auxiliary consumption for 1.5 MW and the tariff has to be determined for 3.5 MW power only, which has been tied up with HPPC.

14. Accordingly, the Commission has proceeded to examine each relevant component relevant for the purpose of tariff determination as under: -

a) **Capital cost**

The Petitioner in the original petition has submitted that actual cost of the project is Rs. 31.52 Crore i.e. Rs. 6.34 Crore/MW, which is far below the HERC/CERC approved norms for Biomass based power project. Subsequently, in its reply dated 14.07.2020, the Petitioner submitted that Capital Cost incurred on power plant is Rs. 30.76 Crore, including cost of land i.e. Rs. 3.24 Crore (114 Kanal, 11 Marla).

Per-contra, HPPC has averred that the Petitioner has filed a statement of capital cost of Rs. 3076 lacs, which is not substantiated by corroborative evidence. Further, the land cost of Rs. 3.24 Crore, cannot be accounted for in instant tariff determination process, since as per DPR, the Plant of the Petitioner was intended to be set up as a co-generation plant for captive use and the incidental power over and above its captive requirement has been offered for sale. Even if there was no sale of energy to the Respondents, the Land had to be acquired by the Petitioner for setting up of Plant for its own use to meet its own energy requirement and substitute the costly generation from alternate sources. As regards the Cost of Plant and machinery claimed by the

Petitioner amounting to Rs. 2752 lacs, no bills/invoices/ proof of payments/ Purchase Orders etc. have been placed on record. The Petitioner has only relied upon a tabular statement, which mentions that Turbine 5MWGWT (Constructed in-house) and Boiler 50 MT (Constructed in-house) has been installed, the value of which is Rs. 2752 Lacs. Further, summary of Loan has been provided, which mentions that 2 no. Loans amounting to Rs. 850 Lacs and 625 Lacs, totalling to Rs. 1475 Lacs were taken for installation of Boiler and Turbine.

The capital cost claimed by the Petitioner, averment of the Respondent, provisions of HERC RE Regulations, 2017, occupying the filed have been tabulated below:-

Claim of the Petitioner for 5 MW		Averment of the HPPC	Normative Figures as per HERC RE Regulations	Remarks
Rs. Crore		Rs. Crore	Rs. Crore	
Land Plant and Machinery	3.24 27.52	Nil Reasonable		No corroborative evidence in support of cost of Plant & Machinery claimed, has been submitted by the Petitioner.
Total	30.76	Reasonable	Rs. 4.92 Crore/MW i.e. Rs. 24.60 Crore for 5 MW	

The Commission has considered the contentions of the parties and observed that CERC RE Regulations, 2017 has recognized non-fossil fuel-based cogeneration power project with normative project cost as Rs. 4.92 Crore/MW. Similarly, this Commission, in its Order dated 20.12.2019, has considered non-fossil fuel-based cogeneration power projects which are different from bagasse cogeneration power projects. The Commission, concurred with the CERC RE Regulations and observed that parameters of cogeneration power project based on bagasse and other biomass are different w.r.t. fuel cost and its GCV only. Therefore, the normative capital cost of the power project of the Petitioner can be taken as Rs. 4.92 Crore/MW .

The Commission further observed that the Petitioner has not provided any corroborative evidence in support of Plant & Machinery installed by it and simply stated that it was constructed in-house. The careful examination of both the bank loan documents (Rs. 8.5 Crore dated 22.03.2013, repaid on 31.03.2019 & Rs. 6.25 Crore dated 30.03.2016) submitted by the Petitioner, reveals that purpose of the loan has been mentioned as installation of <u>additional stand-by Boiler 50 TPH 65 kg/cm2</u> and new 5 MW Turbine, setting up of 11 KV power transmission line. Even the security offered to the bank for the said loans are Land & Building of the Petitioner and not Plant and Machinery. The Commission observes that, In case, purpose of loans was to purchase/construct Boiler/Turbine, the primary security offered to bank should would been the so constructed Boiler/Turbine and the cost of the same should have been evaluated by the bank for determination of eligibility of loan and promotor's contribution. However, nothing of this sort is apparent from the loan documents provided by the Petitioner.

In view of the above, the Commission is not convinced with the submissions of the Petitioner that it has constructed Boiler/Turbine in house and have availed bank loans of Rs. 8.5 Crore & Rs. 6.25 Crore for construction of the same at cost of Rs. 27.52 crore, as the same is not supported by any corroborative evidence e.g. date of the taking loan and dates in which capital expenditure was incurred, bills/details of capital cost other than land claimed by the Petitioner etc. Accordingly, the Commission restricts the Capital Cost of the project to the norm specified in the HERC RE Regulations, 2017 i.e. Rs. 4.92 Crore/MW (total cost of 5 MW power plant comprises of Land - Rs. 3.24 Crore, as claimed by the Petitioner and remaining capital cost – Rs. 21.36 Crore i.e. balancing figure, total capital cost of 5 MW power plant being Rs. 24.60 Crore). The total cost of 3.5 MW power plant is approved at Rs. 17.22 Crore, comprising of Land cost of Rs. 2.27 Crore and remaining capital cost i.e. Plant & Machinery/Civil works etc. of Rs. 14.95 Crore.

b) **Interest on Term Loan & Return on Equity:** The Commission has considered the submissions of the petitioner herein and observes that the loan documents provided by the Petitioner could not be co-related to the capital expenditure approved by the Commission in the preceding para. Therefore, in the absence of actual data regarding term loan availed by the Petitioner and related terms & conditions including rate of interest, the Commission has relied on Regulation No. 12, 13 & 15 of the HERC RE Regulations, 2017 as under:-

"12. Debt Equity Ratio. –

(1) For generic tariff to be determined based on suo motu petition, the debt equity ratio shall be 70: 30.

(2) For Project specific tariff, if the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan.

Provided that where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff. Provided further that the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment.

13. Loan and Finance Charges. –

(1) For the purpose of determination of tariff, loan tenure of 13 years shall be considered.

(2) (a) The loans arrived at in the manner indicated above shall be considered as gross normative loan for calculation for interest on loan. The normative loan outstanding as on 1st April of every year shall be worked out by deducting the cumulative repayment up to March 31st of the previous year from the gross normative loan.

(b) For the purpose of computation of tariff, the normative interest rate shall be considered as the average Marginal Cost of funds based

lending rate (MCLR) (one-year tenor) of SBI prevailing during the last available six months plus a margin of up to 200 basis points i.e. 2%.

(c) Notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed.

15. Return on Equity. –

(1) The value base for the equity shall lower of the two either 30% of the capital cost or actual equity (in case of project specific tariff determination) as determined under Regulation.

(2) The normative Return on Equity shall be as under:-

a) 14% per annum calculated on normative Equity Capital.

b) MAT/Corporate Tax applicable shall be considered as pass through.

Provided that the applicable MAT / Corporate Tax shall be separately invoiced as per the actual paid at the rate as declared by the Income Tax Department. The Generator shall raise the bill for reimbursement of MAT / Corporate Tax applicable on Return on Equity in 12 equal installments which shall be payable by the beneficiaries."

Accordingly, the Capital Cost of Rs. 17.22 Crore approved by the Commission in the present Order has been segregated into normative Equity and Loan in 30:70 ratio i.e. Rs. 5.166 crore & Rs. 12.054 crore, respectively.

Further, the Commission in its Order dated 30.06.2018, while determining levelized tariff for the project commissioned during the FY 2017-18, has determined interest on term loan as 10.17% and discount factor as 11.32%. Although, current Marginal Cost of Lending Rate (MCLR) of SBI, as submitted by HPPC is 6.65%, but, considering the fact that MCLR applicable for the year of CoD ought to be taken for the entire life of the project and variation in MCLR in succeeding year is not considered in tariff determination. Hence, the Commission has considered interest on term loan as 10.17% and discount factor as 11.32% for arriving at the levelized tariff. In line with the Commission Order dated 30.06.2018.

In view of the above, the Commission has considered normative term loan as Rs. 12.054 Crore, with repayment period of 13 years at interest rate of 10.17% p.a. Further, the Equity is determined at Rs. 5.166 Crore eligible for return @ 14% p.a. The Income Tax shall not form part of the tariff determined by the Commission and the Petitioner shall raise the bill for reimbursement of MAT / Corporate Tax applicable on Return on Equity in 12 equal installments which shall be payable by the beneficiaries.

c) **Depreciation:** The Regulation No. 14 of HERC RE Regulations, 2017, provides as under:-

"14. depreciation. –

(1) The value base for the purpose of depreciation shall be the Capital Cost of the asset admitted by the Commission. The salvage value of the asset shall be considered as 10%.

(2) Depreciation per annum shall be based on 'Differential Depreciation Approach' over loan tenure and period beyond loan tenure over useful life computed on 'Straight Line Method'. The depreciation rate for the first 13 years of the Tariff Period shall be 5.38% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 14th year onwards.

(3) Depreciation shall be chargeable from the first year of commercial operation.

Provided that in case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.

Depreciation has been accordingly calculated considering 20 years as useful life of the project, starting from the year of CoD of the project i.e. FY 2017-18. For the first thirteen years the depreciation amount has been estimated @ 5.38% p.a. of the capital Cost less salvage value and remaining eligible depreciation has been equally spread over the remaining useful life of the project i.e. 7 years. Further, since value of land has been separately provided by the Petitioner and the same is not depreciable, depreciation on land has not been allowed. The Commission has taken note of the submissions of the Petitioner that they will not claim the benefits of accelerated depreciation.

d) **Interest on working capital:** The Regulation clause no. 16 (2) of HERC RE Regulations, 2017, provides as under:-

"The Working Capital requirement in respect of biomass power projects (Rankine Cycle Technology), Biomass Gasifier / Bio gas-based projects and bagasse / non-fossil fuel-based co-generation projects shall be computed as under: -

a) Fuel costs for four months at normative PLF;
b) Operation & Maintenance expense for one month;
c) Receivables equivalent to 2 (Two) months of fixed and variable charges for sale of electricity calculated on the normative PLF;
d) Maintenance spare @ 15% of operation and maintenance expenses."

The Commission observes that the Petitioner has not taken any deviation from the norms specified in the Regulations in vogue, while proposing working capital requirement and HPPC also has not raised any specific objection to the same. Accordingly, the Commission decides that all the parameters of working capital shall be taken as per the norms specified in

the Regulations in vogue. Further, the rate of interest on working capital shall be taken as specified by the Commission in its Order dated 30.06.2018 i.e. 10.17% p.a.

e) **Operation and Maintenance (O&M Expenses)**: The Petitioner has claimed O&M Expenses as Rs. 38 lac/MW by comparing the same to the norms of @ Rs. 40 lac/MW for base year as 2017-18, specified for biomass Projects using Travelling Grate boilers and Water-Cooled Condensers. Whereas, the Commission in its RE Regulations, 2017 has specified the norm of Rs. 0.21 Crore / MW for the base year i.e. the FY 2017-18, with an escalation factor @ 5.72% per annum, for cogeneration (other than bagasse) projects. The Petitioner in its additional submissions, accompanied by an affidavit dated 14.07.2020, has revised the claim of O&M expenses to Rs. 287.31 lacs (Rs. 57.46 lacs/MW). However, the same was not substantiated by the Petitioner. On the objection raised by HPPC, the Petitioner simply averred that the claim is based on fact on record. The Petitioner further argued in its reply dated 07.09.2020 that the Commission in its RE Regulations, has inadvertently taken O&M cost for non-bagasse cogeneration projects as Rs. 2.3 lac./MW (instead of Rs. 23.62 lac/MW in CERC order of 19.03.19) against Rs. 44.7 lac/MW for Biomass.

Accordingly, the Commission after taking into consideration of submissions of both the parties and the fact that the O&M expenses claimed are not supported by any corroborative evidence, restrict the same to the norms specified in the Regulations in vogue i.e. Rs. 0.21 Crore / MW for the base year i.e. the FY 2017-18, with an escalation factor @ 5.72% per annum.

f) **PLF**

The Petitioner in its original petition, submitted the actual PLF for FY 2017-18, 2018-19 & 2019-20 as 65%, 80% & 80%, respectively and further changed the same to 66.10%, 75.20% & 81.61%, respectively, in its subsequent filing, based on the actual generation figures.

The Commission observes that the RE Regulations in vogue provides for CUF of 53% for all sorts of cogeneration power projects. However, in the present case specific determination of tariff, it has been observed that the actual power generation has been considerably higher than the normative gross generation arrived at a PLF as high as 81.61% in the FY 2019-20.

The present tariff determination has been carried w.e.f. CoD of the project i.e. FY 2017-18. Therefore, the Commission, after due deliberations, has considered it appropriate to peg PLF for FY 2017-18, 2018-19 & 2019-20 at 66.10%, 75.20% & 81.61%, respectively as per reported actuals and from FY 2020-21 onwards the same has been pegged at 80%.

g) **Auxiliary Energy Consumption**

The Petitioner in its original petition has submitted that the actual Auxiliary consumption for FY 2017-18, 2018-19 & 2019-20 remained as high as 16.50%, 13.90% & 13.40%, respectively. However, the petition was filed claiming Auxiliary consumption at 10%.

The Commission observes that the Petitioner, in its original petition, has proposed Auxiliary Energy Consumption as 10%, as per the norms specified in the HERC RE Regulations, 2017 for biomass-based power projects. However, in the subsequent submissions the petitioner claimed higher auxiliary consumption, without any cogent evidence with respect to such higher claim.

The Commission observes that Proviso to Regulation clause no. 6 of HERC RE Regulations, 2017, provides as under: -

"Provided that the financial norms as specified under Chapter-3 of these Regulations, except for capital cost, shall be ceiling norms while determining the project specific tariff."

Further, the Regulations specifies Auxiliary consumption for Non-Fossil Fuel based cogeneration projects (other than bagasse) as 8.50%.

Accordingly, the Commission approves the Auxiliary Energy Consumption @ 8.50% for the purpose of project specific tariff determination, as per the norms specified in the HERC RE Regulations, 2017.

h) **Fuel Cost:**

The Petitioner has submitted that the average cost of fuel has been recorded as Rs.3300/MT for the base year i.e. FY 2017-18 (comprising of fuel purchase cost -Rs. 1750/MT, stacking cost -Rs. 585/MT, cutting & processing cost – Rs. 535/MT and yard maintenance cost -Rs. 430/MT), and the same has been escalated @ 5% escalation per annum. In its revised submissions the Petitioner submitted fuel cost of Rs. 1985/MT, Rs. 2416/MT & Rs. 1983/MT for the FY 2017-18, FY 2018-19 & FY 2019-20, respectively, in its reply on affidavit dated 14.07.2020, based on the actual generation figures.

Per-contra, HPPC has argued that fuel cost submitted by the Petitioner, comprises of fuel purchase cost, loading and unloading cost, handling cost, labour cost and storage cost, without supported by relevant bills/invoices and without establishing that all such components are not been included in the O&M costs. Accordingly, a reasonable fuel cost with a ceiling of fuel cost of Rs. 1971/- per MT (i.e. Rs. 2083/- claimed by the Petitioner minus handling cost of Rs. 112/- which is included in the O&M cost) may be considered by the Commission for FY 2020-21. HPPC further advanced the arguments by submitting that from the perusal of fuel cost trend during FY 2017-18 to FY

2023-24 as claimed by the Petitioner, fuel cost has increased with CAGR of 3.29% against the normative value of 5%. As such fuel cost escalation may be considered at the rate of 3.29% considering the trend projected by the Petitioner. Further, the Government of Haryana during FY 2019-20 had announced an additional Rs. 1000 per MT incentive for custom hiring centres and straw balers units to support operational costs. This factor may be considered before considering any bald averments of generators claiming huge fuel operational costs.

HAREDA has submitted that as per survey conducted by the field officials of HAREDA, the minimum average procurement price of paddy straw for the year 2020-21 comes out to Rs. 1924.61 per Metric ton, however the maximum average procurement price of paddy straw comes out to Rs. 2566.77 per Metric ton. HAREDA has also sought information with regard to the fuel cost, from the petitioner, who is using biomass paddy straw as fuel for its existing Co-Gen RE facility of 3 MW, who has informed that the fuel cost while using paddy straw as fuel, after carrying out the entire process, comes out to Rs. 2187/MT.

The Petitioner, in its rejoinder dated 29.09.2020, has refuted the submissions of HPPC that the fuel handling cost of Rs. 165/- is included in the O&M cost and has submitted that the cost associated with the activities undertaken by the Fuel Supply Contractors as well as other activities handled by the Petitioner are an essential part of the Fuel Cost. The Petitioner further countered the observation/suggestion of taking a CAGR of 3.29% as there was increase of 21.75% in fuel cost in 2018-19 over 2017-18.

The Commission observes that the Petitioner relies on the services of large number of private collectors/integrators for procurement of paddy straw, which does not have any organised market and the procurement varies from season to season. The Commission has further taken note of the recent decision made by Hon'ble Chief Minister, Haryana, regarding grant of Rs. 500/MT to farmers for procurement of paddy straw. The Commission has also considered the submissions of the Petitioner that the fuel price submitted is based on the actual records.

The Commission further observes that the present tariff determination has been carried out, since the year of CoD of the project i.e. FY 2017-18. Although, the Petitioner has claimed higher fuel cost for the FY 2018-19 at Rs. 2416/MT, but lower fuel cost has been claimed for the FY 2019-20 at Rs. 1983/MT. The Commission has considered fuel cost @ Rs. 3605/MT for the FY 2019-20, with escalation of 5% p.a., in its Order dated 20.12.2019, while determining levelized tariff for Non-Fossil fuel cogeneration projects (other than bagasse i.e. biomass etc.), which even after reducing the compensation of Rs. 500/MT granted by the State Government for preventing farmers to burn paddy straw in fields, is way higher than the fuel cost claimed by the Petitioner. The annual escalation shall be considered as approved by the Commission in its RE Regulations, 2017 i.e. 5%.

Accordingly, after carefully examining the averment of all the parties, the Commission considers it appropriate to peg Fuel Cost for FY 2017-18, 2018-19 & 2019-20 at the actual levels as claimed by the Petitioner i.e. Rs. 1985/MT, Rs. 2416/MT & Rs. 1983/MT, respectively and from FY 2020-21 with annual escalation of 5% on the fuel cost of Rs. 1983/MT.

i) **Gross Calorific Value (GCV)**

The Petitioner has submitted that Calorific Value of the fuel used at the Plant has been recorded as under:-

2017-18	(July 17 to March 18)	2,750 kcal/kg
2018-19	(April 18 to March 19)	2,700 kcal/kg
2019-20	(April 19 to September 19)	2,600 kcal/kg

The Petitioner, in its written submission on affidavit dated 07.09.2020, submitted that it conducts test for the GCV of fuel on random basis. As the fuel is lying in open it is affected by seasonal factors like, rains, storms, frost, etc. While during rains the fuel acquires moisture and gets wet, in extreme summer season, it has to be protected from fire incidence. The Petitioner submitted that GCV recorded during each month for the FY 2019-20, shows a variation from 2114 kCal/kg to 3078.30 kCal/kg, with average GCV coming at 2692.78 kCal/kg.

Per-contra, HPPC submitted that GCV of 3500 kCal/kg envisaged in the DPR, which should be considered by the Commission. Further, M/s Sukhbir Agro Industries Ltd. has recently placed on record a report of analysis of Rice Straw as fuel. The said report indicates GCV of Rice straw as 3472 kcal/kg with moisture of 9.6%. Further, the Test Ccertificate of paddy straw evinces GCV of 4058 kcal/kg with moisture content of 4.75%.

HPPC further referred to the recommendations of the Committee constituted by Central Electricity Regulatory Commission (CERC) on 11th October, 2012 to undertake a detailed study on the "Performance/Viability of Biomass based plants operating in the Country including the prevailing biomass prices". The Committee recommended GCV of 3100 kCal/kg, for mustard husk, rice husk and other kinds of biomass fuel under as fired condition. Based on these recommendations, CERC in its RE Regulations, 2014 as well as HERC in its Regulations, 2017/Order dated 20.12.2019, while determining levelized tariff for Non-Fossil fuel cogeneration projects (other than bagasse i.e. biomass etc.), has considered the GCV norms of 3100 kCal/kg. HPPC submitted that the actual parameters are unsubstantiated by the petitioner, exaggerated or not capable to be determined with exactitude, the reference may be made to normative parameters specified non-fossil fuel Biomass (non-bagasse) based cogeneration power plant for under RE Regulations, 2017.

Accordingly, after carefully examining the averment of all the parties the Commission, in absence of conclusive evidence submitted by the Petitioner in support of lower GCV than the norms determined by the Commission in its Order dated 20.12.2019 while determining levelized tariff for Non-Fossil fuel cogeneration projects (other than bagasse i.e.

biomass etc.), considers it appropriate to consider GCV at 3100 kCal/kg in line with the norms approved by the Commission in its ibid Order dated 20.12.2019.

j) **Station Heat Rate (SHR)**

The Petitioner has submitted that the actual fuel consumption recorded at the power plant has been as follows over the years:-

2017-18	(July 17 to March 18)	47,830 M.T
2018-19	(April 18 to March 19)	58,867 M.T
2019-20	(April 19 to September 19)	29,433 M.T

Thus, the Station Heat Rate recorded at the power plant has been as follows:-

2017-18	(July 17 to March 18)	5829 kcal/kWh
2018-19	(April 18 to March 19)	4938 kcal/kWh
2019-20	(April 19 to September 19)	4724 kcal/kWh

The Petitioner, in its written submission on affidavit dated 07.09.2020, submitted that Station Heat Rate (SHR) largely varies with the quality of fuel. Moisture content in fuel is a major factor which impacts the quantum of fuel used and the ultimate SHR. The Petitioner maintains record of the fuel used. The Petitioner submitted that SHR recorded during each month for the FY 2019-20, showing a variation from 4854 kCal/kWh to 6914 kCal/kWh.

Per-contra, HPPC submitted that there is nothing on record to establish the efficiency of the Plant equipment. Mere reliance of the Petitioner is on a tabular statement. It is reiterated that on the contrary, Petitioner has claimed huge capital cost, which shall mean that a Plant of superior specifications should have been installed by the Petitioner. In that event, the figures of Auxiliary consumption, Station Heat Rate and associated O&M cost ought to have been favourable than the normative figures. The exaggerated figures claimed by the Petitioner are not worthy of any credence.

Accordingly, after carefully examining the averment of all the parties the Commission, in absence of conclusive evidence submitted by the Petitioner in support of higher SHR than the norms determined by the Commission in its Order dated 20.12.2019 while determining levelized tariff for Non-Fossil fuel cogeneration projects (other than bagasse i.e. biomass etc.), considers it appropriate to approve SHR at 3600 kCal/kWh i.e. the norms approved by the Commission in its ibid Order dated 20.12.2019.

k) **Sale of Bio-fertilizer**

The Commission has considered the submissions of HPPC that Clause 12.4 of the MYT Regulations provides for item wise gain to be shared between the generating company and the licensee in the ratio of 50:50. Considering the same, sale value of any residual of generation process has to be taken into account for determination of tariff. The Petitioner has refuted the submissions of HPPC by arguing that the provision is applicable for the licensees who are required to get their Annual Revenue Requirements (ARR) approved from the

Commission on annual basis and the ARRs, approved for the previous years, are to be trued up based on actual performance.

The Commission has considered the contention of HPPC on this issue. It is observed the residual of generation process should only be the ash of paddy straw/other biomass, which may not have any commercial value. Therefore, given the un-certainly regarding the quantum of ash generation and its pricing, the Commission is of the considered view that the proceeds for sale of ash shall be accounted for on actual basis i.e. the Generator shall maintain separate monthly account recording the production and sale of ash. The HPPC may inspect the same at any point of time and the IPP shall provide all possible assistance to the officer / officials of the Discoms / HPPC including production of bills / amount realised etc. Accordingly, on a quarterly basis, the verified proceeds netted off for any associated direct / indirect cost shall be shared in 50:50 ratio between the Discoms / HPPC and the Generator herein.

Based on the parameters discussed in the foregoing paras, the Commission determines the tariff for 20 years life of the project, appended to the present Order (Annexure – A). The tariff payable is the year to year tariff determined by the Commission for the entire life of the project. The applicable tariff shall be from the FY 2020-21 onwards i.e. 4th year of the tariff table. Further, regarding the prayer of the Petitioner to set aside the undermentioned clause no. 2.1.2 of the PPA, the Commission has already considered the issue in its 102nd meeting held on 04.11.2019 and directed HPPC vide memo no. 778/HERC/Tariff dated 12.12.2019 that clause 2.1.2 of the PPA signed by the parties has been incorporated in wrong interpretation of the Commission's Order dated 30.04.2019 (HERC/PRO-20 of 2019) wherein it was ordered that "Tariff shall be decided on the separate petition to be filed by the Respondents under Section 62 of the Electricity Act, 2003." Accordingly, HPPC is directed to strictly comply with the directions of the Commission.

In terms of the above Order, the present petition is disposed of.

This Order is signed, dated and issued by the Haryana Electricity Regulatory Commission on 26.10.2020.

Date: 26.10.2020	**(Naresh Sardana)**	**(Pravindra Singh Chauhan)**
Place: Panchkula	**Member**	**Member**

ANNEXURE - A

Project Specific Tariff (Rs / kWh) for 20 years from FY 2017-18 onwards

Non Fossil Fuel (Cogeneration) Other than Bagasse i.e. biomass etc. - Sainson Paper for 3.5 MW

Table of Parameters	**Per MW**	**3.5 MW**	
Capital cost (Rs. in Million / MW)	49.250	172.200	
Cost of Land (Rs. Million)		22.700	
Remaining capital cost		149.500	
Residual value (10%)	4.93	14.95	
Total depreciation (Rs in Million / MW)	44.33	134.55	
Loan component (Rs in Million / MW)	34.48	120.54	
Equity component (Rs in Million / MW)	14.78	51.66	
CUF			
-FY 2017-18	53%	66.10%	
-FY 2018-19	53%	75.20%	
-FY 2019-20	53%	81.61%	
-FY 2020-21 onwards	53%	80.00%	
O&M (Rs Million / MW)	0.21	0.21	
O&M escalation	5.72%	5.72%	
Depreication (first 13 years)	5.38%	5.38%	
ROE (1st 10 years)	14%	14%	
ROE (11th year onwards)	14%	14%	
Income tax (MAT) **pass through**	0.00%	0.00%	
Income tax (Corporate Tax) **pass through**	0.00%	0.00%	
Interest on term loan	10.13%	10.17%	
Interest on working capital	9.13%	10.17%	
Auxiliary consumption (1st year)	8.50%	8.50%	
Auxiliary consumption (2nd year onwards)	8.50%	8.50%	
Fuel cost (Rs. / MT)		1983	FY 2019-20
Fuel price escalation	5.00%	5.00%	
Heat rate (Kcal/kWh)	3600	3600	
GCV (Kcal/kg)	3100	3100	
Discount rate WACC (%)	11.29%	11.32%	
Levellised tariff (Rs / kWh)		4.47	

3.5 MW

Year		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fuel cost with escalation (Rs Million)		1985	2416	1983	2082	2186	2296	2410	2531	2657	2790	2930	3076	3230	3392	3561	3739	3926	4123	4329	4545
O&M with escalation (Rs. Million)		0.21	0.22	0.23	0.25	0.26	0.28	0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.43	0.46	0.48	0.51	0.54	0.57	0.60
Outstanding Loan amount (Rs Million)		120.54	111.27	102.00	92.72	83.45	74.18	64.91	55.63	46.36	37.09	27.82	18.54	9.27							
Loan repayment (Rs. Million)		9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27							
Interest on loan		11.79	10.84	9.90	8.96	8.02	7.07	6.13	5.19	4.24	3.30	2.36	1.41	0.47							
Working Capital																					
Fuel cost for four months (Rs. Million)		15.57	21.56	19.21	19.77	20.76	21.80	22.89	24.03	25.23	26.49	27.82	29.21	30.67	32.20	33.81	35.50	37.28	39.14	41.10	43.15
One month O&M (Rs. Million)		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05
2 Months receivables (Rs. Million)		12.81	15.81	14.41	14.55	14.91	15.30	15.71	16.16	16.63	17.14	17.68	18.26	18.87	18.96	19.81	20.71	21.64	22.63	23.66	24.75
Maintenance spares15% of O&M (Rs. Million)		0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.09
Total (Rs. Million)		28.43	37.42	33.67	34.38	35.73	37.16	38.67	40.26	41.94	43.71	45.58	47.56	49.63	51.26	53.73	56.32	59.04	61.90	64.90	68.05
Interest on working capital (Rs. Million)		2.89	3.81	3.42	3.50	3.63	3.78	3.93	4.09	4.27	4.45	4.64	4.84	5.05	5.21	5.46	5.73	6.00	6.30	6.60	6.92
Variable Costs																					
Parameters	**Derivation**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Capacity (MW)		**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**
Generation (Million Units)	A	20.27	23.06	25.02	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53	24.53
Auxiliary Cons (%)		8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%
Generation (Ex-bus Mllion Units)	A1	18.54	21.10	22.89	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44	22.44
Station Heat Rate (Kcal/kWh)	B	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600
Calorific Value of fuel(Kcal/Kg)	C	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100
Overall Heat (Gcal)	D= (A*B)	72959	83003	90078	88301	88301	88301	88301	88301	88301	88301	88301	88301	88301	88301	88301	88301	88301	88301	88301	88301
Fuel Consumption (MT)	E=(D*1000/C)	23535	26775	29057	28484	28484	28484	28484	28484	28484	28484	28484	28484	28484	28484	28484	28484	28484	28484	28484	28484
Cost of fuel per MT `	F	1985	2416	1983	2082	2186	2296	2410	2531	2657	2790	2930	3076	3230	3392	3561	3739	3926	4123	4329	4545
Total Cost of fuel (Rs Million)	G=E*F/10^6	46.72	64.69	57.62	59.31	62.27	65.39	68.66	72.09	75.69	79.48	83.45	87.63	92.01	96.61	101.44	106.51	111.83	117.43	123.30	129.46
Fuel Cost (Rs/kWh)	H=G/A1	2.52	3.07	2.52	2.64	2.77	2.91	3.06	3.21	3.37	3.54	3.72	3.90	4.10	4.30	4.52	4.75	4.98	5.23	5.49	5.77
Fixed Costs																					
O&M Expenses (Rs. Million)		0.21	0.22	0.23	0.25	0.26	0.28	0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.43	0.46	0.48	0.51	0.54	0.57	0.60
Depreciation (Rs. Million)		8.04	8.04	8.04	8.04	8.04	8.04	8.04	8.04	8.04	8.04	8.04	8.04	8.04	4.28	4.28	4.28	4.28	4.28	4.28	4.28
Interest on Term Loan (Rs. Million)		11.79	10.84	9.90	8.96	8.02	7.07	6.13	5.19	4.24	3.30	2.36	1.41	0.47							
Interest on Working Capital (Rs. Million)		2.89	3.81	3.42	3.50	3.63	3.78	3.93	4.09	4.27	4.45	4.64	4.84	5.05	5.21	5.46	5.73	6.00	6.30	6.60	6.92
Return on Equity		7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23
Income tax on ROE (Rs. Million)		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 Cost (Rs. Million)		30.16	30.15	28.84	27.98	27.19	26.40	25.63	24.87	24.11	23.37	22.64	21.91	21.20	17.16	17.44	17.73	18.03	18.35	18.69	19.04
Fixed cost (Rs/kWh)		1.63	1.43	1.26	1.25	1.21	1.18	1.14	1.11	1.07	1.04	1.01	0.98	0.94	0.76	0.78	0.79	0.80	0.82	0.83	0.85
Total cost (Fixed+variable) Rs. Million		76.88	94.84	86.46	87.29	89.46	91.79	94.29	96.96	99.81	102.85	106.09	109.54	113.21	113.77	118.88	124.24	129.87	135.78	141.99	148.50
Tariff (Rs/kWh)		4.15	4.50	3.78	3.89	3.99	4.09	4.20	4.32	4.45	4.58	4.73	4.88	5.04	5.07	5.30	5.54	5.79	6.05	6.33	6.62
Per unit tariff components																					
Per unit O&M Expenses		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03
Per Unit Depreciation		0.43	0.38	0.35	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Per Unit Interest on term loan		0.64	0.51	0.43	0.40	0.36	0.32	0.27	0.23	0.19	0.15	0.11	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Per Unit Interest on working capital		0.16	0.18	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.20	0.21	0.22	0.22	0.23	0.24	0.26	0.27	0.28	0.29	0.31
Per Unit Return on equity		0.39	0.34	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Per unit income tax		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
Levellised tariff																					
Discount factor		1.00	0.898	0.807	0.725	0.651	0.585	0.525	0.472	0.424	0.381	0.342	0.307	0.276	0.248	0.223	0.200	0.180	0.162	0.145	0.130
Discounted tariff components(variable)	3.29	2.52	2.75	2.03	1.92	1.81	1.70	1.61	1.52	1.43	1.35	1.27	1.20	1.13	1.07	1.01	0.95	0.90	0.85	0.80	0.75
Discounted tariff components(fixed)	1.18	1.63	1.28	1.02	0.90	0.79	0.69	0.60	0.52	0.46	0.40	0.35	0.30	0.26	0.19	0.17	0.16	0.14	0.13	0.12	0.11
Discounted tariff components (Total)		4.15	4.04	3.05	2.82	2.60	2.39	2.21	2.04	1.89	1.75	1.62	1.50	1.39	1.26	1.18	1.11	1.04	0.98	0.92	0.86
Fuel (Variable Cost) Rs/kWh		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Levellised Tariff (Rs/kWh)		4.47																			