

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

**Petition No. 08 of 2020
Date of Order: 09.10.2020**

Petition for Determination of Levellised Generic Tariff in terms of Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan (PM-KUSUM) Scheme for setting up of grid connected solar power plants of individual capacity ranging between 500KW to 2MW in the State of Punjab under Component–A of the ibid scheme for sale of solar power generated thereof to the DISCOM in the State of Punjab.

AND

In the matter of: Punjab Energy Development Agency, having its office at Plot No. 01 and 02, Sector 33-D, Chandigarh.

.. Petitioner

Present: Ms. Kusumjit Sidhu, Chairperson
Ms. Anjali Chandra, Member

ORDER

- 1.1. Punjab Energy Development Agency (PEDA), the state nodal agency for promotion and development of renewable energy programmes/projects and energy conservation programme in the state of Punjab, has filed the present petition for determination of Levellised Generic Tariff in terms of The Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan (PM-KUSUM) Scheme for setting up of grid connected solar power plants of individual capacity ranging between 500KW to 2 MW in the State of Punjab under Component–A of the ibid scheme for sale of solar power generated to the DISCOM in the State of Punjab. It has been prayed to

- i) Determine levelled generic tariff in terms of Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyaan (PM-KUSUM) Scheme for setting up of grid connected solar power plants of individual capacity ranging between 500Kw to 2MW in the State of Punjab under Component–A of the ibid scheme, for sale of power generated thereof to the DISCOM in the State of Punjab;
- ii) Pass any other order or grant any other relief in favor of the petitioner in the facts and circumstances of the instant case.

1.2. The Commission vide Order dated 10.07.2020 inquired from PSPCL whether it was ready to purchase the power under KUSUM Scheme at the tariff determined by the Commission and whether PSPCL had identified the feeders where this power could be absorbed. PSPCL filed additional affidavit vide memo No. 5470 dated 28.07.2020 and PEDDA filed its rejoinder thereto on 04.08.2020. The Petition was admitted vide Order dated 10.08.2020. PEDDA was directed to issue a public notice inviting objections/suggestions from the public/stakeholders. The public notice was published by PEDDA on 12.08.2020 in 'The Tribune' (English), 'Hindustan Times' (English) and Punjabi Tribune. The last date for submission of objections was fixed as 15 days from the date of publication of the notice. In response to the public notice three objections were received. The petition was taken up for hearing/public hearing on 27.08.2020 and the objections raised by Sh. Kuljit Singh Nagra, MLA, Punjab, Sh. B.S. Rajewal, BKU and Sh. M.S. Randhawa, President, Farmers Association, during the public hearing through video conference were heard. PEDDA was directed to submit its reply to the objections with a copy to PSPCL (through hard copy and soft copy) as well as

calculation of rate per unit under Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyaan (PM-KUSUM) Scheme. Further, PSPCL was directed to file its reply to the information/calculation submitted by PEDDA alongwith its comments on the issue of capacity utilization factor with a copy to PEDDA. The petition was fixed for hearing on 16.09.2020.

- 1.3. PEDDA, vide submissions dated 31.08.2020 (received on 01.09.2020), submitted the calculations of generic levelised solar tariff under component A of KUSUM scheme alongwith replies of objections raised by the stakeholders during the public hearing. PSPCL submitted its reply vide Memo No. 5761/TR-5/967 dated 14.09.2020. The Petition was taken up for hearing on 16.09.2020 and after hearing the parties Order was reserved vide Order dated 18.09.2020.

2.0 PEDDA's submissions:

- 2.1 The Ministry of New and Renewable Energy, Government of India has allocated a target of 30MW for grid connected solar power plants to the State of Punjab, the sanction of which has been rendered by Government of India vide order dated 03.10.2019. As per the scheme and the approval granted by the Government of India for implementation of component-A in the State of Punjab, it has been inter alia provided that:

- i) The Distribution Company (DISCOM) will notify Sub-station wise surplus capacity which can be fed from such RE power plants to the Grid. The renewable power generated will be purchased by DISCOMs at a pre-fixed levelised generic tariff and Discom shall sign PPA for 25 years from the Commercial Operation Date (COD) of the project. The total energy purchased from these RE

plants will be accounted for fulfillment of RPO by the DISCOM.

- ii) DISCOM will provide connectivity with the 11kV side of substation through the dedicated 11kV line laid by the Renewable Power Generator (RPG).
- iii) DISCOM will ensure must run status to the solar plants installed under the scheme and will keep the feeders ON during sunshine hours of the day.
- iv) PEDDA shall conduct tendering process and invite applications from interested beneficiaries for setting up of the renewable energy plants as per MNRE Guidelines. In case, the aggregate capacity offered by Applicants is more than notified capacity for a particular sub-station, bidding route will be followed to select Renewable Power generator and in such cases the pre-fixed levellised generic tariff will be the ceiling tariff for bidding. Selection of bidders will be based on the lowest tariff offered in the ascending order as quoted by the bidders in the closed bid or e-reverse auction as the case may be.
- v) All conditions specified in the PM-KUSUM scheme will be incorporated in the tender document.

2.2 Earlier Component-A was to be carried out primarily by the DISCOM, however sanction dated 03.10.2019 was issued by Government of India in favour of PEDDA for setting up of 30MW capacity under Component-A in the State of Punjab. Thus, PEDDA has been attributed with a major role in this regard by the Government of India for implementation of the ibid scheme being the State Nodal Agency.

2.3 As per the ibid scheme, it has been mandated that the DISCOMs will purchase solar power from the RPGs at the rate decided by the

respective State SERC. Further, DISCOM would be eligible to get Procurement Based Incentive (PBI) @ Rs. 0.40 per /unit for the purchased power or Rs. 6.6 lakh per MW of capacity installed, whichever is lower, for a period of five years from the COD.

2.4 PEDA at its own level on the basis of the technical knowhow and the information gathered by it has finalized the capital Cost of a 1 MW capacity project as Rs. 340 Lakhs. In addition:-

- a) Rajasthan Electricity Regulatory Commission (RERC) has finalized the tariff vide order dated 11.02.2020 for sale of solar power under PM-KUSUM Scheme, as per which they have also taken Rs. 3.40 Crore as the capital cost of 1 MW solar power plant, 20% CUF and Rs. 4.50 lacs per MW as O&M cost.
- b) As per CERC 2016-17 order (last determined tariff by CERC), O&M is Rs. 7 lacs / MW and CUF is 19%.
- c) Solar insolation in Punjab being less than Rajasthan, CUF for Punjab proposed was 18% whereas O&M was taken as Rs. 4.50 lacs per MW as per RERC for generic tariff calculations. Other parameters requisite for determination of the tariff qua the projects under reference proposed as per CERC norms for 2019-20.

2.5 The Proposal with parameters as above was sent to PSPCL for concurrence and Dy. CE/IPC, PSPCL vide memo no. 240 dated, 13.02.2020 has sent comments for incorporation in the proposal. The comments of PSPCL are proposed to be accepted in to except the CUF of 19%. The Return on Equity has been taken as 16.47% against 17.6% in view of the proposed rate of Income Tax

of 15% as per Finance Bill 2020 for newly incorporated Domestic Generating Companies.

2.6 As far as CUF is concerned PEDDA has proposed to consider it as 17.14% for the solar power plants of capacity 1 to 2 MW to be setup under the PM-KUSUM scheme. PEDDA mentioned that 43 small capacity (1 to 4 MW) IPP solar power plants were setup in Punjab between 2014 to 2017 and 17.14% CUF has been derived from the power sold (Trued up) by 27 Nos. solar power plants having CUF more than 15% during FY 2017-18 and FY 2018-19 as submitted by PSPCL to PSERC in the ARR for FY 2019-20 and FY 2020-21 respectively. These plants of an aggregate capacity 59.50 MW had generated 88.49 MU with a cumulative CUF of 16.98% during FY 2017-18 and 85.66 MU with a cumulative CUF of 16.43% during FY 2018-19. Degradation of 1% per year has been taken and is applied with which the CUF of the commissioning years works out to be 17.26% for the projects from which power was purchased by PSPCL during FY 2017-18 and 17.01% for the projects from which power purchased by PSPCL during FY 2018-19. The aggregate CUF of both the years works out to be 17.14%.

2.7 In view of the above, PEDDA has proposed to consider 17.14% CUF for determining the tariff for the solar power plants to be setup under PM-KUSUM scheme. The finalized parameters as per above submissions are as under:-

- Capacity = 1MW
- Aux. Consumption = 0%
- CUF = 17.14% (As per existing projects)
- Capital cost = Rs. 3,40,00,000/-

- Debt 70% = Rs. 2,38,00,000/-
- Equity 30% = Rs. 1,02,00,000/-
- Interest Rate = 10.41% (as per CERC order 2019-20)
- Loan Moratorium = 0 years
- Loan term = 13 years
- Depreciation 1 to 13 years = 5.28% (as per CERC order 2019-20)
- Depreciation 14 to 25 years = 1.78%
- Income tax = 15% (as per finance bill 2020)
- O & M for 1st year = Rs.4.50 lakh/MW (As per RERC)
- O & M Escalation = 5.72%(as per CERC 2019-20)
- Discount rate = 9.36% (as per CERC 2019-20)
- ROE = 16.47%(as per Calculations attached)
- Life and tariff period = 25 years

3.0 Stake holders' objections/submission:

- 3.1 Sh. Deep S Brar requested the tariff of Rs. 4.50 per kWh be fixed for ensuring good return to the farmers. Sh. Gurbaj Brar and Sh. Amit Kamboj requested the tariff to be fixed at Rs. 4.40/kWh and Rs. 4.35/kWh respectively. All the 3 objectors submitted that since the farmers have meager resources which will be put into this project, hence in order to complement his investment the tariff should ensure a good return on the same.

4.0 PEDDA's reply to objections:

- 4.1 In reply to the objections PEDDA stated that the tariff needs to be decided on the basis of different parameters and CUF may be

taken on actual basis as mentioned in the petition submitted by it. It was submitted that this scheme will lead to another source of income for the farmer in addition to their agriculture income and therefore should be encouraged to strengthen the rural economy.

5.0 PSPCL's Submissions:

- 5.1 PSPCL vide Memo No. 5761/TR-5/967 dated 14.09.2020 submitted the detailed calculation for levellised solar tariff under component A of KUSUM Scheme. PSPCL submitted that as per latest norms and parameters the levellised tariff for 25 years works out to Rs. 2.52/kWh.
- 5.2 PSPCL had given its concurrence for implementation of the PM-KUSUM Scheme in the Meetings held on 12.06.2019 and 20.06.2019 under the chairmanship of Principal Secretary, New and Renewable Energy Sources, Govt. of Punjab, subject to the scheme being economically viable and beneficial to all the stakeholders. The relevant extracts from the Meetings reads as under:

“Component A - After detailed deliberations, a target of 500 MW capacity solar power plants was fixed for which concurrence was given by the officers of PSPCL present in the meeting. PSNRE said that these power plants shall be set up by the Gram Panchayats, Farm Producer Organizations and Co-operative Societies for which reverse tariff based bidding shall be carried out on the Feed in Tariff to be notified by PSERC and purchase cost of PSPCL shall reduce to Rs. 2.50/KWh to Rs. 2.60/kwh after availing of MNRE, GOI incentive of Rs. 0.40/KWH of feed in tariff is taken as Rs 3/KWH. This shall help PSPCL is meeting the

solar RPO shortfall of 700 MUs also.”

- 5.3 PSPCL submitted that PEDDA in its Rejoinder dated 04.08.2020, has admitted that the Petition was filed in the last quarter of FY 2019-20, as per the rates prevalent at the relevant time and as per the CERC RE Regulations, 2017. Subsequently, the norms and parameters have been revised by the Central Commission and the same have been incorporated in the CERC RE Regulations, 2020 notified on 23.06.2020 and the Order dated 21.07.2020 in Petition No. 13/SM/2020. Since, PEDDA has admitted that the installation works will only be completed during FY 2020-21 and FY 2021-22, therefore, the latest norms, parameters and technology, as prevalent on the present date should form the basis of the computation of the tariff by the Commission.
- 5.4 The Capacity Utilization Factor (CUF) should be considered as 21%, as per the latest data available and incorporated by the Central Commission in its RE Regulations, 2020. As regards the implications of the email dated 18.02.2020 wherein PSPCL had sought a CUF of 19%, it is submitted that the latest data regarding the CUF became available only in June/July, 2020. Up until then, the prevalent norms were as notified by the Central Commission for FY 2019-20 and as adopted by the Commission. In any event, PEDDA is seeking to rely on the data pertaining to the years 2014-17 to claim a CUF of 17.14%. There have been significant advancement in the Solar PV technology leading to a higher CUF in recent times. The size/capacity of the Plant does not have a significant impact on the CUF. As is evident from the data produced by PEDDA, there is a marginal difference in the CUF on account of the capacity of the Plant.

- 5.5 The details of the savings in tariff on account of CUF and Income Tax implications are as under:

Table:1 Details of savings in tariff submitted by PSPCL

Sr. No	Parameters	PEDA	PSPCL	Impact
1.	CUF	17.14%	21%	-0.65 Rs. (decrease)
2.	Income Tax	34.94% (corporate tax) 17.47% (MAT)	15%	-0.14 Rs. (decrease)
3.	Working Capital	11.41%	11.17%	-0.01 Rs. (decrease)

6.0 Commission's Analysis and Decision.

The Commission has considered the submissions made by PEDA and PSPCL and the objections and suggestions received.

- 6.1 Given the large difference between regulated feed-in-tariffs / preferential tariffs and the winning bids for solar PV and wind in the past, CERC has stopped notifying wind and solar PV tariffs since the last 2 years. Similarly, the Commission has last determined the generic tariff for solar PV vide order dated 9.10.2017 for the year 2017-18 as Rs. 3.93 per unit for solar PV projects.
- 6.2 The Commission vide Suo-Motu Order dated 18.09.2020 in Petition No. 26 of 2020 has adopted the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2020 with State specific amendment in respect of CUF for small hydro projects and accordingly, determined the levellised generic Tariff for various Renewable Energy Technologies/ Projects for FY 2020-21. These Regulations are applicable from the date of the Order i.e. 18.09.2020.
- 6.3 PEDA vide submission dated 31.08.2020 has given the calculation of Rs. 3.41 per unit, based on the revised assumptions. However, the Commission has observed the following points in the

calculations of the levellised tariff submitted by PEDA:

- i) The loan term as per CERC Regulations is 15 years and the same has been considered by PEDA, however, while calculating interest on long term loan the same has been worked out for 13 years instead of 15 years
- ii) Similarly, PEDA has worked out depreciation for the first 13 years instead of the first 15 years at 4.67%.
- iii) Also, while computing the Return on Equity, PEDA has considered Income Tax/MAT for 10 years.

6.4 The Commission has considered the capital cost of Rs. 340 Lakh/MW as submitted by PEDA in its Petition and also by PSPCL in its submission dated 14.09.2020. With regard to other financial and operational parameters, the Commission has considered the same as per PSERC Regulations (CERC RE Regulations, 2020 as adopted) while determining the solar PV tariff in this petition. Regulations state that the O & M expenses shall be as per market conditions. PEDA has considered O & M expenses of rupees 4.50 Lakh/MW for FY 2020-21 with an escalation of 3.84%. PSPCL in its submission dated 14.09.2020 has also considered the same O & M expenses The Commission has decided to take the O & M expenses as per submission of PEDA & PSPCL. The financial and operational parameters are as hereunder:

Table 2: Financial and Operational parameters

Sr. No	Particulars	As per PEDA Petition	As per PEDA submission dated 31.08.2020	As per PSPCL submission dated 14.09.2020	PSERC Regulations (as per CERC Regulations 2020)
1	Capacity	1 MW	1 MW	1MW	1MW
2	Aux. Consumption	0%	0%	0%	0.75%

Sr. No	Particulars	As per PEDA Petition	As per PEDA submission dated 31.08.2020	As per PSPCL submission dated 14.09.2020	PSERC Regulations (as per CERC Regulations 2020)
3	Capacity Utilization Factor(CUF)	17.14%	17.14%	21%	21%
4	Capital Cost(Rs.)/MW	3.40 Crore	3.40 Crore	3.40 Crore	3.40 Crore
5	Debt	70%	70%	70%	70%
6	Equity	30%	30%	30%	30%
7	Debt(Rs.)	2.38 Crore	2.38 Crore	2.38 Crore	2.38 Crore
8	Equity(Rs.)	1.02 Crore	1.02 Crore	1.02 Crore	1.02 Crore
9	Interest rate on term loan	10.41%	9.67%	9.67%	9.67%
10	Loan Moratorium period	0 years	0 years	0 years	0 years
11	Term of loan	13 years	13 years	15 years	15 years
12	Depreciation upto	90%	90%	90%	90%
13	Rate of Depreciation	5.28% (upto 13 years)	4.67% (upto 13 years)	4.67% (upto 15 yrs)	4.67% (upto 15 yrs)
		1.78%	2% (after 13 years)	2% (after 15 yrs)	2% (after 15 yrs)
14	Rate of Income Tax	15%	17.47%	0% (MAT) 15% (Corporate Tax)	17.47% (MAT-15%, surcharge @12% and Health and Education Cess @4%)
15	Corporate Tax Rate	-	34.94%	-	34.94%
16	O&M for 1st year	4.50 lacs/MW	4.50 lacs/MW	4.50 lacs/MW	4.50 lacs/MW
17	O&M Escalationrate	5.72%	3.84%	3.84%	3.84%
18	Interest rate on Working Capital	-	11.41%	11.17%	11.17%
19	Discount rate	9.36%	8.61%	8.61%	8.61%
20	ROE for 1 to 20 years (14% Gross up with MAT.	16.47%	16.96% (for 10 years)	16.47%	16.96%
21	ROE from 21st to 25th years (14% Gross up with corporate tax.	-	21.52% (from 11 years to 25 years)	16.47%	21.52%
22	Life and Tariff Period	25 years	25 years	25 years	25 years
23	Total number of hours	8766	8766	8766	8766

6.5 The Commission has worked out the levellised tariff as Rs. 2.748 per KWh for solar PV projects in this petition on the basis of the parameters listed above, without the accelerated depreciation benefit. The details of the same are attached as Annexure-A.

- 6.6 **Accordingly, the Commission specifies Rs. 2.748/kWh as the levellised tariff for solar PV projects in this petition. The above tariff shall be applicable for the projects set up in both conditions either on land mounted (in case of barren land) or stilt mounted (in case of agricultural land).In case benefit of accelerated depreciation is availed, the tariff will be adjusted accordingly.**
- 6.7 The other terms and conditions stated under the PM KUSUM Scheme shall remain applicable and need to be followed by the concerned entities.

The Petition is disposed of accordingly

Sd/-

(Anjuli Chandra)

Member

Sd/-

(Kusumjit Sidhu)

Chairperson

Chandigarh

Dated: 09.10.2020

Levelling Tariff for Solar PV Projects in Petition No. 08 of 2020

Annexure-A

Units Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841	1.841
Auxiliary Consumption	MU	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
Net Generation	MU	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827

Fixed Cost	Unit	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	4.50	4.67	4.85	5.04	5.23	5.43	5.64	5.86	6.08	6.32	6.56	6.81	7.07	7.34	7.63	7.92	8.22	8.54	8.87	9.21	9.56	9.93	10.31	10.71	11.12
Depreciation	Rs Lakh	15.88	15.88	15.88	15.88	15.88	15.88	15.88	15.88	15.88	15.88	15.88	15.88	15.88	15.88	15.88	6.80	6.80	6.80	6.80	6.80	6.80	6.80	6.80	6.80	6.80
Interest on term loan	Rs Lakh	22.26	20.72	19.19	17.65	16.11	14.58	13.04	11.50	9.97	8.43	6.90	5.36	3.82	2.29	0.75	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	0.97	0.95	0.94	0.92	0.91	0.90	0.88	0.87	0.86	0.85	0.83	0.82	0.81	0.80	0.79	0.66	0.68	0.69	0.70	0.72	0.80	0.81	0.83	0.84	0.86
Return on Equity	Rs Lakh	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	21.95	21.95	21.95	21.95	21.95
Total Fixed Cost	Rs Lakh	60.91	59.53	58.16	56.79	55.44	54.09	52.75	51.41	50.09	48.78	47.47	46.18	44.89	43.61	42.35	32.69	33.00	33.33	33.67	34.03	39.11	39.49	39.89	40.30	40.73
Per unit Fixed Cost	Rs/k Wh	3.33	3.26	3.18	3.11	3.03	2.96	2.89	2.81	2.74	2.67	2.60	2.53	2.46	2.39	2.32	1.79	1.81	1.82	1.84	1.86	2.14	2.16	2.18	2.21	2.23

Discount Factor		1	0.92	0.85	0.78	0.72	0.66	0.61	0.56	0.52	0.48	0.44	0.40	0.37	0.34	0.31	0.29	0.27	0.25	0.23	0.21	0.19	0.18	0.16	0.15	0.14
Levelling Tariff	Rs/ Kwh	2.748																								