

**PUNJAB STATE ELECTRICITY REGULATORY COMMISSION**  
SITE NO. 3, BLOCK B, SECTOR 18-A MADHYA MARG, CHANDIGARH

**Petition No. 32 of 2022**  
**Date of Order: 27.10.2022**

Petition under Regulation 36 of the MYT Regulation, 2019 and other applicable Regulations by Punjab State Power Corporation Ltd. for seeking and consideration of addition of cost on account of use of Biomass Pellets along with Coal and Oil to be used as fuel at Punjab State Power Corporation Ltd. Thermal Generating Units (Guru Gobind Singh Super Thermal Plant, Ropar & Guru Hargobind Thermal Plant, LehraMohabbat) for Generation of Electricity.

AND

In the Matter of: Punjab State Power Corporation Limited., The Mall, Patiala.

.....Petitioner

Versus

Punjab Energy Development Agency, Plot. No. 1 & 2, Sector - 33D, Chandigarh.

.....Respondent

Present: Sh. Viswajeet Khanna, Chairperson  
Sh. Paramjeet Singh, Member

PSPCL: Sh. Rupinderjit Singh, CE/ARR&TR  
Sh. Naveen Malhotra, Dy/CE  
Sh. Ravi Luthra, SE/TR-2  
Sh. Baljinder Pal Singh, AE/TR-5  
Sh. Gurvinder Singh, Sr.Xen/TR-5  
Sh. Swaran Singh, Sr.Xen

PEDA: Sh. Aditya Grover, Advocate

**ORDER**

1. The Petition has been filed by Punjab State Power Corporation Limited (PSPCL) for allowing the addition of cost of biomass pellets along with cost of coal and oil in the total Fuel cost of PSPCL Thermal Generating Units (GGSSTP Ropar & GHTP, Lehra Mohabbat) for ARR, FCA and other purposes.
2. The submissions of the petitioner are as under:
  - i) PSPCL is a duly incorporated Public Limited Company and a Distribution Licensee under the Electricity ACT 2003 in the State of Punjab. Its thermal plant GGSSTP Ropar & GHTP Lehra Mohabbat are having 4 units with a total capacity of 840 MW & 920 MW respectively and are using Coal and Oil as base fuel for Generation of Electricity.
  - ii) Ministry of Power, Govt. of India has forwarded office Memorandum dated 05.10.2021 with a copy of the direction no. 42 issued by CERC for Air Quality Management (CAQM) to initiate immediate steps to Co-fire biomass pellets, Torrefied pellets/Briquettes (with focus on paddy straw) with Coal (up to 5-10%) in the power plants through a continuous and uninterrupted supply chain by Coal based Thermal Power Plants situated within a radius of 300 km of National Capital Region (NCR).

Ministry of New and Renewable Energy (MNRE), Govt. of India has also issued the Clarification vide Notification No. 19/2/2019-BPD dated 26.09.2019 stating that the power generated from co-firing of bio-mass in thermal power plants is renewable energy and is eligible for meeting non-solar Renewable Purchase Obligation (RPO).

On the request of MNRE, The Central Electricity Regulatory Commission, New Delhi (CERC) vide Suo Motu Petition No. 12/SM/2019 has issued Order dated 18.02.2020 whereby methodology for Estimation of Electricity Generated from bio-mass in Biomass co-fired Thermal Power Plants has been prescribed.

The Commission vide order dated 24.09.2021 in Petition no. 23 of 2021 filed by Ambuja Cements, has given approval to adopt the aforementioned methodology for estimating electricity generated from bio-mass in Bio-mass co-fired captive Thermal Power Plants in the State of Punjab. As per Commission's order, PEDA the state designated agency for renewable energy will upload the formats for the estimation of electricity generated from bio-mass on its website.

iii) When the co-firing of bio-mass is started in the boilers of thermal power plants of PSPCL, provisions will be made to ascertain quantum of the energy generated from co-firing of bio-mass. In addition, the energy accounting and stock maintenance of fuel will have to be done as per above mentioned Orders/guidelines and the formats finalized by PEDA.

iv) It is mandatory for PSPCL to meet with the year wise Renewable Purchase Obligation targets (Both Solar and Non-Solar Renewable Power) fixed by the Commission, failing which there are provisions for imposition of Penalty as per Electricity Act 2003.

v) PSPCL sends data for ARR, Fuel Cost and Performance data to the Commission for claiming Generation Cost and other expenses incurred on Generation of Power at PSPCL thermal Generating Units. Currently, Fuel cost consists of Coal and Oil

cost only for estimating and calculating fuel cost. But as per above instructions, Biomass pellets are required to be used as fuel along with coal and oil which will change the generation cost used in ARR, FCA and for other Performance data sheets.

vi) PSPCL prayed to the Commission to allow the addition of cost of biomass pellets along with Coal and oil to add in the total Fuel cost of PSPCL's Thermal Generating Units (GGSSTP Ropar & GHTP, Lehra Mohabbat) for ARR, FCA and other purposes.

3. The petition was taken up for hearing on admission on 28.07.2022. PSPCL was directed to specify the quantum of the biomass pellets intended to be blended with coal and its cost benefit analysis along with increase of generation cost due to said blending. Since, the petition pertains to use of Biomass Pellets, hence, PEDDA, being the state designated agency for Renewable Energy, was impleaded as a respondent in the petition vide Order dated 02.08.2022.

4. PSPCL submitted its reply vide letter dated 07.09.2022 with submissions as under:

i) The Commission of Air Quality Management constituted by GoI under Commission for Air quality Management in National Capital Region & Adjoining Act ,2021 directed all the concerned states to take necessary steps vide point No. 14 of the Direction 42 vide letter No. 120015/25/TPP/2021/CAQM/948-953 Dated 17.09.2021 as below:

*"Now therefore in view of the above position & Compelling Need to Air Pollution from Burning of Paddy straw & its effective utilization as resource, the Commission constituted under the Provisions of "Commission for Air Quality Management in National Capital Region & Adjoining Areas , ACT,2021" hereby directs the Coal based Thermal Power Plants situated up to a radius of 300 KMs of Delhi:*

*I. To initiate immediate steps to Co-fire biomass based Pellets , Torrified Pellets/Briquettes( With focus on paddy straw) with Coal (upto 5-10%) in*

*the power plants through a continuous & uninterrupted supply chain and*  
*II. To take all necessary steps to ensure that Co-firing of biomass pellets in Thermal Power Plants begin without any delay.”*

Both the Thermal Plants of PSPCL i.e. GGSSTP, Ropar & GHTP, Lehra Mohabbat are situated within radius of 300 KMs of National Capital Region, as such this direction issued by CAQM is applicable to both the Thermal Plants of PSPCL.

ii) Ministry of Power, GoI issued “Revised Policy for Biomass Utilization for Power Generation through Co-firing in Coal based Power Plants” vide memo no 11/86/2017-Th.II Dated 08.10.2021. The Points No 2, 3 (I) & 3 (viii) of the Revised Policy of Biomass Utilization for Power Generation through Co-firing in Coal based Power Plants are re-produced as below:-

*2. Ministry of Power (MOP) vide its policy dated 17.11.2017 on biomass utilization for power generation had advised that all fluidized bed & pulverized coal units (Coal based thermal power plants ) except those having ball & tube mills , of power generation utilities , public or private located in India, to use 5-10% blend of biomass pellets , primarily of agro residue along with coal after assessing the technical feasibility, viz, safety aspect etc.*

*3. In order to further promote use of biomass pellets in coal based thermal power plants, the above policy is further modified. The modifications in the above policy areas below:-*

*(i) All coal based thermal power plants of power generation utilities with bowl mill, shall on annual basis mandatorily use 5% blend of biomass pellets made , primarily, of agro residue along with coal with effect from one year of issue of this guideline . The obligation shall increase to 7% with effect from 2 years after the date of issue of this order & thereafter.*

....

*(viii) Provisions related to tariff determination & scheduling shall be given below:*

*a. For projects set up under Section 62 of Electricity Act,2003 the increase in cost duet to co-firing of biomass pellet shall be pass through Energy Charge Rate( ECR)*

*b. For projects set up under Section 63 of Electricity Act,2003 the increase in ECR due to biomass co-firing can be claimed Change in Law Provisions.*

*c. Such additional impact in ECR shall not be considered in deciding Merit Order Despatch (MOD ) of the Power Plant.*

*d. Obligated Entities such as Discoms can meet their Renewable Purchase Obligation by buying such generation of Co-firing.”*

iii) Both Thermal Plants of PSPCL have bowl type coal mills, as such as per point no 3(I) of said policy both the thermal plants have to mandatorily use 5% blend of biomass pellets primarily

made of agro residue w.e.f. from one year of date of issue of these guidelines (Cut off date is 08.10.2022). This obligation shall increase to 7 % w.e.f. from 2 years after the date of these guidelines & thereafter (Cut off date is 08.10.2023)

iv) As per Point 3(viii) of said policy of MoP both the thermal plants are entitled to claim the increase in cost due co-firing of biomass pellets under the provision of section 62 of Electricity Act,2003 . This increase in cost shall be pass through Energy Charge Rate (ECR). Additionally, such additional impact on ECR shall not be considered in deciding Merit Order Dispatch for both GGSSTP, Ropar & GHTP, Lehra Mohabbat. PSPCL should also be allowed to consider the quantum of power produced through Co-firing of Biomass Pellets as Renewable Power & this should be included in Renewable Purchase Obligation (RPO) of PSPCL.

v) National Thermal Power Corporation Ltd ( NTPC) has successfully Co-fired Biomass Pellets 5-10% along with Coal at Its Dadri Thermal Plant. GGSSTP, Ropar floated a tender enquiry on dated 07.08.2021 for procurement of 6000 MTs of 100% Paddy Straw Based Torrified Pellets (3000 MTs each for both GGSSTP, Ropar & GHTP, Lehra Mohabbat) for test Co-Firing the Biomass Pellets on Unit 6 of GGSSTP, Ropar & Unit 1 of GHTP Lehra Mohabbat. Purchase Order was placed upon M/s Badshah Energies, Ludhiana on 27.01.2022 at a landed cost of Rs 8100 per MT (basic rate Rs. 6802/MT + Freight Rs. 1180/MT+ Transit insurance Rs. 118/MT) with assured GCV of 4000 Kcal/Kg. So landed Cost per 1000 Kcal of Biomass Pellets Comes out to be Rs 2.025 per 1000 Kcals. Till date the firm has supplied 61 MTs to GGSSTP, Ropar & 38 MTs to GHTP, Lehra Mohabbat

respectively which have been successfully Co-fired along with Coal .

vi) At present only 40 Nos of Biomass Pellets manufacturers are available in India. Out of which only 3 manufacturers (A2P Energy Solutions Pvt. Ltd, Chandigarh, M/S Badshah Energies Ltd, Ludhiana , Pooja Agro Fuel Industries Ltd, Sangrur) are from Chandigarh & Punjab. Further, establishing a continuous supply chain of biomass pellets is a major issue as most of biomass pellets manufacturers are small & medium enterprises having limited manufacturing capacity. Additionally working capital of 18 months is required for procurement of Agro Residue Straw during Harvesting Season as Straw has to be stored for continuous manufacturing of Pellets. Banks & NBFCs presently are reluctant to give commercial loans for raising 18 months working capital loans. Further manufacturers prefer to supply the pellets to thermal Plants at a distance of 40-50 KMs

vii) Ministry of Power, Govt of India has also issued Model Contract for use of Biomass Power Plants (TPPS) on dated 02.03.2022 in order to enable all Gencos to procure 5% Biomass Pellets for Co-firing with Coal by floating Tender enquiries of long duration. Quantity of Biomass Pellets to be procured per annum for GGSSTP Ropar & GHTP Lehra Mohabbat were worked out to 30287 MTs & 50000 MTs with co-firing of 5% Biomass Pellets along with Coal Quantity of 30287 MTs for GGSSTP, Ropar was worked out on the basis of PLF of 12% & Specific Coal Consumption of 0.686 Kcal/kWh (FY 2020-21) while in case of GHTP quantity of Biomass Pellets to be procured per annum was worked out on the basis of anticipated annual coal consumption of 10 LMTPA.

viii) In order to achieve 5% Co-Firing for its Thermal Plants, PSPCL floated tender enquiry dated 13.04.2022 on the basis of Model Contract for total quantity of 1,60,000 (One lac Sixty Thousand) MT Biomass Torrified Pellets for 2 years but till date no firm has submitted any quotation & enquiry is under process.

ix) Landed Cost of Coal of Rs 5200 Per MT & Prevalent Landed Cost of Biomass Pellets of Rs 9000 per MT, fuel Cost per annum will increase by Rs 11.4 Crores & 19 Crores in respect of GGSSTP & GHTP respectively in case 5%Co-firing of biomass pellets along with coal is achieved. Overall increase in fuel cost per annum will be Rs 30.4 Crores for PSPCL.

x) Based upon landed Cost of Coal of Rs. 5200 Per MT & Prevalent landed Cost of Biomass Pellets of Rs 9000 per MT, GCV of Coal of 3950 Kcal/Kg, GCV of Biomass Pellets of 4000 Kcal/Kg & Specific Coal Consumption of 0.686 Kgs/Kwh, the Fuel cost per KWh in case of GGSSTP, Ropar will increase from Rs 3.57 per Kwh to Rs 3.70 per KWh i.e Fuel Cost per KWh in case of GGSSTP, Ropar will increase by Rs 0.13 per Kwh. The increase in cost in respect of GHTP Lehra Mohabbat more or less will be the same.

xi) Cost Benefit Analysis:- The Cost Benefit analysis of Co-firing of Biomass Pellets is as below:-

a. Torrified Biomass Pellets is carbon neutral fuel since no CO<sub>2</sub> Emission is involved in its manufacturing & during Co-firing of Pellets with Coal, the flue gases generated are passed through Electrostatic Precipitators & Emission of harmful gases is controlled. Thus, Co-firing of Biomass Pellets along with coal helps in reduction of CO<sub>2</sub> emission.



b. Since Biomass Pellets are rich in minerals like silica, calcium potassium, Magnesium, during combustion these minerals react with Sulphur present in coal and Chemical Compounds thus produced are removed by ESP & are not released to the atmosphere. This results in reduction of SO<sub>x</sub> emissions up to 15% .

c. Demand for Biomass Pellets has opened new avenues of income for Farmers as instead of burning their crop residue in fields they can sell the crop residue to Aggregators at a rate of Rs. 2000 to 3000 per MT.

xii) PSPCL is committed to Co-fire 5% Biomass Pellets along with Coal in its thermal plants and blending of Biomass Pellets with coal will be gradually increased to 10% as per directions issued by CAQM & Ministry of Power (MOP), Govt. of India from time to time. However, at present major issue is that of non-availability of continuous supply chain as only a few vendors with limited manufacturing capacity are available. Although, presently, the cost of biomass pellets is higher as compared to Coal , yet it is expected as more & more vendors will be developed , the cost of Biomass Pellets will considerably reduce in the future & increase in fuel cost due to co-firing of Pellets will be considerably less.

PSPCL has prayed that the Commission consider the proposal of PSPCL to include the Cost incurred on Procurement of Biomass Pellets in the fuel cost of PSPCL's Thermal Plants for ARR, FCA & other purposes

5. The petition was taken up for hearing on admission on 28.07.2022. PEDDA requested for time to file reply/written submissions in the petition. The Commission allowed PEDDA to file the same within a week. After hearing the parties, Order was reserved.

6. PEDDA submitted its reply vide letter dated 10.10.2022. The submissions of PEDDA are as under:
- i) PSPCL owned two number thermal plants have annual PLF of around 12% only whereas the 3 IPP's actually run at much higher PLF and can consume large quantum of rice straw in the shape of pellets. While PSPCL is taking all steps to implement the decision, the other similarly placed IPP's have not so far come forward for the implementation of the MoP letter dated 05.10.2021, though the copies of the said letters have also been forwarded to them. IPP's should also be directed to comply with the direction of the MOP and start consumption of rice straw based pellets for optimum utilization of the surplus biomass waste.
  - ii) Regarding the clarification issued by MNRE, GOI dated 26.09.2019, the energy generated with the usage of co-firing of Biomass should be eligible for meeting the RPO of the PSPCL and PEDDA shall continue to monitor and report the fulfillment of RPO of PSPCL on the basis of quarterly data submitted to PEDDA by PSPCL, in terms of the directives issued by the Commission as per RPO regulations.
  - iii) CERC vide order dated 18.02.2020 in suo-motu petition no. 12/SM/2019 has already defined the methodology for estimation of electricity generated from such rice straw pellets etc. in co-firing mode. The same methodology is recommended for acceptance by the Commission for which suitable provision needs to be made in the MYT regulations notified by the Commission, since this will be a part of the annual revenue requirement of PSPCL and will have to be approved by the Commission and passed on to the consumer of the State through tariff orders.

iv) As per the duty assigned by the Commission to PEDDA in Order dated 24.09.2021 in petition No. 23 of 2021 filed by Ambuja Cements, methodology for estimating the energy generated from co-firing of biomass in coal based CPP's and CGP's, requisite necessary amendments in RPO manual vide amendment dated 24.11.2021 has already been enunciated. The said methodology has been formulated keeping in view the ownership of the CPP's being private entities. Further this methodology is for working out the RE component for the purpose of RPO and there was no determination of fuel cost, whereas, the present petition is by a state licensee regulated by the Commission. The present exercise also requires determination of cost component of the fuel for recovery through tariff. Therefore, the methodology shall have to be for determination of the generation component as well as cost component for the Renewable Energy generated through co-firing of pellets and this will have to be as per the provision of the MYT regulations. Thus, the order referred to by petitioner-PSPCL passed by the Commission in the case of Ambuja Cement is of no consequence, rather, the order passed by CERC is complete and can be well relied upon in the instant case since it is already being followed by NTPC etc. Even otherwise the DO letter dated 02.07.2020 issued by ACS, Department of NRES, GoP also inter alia recommends that the Biomass co-firing will be allowed based on CERC methodology.

v) Presently PSPCL is generating electricity at its thermal plants using coal as primary fuel and oil as a secondary fuel. The quantum of the fuel(s) and their cost is being submitted by the licensee, authenticated and approved as per the MYT regulations and similar provisioning shall have to be made appropriately for

verification and approval of the parameters of the RE fuels proposed to be used by PSPCL and submission of data in its ARR.

vi) PEDA is not in a position to offer any comments relating to the calculation of quantum of pellets required for the proposed co-firing of 5%, CERC is allowing working capital for the Biomass fuel for 4 months as per RE Tariff Regulations for calculation of generic tariff of Biomass plants. Whereas, PSPCL has stated the working capital requirement of 18 months of storage of rice straw/ pellets, which patently does not seem to be justified and in consistence with the CERC regulation which have been duly adopted by the Commission.

vii) PSPCL has worked out the cost of generation of its thermal plants as Rs. 3.57/- per Kwh, whereas the actual cost of generation as per Merit Order Dispatch (MOD) being issued every month is being projected as more than Rs. 4/- per unit. Further, it is also observed that PSPCL is submitting the figure of Station Heat Rate (SHR) and Auxiliary Consumption (AC) in the ARR, however the same are reduced by the Commission while issuing the tariff order. It is therefore, to be decided by the Commission as to which figures of SHR/AC are to be considered while working out the increase in the cost of generation in the proposed mechanism.

viii) PSPCL has claimed the cost of rice straw ranging between Rs. 2000/- to Rs. 3000/- MT, however, it has been consistent stand of PSPCL before the Commission in various other petitions that the cost of rice straw is near about Rs. 1600/- per MT. Therefore, the Commission may take appropriate decision in the matter in terms of the directives issued by CERC, as adopted by

the Commission and the guidelines issued by Ministry of Power, GOI with regard to co-firing of Biomass pellets in Thermal Plants.

## 7. **Observations and Decision of the Commission**

The Commission has examined the submissions made in the petition by PSPCL & PEDDA and pleadings made during the course of hearing of the matter. The Commission observes and decides as under:

i) The Coal based Thermal Power plants situated up to a radius of 300 Km of Delhi are liable to comply with the direction of CAQM under Section 14 of the CAQM Act, 2021 to co-fire biomass-based Pellets, Torrefied Pellets/Briquettes (with focus on paddy straw) with Coal (up to 5-10%) in the power plants through a continuous and uninterrupted supply chain. PSPCL submitted that its both thermal plants i.e. GGSSTP and GHTP are situated within a radius of 300kms of NCR and the directions of CAQM are applicable on these plants.

ii) The Commission notes PSPCL submission that as per issued guidelines it shall be using 5% blend of biomass pellets primarily made of agro residue which shall be increased to 7 % w.e.f. 08.10.2023.

iii) CERC vide order dated 18.02.2020 in suo-motu petition no. 12/SM/2019 has already defined the methodology for estimation of electricity generated from such co-fired biomass-based Pellets, Torrefied Pellets/Briquettes with Coal (up to 5-10%). Addl. Chief Secretary, Department of NRES, Government of Punjab has also recommended that the Biomass co-firing will be allowed based on CERC methodology. The commission also notes the submission of PEDDA that the order passed by CERC is complete and can be well relied upon in the instant case since it is already being followed by NTPC etc.

iv) Regarding observation of PEDDA that PSPCL has worked out the cost of generation of its thermal plants as Rs. 3.57/- per Kwh, whereas the actual cost of generation as per Merit Order Dispatch (MOD) being

issued every month is being projected as more than Rs. 4/- per unit, the Commission observes that generation cost varies with the Cost of Coal, GCV of coal, Specific coal consumption etc. PSPCL has projected the generation cost of Rs. 3.57/kWh with consideration of coal cost of Rs. 5200/MT, GCV of coal 3950kCal/kg, specific coal consumption as 0.686kg/kWh and projected an increase of Rs. 0.13/kWh in generation cost with 5% blend of biomass pellets based on an estimated price of Biomass available in Punjab. The Commission shall consider Station Heat Rate (SHR), Auxiliary Consumption (AC) and other operational parameters as per PSERC MYT Regulations as amended from time to time to determine the final additional cost based on accurate actual data furnished by PSPCL.

v) As the increase in generation cost shall be borne by the consumers of Punjab State against which burning of paddy straw is required to be reduced in Punjab, accordingly, the Commission directs PSPCL to procure the biomass-based Pellets, Torrefied Pellets/Briquettes subject to the conditions that the pellets are manufactured using biomass (paddy straw/stubble) procured preferably from within Punjab as far as possible and as long as price is competitive so as to have the maximum positive environmental impact. Further, to reduce the cost of transportation of pellets, pellets manufacturer situated in Punjab may be preferred to avoid double transportation cost.

**vi) Keeping the above in view, the Commission adopts CERC Order issued on dated 18.02.2020 in Suo Moto Petition No. 12/SM/2019 in toto and allows the addition of cost of biomass pellets along with Coal and oil to add to the total Fuel cost of PSPCL Thermal Generating Units (GGSSTP Ropar & GHTP, Lehra Mohabbat) for ARR, FCA and other purposes on account of usage of biomass pellets co-fired with coal in thermal power plants in line**

with the above referred Order. However, MOD shall be calculated without considering the impact of Biomass Pellets.

The final cost for pass through will be calculated on the basis of actual accurate data on pricing of pellets and other factors as detailed above in Para iv as per PSERC MYT Regulation.

Further, PSPCL shall submit the requisite data for quantifying the energy produced from biomass in biomass co-firing for verification/inspection by PEDDA, being the State Agency for monitoring of RPO compliance by the obligated entities in Punjab, for qualification of same as PSPCL's RPO compliance.

The Petition is disposed of accordingly.

Sd/-

(Paramjeet Singh)  
Member

Sd/-

(Viswajeet Khanna)  
Chairperson

Chandigarh

Dated: 27.10.2022