

**BEFORE THE HARYANA ELECTRICITY REGULATORY COMMISSION
BAYS No. 33-36, SECTOR-4, PANCHKULA- 134112, HARYANA**

Case No. HERC/PRO-57 of 2019

Date of Hearing : 18.12.2019

Date of Order : 20.12.2019

In the Matter of

Petition for determination of Pre-fixed levelized tariff for purchase of power by Discoms from decentralized Solar Power Plants and other Renewable Energy Generation Plants having capacity of 500 kW to 2MW to be set up by individual farmers/group of farmers/cooperatives/panchayats/Farmer Producer Organizations (FPO) /Water User Associations (WUA) in the vicinity of rural grid sub-stations under Component-A of the Pradhan Mantri Kisan Urja Suraksha evem Utthan Mahabhiyan (PM KUSUM) Scheme introduced by Government of India (GoI).

Petitioner

Uttar Haryana Bijli Vitran Nigam Limited (UHBVNL) and Dakshin Haryana Bijli Vitran Nigam Limited (DHBVNL)

Quorum

Shri D.S. Dhesi

Shri Pravindra Singh

Shri Naresh Sardana

Chairman

Member

Member

ORDER

1. The present petition has been filed by the Distribution Licensees in Haryana i.e. Uttar Haryana Bijli Vitran Nigam Limited (UHBVNL) and Dakshin Haryana Bijli Vitran Nigam Limited (DHBVNL) on 08.11.2019. The Discoms have prayed that the Commission may determine of Pre-fixed levelized tariff for purchase of power by Discoms from decentralised Solar Power Plants and other Renewable Energy Generation Plants having capacity of 500 kW to 2MW to be set up by individual farmers/group of farmers/cooperatives/panchayats/Farmer Producer Organisations (FPO)/Water User Associations (WUA) in the vicinity of rural grid sub-stations under PM KUSUM Scheme introduced by the Government of India (GoI).

2. **Brief facts of the case are presented below: -**

A. Background

A.1. That as a part of Intended Nationally Determined Contributions (INDCs) for reduction of greenhouse gas emission, India has committed to increase the share of installed capacity from non-fossil sources to 40% by 2030. The Govt. of India has accordingly scaled up the target for solar power from 20,000 MW of Grid Connected Solar Power Projects to 1, 00,000 MW by 2022. While large scale solar power generation projects are being set up to achieve the ambitious target of 1,00,000 MW of Solar Power Generation, it has been planned to simultaneously develop decentralized Solar Energy and other Renewable Energy Generation Plants of capacity upto 2MW which could be directly connected to the existing 33/11kV, 66/11kV, 110/11kV substations of the Distribution Company, thus, saving transmission system requirements apart from reduction in T&D Losses. Such plants are proposed to be set up near the substation (within 5km) in rural areas preferably by the farmers or farmers' bodies such as Panchayats, Corporative etc giving them an opportunity to increase their income by utilizing their barren land to set up solar or other renewable energy-based power plants. Cultivable land may also be used if the Solar plants are set up on stilts (raised structure) where crops can be grown below the stilts. Besides it is planned to replace the existing 10million tubewell pumps run on diesel with Solar Powered Pumps and further to solarize 20million grid connected pumps presently being supplied electricity by the Discoms.

A.2. That the Government of India, Ministry of New and Renewable Energy has accordingly formulated and launched a New Scheme for the farmers under the name Pradhan Mantri Kisan Urja Suraksha evem Utthan Mahabhiyan (PM KUSUM) Scheme. The scheme will also

give an opportunity to the farmers to increase their income. PM KUSUM scheme has the following three components: -

- (i) Component-A: Setting up of 10,000 MW of Decentralized Ground/ Stilt Mounted Grid Connected Solar or other Renewable Energy based Power Plants;
- (ii) Component-B: Installation of 17.50 Lakh Stand-alone Solar Agriculture Pumps; and
- (iii) Component-C: Solarisation of 10 Lakh Grid Connected Agriculture Pumps.

The Operational guidelines for implementation of the scheme have been issued by MNRE, GoI vide Office Memorandum dated 22.07.2019. A copy of the Operational Guidelines as received is enclosed with the petition.

As per the guidelines, the component A will be implemented initially on pilot mode for 1000 MW capacity and Similarly, Component-C would also be implemented initially in pilot mode for one lakh grid connected agriculture pumps. Component-B will be implemented in full-fledged manner.

All the three components of the scheme aim to add Solar Capacity of 25,750MW by 2022 with total central support of Rs 34,422 Cr.

A.3. That power generated from all the Renewable Energy (RE) based power plants to be set up under Component –A of the scheme, will be purchased by the Discoms at a pre-fixed levelized tariff.

A.4. That the State Nodal Agency (SNA) i.e. HAREDA will coordinate with States, DISCOMs and farmers for implementation of the scheme. They will assist the farmers in project development activities including formulation of DPR, PPA/EPC contracts, getting funds from financial institutions, etc. As per Memo No. DRE/PO-1/2019/2972 dated

04.09.2019, Discoms are mandated to take the following actions as mandated in the guidelines: -

- i. Send demand to MNRE for sanction/allocating capacity of minimum 100MW capacity for the State under the scheme along with letter of readiness to implement Component A of the Scheme.
- ii. Assess and notify RE Generation Capacity (Sub-station wise) that can be injected into all 33/11, 66/11kV sub-stations of Rural areas and place such notification on its website for information of all Stakeholders.
- iii. Facilitate farmers willing to lease out land for RE plants near above notified sub-station(s), as provisions of this scheme. Discoms may also place list of such farmers on their website.
- iv. Invite substation wise EoI from RPGs (Renewable Power Generator) to participate in the selection process to set up decentralized Renewable Power Plants.
- v. File a Petition in HERC for determination of pre-fixed levelized tariff for purchase of RE Power from the RPGs who set up Renewable Energy Power plants (REPP) under this scheme.
- vi. Nominate Commissioning Committee for implementation of the Projects.

The Discoms have already assessed substation wise RE Generation capacity that can be injected at various 33/11 kV substations in the rural areas. The total RE capacity that can be injected adds upto 59.00 MW in case of UHBVN and 76.00 MW in case of DHBVN. A copy each of the list giving transformer wise RE Capacity that can be injected for UHBVN and DHBVN is enclosed with the petition. Discoms have already sent requisition to MNRE, GoI for allocation of 135MW capacity under Component A of the Scheme.

A.5. That this Petition is being filed in compliance of requirements as at Sr. No. v above for determination of pre-fixed levelized tariff for purchase

of RE power from the RPGs who will set up REPPs under component A of the scheme. It has been submitted that the Discom will be in a position to invite substation wise EoI from RPGs (Renewable Power Generator) to participate in the selection process to set up decentralized Renewable Power Plants only after the pre-fixed levelized tariff is determined by the Commission.

B. Modalities of Component-A of Pradhan Mantri Kishan Urja Suraksha evem Utthan Mahabhiyan (PM KUSUM) Scheme.

The modalities for implementation of Component A of the PM KUSUM Scheme, as per the MNRE guideline are in brief as under:-

B.1. That under Component-A of PM KUSUM, solar or other renewable energy-based power plants (REPP) of capacity 500 kW to 2 MW will be setup by individual farmers/ group of farmers/ cooperatives/ panchayats/ Farmer Producer Organizations (FPO)/Water User associations (WUA) hereinafter called Renewable Power Generator (RPG). However, States/DISCOMs may allow setting-up of solar or other renewable energy-based power plants of capacity less than 500 kW in specific cases. The REPP will be preferably installed within five km radius of the sub-stations in order to avoid high cost of sub-transmission lines and to reduce transmission losses.

The Distribution companies (DISCOMs) will assess sub-station wise surplus capacity which can be fed from such RE power plants to the Grid and shall invite applications from interested beneficiaries for setting up the renewable energy plants. The renewable power generated will be purchased by DISCOMs at a pre-fixed levelized tariff.

In case, the aggregate capacity offered by Applicants is more than notified capacity for a particular sub-station, bidding route will be followed by DISCOMs to select Renewable Power generator and in such cases the pre-fixed levelized 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.

A model PPA (Power Purchase Agreement) to be executed between RPG and DISCOMs has been prepared by MNRE. The duration of PPA will be 25 years from Commercial Operation Date (COD) of the project. The total energy purchased from these RE plants will be accounted for fulfilment of RPO by the DISCOM.

In case the farmers/ group of farmers/ cooperatives/ panchayats/ Farmer Producer Organizations (FPO)/ Water User associations (WUA) etc. are not able to arrange equity required for setting up the REPP, they can opt for developing the REPP through developer(s) or even through local DISCOM, which will be considered as RPG in this case. In such a case, the land owner will get lease rent as mutually agreed between the parties. The lease rent may be in terms of Rs per year per acre of land or in terms of Rs per unit energy generated per acre of land area. The farmer(s) may opt for payment of lease rent directly in their bank account by the DISCOM, from the payment due to the developer. A model Land Lease Agreement to facilitate the

beneficiaries has also been prepared by MNRE. However, the terms of Land Lease Agreement may be finalized on mutual consent of concerned parties.

The REPP under the scheme would be implemented primarily on Barren / uncultivable land. Agricultural land is also permitted under the scheme provided that solar plants are installed in stilt fashion (i.e. raised structure for installation of Solar panels) and with adequate spacing between panel rows for ensuring that farming activity is not affected. The RPG would be free to adopt any renewable energy source or technology while responding to the bid. However, in case of cultivable land with solar plants, the same may be installed on stilts, so that the farmers continue to cultivate the land, apart from getting the benefit of lease rent. In such a case DISCOM may also float bids (in case of specific substations) where setting up of solar projects on stilts may be mandatorily required, and bids for energy tariff invited accordingly.

B.2. Selection and Implementation of Decentralized Renewable Energy Power Plants

a. Notification of sub-station wise generation capacity

DISCOM shall assess and notify RE generation capacity that can be injected in to all 33/11 kV sub-station of rural areas and place such notification on its website for information of all stakeholders. To facilitate farmers willing to lease out their land for development of RE plants near above notified substation(s), as per provisions of this scheme, DISCOM may also place list of such farmers on their website. However, the leasing of land of any farmers will be a bi-partite agreement between the farmer and the developer and DISCOM will not be held responsible for failure in getting the land leased out to a developer. To meet additional demand DISCOM will

augment the capacity of sub-station under IPDS or any other scheme.

b. Expression of Interest (Eoi) for Short-listing of RPG

DISCOM or any agency authorized by the DISCOM shall invite 33/11 kV sub-station wise Eoi from RPG to participate in selection process for development of decentralized renewable power plants. The RPG shall submit their interest against the Eoi as per the schedule notified by DISCOM. An RPG will not be allowed to apply for more than one renewable power plant for a particular 33/11 kV sub-station.

The DISCOM may recover non-refundable processing fee from the interested RPGs, which in no case shall be higher than Rs. 5000 per MW or part thereof of the capacity applied for.

In case of REPP being developed by a developer, the Net-Worth of the developer should not be less than Rs. 1.00 Crore per MW (of the capacity applied). This shall not be applicable for farmers' cooperative or panchayats or Farmer Producer Organizations (FPO) /Water User associations (WUA) or farmers setting up REPP in their own lands.

c. Selection of REPP

In case the total aggregate capacity of eligible applications received for a particular sub-station is less than or equal to the capacity notified for connectivity at the sub-station, LoA will be awarded to all eligible applicants for procurement of renewable power at a pre-fixed levelized tariff.

In case the total aggregate capacity of eligible application received for a particular sub-station is more than the capacity notified for connectivity at the sub-station, then DISCOM shall invite Bids from all these applicants. 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. LoA will be awarded to all successful bidders.

d. Connectivity with the sub-station

REPP of capacity up to 2 MW may be connected at 11 kV side of substation and the selected RPG will be responsible for laying of dedicated 11 kV line from REPP to sub-station, construction of bay and related switchgear at sub-station where the plant shall be connected to the grid and metering is done.

RPG will be responsible for maintaining this dedicated line.

e. Power Purchase Agreement (PPA)

A copy of standard Power Purchase Agreement to be executed between the DISCOM and the RPG shall be provided by DISCOM along with invitation for submission of EoI. The model PPA agreement has been enclosed by the MNRE with the guidelines.

The PPA shall be for a period of 25 years from the date of COD. The DISCOM will be obliged to buy the entire power from RPG within the contract capacity. The RPG would be required to achieve a minimum CUF of 15% on annual basis during the PPA period. However, in case of low Solar radiation zones, minimum CUF can be revised by concerned DISCOM.

f. Bank Guarantees

The RPG shall provide the following Bank Guarantees to DISCOM as follows:

- Earnest Money Deposit (EMD) of Rs. 1 Lakh/MW in the form of Bank Guarantee along with EoI.
- Performance Bank Guarantee (PBG) of Rs. 5 Lakh/MW within 30 days from date of issue of Letter of Award.

The Bank Guarantees against EMD shall be returned to the selected RPG on submission of valid PBGs. The selected RPGs are required to sign PPA with the DISCOM in line with the timeline given in the Guidelines. In case, the selected RPG fails to execute the PPA within the stipulated time period, the Bank Guarantee equivalent to EMD shall be en-cashed by DISCOM as penalty.

g. Release of PBI to DISCOM

DISCOM would be eligible to get PBI @ Rs. 0.40 per unit purchased or Rs. 6.6 lakh per MW of capacity installed, whichever is less, for a period of five years from the COD. However, to avail the PBI, DISCOM shall submit following documents after completion of one year from the COD and every year thereafter till five years:

- Timely payment of monthly lease rent, if applicable, to the land owner of the project.
- Monthly units purchased from the plant and corresponding payment made to the project developer.

B.3. The total energy purchased from these RE plants will be accounted for fulfillment of RPO by the DISCOM.

C. Regarding determination of prefix levelized tariff for purchase of energy generated from Solar Plants set up under Component -A of PM KUSUM Scheme

C.1. As already stated, under Component-A of PM KUSUM Scheme, Solar or Other renewable energy-based power plants of capacity 500kW to 2 MW will be set up by farmers or other bodies as detailed in the earlier section. Discoms have requisitioned for allocation of a capacity of 135MW to be set up on pilot basis. Energy generated from the Solar plants developed under the Component-A of PM KUSUM Scheme will be purchased by Petitioners at pre-fixed levelized tariff.

C.2. Regarding determination of Pre-fixed levelized tariff, the kind attention of the Hon'ble Commission is invited to the following provisions in the guidelines:-

- i. The RPG shall Commission the Solar Power Plant within 9 months from the date of issuance of LOI.
- ii. The CUF of the plant shall be taken as minimum 15%.

From these provisions in the guidelines, it can be inferred that the REPPs that will be set up under Component A of the PM KUSUM scheme ought to be Solar Power Plants only. Therefore, the Hon'ble Commission is required to determine pre-fixed levelized tariff at

which power from the Solar Power Plants to be set up under Component A of the Scheme would be purchased by the DISCOM.

C.3. In this context it is further submitted that the Petitioner had recently floated Request for Proposal (RFP) under Category-II having NIT no: 77/CE/HPPC/SOLAR/300MW on 03.01.2019 for procurement of 60 MW solar power from plants having individual capacity of 1MW to 2MW. The power from the successful bidders as per the RFP was to be purchased for a period of 25 years. The lowest tariff discovered against the said RFP for 1MW to 2MW capacity solar plants was 2.999 Rs/kWh. (details enclosed with the petition) It is submitted that while quoting for setting up of solar power plants against tariff based competitive bidding, the developer takes cognizance and keeps in view all cost factors and other relevant parameters. Therefore, the tariff of Rs 2.999 per kWh is the last discovered levelized tariff emerged based on competitive tariff-based bidding.

C.4. As already stated, the energy generated from the solar plants established under Component-A of PM KUSUM is to be purchased by the Petitioners at a pre-fixed levelized tariff, therefore in this regard it is requested that the Hon'ble Commission may kindly allow the last discovered tariff of Rs 2.999 per kWh as the pre-fixed levelized tariff for purchase energy by the Petitioners from RGPs who will set up solar power plants under the Component-A of the PM KUSUM Scheme.

C.5. The matter as above is submitted for kind consideration of the Hon'ble Commission and necessary directions on the same.

D. That the petitioner has made the following prayers:

a) To kindly approve the pre-fixed levelized tariff at Rs. 2.999/kWh for procurement of energy from the solar plants to be installed under Component-A of PM KUSUM Scheme.

- b) Condone any inadvertent omissions/errors/shortcomings and permit the Petitioner to add/change/modify/alter this filing and make further submissions as may be required.
- c) Pass such Order, as the Hon'ble Commission may deem fit and appropriate keeping in view the facts and circumstances of the case submitted by the Petitioner.

Proceedings in the Case

3. The Commission heard the case on 18.12.2019 where the representatives of the petitioner and HAREDA were present. The petitioner reiterated the written submissions, which, for the sake of brevity, are not reproduced herein.

4. **Commission's Analysis and Order**

At the onset it is made clear that the Commission, in the present Order, is carrying out limited exercise for determination of levelized tariff for purchase of power by Discoms from decentralized Solar Power Plants and other Renewable Energy Generation Plants having capacity of 500 kW to 2MW to be set up by individual farmers/group of farmers/cooperatives/panchayats/Farmer Producer Organizations (FPO) /Water User Associations (WUA) in the vicinity of rural grid sub-stations under Component-A of the Pradhan Mantri Kisan Urja Suraksha evem Utthan Mahabhiyan (PM KUSUM) Scheme introduced by Government of India (GoI). Hence, the levelized tariff determined herein shall be subject to all the terms and conditions of the ibid scheme.

The HERC RE Regulations in vogue provides that the norms including Capital Cost, CUF, Auxiliary Energy consumption, O&M expenses shall be determined on the basis of prevalent market trend. The broad guidelines of the relevant regulations are as under: -

48. Capacity Utilisation Factor. – *The Capacity utilisation factor for Solar PV project shall be 19%. Provided that the Commission may deviate from above norm in case of project specific tariff determination.*

49. Operation and Maintenance Expenses. –

(1) The O&M Expenses shall be determined based on prevalent market conditions.

(2) Normative O&M expenses allowed at the commencement of the Control Period under these Regulations shall be escalated at the rate of 5.72% per annum.

50. Auxiliary Energy Consumption. – *The auxiliary energy consumption shall be 0.25% of the gross generation.*

The Commission has perused the aforesaid regulations and observes that with advancement in technology and continuous improvement in the efficiency of the solar modules including capability to generate power even in diffused sunlight, the CUF has also witnessed improvement. Hence, for the limited purpose of working out levelized tariff in the present Order, the Commission has considered CUF of 20%.

Further, the normative O&M has been considered at Rs. 10 Lakhs / MW with an annual escalation factor of 5.72% in line with the HERC Regulations for the solar power projects to be set up under KUSUM. Auxiliary Energy Consumption has been pegged at 0.25% as per the HERC Regulations. Return on normative equity (debt – equity ratio as per HERC RE Regulations is 70:30) has been pegged at 14% in line with the HERC RE Regulations.

Interest cost on term loan has been considered at MCLR + 200 basis points and for normative working capital the interest rate has been pegged at MCLR + 100 basis point. Accordingly, Weighted Average Cost of Capital (WACC) to be used as the discounting factor for arriving at the levelized tariff in the present case, has been computed as $14 \text{ (RoE)} * 0.3 \text{ (Equity Component)} + 10.31$

(Interest on Term Loan) * 0.70 (Debt Component). Accordingly, WACC has been estimated at 11.42%.

The Commission observes that the most important parameter impacting the levelized tariff is the project cost which as per HERC RE Regulations has to be aligned with the market trend. In the past when this Commission determined tariff for solar power projects, the said cost was estimated on the basis of international price at the prevalent INR : USD exchange rate. However, as of now good quality solar module manufacturing capacities have come up in India as well and the same is available at a competitive rate. Hence, under 'Make in India' campaign the same needs to be promoted.

The Commission has perused pre-fixed levelized tariff determined by a few SERCs in India. The Ld. SERC of Rajasthan vide its Order dated 06.09.2019 (draft Order) has considered Capital Cost of Rs. 3.40 Crore / MW largely based on the Solar Tariff notified by the Ld. SERCs of Karnataka and Tamil Nadu for the FY 2019-20. The Ld. KERC has considered Capital Cost of Rs. 3.40 Crore / MW while SERCs of Tamil Nadu has considered Capital Cost of Rs. 3.35 Crore / MW.

The Commission is of the considered view that the Capital Cost of such projects especially cost of modules, inverter and civil work may not vary significantly across the country. Further, as the relevant Orders of the Ld. KERC and Ld. RERC are more recent, the Commission has accordingly pegged the Capital Cost, for the limited purpose of the present Order at Rs. 3.40 Crore / MW.

Additionally, the Commission observes that the Discoms have prayed that this Commission may allow a pre-fixed leveled tariff of Rs. 2.999 / kWh i.e. the lowest tariff discovered by way of NIT dated 03.01.2019. The Commission has considered the submission and also the relevant Annexures of the present petition and observes that the said price was offered by a single bidder only. Hence, the said rate cannot be construed as competitive and used as a

benchmark due to the fact that the single bidder may be having some specific comparative advantageous that ought not to be generalized.

In view of the above discussions, the Commission has proceeded to determine the levelized tariff based on the following parameters: -

1	Useful Life / Tariff Period	25 years
2	Capital Cost (Rs. Crore / MW)	3.40
3	(CUF %)	20%
4	Auxiliary Energy Consumption (%)	0.25%
5	RoE	14%
6	Interest on Term Loan (MCLR + 2%)	10.31%
7	Interest on Normative Working capital (MCLR + 1%)	9.31%
8	O&M	Rs. 0.105 Crore /MW escalated at the rate of 5.72% per annum thereafter
9	Deprecation on 90% of the Project Cost, 10% being the residual value	3.6% (SLM 90 / 25)
10	Discounting Factor	11.42%

Based on the aforesaid parameters, the Commission determines levelized tariff at Rs. 3.11 / kWh for entire life of the project. The computational details are placed at **Annexure – A**.

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

This Order is signed, dated and issued by the Haryana Electricity Regulatory Commission on 20th December, 2019.

Date: 20.12.2019

(Naresh Sardana)

(Pravindra Singh)

(D.S. Dhesi)

Place: Panchkula

Member

Member

Chairman



