

Before

UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

Petition No. 18 of 2019 (Suo-Moto)

Order

In the matter of:

Review of the Benchmark Capital Cost for Solar PV, Solar Thermal and Grid Interactive Rooftop & Small Solar PV Plants to be applicable for FY 2019-20 and onwards till reviewed/revised by the Commission.

CORAM

Shri D.P. Gairola Member (Law)

Shri M.K.Jain Member (Technical)

Date of Order: June 07, 2019

1. The Commission in exercise of the powers vested in it under Section 61(h) and Section 86(1)(e) read with Section 181(2)(zd) of the Electricity Act, 2003, notified the UERC (Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) Regulations, 2018 (hereinafter referred to as "RE Regulations, 2018") on 06th September, 2018.
2. In accordance with the first proviso of Regulation 11 of the aforesaid Regulations, the Commission issued a draft order dated 7th December, 2018 on Misc. Application No. 97 of 2018 (Suo-Moto) in the matter of review of benchmark capital cost for Solar PV, Solar Thermal and Grid Interactive Rooftop & Small Solar PV Plants to be applicable for the projects commissioned on or after 1st April, 2019 and on or before 31st March, 2020.
3. The draft order was also posted on the Commission's website and comments were sought from the stakeholders on the same latest by 12th January, 2019. In response, total three stakeholders have submitted comments on the draft order as listed in **Annexure-1**. In order to have participation of all the stakeholders by way of direct interaction with the Commission, a public hearing was also held on 22nd February, 2019 and the stakeholders present during the hearing are listed in **Annexure-2**.

4. The Commission through this Order has determined the generic tariff for solar power plants on Suo-Moto basis based on the norms specified in the Regulations duly taking into account the suggestions/comments made by the stakeholders on the draft Order. The present regulatory exercise is limited to the determination of benchmark capital cost and determination of generic tariff for Solar PV Power Plants, Solar Thermal Power Plants and Grid Interactive Rooftop & Small Solar PV Power Plants. The comments/suggestions of the stakeholders on the parameters, such as life of the project & CUF, which have already been specified in the said Regulations, are beyond the scope of the present proceedings as tariff determined herein are based on the Regulations presently in force.
5. Issue-wise submissions/comments of the stakeholders and the Commission's view, analysis & decision on the same have been discussed in the following paragraphs. As far as possible, the Commission has given due consideration to the issues raised by the stakeholders/ developers in deciding the project cost & corresponding tariff.
6. **Solar PV Based Projects**

6.1 Capital Cost

The Commission, vide its draft Order dated 07th December, 2018 had proposed to revise the capital cost of Solar PV based Projects and while doing so the Commission had considered the average cost of Module at 0.251 USD/Wp and an exchange rate of Rs. 71.126/USD based on the average of July, 2018 to November, 2018. The cost of Solar Modules had been worked out to Rs. 178.47 Lakh/MW and the Commission had also considered a degradation of 0.5% on a yearly basis, which was then applied to the module cost to arrive at yearly degradation cost, followed by discounting the same to arrive at the net present value of the degradation cost at Rs. 9.291 Lakh/MW. Thus, the total cost of module worked out to Rs. 235.65 Lakh/MW. The Commission had considered Rs. 50.00 Lakh/MW as cost of land for arriving at the capital cost of Solar PV projects for FY 2018-19. The Commission had proposed the same land cost, i.e. Rs. 50.00 Lakh/MW for FY 2019-20. The costs of other components had been adopted in the same proportion in which the respective costs were considered at the time of finalization of capital cost for Solar PV power projects for FY 2018-19.

In light of the above discussion, the Commission had proposed the capital cost of

Rs. 400.40 Lakh/MW for Solar PV projects to be commissioned on or after 01.04.2019.

6.1.1 Comments of the Stakeholders

- a) UPCL, the distribution licensee, submitted that during the last decade there has been a tremendous policy push by Govt. of India for promotion of Solar Power Generation which helped Solar PV manufacturing industry to grow and achieve economy of scales. This has further resulted in up-gradation in Solar PV module technology and over a period of time Solar PV module of lesser size has been able to generate same power in comparison to the earlier Solar PV modules. Accordingly, less land would be required per MW for installation of Solar PV Plant. UPCL also submitted that the cost of the mounting structure would also reduce on account of use of less number of Solar PV modules for installation of a particular capacity of a project in comparison to the plants installed during previous years. Therefore, it requested to consider reduce land cost and module cost while determining the Benchmark capital cost for Solar PV, Solar Thermal and Grid Interactive Rooftop & Small Solar PV Plants for FY 2019-20.

With regard to the exchange rate, UPCL submitted that the Commission in its draft Order had considered an average dollar rate of Rs. 71.126 for the period July, 2018 to Nov, 2018 whereas the same should be taken at an average of whole year from Jan, 2018 to Dec. 2018 which comes out to Rs. 68.37 per dollar.

With regard to the other components of the benchmark capital cost, UPCL submitted that it was apparent that substantial cost impact was in the cost of solar PV modules and, therefore, variation in the cost must be considered in the cost of PV modules only and all other cost viz, Land cost, Civil & General Works cost, Mounting structures cost, Power Conditioning Unit cost, Evacuation Cost and Preliminary & Pre-operative expenses cost should not be considered as a fixed percentage. Considering fixed percentages for above mentioned works basically increases these costs with the increase in overall PV panel cost while in actual these costs are unaffected with the increase of any duty on PV panels or variation in dollar rate.

UPCL also submitted that it should be analysed whether safeguard duty has

made indigenous Solar PV module competitive w.r.t. imported Solar PV module or not and if it is found that the indigenous solar PV modules have become cost competitive w.r.t. imported Solar PV modules, there is no use of incorporating provisions of safeguard duty in tariff calculations and tariff may be calculated based on indigenous cost of Solar PV modules otherwise consumers of the State will be unnecessarily burdened for higher tariff. Further, UPCL also suggested that the Commission may determine benchmark tariff under two subcategories one for indigenous solar PV modules and second for imported solar PV modules with the provisions that Generator will explicitly opt tariff of either category based on use of indigenous or imported solar PV module subject to prudence checks. UPCL also submitted that the Commission may think about framing benchmark tariff for solar plants having mix of indigenous and imported solar PV modules because in order to be efficient and cost effective, solar generators may also resort to use of various mix of indigenous and imported solar PV for erection of plant.

- b) UREDA has requested the Commission to allow GST on the other components which are required for installation and commissioning of the Solar Power plant while determining the cost of Solar PV Projects for finalization of tariff for the FY 2019-20.
- c) Akshay Urja Association submitted that the benchmark cost of solar power plants given in the draft Order has not considered the terrain type of the project as the project cost cannot be same for plain and hilly terrains. The stakeholder also submitted that the CUF of 15.67% should be considered on actual basis based on MNRE report on performance analysis of Grid connected solar PV plants commissioned under Phase-I of JNNSM for the period of January, 2014 to December, 2014 instead of 19%. The stakeholder further submitted that the Commission has considered GST of 5% on Solar PV module whereas GST of 5% is applicable on the 70% of the Contract Value and 18% of GST is applicable on the balance 30% of the Contract Value.

6.1.2 Commission's Views and Decision

A) Cost of Solar PV Module

The Commission in its draft Order dated 07th December, 2017 had considered the cost of Solar PV Module as Rs. 235.65 Lakh/MW considering the exchange rate of Rs. 71.126/ USD based on the average rate of July, 2018 to November, 2018 and module cost of 0.251 USD/Wp, and the cost of module worked out to Rs. 226.36 Lakh/ MW. Further, compensation on account of degradation worked out to Rs. 9.291 Lakh/MW. Accordingly, the Commission had proposed the module cost of Rs. 235.65 Lakh/ MW.

UPCL requested the Commission to consider exchange rate at an average rate of whole year from January, 2018 to December, 2018 while determining the module cost. In this regard, the Commission is of the view that it would be appropriate to consider the average exchange rate for the same period for which average module cost has been considered. Further, UPCL also submitted that it should be analysed whether safeguard duty has made indigenous Solar PV module competitive w.r.t. imported Solar PV module or not and if it is found that the indigenous solar PV modules have become cost competitive w.r.t. imported Solar PV modules, there is no use of incorporating provisions of safeguard duty in tariff calculations and tariff may be calculated based on the indigenous cost of Solar PV modules otherwise consumers of the State will be unnecessarily burdened for higher tariff. In this matter, it is to be noted the UPCL has not provided any data w.r.t. cost of indigenous modules. Moreover, the safeguard duty is a type of safety-valve built to protect domestic producers temporarily. The purpose of the safeguard duty is not to make imported goods costlier than the indigenous goods but to make the market competitive. Accordingly, the Commission has considered the cost of imported modules while determining the benchmark capital cost for Solar PV Power Plants.

The Commission has considered the average module cost of 0.241 USD/Wp based on the average rate from July, 2018 to March, 2019. Thus, average exchange rate for the same period has been considered which works out to Rs. 70.735/USD. Accordingly, based on the above discussion and considering GST and safeguard duty applicable for FY 2019-20, module cost works out to Rs. 216.01 Lakh/MW. Further, based on the degradation cost of Rs. 8.84 Lakh/MW, the Commission has considered the solar PV module cost of Rs. 224.85 Lakh/MW for FY 2019-20.

B) Land Cost

The Commission in the draft order had retained the land cost as considered by the Commission while determining the Benchmark Capital Cost for FY 2018-19.

With regard to UPCL's comment to reduce the cost of land, it is to be noted that the Commission while reviewing the Benchmark Capital Cost for solar energy based solar power plants for FY 2017-18 has already reduced the cost of land from Rs. 125 Lakh/MW to Rs. 50 Lakh/MW. Moreover, UPCL has not provided any documentary proof regarding land required for development of Solar PV plant. Accordingly, the Commission is of the view to retain the land cost of Rs. 50 Lakh/MW for the Solar PV power plants for determination of capital cost and fixation of corresponding tariff in accordance with the existing RE Regulations, 2018.

C) Civil & General Works and Mounting Structure Cost, Cable & Transformers, Power Conditioning Units

The Commission had proposed the cost of Rs. 22.05 Lakh/MW each for 'Civil & General Works, Mounting Structure and Power Conditioning Unit' and Rs. 27.72 Lakh/MW towards the evacuation cost upto the interconnection point (Cable and Transformer). Further, Akshay Urja Association submitted that GST of 5% on the 70% of the Contract Value and 18% on the balance 30% of the Contract Value should be allowed for installation of Solar PV Plant. In this regard, it is to be noted that such arrangement of GST is applicable where the entire plant is developed by the Contractor. 70% of the Contract Value is considered as material and balance 30% of the Contract Value is considered as Services. Moreover, the Service tax has already been taken into account by the Commission while fixing the civil and general works. Further, as far as GST on the equipments is concerned, the Commission has already considered 5% GST on the Solar Module cost. Furthermore, UREDA has also requested the Commission to consider GST on the other equipment of Solar PV power plant apart from Solar Module. In the matter, the Commission has observed that with the implementation of GST, a rate of 5% has been levied on all the Solar Power generation based generating system & parts. Accordingly, the Commission is of the view to consider GST of 5% on the Mounting Structure Cost, Cable & Transformers and Power Conditioning Units.

With regard to UPCL request for not considering other components' cost of the Solar PV plant as fixed percentage because considering fixed percentage increases these costs with the increase in overall PV panel cost while in actual these costs are unaffected with the increase of any duty on PV panel or variation in dollar rate, the Commission is of the view that the cost of Civil & General Works, Mounting structures, Power Conditioning Unit and Evacuation works depends on the technology and other market driven parameters such as demand, supply, technology etc. However, it can also not be denied that cost of module depicts the market trend of solar products. Accordingly, in the present matter, the Commission has adopted the same methodology as followed in the past years for determination of the cost of aforesaid works and escalated the same with the average increase of Whole Price Index (WPI) and Consumer Price Index (CPI) for immediately preceding three years by giving equal weightage. However, while applying the indexation and previous year methodology, the Commission has excluded the cost of land and cost pertaining to safeguard duty as the cost of land is market driven while safeguard duty depends on the policies of the government.

Based on the above discussion, the Commission has considered the cost of Rs. 14.22 Lakh/MW for 'Civil & General Works', Rs. 14.93 Lakh/MW each for 'Mounting Structure' and 'Power Conditioning Unit' and Rs. 18.77 Lakh/MW for Evacuation cost upto interconnection point (Cable and Transformer).

D) Preliminary and Pre-operative expenses

The Commission had proposed Rs. 20.87 Lakh/MW, i.e. 5.21% of the total capital cost as the preliminary and pre-operative expenses in its draft Order dated 07th December, 2018. No comments have been received from any of the stakeholder on the Preliminary and Pre-operative expenses. Accordingly, the Commission is of the view to keep the same proportion, i.e. 5.21% of total capital cost for the preliminary and pre-operative expenses.

As discussed earlier, M/s Akshay Urja Association submitted that the benchmark cost of solar power plants given in the draft Order did not consider the terrain type of the project as the project cost cannot be same for plain and hilly terrains. In this regard, as far as cost of civil work is concerned for hilly region, the Commission is of the view

that Land cost has already been considered on higher side as compared to other neighboring states. Furthermore, with the advent of technologies since the panel ratings have increased there will be less requirement of civil works and mounting structures, etc. Moreover, it is pertinent to mention that RE Regulations, 2018 does not provide any separate provision for terrain wise determination of benchmark capital cost and levellised tariff. Accordingly, the Commission does not find it appropriate to determine terrain wise benchmark capital cost for Solar PV power plants.

In view of the above discussions & analysis, the Commission has approved the cost of Solar PV based Plant for FY 2019-20 as follows:

Benchmark Capital Cost of Solar PV Project proposed and Approved for FY 2019-20

S. No.	Particulars	Proposed Capital Cost Norm		Approved Capital Cost Norm	
		Rs. Lakh/MW	%	Rs. Lakh/MW	%
1	PV Modules	235.65	58.85%	224.85	63.11%
2	Land Cost	50.00	12.49%	50.00	14.03%
3	Civil and General Works	22.05	5.51%	14.22	3.99%
4	Mounting Structures	22.05	5.51%	14.93	4.19%
5	Power Conditioning Units	22.05	5.51%	14.93	4.19%
6	Evacuation Cost upto interconnection point (Cables and Transformer)	27.72	6.92%	18.77	5.27%
7	Preliminary and Pre-operative expenses	20.87	5.21%	18.57	5.21%
	Total Capital Cost	400.40	100.00%	356.27	100.00%

6.2 Tariff for Solar PV Plants

Based on the proposed benchmark capital cost for Solar PV Plants, the Commission in its draft Order dated 07th December, 2018 had proposed a gross tariff of Rs. 4.89/kWh and accelerated depreciation of Rs. 0.27/kWh.

With regard to the request of UPCL regarding determination of separate levellised tariff for the projects with indigenous solar module and those with imported modules and a special tariff based on the mixed use of both type of modules, the Commission of the view that as discussed in above paragraphs of this Order, the Commission has determined the benchmark capital cost based on the imported modules. Moreover, UPCL has not provided any information regarding the cost of indigenous modules as well as regarding mixed module usage. Accordingly, its request is not acceptable.

The Commission is of the view that the present exercise has been initiated under

the mandate of RE Regulations, 2018 which requires the Commission to review the benchmark capital cost in each financial year. In compliance to the same, the Commission has approved the benchmark capital cost of Solar PV Plants to be commissioned during FY 2019-20. Based on the revised capital cost, tariff has been strictly worked out in accordance with the tariff principles stipulated in RE Regulations, 2013.

In view of the above discussion, the Commission has determined the gross tariff of Rs. 4.49/kWh for Solar PV sources and accelerated depreciation of Rs. 0.24/ kWh commissioned on or after 1st April, 2019 as depicted in Annexure-I. This tariff shall continue to be the maximum tariff and the distribution licensee shall invite bids from generators/developers for procurement of power from these generators/ developers.

7. Grid Interactive Rooftop & Small Solar PV based Projects

7.1 Capital Cost

The Commission in the draft Order had considered the capital cost for FY 2019-20 as per the methodology adopted by the Commission while finalizing the benchmark capital cost for different slabs based on the installed capacity for FY 2018-19. Further, the Commission had kept the Solar Module cost and land cost for Grid Interactive Rooftop & Small Solar PV plants having capacity above 500 kW & up to 1 MW equivalent to the Solar Module cost determined for Solar PV plants and cost of mounting structure, Power Conditioning Unit & Cable Transformer as 35% higher than the cost considered w.r.t. respective components for Solar PV Plants. Further, the total capital cost determined for Grid Interactive Rooftop & Small Solar PV plant having capacity above 500 kW & upto 1 MW has been proportionately increased for aforementioned slabs on the basis of Office Memorandum dated 15.06.2018 of MNRE which lays down the benchmark costs for off-grid Solar PV systems and grid connected rooftop solar Power plants.

Accordingly, the Commission had proposed a capital cost of Rs. 48,636/kW, Rs. 44,583/kW, Rs. 41,899/kW and Rs. 40,365/kW for Grid interactive Rooftop & small Solar PV plants having installed capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively in the draft Order.

7.1.1 Comments of Stakeholders

- a) Akshay Urja Association requested the Commission to clarify whether small solar ground mounted solar plants are included in Grid interactive rooftop & small solar PV plants.
- b) UREDA submitted that the Central Government has revised the subsidy provision and now subsidy is available only for grid interactive rooftop solar power plants having capacity upto 10 kW.
- c) Some of the stakeholders requested the Commission to ease the process for development of such plant in the State of Uttarakhand and also requested the Commission to determine the generic tariff taking cognizance of the difficulties faced by individual developers in hilly terrain.

7.1.2 Commission's View and Analysis

A) Solar PV Module Cost

The Commission in its draft Order had proposed the Solar PV module cost of Rs. 28,393/kW, Rs. 26,027/kW, Rs. 24,454/kW and Rs. 23,565/kW for grid interactive Rooftop & small Solar PV projects having installed capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively based on the methodology adopted by the Commission during FY 2018-19. The Commission has not received any particular objection from the stakeholders in the matter. Accordingly, based on the latest available data and methodology adopted during FY 2018-19, the revised PV module cost of Rs. 27,092/kW, Rs. 24,834/kW, Rs. 23,333/kW and Rs. 22,485/kW has been considered by the Commission for Rooftop and Small Solar PV plants having installed capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively.

B) Land Cost and Civil & general works

The Commission in the draft order had proposed the Land and Civil & general works cost amounting to Rs. 6,024/kW, Rs. 5,522/kW, Rs. 5,189/kW and Rs. 5,000/kW for projects having installed capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively. The Commission has not received comments from the stakeholders in the matter. Accordingly, the Commission has considered the cost proposed for such works in draft Order as final.

C) Mounting Structures cost and Power Conditioning Units

The Commission had proposed a cost of Rs. 3,586/kW, Rs. 3,288/kW, Rs. 3,089/kW and Rs. 2,977/kW for grid interactive Rooftop and small Solar PV plants having capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively in the Draft Order for each Mounting Structure and Power Conditioning Unit. The Commission has not received any comments for mounting structure and power conditioning units w.r.t. grid interactive Rooftop and small Solar PV plants. Accordingly, based on the latest available data and methodology adopted during FY 2018-19, the Commission has approved Rs. 2,428/kW, Rs. 2,226/kW, Rs. 2,092/kW and Rs. 2,015/kW each for grid interactive Rooftop and small Solar PV plants having installed capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively for each Mounting Structure and Power Conditioning Unit.

D) Evacuation Cost upto interconnection point (Cables and Transformer)

The Commission had proposed a cost of Rs. 4,509/kW, Rs. 4,133/kW, Rs. 3,884/kW and Rs. 3,742/kW for grid interactive Rooftop and small Solar PV plants having capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively in the Draft Order for Cables & Transformer. The Commission has not received any particular comment regarding cost of cables & transformer for Grid Interactive Rooftop & Small Solar PV Plants. Accordingly, based on the latest available data and methodology adopted during FY 2018-19, the Commission has approved Rs. 3,053/kW, Rs. 2,798/kW, Rs. 2,629/kW and Rs. 2,534/kW each for grid interactive Rooftop and small Solar PV plants having installed capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively for Evacuation system upto interconnection point (Cables and Transformers).

E) Preliminary & Pre-operative expenses including IDC & contingency etc.

The Commission, in line with the methodology adopted for FY 2018-19, had proposed Rs. 2,536/kW, Rs. 2,324/kW, Rs. 2,184/kW and Rs. 2,104/kW i.e. 5.50% of the Hard cost, as preliminary & Pre-operative expenses for grid interactive Rooftop and small Solar PV plants having installed capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively. The Commission has not received any

comments from the Stakeholders with regard to preliminary & Pre-operative expenses. Accordingly, adopting the same methodology as followed in draft Order, the Commission has approved Rs. Rs. 2,256/kW, Rs. 2,068/kW, Rs. 1,943/kW and Rs. 1,873/kW as preliminary & Pre-operative expenses for grid interactive Rooftop and small Solar PV plants having installed capacity upto 10 kW, above 10 kW to 100 kW, above 100 kW upto 500 kW and above 500 kW & upto 1 MW respectively.

In view of the above discussions & analysis, the Commission has approved the cost of Roof-top & Small Solar PV based Plant for FY 2019-20 as follows:

Benchmark Capital Cost of Grid Interactive Rooftop & Small Solar PV Plants proposed and Approved for FY 2019-20

S. No.	Particulars	Proposed Capital cost (Rs./kW)				Approved Capital cost (Rs./kW)			
		Upto 10 kW	Above 10 kW to 100 kW	Above 100 kW to 500 kW	Above 500 kW & upto 1 MW	Upto 10 kW	Above 10 kW to 100 kW	Above 100 kW to 500 kW	Above 500 kW & upto 1 MW
1	PV Module inc. degradation	28,393	26,027	24,454	23,565	27,092	24,834	23,333	22,485
2	Land Cost, Civil and General Works	6,024	5,522	5,189	5,000	6,024	5,522	5,189	5,000
3	Mounting Structures	3,587	3,288	3,089	2,977	2,428	2,226	2,092	2,015
4	Power Conditioning Units	3,587	3,288	3,089	2,977	2,428	2,226	2,092	2,015
5	Evacuation cost upto interconnection point (Cables and Transformers)	4,509	4,133	3,884	3,742	3,053	2,798	2,629	2,534
6	Preliminary & Pre-operative expenses including IDC & contingency etc.	2,536	2,324	2,184	2,104	2,256	2,068	1,943	1,873
	Total Capital Cost	48,636	44,583	41,889	40,365	43,282	39,676	37,278	35,922

7.2 Tariff for Roof-top & Small Solar PV Plants

Based on the proposed benchmark capital cost for Solar PV Plants, the Commission in

its draft Order dated 07th December, 2018 had proposed a levellised tariff as follows:

Proposed Generic Tariffs for Grid connected Rooftop & Small Solar PV Plants for FY 2019-20 (Rs./kWh)

Level of Subsidy	0%	30%	70%	90%
Particulars				
For Projects having capacity upto 10 kW				
Gross Tariff	6.16	5.37	4.32	3.88
Less : Acc Dep Benefit	0.32	0.27	0.19	0.14
Net Tariff	5.83	5.10	4.13	3.74
For Projects having capacity above 10 kW and upto 100 kW				
Gross Tariff	5.58	4.79	3.75	3.39
Less : Acc Dep Benefit	0.30	0.24	0.16	0.10
Net Tariff	5.28	4.55	3.59	3.29
For Projects having capacity above 100 kW & upto 500 kW				
Gross Tariff	5.18	4.50	3.60	3.23
Less : Acc Dep Benefit	0.28	0.23	0.16	0.12
Net Tariff	4.91	4.27	3.44	3.11
For Projects having capacity above 500 kW & upto 1 MW				
Gross Tariff	4.92	4.26	3.40	3.03
Less : Acc Dep Benefit	0.27	0.22	0.16	0.11
Net Tariff	4.65	4.04	3.24	2.92

With regard to clarification sought by M/s Akshay Urja Association, it is to be noted that as per RE Regulations, 2018, ground mounted Solar PV plant having installed capacity upto 1 MW in the premises shall be included in Grid interactive rooftop & small solar PV plants where premises means the land, building or infrastructure or part or combination thereof including the rooftops or/and elevated areas owned by the Eligible Consumer.

Further, with regard to the comment of UREDA regarding subsidy for grid connected rooftop solar plants, the Commission observed that the cabinet committee on Economic Affairs has given its approval for the Phase-II of Grid Connected Rooftop Solar Programme for achieving cumulative capacity of 40,000 MW from Rooftop Solar (RTS) Projects by the year 2022. Accordingly, apart from the tariff based on subsidy of 30%, 70% and 90%, the Commission is of the view to incorporate tariff based on the subsidy level of 20% and 40%.

Based on the above discussion, the Commission has determined the gross and net

levellised tariff to be applicable for FY 2019-20 as depicted in Annexure II-A , Annexure II-B, Annexure II-C & Annexure II-D and as follows:

Approved Generic Tariffs for Grid connected Rooftop & Small Solar PV Plants for FY 2019-20 (Rs./kWh)						
Level of Subsidy	0%	20%	30%	40%	70%	90%
Particulars						
For Projects having capacity upto 10 kW						
Gross Tariff	5.50	5.02	4.97	4.55	3.85	3.45
Less : Acc Dep Benefit	0.29	0.26	0.24	0.22	0.17	0.12
Net Tariff	5.21	4.77	4.55	4.32	3.68	3.35
For Projects having capacity above 10 kW and upto 100 kW						
Gross Tariff	4.98	4.55	4.33	4.11	3.47	3.11
Less : Acc Dep Benefit	0.27	0.24	0.22	0.21	0.16	0.11
Net Tariff	4.72	4.31	4.11	3.91	3.32	3.00
For Projects having capacity above 100 kW & upto 500 kW						
Gross Tariff	4.63	4.44	4.02	3.85	3.21	2.87
Less : Acc Dep Benefit	0.25	0.22	0.21	0.19	0.15	0.11
Net Tariff	4.38	4.00	3.81	3.62	3.06	2.77
For Projects having capacity above 500 kW & upto 1 MW						
Gross Tariff	4.52	4.13	3.93	3.73	3.15	2.82
Less : Acc Dep Benefit	0.24	0.21	0.20	0.19	0.14	0.10
Net Tariff	4.28	3.91	3.73	3.55	3.01	2.72

8. Solar Thermal Projects

8.1 Capital Cost

In line with RE Regulations, 2018, the Commission had proposed benchmark cost of Solar Thermal Plants of Rs. 1200.00 Lakh/MW.

The Commission has observed that no comments/objections on the proposed capital cost have been submitted by any of the developers or stakeholders, hence, the same has been considered by the Commission for the FY 2019-20.

8.2 Tariff

The Commission had proposed the tariff in respect of Solar Thermal Plants as Rs. 14.17/ kWh in its draft Order dated 07th December, 2018.

Based on the approved capital cost and in accordance with the norms specified

in RE Regulations, 2018, the applicable gross tariff for FY 2019-20 has been determined as Rs. 14.24/kWh as depicted in Annexure-III enclosed.

9. Other Comments

a) M/s Akshya Urja Associates

The stakeholder submitted that the CUF of 15.67% should be considered on actual basis based on the MNRE report on performance analysis of Grid connected solar PV plants commissioned under Phase-I of JNNSM for the period of January, 2014 to December, 2014 instead of 19%. Further, complete net metering process should be in scope of UPCL, including providing meter for which consumers will pay a fixed fee. Furthermore, only one Net meter should be installed in domestic/small power plants instead of two net meters and net metering adjustment period should be annually instead of monthly basis.

The Stakeholder also submitted that individuals should be allowed to install grid tied solar power plant in Uttarakhand without participating in tender or SECI scheme. During the hearing, the Stakeholder, referring to UREDA's Request for Proposal (RfP)/tender document for inviting bids for installation of Solar PV Plants having cumulative capacity of 200 MW submitted that under RfP same ceiling tariff has been considered by UREDA irrespective of size of the Solar PV plant whereas the Commission has provided different rates for rooftop & small solar PV plants having capacity upto 1 MW and different rates for large solar PV plants having capacity more than 1 MW.

With regard to CUF and billing cycle under net metering arrangement, the Commission has already dealt with the matter during the finalization of RE Regulations, 2018. The relevant extract of the Statement of Reasons of RE Regulations, 2018 is as follows:

"1.33.11 With regard to the CUF, it is to be noted that as per the previous regulations, it is the responsibility of the RE based generating companies to submit the information to the Commission in respect to generation, demand met, capacity availability, capacity utilization factor, auxiliary consumption and other parameters on yearly basis. However, no information has been submitted by any of the developer or nodal agency. The MNRE report on

Performance analysis of Grid connected solar power projects commissioned in year 2014 is not relevant as the report pertains to FY 2015-16. No current/latest data has been submitted by any of the agency or developer. Further, CERC has specified the CUF of 19% based on the CUF specified by various SERCs and bidding documents issued by various agencies including SECI for competitive bidding and inviting project Developers and Engineering, Procurement and Construction (EPC) companies to setup and construct solar PV projects. Accordingly, the Commission does not find it prudent to change the CUF.

1.33.12 ... Further, on the request of beneficiaries of SECI scheme that adjustment of generation should be done on yearly basis instead of monthly billing cycle basis, the Commission of the view that this proposal needs to be analysed before taking any decision in this regard and accordingly, the Commission directs UPCL to collect monthly generation as well as consumption data, of such SECI and other schemes' beneficiaries who do not have PPA with UPCL and are supplying excess power to UPCL free of cost, for atleast one complete year and submit the same before the Commission for taking further view in the matter''

Further, with regard to NOC by UPCL to individuals to install grid tied Solar Power Plants in Uttarakhand without participating in tender or SECI Scheme and an online portal be developed by UPCL wherein individuals can get themselves registered for installation of grid interactive rooftop & small solar PV plants under net metering instead of waiting for scheme of UREDA, the Commission vide letter dated 06.12.2018 to UREDA, has already taken a view that providing NOC by UPCL to various Govt. Institution/Organization, Private Instaurations and Commercial & Industrial users for captive use was a special dispensation not covered under RE Regulations applicable from time to time and such dispensation of providing NOC by UPCL shall be applicable in case of Rooftop Solar Power Plants installed by individual users. Such plants can be installed by the individuals in accordance with the provisions of RE Regulations as applicable from time to time.

Further, the Stakeholder also raised the issue regarding the net metering process. In this regard, it is to be noted that the same shall be done in accordance with the provisions of the applicable Regulations and provision of PPA executed between solar power generator and UPCL.

b) Delayed Payment by UPCL

Shri D. S. Rawat and Shri K.S. Bisht submitted that UPCL is not paying the dues in a time bound manner even after the order of the Commission in the matter and there is revenue loss due to breakdown/unscheduled outage of UPCL system.

With regard to the issue of dues not being paid by UPCL in time bound manner, the Commission advises the stakeholder to approach the Commission separately as the matter does not pertain to the fixation of the benchmark capital cost of the Solar Energy based power Plants for FY 2019-20.

c) Common issues

Some of the stakeholders requested the Commission to reserve the small Solar PV plants' capacity of at least 100 MW for hilly terrain so that migration of the localities can be stopped by developing such plants in hilly terrain. Further, Stakeholders also submitted that UREDA has issued RfP/tender for inviting bids for development of Solar PV plants having cumulative capacity of 200 MW wherein size of single plant ranges from 100 kW and upto 5 MW. However, the range of small Solar PV plant for the hilly terrain should be from 25 kW to 500 kW considering the limited land availability in the hills.

In the matter, the Commission would like to mention that the request and comments made by the Stakeholders regarding RfP issued by UREDA or reservation of particular range of small solar PV plants for the hilly terrain does not come under the purview of the Commission. Therefore, the stakeholders are advised to approach appropriate authorities in the matter.

10. Generic Tariffs

Based on the revised capital cost, as proposed above, the Commission has determined the generic tariff to be applicable for projects to be commissioned in FY 2019-20 which is as follows:

Particulars	Solar PV Plant (Rs./kWh)		Solar Thermal Plant (Rs./kWh)	
	FY 2018-19	FY 2019-20	FY 2018-19	FY 2019-20
Gross Tariff	4.73	4.49	14.04	14.24
Less : Acc Dep Benefit	0.25	0.24	0.79	0.80
Net Tariff	4.48	4.25	13.26	13.44

**Generic Tariffs for Grid Interactive Rooftop & Small Solar PV Plants Approved for FY 2018-19 vis-à-vis
FY 2019-20 (Rs./kWh)**

Level of Subsidy	0%		20%		30%		40%		70%		90%	
Particular	Approved for FY 2018-19	Approved for FY 2019-20	Approved for FY 2018-19	Approved for FY 2019-20	Approved for FY 2018-19	Approved for FY 2019-20	Approved for FY 2018-19	Approved for FY 2019-20	Approved for FY 2018-19	Approved for FY 2019-20	Approved for FY 2018-19	Approved for FY 2019-20
For Projects having capacity upto 10 kW												
Gross Tariff	5.93	5.50		5.02	5.18	4.97		4.55	4.18	3.85	3.76	3.45
Less: Acc. Dep Benefit	0.31	0.29	N.A.	0.26	0.26	0.24	N.A.	0.22	0.18	0.17	0.13	0.12
Net Tariff	5.62	5.21		4.77	4.92	4.55		4.32	4.00	3.68	3.36	3.33
For Projects having capacity above 10 kW and upto 100 kW												
Gross Tariff	5.37	4.98		4.55	4.62	4.33		4.11	3.64	3.47	3.29	3.11
Less: Acc. Dep Benefit	0.28	0.27	N.A.	0.24	0.23	0.22	N.A.	0.21	0.16	0.16	0.10	0.11
Net Tariff	5.09	4.72		4.31	4.39	4.11		3.91	3.48	3.32	3.19	3.00
For Projects having capacity above 100 kW & upto 500 kW												
Gross Tariff	4.99	4.63		4.44	4.35	4.02		3.85	3.49	3.21	3.13	2.87
Less: Acc. Dep Benefit	0.27	0.25	N.A.	0.22	0.22	0.21	N.A.	0.19	0.16	0.15	0.11	0.11
Net Tariff	4.72	4.38		4.00	4.12	3.81		3.62	3.33	3.06	3.01	2.77
For Projects having capacity above 500 kW & upto 1 MW												
Gross Tariff	4.77	4.52		4.13	4.15	3.93		3.73	3.32	3.15	2.97	2.82
Less: Acc. Dep Benefit	0.26	0.24	N.A.	0.21	0.22	0.20	N.A.	0.19	0.15	0.14	0.11	0.10
Net Tariff	4.51	4.28		3.91	3.93	3.73		3.55	3.17	3.01	2.86	2.72

The above ceiling tariff shall be applicable on the projects commissioned or to be commissioned on or after 1st April, 2019 and will remain applicable till further reviewed by the Commission.

(M.K. Jain)
Member (Technical)

(D.P. Gairola)
Member (Law)

List of Stakeholders

Sr. No.	Name	Designation	Organisation	Address
1.	Sh. A.K. Tyagi	Chief Project Officer	Uttarakhand Renewable Energy Development Agency	Urja Park Campus, Industrial Area, Patel Nagar, Dehradun
2.	Sh. S.K. Tamta	Chief Engineer (Commercial)	Uttarakhand Power Corporation Ltd.	Victoria Cross Vijeta Gabar Singh Bhawan, Kanwali Road, Dehradun.
3.	Sh. R.K. Bahuguna	President	M/s Akshay Urja Association	47/1, Chakrata Road, Vasant Vihar, Dehradun-248006

List of Participants

Sr. No.	Name	Designation	Organisation	Address
1.	Sh. Gaurav Sharma	Superintending Engineer (RM)	Uttarakhand Power Corporation Ltd.	Victoria Cross Vijeta Gabar Singh Bhawan, Kanwali Road, Dehradun.
2.	Sh. A.K. Tyagi	Chief Project Officer	Uttarakhand Renewable Energy Development Agency	Urja Park Campus, Industrial Area, Patel Nagar, Dehradun
3.	Sh. Abhishek Pandey	Sr. Project Officer	Uttarakhand Renewable Energy Development Agency	Urja Park Campus, Industrial Area, Patel Nagar, Dehradun
4.	Sh. Sanjeev Singh	Owner	M/s MVC Renewable Energy	622K, Station Chowk, Nazibabad Road, Bijnor, Uttar Pradesh
5.	Sh. Naved	Owner	M/s Riza Renewable	54, Govindpuri, Ranipur Mour, Distt. Haridwar
6.	Sh. Manish Kathait	Member	M/s Akshay Urja Association	47/1, Chakrata Road, Vasant Vihar, Dehradun-248006
7.	Sh. D.S. Rawat	-	-	Village-Odda, Block-Koti, P.O.-Khandyusain, Distt. Pauri Garhwal
8.	Sh. M.S. Negi	-	-	Distt. Pauri Garhwal
9.	Sh. J.P. Barthwal	-	-	Mohkampur, Dehradun
10.	Sh. Kavindra Singh Bisht	-	-	1148, Indira Nagar Colony, Dehradun
11.	Sh. Snehil Pandey	Sr. Manager	UCO Bank	Hathibarkala, Dehradun-248001