

**JOINT ELECTRICITY REGULATORY COMMISSION  
FOR THE STATE OF GOA AND UNION TERRITORIES  
GURUGRAM**

**CORAM**

Shri M.K. Goel, Chairperson

**Petition No. 43/2021**

**Date of Hearing: 05.02.2021**

**Date of Order: 05.03.2021**

**In the matter of:**

The Petition for Determination of Levelized Tariff for Power from Ground Mounted Solar PV Plants and Rooftop Solar PV Plants.

**And in the matter of:**

DNH Power Distribution Corporation Limited referred to "(DNHPDCL)", .. **Petitioner**

**Present:**

**For the Petitioner**

1. Shri C.A. Parmar, Chief Engineer, DNHPDCL
2. Shri Pawan Mishra, Chief Financial Officer, DNHPDCL
3. Shri Gaurav Lohani, Consultant for DNHPDCL

**ORDER**

Shri Pawan Mishra, Chief Financial Officer, DNH Power Distribution Corporation Ltd. (DNHPDCL), advanced his arguments at length. The said submissions in brief are as under: -

1. DNH Power Distribution Corporation Limited (DNHPDCL) has been incorporated from the erstwhile Electricity Department of Dadra & Nagar Haveli (ED-DNH) and started its operation from April 1, 2013. The Ministry of Home Affairs vide letter No. U-3034/59/2010-CPD dated 29<sup>th</sup> September, 2011 has conveyed approval to corporatize ED-DNH. Subsequently, the MOP vide letter No. 36/1/2010-R&R dated 29<sup>th</sup> February, 2012 has conveyed its "No Objection" for the Corporatization of ED-DNH.



2. For meeting the RPO compliance notified under the JERC Regulations, the DNHPDCL has installed and commissioned Ground Mounted and Rooftop Mounted Solar PV Plants. DNHPDCL has also signed PSA (Power Supply Agreement) with SECI for the procurement of 50 MW wind power. DNHPDCL is also shown its willingness for signing of PSA with SECI for procurement of 200 MW Round the Clock (RTC) power.
3. In order to meet the RPO targets, the DNHPDCL has installed Ground Mounted Solar PV Plants and Rooftop Solar PV Plants in the UT of Dadra & Nagar Haveli. The Ground Mounted Solar PV Plants and Rooftop Solar PV Plants installed and commissioned in the UT of DNH is as tabled below: -

#### Solar Plants Installed in Dadra and Nagar Haveli

Description	Capacity of the plant (kWp)	COD	Amount (cr.)
Rooftop Solar PV System	485	Sept., 16	3.21
Ground Mounted Solar Plant at Kala	900	March, 17	4.84
Ground Mounted Solar Plant at Velugam and Athal S/S	3200	April, 17	20.70
Ground Mounted Solar Plant at Athal	200	Oct., 19	1.66
<b>TOTAL</b>	<b>4785</b>		<b>30.41</b>

The Solar Power generated from these Plants are tabled below:

#### Details of Solar Generation

Description	MUs
FY 2016-17	0.88
FY 2017-18	5.23
FY 2018-19	5.38
FY 2019-20	6.18

4. In the aggregate revenue requirement (ARR) determined for these financial years as stated above, the power purchase cost for the Solar Power generated from these self-owned power plants has been considered as zero (i.e., nil amount) for the determination of power purchase cost. If the said quantum of power has been procured from the other sources (i.e., any third parties) in such situation, the power purchase cost would have been allowed, and accordingly, ARR for the

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particular financial year would be higher by the said amount (i.e., procurement amount incurred on purchasing the said power). As these generated units have been sold to the consumers, the revenue realized on account of sales of these units have already been included in the Revenue from sale of power considered for the determination of GAP / surplus for the particular Financial Year. Accordingly, it may be noticed that the cost of power on account of power generated from these self-owned Solar Plants is required to be allowed as per the applicable regulation of JERC.

5. The following Regulations of JERC would be applicable in the said matter;
  - a. *Joint Electricity Regulatory Commission for the State of Goa and Union Territories (Grid Connected Solar Power Regulations) - 2015 for the Solar Plants commissioned till 24.07.2019 (hereinafter referred as JERC Regulations - 2015) and*
  - b. *Joint Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2019 for the Solar Plants commission after 24.07.2019 (hereinafter referred as JERC Regulation - 2019).*
6.
  - (a) *The tariff for the power generated from 4,585 KWp Ground Mounted Solar PV Plants and Rooftop Solar PV Plants which was commissioned prior to 31<sup>st</sup> March 2019 was required to be determined JERC Regulation, 2015 as stated above.*
  - (b) *The tariff for the power generated from 200 KWp Ground Mounted Solar PV Plants, which was commissioned after 31<sup>st</sup> March, 2019 was required to be determined JERC Regulations, 2019 as stated above.*
7. Further, the Chapter II (General Principles of Solar Power Projects) of JERC Regulation, 2015 in Clause 7 (e) provides the following: -



*The solar tariff determined under these Regulations, for projects commissioned during the control period, shall continue to be applicable for the entire duration of the Power Purchase Agreement Period as specified in these Regulations.*

8. The Chapter I (General Principles) of JERC Regulation, 2019 in Clause 5 (Control Period) provides the following;

The Control Period under these Regulations shall be of three (3) years starting from the date of the notification of these Regulations, or as extended by the commission upon expiry of the period. The first year of the control period shall be the financial year 2019-20; Provided that the tariff determined as per these Regulations for the RE Projects commissioned during the Control Period, shall continue to be applicable for the entire duration of the Tariff Period as specified in Regulation 6 below:

*Regulation - 6 (3) Tariff determined as per these Regulations shall be applicable for Renewable Energy Power Projects for the entire duration of the Tariff period as stipulated under Clause (6.1) and (6.2).*

9. In view of above, it may also be noticed that the tariff determined for the respective solar plants in the JERC Regulations, 2015 or JERC Regulation, 2019 would be applicable for the entire life of the project and accordingly, there would not be any change in the tariff approved by the Hon'ble Commission.
10. Further, as per the approved Business Plan Order for the MYT Control Period FY 2016-17 to FY 2018-19, it has been provided that:

“The Commission is not approving any generation related capex as part of the Business Plan. The Commission notes that the tariff for solar generation plants is to be determined as per the JERC Solar Regulations and amendments thereof. The Petitioner will recover tariff as per the JERC Solar Regulations for the capex incurred for such scheme.”

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11. Financial Principles for Computing Tariff for Solar PV Plants commissioned before 31<sup>st</sup> March, 2019

The levelized Tariff for the Ground Mounted Solar PV Plants and the Roof top Solar PV Plants commissioned prior to 31<sup>st</sup> March, 2019 has been determined based on the following factors as outlined in Para 38 (Tariff Structure) of the Joint Electricity Regulatory Commission for the State of Goa and Union Territories (Grid Connected Solar Power Regulations) – 2015 (herein after referred as JERC Solar Regulations, 2015):

- a. *Capital cost of the Project*
- b. *Interest on long term loan,*
- c. *Interest on Working Capital*
- d. *Return on Equity,*
- e. *Depreciation,*
- f. *Operations and Maintenance Expenses*

12. Capital cost and capacity of the Solar PV Plants

As per the JERC Solar Regulations, 2015, the capital cost of the Ground Mounted Solar PV Plants and Rooftop Solar PV Plants shall comprise of the following:

- a. *The capital cost for Solar Power Projects for working out of the Tariff shall be inclusive of all capital works including plant and machinery, civil works, erection and commissioning, financing and interest during construction, other misc. expenses such as overheads, administrative cost etc. during construction, and evacuation infrastructure up to the interconnection point, if any.*
- (b) *The normative capital cost ceiling limit for setting up of Rooftop Solar Photovoltaic Power Projects shall be determined based on the capital cost of various items specified hereunder:*
  - i. *Cost of Modules at site*
  - ii. *Land Cost for Ground Mounted / Capitalized Rooftop Rental or lease for Rooftop*

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- iii. *Civil & General works*
- iv. *Mounting Structure*
- v. *Power Conditioning Unit (PCU/ Inverter)'*
- vi. *Cables & Transformers (if applicable)*
- vii. *Preliminary and Operative expenses, Interest during Construction etc."*

The total capacity of the Ground Mounted Solar PV Plants and the Rooftop Solar PV Plants in the UT of Dadra and Nagar Haveli installed prior to 31<sup>st</sup> March, 2019 is 4.585 MWp. The details of the same are given in the table below:

**Details of Solar PV Plants commissioned before 31<sup>st</sup> March, 2019**

Description	Capacity of the Plant (KWp)	COD	FY	Amount (cr.)
Rooftop Solar PV System	485	Sept.,16	2016-17	3.21
Ground Mounted Solar Plant at Kala	900	March,17	2016-17	4.84
Ground Mounted Solar Plant at Velugam	3200	April,17	2017-18	20.70
<b>Total</b>	<b>4585</b>			<b>28.75</b>

The total cost incurred by the DNHPDCL in construction of the Ground Mounted Solar PV Plants and the Rooftop Solar PV Plants is Rs 28.75 Crores out of which Rs 25.54 Crores was incurred towards the construction of 4.10 MWp of the Ground Mounted Solar PV Plants and Rs 3.21 Crores was incurred towards the construction of 0.485 MWp of Rooftop Solar PV Plants. The DNHPDCL would also like to submit that no cost was incurred by the Corporation towards purchase of land for construction of the Solar PV Plants and the construction of these Solar Plants was carried out by fund from the internal accruals (i.e., equity) of the DNHPDCL.

13. The JERC Regulations, 2015 states the following for determination of the debt equity ratio:

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- a. *Debt equity ratio of 70:30 shall be considered. However, if the equity actually deployed is less than 30% (Thirty Percent), the actual equity shall be considered and if the equity actually deployed is more than 30% (Thirty Percent) of the capital cost, equity in excess of 30% (Thirty Percent) shall be treated as normative loan."*

Accordingly, the DNHPDCL has considered 70% of the capital cost incurred towards construction of the Solar PV Plants as normative debt and 30% as normative equity.

14. The JERC Solar Regulations, 2015 allows interest on long term normative loans as per the following clause:

*:" .... The normative loan outstanding as on April 1st of every financial year shall be worked out by deducting the cumulative repayment up to March 31st of the previous financial year from the normative gross loan....."*

Accordingly, the DNHPDCL has considered interest on normative loan for 70% of the capital cost incurred towards construction of the Solar PV Plants.

The Rooftop Solar PV Plants of the capacity of 485 KWp and Ground Mounted Solar PV Plants of the capacity of 900 KWp was commercialized in FY 2016-17 and accordingly, the DNHPDCL has considered interest rate of 12.76% for computation for the interest on normative loan.

Further, Ground Mounted Solar PV Plants of the capacity of 3200 KWp was commercialized in FY 2017-18 and accordingly, the DNHPDCL has considered interest rate of 12.30% for computation for the interest on normative loan.

15. The JERC Solar Regulations, 2015 allows interest on working capital as per the following clause:

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- a. *The working, capital requirement with respect to Solar Power Projects shall be computed in accordance with the following: -*
- i. *Operation & Maintenance expenses for one month;*
  - ii. *Receivable equivalent to 2 (Two) months of energy charges for sale of electricity calculated the normative Capacity Utilization Factor;*
  - iii. *Maintenance spares at the rate of 15% (fifteen percent) of operation and maintenance expenses."*

Further, the rate of interest has been considered as per the following clause;

- b. *Interest on Working Capital shall be at an interest rate equivalent to an average State Bank of India Base Rate equivalent during the first six months of the previous year plus 350 basis points.*

The Rooftop Solar PV Plants of the capacity of 485 kWp and Ground Mounted Solar PV Plants of the capacity of 900 kWp was commercialized in FY 2016-17 and accordingly, the DNHPDCL has considered interest rate of 13.26% for computation for the interest on normative loan.

Further, Ground Mounted Solar PV Plants of the capacity of 3200 kWp was commercialized in FY 2017-18 and accordingly, the DNHPDPCL has considered interest rate of 12.80% for computation for the interest on normative loan.

16. The JERC Regulations, 2015 allows return on equity as per the following clause:

- a. *The base value for the equity shall be 30% (Thirty Percent) of the capital cost or actual equity (whichever is less) as determined under these Regulations.*
- b. *The normative return on equity shall be ;*
- i. *Pre-tax return of 20% (Twenty percent) per annum for the first 10 (Ten) years*

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- ii. *Pre-tax return of 24% (twenty four percent) per annum from 11<sup>th</sup> year onwards."*

Accordingly, the return on equity has been determined for the Solar PV Plants for 25 years.

17. The JERC Solar Regulation, 2015 allows operations and maintenance expenses as per the following clause:-

- a. *Operation and Maintenance or O & M expenses shall comprise of repair and maintenance (R&M), establishment including employee expenses and the lease rental, if any, and administrative and general expenses including insurance.*
- b. *The normative O&M expenses for Solar Power projects shall be decided by the Commission while deciding the Tariff for a specific Financial Year.*
- c. *Normative O&M expenses allowed during the first year of control period (i.e. FY 2015-16) under these Regulations shall be escalated at the rate of 5.72% (Five point Seven Two percent) per annum over the tariff period (i.e. from the 2<sup>nd</sup> year onwards)."*

JERC Regulations, 2015 considered the O&M Expenses of 13 lakh per MW for the calculation of Generic Tariff valid up to 31.03.2013. Accordingly, DNHPDCL has considered the first year for the determination of the O&M expenses as FY 2016-17, the same level of expenses being the first year of the 1<sup>st</sup> Control Period. The O&M expenses have been further escalated at the rate of 5.72% per annum over the tariff period to arrive at the O&M expenses of the Solar PV Plants.

18. The JERC Solar Regulations, 2015 allows depreciation as per the following clause:

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- a. *The value base for the purpose of depreciation shall be the capital cost of the asset determined by the Commission. The salvage value of the asset shall be considered as 10% (ten percent) and depreciation shall be allowed up to maximum of 90% (ninety percent) of the capital cost of the asset.*
- b. *Depreciation per annum shall be based on 'Different Depreciation Approach' over the loan period and beyond the loan tenure shall be computed based on 'Straight Line Method' over the useful life. The depreciation rate for the first 12 years of the tariff period shall be 5.83% (five point eight three per cent) of the capital cost per annum and the remaining depreciation shall be spread over the remaining useful life of the project from the 13<sup>th</sup> year onwards."*

Accordingly, DNHPDCL has claimed depreciation for 90% of the capital cost of the Solar PV Plants.

19. The discount factor for the computation of the levelized tariff has been computed as per the following clause given in the JERC Solar Regulations, 2015 which states the following:

- a. *For the purpose of levelized tariff computation, the discount factor equivalent to Post Tax weighted average cost of capital shall be considered. The generic tariff shall be determined on levelized basis for the Tariff Period.*
- b. *Discount factor for calculating Levelized Tariff:  $((\text{Cost of Capital in } \% * 0.70 \text{ Long Term loan Component} \times (1 - \text{Corporate Income Tax } \%)) + \text{Weighted average Post Tax Return on Equity } \% * \text{Equity } \%)$ ]."*

Accordingly, the discount factor has been considered as 12.09%.

20. The life of the Solar PV Plants would be 25 years in consonance with the JERC Solar Regulations, 2015.



A normative CUF of 18% has been considered to estimate the generation forms the Solar PV Plants.

21. Based on the financial principles and assumptions detailed in the preceding sections the DNHPDCL has computed the levelized tariff for the Solar Plants as explained hereunder:

- The Rooftop Solar PV Plants of the capacity of 485 kWp and Ground Mounted Solar PV Plants of the capacity of 900 kWp, which was commercialized in FY 2016-17, the levelized tariff has been computed as Rs 7.33 per unit as detailed provided in Annexure A/1.

- The Ground Mounted Solar PV Plants of the capacity of 3200 kWp, which was commercialized in FY 2017-18, the levelized tariff has been computed as Rs 7.93 per unit as detailed provided in Annexure A/2.

22. Financial Principles for Computing Tariff for Plants Commissioned after 31<sup>st</sup> March, 2019

The levelized tariff for the Ground Mounted Solar PV Plants commissioned in FY 2019-20 has been determined based on the following factors as outlined in Para 11 (Tariff Structure) of Joint Electricity Regulatory Commission (Terms and Condition for Tariff determination from Renewable Energy Sources) Regulations, 2019 (hereinafter referred as JERC Solar Regulations, 2019);

- i. Operation and Maintenance Expenses*
- ii. Interest on Loan*
- iii. Depreciation*
- iv. Interest on Working Capital*
- v. Return on Equity*

Capital Cost and capacity of the Solar PV Plants

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As per the JERC Renewable Energy Tariff Regulations, 2019, the capital cost of the Ground Mounted Solar PV Plants shall comprise of the following:

*The norms for Capital Cost as specified in the subsequent technology specific Chapters shall be inclusive of all capital works including plant and machinery, transportation cost, civil work, erection and commissioning, financing and interest during construction, and evacuation infrastructure up to inter-connection point:*

*Provided that for project specific tariff determination, the generating company shall submit the break-up of Capital Cost items along with its Petition in the manner specified under Regulation 9”.*

The total installed capacity of the Ground Mounted Solar PV Plants commissioned in FY 2019-20 is 200 kWp. The detail of the same is given in the table below: -

**Details of Solar PV Plants commissioned after 31<sup>st</sup> March, 2019**

Description	Capacity of the Plant (KWP)	COD	Amount (cr.)
Ground Mounted Solar Plant at Athal	200	Oct., 19	1.66
<b>Total</b>	<b>200</b>		<b>1.66</b>

The total cost incurred by the DNHPDCL in construction of the Ground Mounted Solar PV Plant is Rs 1.66 Crores. The capacity of the Ground Mounted Solar PV Plant is 200 kWp. The DNHPDCL would also like to submit that no cost was incurred by the Corporation towards purchase of land for construction of the Solar PV plants and the construction of these solar plants was carried out by fund from the internal accruals (i.e., equity) of the DNHPDCL.

23. The JERC Renewable Energy Tariff Regulations, 2019 states the following for determination of the debt equity ratio;



- a. Debt Equity ratio of 70:30 shall be considered: Provided that if the equity actually deployed is less than 30% (thirty percent) the actual equity shall be considered, and if the equity actually deployed is more than 30% (thirty percent) of the capital cost, equity in excess of 30% (thirty percent) shall be treated as normative loan: Provided further that the equity invested and loan drawn in foreign currency shall be designated in Indian Rupees on the date of such investment.
- b. The commission shall take into consideration any capital grant or subsidy offered by the Central State Government or any other agency, while determining the tariff under these Regulations.

Accordingly, the DNHPDCL has considered 70% of the capital cost incurred towards construction of the Solar PV Plants as normative debt and 30% as normative equity.

24. The JERC Renewable Energy Tariff Regulations, 2019 allows interest on long term normative loans as per the following clause:

*For the purpose of determination of tariff, a loan tenure of 12 years shall be considered."*

Further, the Regulations state that,

- a. The loans arrived at in the manner indicated in Regulation 14 shall be considered as gross normative loan for calculation for interest on loan.
- b. The normative loan outstanding as on April 1<sup>st</sup> of every years shall be worked out by deducting the cumulative repayment up to march 31<sup>st</sup> of previous year from the gross normative loan.
- c. For the purpose of computation of tariff for Renewable Energy Projects in Mainland Areas, normative interest rate as mentioned in the Table below shall be considered;

Normal Interest Rate

<b>Particulars</b>	<b>Interest Rates</b>
Mainland	SBI MCLR (One year tenor) prevalent during the last available six months + 200 basis points

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<i>Particulars</i>	<i>Interest Rates</i>
<i>Island</i>	<i>SBI MCLR (One year tenor) prevalent during the last available six months + 300 basis points</i>

25. The Ground Mounted Solar PV Plant commissioned is commissioned on 01.10.2019 and accordingly, the prevalent SBI MCLR during the six month from 01.04.2019 to 31.09.2019 was 8.40% and considering the 200 basis points, the DNHPDCL has considered interest rate of 11.40% for computation for the interest on normative loan.

The JERC Renewable Energy Tariff Regulations, 2019 allows interest on working capital as per the following clause;

- a. Operation and Maintenance expenses for one month.*
- b. Receivable equivalent to 2 (two) months of energy charges for sale of electricity calculated on the normative Capacity Utilization Factor (CUF /PLF) as applicable;*
- c. Maintenance spares @ 15% of Operation and Maintenance expenses."*

Further, the rate of interest has been considered as per the following clause:

*Normative Rate of Interest on Working Capital shall be considered as follows:*

#### **Normal Working Capital Interest Rate**

<i>Particulars</i>	<i>Interest Rates</i>
<i>Mainland</i>	<i>SBI MCLR (One year tenor) prevalent during the last available six months + 300 basis points</i>
<i>Island</i>	<i>SBI MCLR (One year tenor) prevalent during the last available six months + 400 basis points</i>

Accordingly, the rate of interest has been considered as 12.60% for computing the interest on working capital for the entire life of the Solar PV Plants.

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26. The JERC Renewable Energy Tariff Regulations, 2019 allows return on equity as per the following clause:

The JERC Renewable Energy Tariff Regulations, 2019 allows return on equity as per the following clause:

17.1 *The value base for the equity shall be 30% of the capital cost or actual equity on case of project specific tariff determination) as determined during Regulation 14.*

17.2 *The normative Return on Equity shall be :*

- a) *14% for Renewable Energy Projects in Mainland areas;*
- b) *16% for Renewable Energy Projects in Island areas; to be grossed up by prevailing Minimum Alternate Tax (MAT) rate as on 1<sup>st</sup> April of available year at the time of determination of tariff for the entire useful life of the project."*

Accordingly, the return on equity has been determined for the Solar PV Plants for 25 years.

27. The JERC Renewable Energy Tariff Regulations, 2019 allows operations and maintenance expenses as per the following clause:

20.1 *'Operation and Maintenance' or O&M expenses shall comprise of repair and maintenance (R&M), establishment including employee expenses, and administrative and general (A&G) expenses.*

20.2 *O&M expenses shall be determined for the Tariff Period based on normative O&M expenses as specified by the Commission subsequently in these Regulations for the first Year of Control Period.*

20.3 *Normative O&M expenses allowed during first year of the Control Period (i.e. FY 2019-20) under these Regulations shall be escalated at average inflation factor of*

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*previous three years considering 60% weightage for the actual point to point inflation over Wholesale Price Index numbers as per Office of Economic Advisor, Ministry of Commerce and Industry, Government of India and 40% weightage for the actual Consumer Price Index for Industrial Workers (all India) as per Labour Bureau, Government of India in the previous three years."*

The DNHPDCL has considered the first year for the determination of the O&M expenses as FY 2019-20, the same being the first year of the 2<sup>nd</sup> Control Period. The O&M expenses for the FY 2019-20 have been determined based on the Clause No. 37.1 given below:

*"1.5% of Capital Cost for first year, for Solar PV Projects in Mainland Areas,"*

Accordingly, the O&M expenses for the FY 2019-20 are computed as Rs 16.59 lacs/MW. The O&M expenses have been further escalated at the rate of 3.32% per annum over the tariff period to arrive at the O&M expenses of the Solar PV Plants.

28. The JERC Renewable Energy Tariff Regulations, 2019 allows depreciation as per the following clause:

16.1 *The value base for the purpose of depreciation shall be the Capital Cost of the asset admitted by the Commission.*

16.2 *The Salvage value of the asset shall be considered 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset.*

16.3 *Depreciation rate of 5.83% per annum shall be considered for first 12 years and remaining depreciation shall be spread during remaining useful life of the RE Projects considering the salvage value of the project as 10% of project cost.*

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16.4 *Depreciation shall be chargeable from the first year of commercial operation: Provided that in case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis."*

29. The discount factor for the computation of the levelized tariff has been computed as 10.46% which is equal to the normative post-tax weighted average cost of capital on the basis of the normative debt-equity ratio of 70:30 specified in the Regulations.
30. The life of the Solar PV Plants would be 25 years in consonance with the JERC Renewable Energy Tariff Regulations, 2019.

*A normative CUF of 18% has been considered to estimate the generation form the Solar PV plants.*

31. Based on the financial principles and assumptions detailed in the preceding sections the DNHPDCL has computed the levelized tariff for the Ground Mounted Solar Plant of 200 kWp as commissioned in FY 2019-20 as Rs 8.97 per unit. The detailed calculations have been provided in the next section of this Petition.

The Clause 7 (Generic Tariff) on the matter of determination of Generic Tariff states` the following;

The (Generic Tariff) shall be determined by the Commission in accordance with these Regulations for the following types of projects:

- (1) Solar PV (for Gross Metering)

In this regard, it may be noticed that the said solar project of 200 kWp Ground Mounted at Athal has been awarded on 09.12.2016, whereas, the said project was commercialized on 01.10.2019 (i.e. after a period of 2 years



and 9 months). The delay in the commercial operation of the said Solar project was on account of delay in receipt of clearance letter from Chief Electrical Inspection, CEA, which was received on 23.09.2019. The delay in the commissioning of said plant was solely attributable to certification works of CEA. Whereas, the said project was completed before the applicability of JERC Regulation, 2019. As, the construction activity of the said solar plants was started with an objective of fixation of levelized tariff in place of generic tariff, hence, it is being submitted to Hon'ble Commission to adopt and approve the levelized tariff for the said plant.

Accordingly, the Hon'ble Commission is requested to approve the levelized tariff for Ground Mounted Solar PV Plants for DNHPDCL (details are provided in Annexure A/3).

32. After hearing the Petitioner in detail, the Commission directed the Petitioner to place on record his submissions in brief.
33. The Commission has received the submissions of the Petitioner on 08.02.2021 and subsequent submissions thereafter dated 19.02.2021 & 01.03.2021 and the same are taken on record.
34. The Commission has examined the entire record placed before it by the Petitioner and also examined the relevant specific provisions of the Electricity Act, 2003 and Rules & Regulations applicable in this matter. The Commission has also considered the arguments advanced before it. The Commission has also examined some relevant Orders of the Hon'ble Supreme Court.
35. It is pertinent to mention here that Commission has notified new regulations for renewable energy plants including solar ground mounted and rooftop plants in 2019. These regulations has also repealed the regulations of 2015.

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36. The petitioner through this petition has prayed that the solar ground mounted projects which were commissioned on the respective financial years 2016-17 & 2017-18, the levelized tariff maybe determined in accordance with regulation 2015 and one solar plant which was commissioned on dt. 01/10/2019, the levelized may be determined as per regulation 2019.
37. The delay in filing these Petitions by the Petitioner has created a situation wherein the Commission has to examined the following orders of Supreme Court and specific provisions of the Electricity Act, 2003.
38. The Commission has noted that it has been empowered by the Electricity Act, 2003 to determine the tariff in accordance with Section 61,62 and 63. At the same time under Section 86 of the Electricity Act, Commission is empowered not only approve the power purchase agreement but also the price/rate of the power to be purchased.
39. In order to determine tariff in this petition, the Commission has examined the Supreme Court order in the matter **Sushila N. Rungta (D) thr. L.Rs Vs. The Tax Recovery Officer-16(2) and Ors. In Civil Appeal No. 10824 of 2018 (Arising out of SLP © No. 26686/2016) etc.** wherein Hon'ble Supreme Court had observed once the Act/regulation has been repealed the said regulation cannot be brought into effect in future. The excerpts of this judgement are mentioned as under-

*Decided On: 30.10.2018*

***Appellants: Sushila N. Rungta (D) thr. L.Rs.***

***Vs.***

***Respondent: The Tax Recovery Officer-16(2) and Ors.***

***Hon'ble Judges/Coram:***

***Rohinton Fali Nariman and Navin Sinha, JJ.***

#### ***JUDGMENT***

***Rohinton Fali Nariman, J.***

***Civil Appeal No. 723/1973:***

***1. In this appeal, an order dated 03.01.1970 was passed by the Collector of Central***

***Excise in which, it was ordered as follows:***



17. In view of the above-mentioned facts, the party charged is entitled to the benefit of the amnesty granted by the Government. Even though he had initially failed to declare the gold, time was available to him up to 31.5.66 to invest the gold into gold bonds and his intentions would have materialized but for the fact that seizure of gold prevented him from tendering the Gold to the Bank, as it was not in his possession at that time.

18. While intention to invest the gold in gold bonds is conceded failure to declare was, no doubt, there. He was required by law to declare his gold to the Government. Since he did not declare this gold, even though he is given the benefit of the gold bond scheme, he has rendered himself liable to punishment for not declaring his gold, at the appropriate time, as required by law.

19. Considering all the facts and circumstances of the case and weighing the merits of the evidence available on record, I order that the gold shall be released to the party charged for invest in gold bond in pursuance of the application tendered by him to the State Bank of Indore in 1965.

20. I also order that for failure to declare the gold in his possession, which involves contravention of gold control rules, I impose upon him a penalty of Rs. 25,000/- (Rupees twenty-five thousands only) Under Rule 126-I(16) of The Gold Control Rules, 1962 (Corresponding to Section 74 of the Gold Control Act, 1968)

2. Against the aforesaid order, an appeal was dismissed on 08.02.1971. Exercising Suo-Motu powers under the Defence of India Rules, a show cause notice dated 01.06.1971 was issued in which it was sought to confiscate the items of gold and enhance penalty that had been imposed. This show cause notice was challenged by the grand-father of the present Petitioner in a writ petition that was ultimately dismissed by the Delhi High Court on 29.09.1972. This appeal is an appeal from the aforesaid judgment. This Court, on 09.08.1973, passed the following order: Upon hearing the counsel for the parties, while counsel for Respondent No. 3 waiving notice of motion, the Court directed stay of all further proceedings in pursuance of the impugned proceedings dated 01.06.1971 pending final disposal of this appeal. The Court allowed C.M. Ps. 3056 and 3058 of 1973.

3 . While the stay order of this Court continued, the Gold Control Act itself was repealed.

This was effected by two sections, namely,:

**1. Short title.- This Act may be called the Gold (Control) Repeal Act, 1990.**

**2 . Repeal of Act 45 of 1968.- The Gold (Control) Act, 1968 is hereby repealed.**

The statement of objects and reasons for this Act is as follows:

Gold control which regulated the domestic trade and movement of gold within the country was introduced on 9<sup>th</sup> January, 1963 as part of the Defence of India Rules. Later on, the Gold Control Act, 1968 was enacted with the broad objectives of controlling the production, manufacture, supply, distribution, use and possession of and business in gold, ornaments and articles of gold. The said enactment was meant to supplement other preventive measures to make circulation of smuggled gold difficult and its detection easier by extending the control over gold beyond the stage of import.

2. Over the past 22 years, the results achieved under the Act have not been encouraging and the desired objectives for which the Act was introduced have not been achieved due to various socio- economic and cultural factors in the vast multitude of the country's population and the lack of administrative machinery. On the other hand, this regressive and purely regulatory Act has given rise to considerable dissatisfaction in the minds of the public as it has caused hardship and harassment to the artisans and small self- employed goldsmiths who have not been able to develop their skills and earn proper living on account of the rigours which this Act imposed upon them.

3. Taking these factors into consideration and the advice of experts who have examined issues related to this Act, it is proposed to repeal the Gold (Control) Act, 1968.

4. ....



5.....

6. Having heard learned Counsel for both sides, we are of the view that the statement of objects and reasons makes it clear that over 22 years, the results achieved under the Act have not been encouraging and the desired objectives for which the Act has been introduced have failed. Following the advice of experts, who have examined issues related to the Act, the objects and reasons goes on further to state that this Act has proved to be a regressive measure which has caused considerable dissatisfaction in the minds of the public and hardship and harassment to artisans and small self-employed goldsmiths.

7. This being the case, we are of the opinion that the repeal simpliciter, in the present case, does not attract the provisions of Section 6 of the General Clauses Act as a contrary intention is very clearly expressed in the statement of objects and reasons to the 1990 repeal Act. In this behalf, it would be apposite to refer to **New India Assurance Co. Ltd. v. C. Padma and Anr. MANU/SC/0704/2003 : (2003) 7 SCC 713 (para 10).**

8. This Court noticed that, in a parallel instance of simpliciter repeal, Parliament realized the grave injustice and injury that had been caused to heirs of LRs of victims of accidents if their petitions were rejected only on the ground of limitation. This being the case, this Court found that a different intention had been expressed and, therefore, Section 6-A of the General Clauses Act would not in that situation apply.

9. We find a similar situation in the present case. In point of fact, ongoing through the impugned judgment, it is clear that every time an amendment was made to the Defence of India Rules and/or repeal of the said Rules had taken place, there was always an inbuilt savings clause. In fact, Section 116 of the Gold (Control) Ordinance No. 6 of 1968 also made it clear that it went to the extent, in Sub-Section 2 thereof, by saving show cause notices which, ordinarily, are not saved even if Section 6 were to apply - **See M.S. Shivananda v. Karnataka State Road Transport Corporation and Ors. MANU/SC/0371/1979 : [1980] 1 SCR**

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**684 following Director of Public Works and Anr. v. Ho Po Sang and Ors., [1961] 2 All. ER 721.**

10. This being the case, we are of the view that the show cause notice dated 01.06.1971, which is the subject matter of this appeal, no longer survives. In this view of the matter, the appeal is disposed of.

11. Leave granted.

40. From the above judgment it is clear that the repealed Act/Regulations cannot be revived in future. In view of the above Commission has examined another Supreme Court order **in Civil Appeal No. 3902/2006 in the matter PTC India Ltd. Versus Central Electricity Regulatory Commission, thr. Secy.** Wherein the Constitution Bench of five Judges of the Hon'ble Supreme Court in para 43 observed that the above 2 citations namely in the case of National Hydroelectric Power Corporation Ltd. Vs. CIT reported in 2010 (1) SCALE 5 and in the case of M/s Southern Technologies Ltd. V. Joint Commissioner of Income Tax, Coimbatore have been given by us only to demonstrate that under the 2003 act applying the test of "general application" a Regulation stands on a higher pedestal visa-vis an Order of CERC in the sense that an order has to be in conformity with the regulations. However, that would not mean that a regulation is a precondition to the order. Therefore, we are not in agreement with the contention of the appellant(s) that under the 2003 Act, power to make regulations under Section 178 has to be correlated to the functions ascribed to each authority under the 2003 Act and that CERC can enact regulations only on topics enumerated in Section 178(2). In our view, apart from Section 178(1) which deals with "generality" even under Section 178(2) (ze) CERC could enact a regulation on any topic which may not fall in the enumerated list provided such power falls within the scope of 2003 Act.

41. The constitution bench further observed that the Commission can discharge its functions in the Electricity Act, 2003 even without regulation but once the Commission has made a regulation on any specific provision then there must be strict adherence to that Regulation by the Commission also.



42. From the above, it is clear that even in the absence of a specific regulation for determination of levelized tariff in this petition the Commission can determine the tariff by adopting the basic principles on its own. In this Petition the situation is very unique as regulations of 2015 has been repealed therefore the Commission has determined the tariff as under:-

43. The following projects have been commissioned prior to gazette notification dated 25<sup>th</sup> July, 2019 of Joint Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2019:

Sl. No.	Name of Project	Capacity of Project (KWp)	Date of Commissioning
1	Rooftop Solar PV System	485	30/09/2016
2	Ground Mounted Solar plant at Kala	900	31/03/2017
3	Ground Mounted Solar plant at Velugam and Athal S/S	3200	17/04/2017

The Commission has considered following parameters for calculation of levelized tariff for power from Roof Top & ground mounted solar PV plants for the projects commissioned prior to gazette notification dated 25<sup>th</sup> July, 2019 of Joint Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2019.

a) Capital Cost of the Project

The information submitted by the Petitioner has been examined and accordingly the Capital cost is approved as under.

Description	Capital Cost Claimed by Petitioner (₹ Lacs)	Capital Approved by the Commission (₹ Lacs)
Roof top Solar PV system (485 KWp) and Ground Mounted Solar Plant at Kela (900 KWp)	805.00	805.00
Ground Mounted Solar Plant at Velugam and Athal S/ S (3200 KWp)	2,070.00	1,784.08

*Signature*



**Note:**

For calculating the Capital Cost of Ground Mounted Solar Plant at Velugam and Athal S/ S (3200 KWp), Rs.60.44 thousands per kwp has been considered by the Commission, which arrives at Rs.1934.08 lacs after adjusting Rs. 150 lacs of subsidy from the capital of this project, 1784.08 lacs Project cost allowed by the commission.

*b) Debt Equity Ratio*

The Commission has considered the Debt Equity Ratio in the proportion of 70:30 as also proposed by the petitioner.

*c) Interest and Financing Charges for Long Term Debt*

For the purpose of computation of tariff, the normative interest rate is considered as 12.76% and 12.30% by the petitioner.

<b>Power Plants</b>	<b>Submitted by Petitioner</b>	<b>Approved by Commission</b>
Roof top Solar PV system (485 KWp) and Ground Mounted Solar Plant at Kela (900 KWp)	12.76%	12.75%
Ground Mounted Solar Plant at Velugam and Athal S/S (3200 KWp)	12.30%	12.30%

For the purpose of computation of tariff, the normative interest rate shall be considered as an average State Bank of India (SBI) Base rate prevalent during the first six months of the previous year plus 300 basis points.

Accordingly, Commission has approved the Interest and Financing Charges for Long Term Debt is 12.75% for all the plants commissioned during FY 2016-17 & 12.30% for all the plants commissioned during FY 2017-18.

*d) Interest on Working Capital*

For the purpose of computation of tariff, Interest on Working Capital is considered as 13.26% & 12.80% by the petitioner.

<b>Power Plants</b>	<b>Submitted by Petitioner</b>	<b>Approved by Commission</b>
Roof top Solar PV system (485 KWp) and Ground Mounted Solar Plant at Kela (900 KWp)	13.26%	13.25%

*Planner*

Ground Mounted Solar Plant at Velugam and Athal S/ S (3200 KWp)	12.80%	12.80%
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For the purpose of computation of tariff, interest on Working Capital shall be at an interest rate equivalent to an average State Bank of India Base Rate equivalent during the first six months of the previous year plus 350 basis points.

Accordingly, Commission has approved the Interest on Working Capital is 13.25% for all the plants commissioned during FY 2016-17 & 12.80% for all the plants commissioned during FY 2017-18.

e) *Return on Equity*

The Commission has considered the normative return on equity (i) Pre-tax return of 20% (Twenty percent) per annum for the first 10 (ten) years and (ii) Pre-tax return of 24% (Twenty Four percent) per annum from 11th year onwards as also proposed by the petitioner.

Particulars	Petitioner Submission		Considered by Commission	
	Up to 10 <sup>th</sup> year	11 <sup>th</sup> year onwards	Up to 10 <sup>th</sup> year	11 <sup>th</sup> year onwards
Return on Equity	20%	24%	20%	24%

f) *Operation & Maintenance (O&M) Expense*

The Commission has considered the Operation and Maintenance or O & M expenses @ ₹ 13.00 lakh per MW as also proposed by the petitioner, which shall be escalated at the rate of 5.72% per annum over the tariff period.

g) *Depreciation*

The Commission has considered the depreciation rate for the first 12 years is 5.83% and 1.54% for 13<sup>th</sup> year onwards, till the useful life of the project. as also proposed by the petitioner.

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h) *Discount factor for calculating Levelized Tariff:*

The following parameter has been considered for determining discount factor:

*“Discount factor for calculating Levelized Tariff: ((Cost of Capital in % \* 0.70 Long term loan Component x (1 - Corporate Income Tax %)) + (Weighted average Post Tax Return on Equity % \* Equity %))*

Accordingly, the Discount factor for calculating Levelized Tariff is derived by the Commission.

<b>Description</b>	<b>Petitioner Submission</b>	<b>Approved by Commission</b>
Roof top Solar PV system (485 KWp) and Ground Mounted Solar Plant at Kela (900 KWp)	12.092%	10.23%
Ground Mounted Solar Plant at Velugam and Athal S/ S (3200 KWp)	12.092%	10.02%

**Note:** Considering the fact that Corporate Income tax rate will be applicable to DNHPDCL during the Project life of these solar plants, The Commission has calculated the Discount factor rate according to the Corporate Income tax rate instead of the MAT.

44. The Commission further observed that the petitioner is entitled for a subsidy of Rs. 3 crores for ground mounted solar plant at Velugam and Athal s/s (3200 KWp) on whereas the petitioner has claimed subsidy amount of Rs. 1.50 crores only and accordingly, the capitalized cost has been reduced to the extent of Rs. 1.50 crores which has been considered by the Commission in its working for tariff determination. The Commission directs the petitioner that in case any further subsidy is received against the commissioned solar plants as mentioned above the Commission shall be informed accordingly and the tariff to that affect shall be reduced immediately after receipt of the balance subsidy.

45. Considering the above parameters and the discount factor of 10.23% for Roof top Solar PV system (485 KWp) & Ground Mounted Solar Plant at Kela (900 KWp) and 10.02% for Ground Mounted Solar Plant at Velugam and Athal S/ S (3200KWp). The levelized Tariff has been determined for these projects as under:

Description	Date of Commissioning	Tariff Approved till Date	Petitioner Submission ₹ per KW	Commission Approved Tariff ₹ per KW
Rooftop Solar PV System (485 KWp)	30/09/2016	29/09/2041	7.33	7.12
Ground Mounted Solar plant at Kala (900 KWp)	31/03/2017	30/03/2042	7.33	7.12
Ground Mounted Solar plant at Velugam and Athal S/S (3200 KWp)	17/04/2017	16/04/2042	7.93	6.82

46. The Petitioner, in the present petition has claimed the levelized tariff w.e.f. FY 2016-17, FY 2017-18, & FY 2018-19 for the roof top solar system & ground mounted solar systems w.r.t. the commissioning date of solar units generated from the date of commissioning of respective solar plant. The Commission observed that the petitioner has not filed the petition timely after commissioning solar plant, hence the petitioner will not be entitled for any recovery of tariff for these years. Further the commission felt that the solar power tariff cannot be allowed retrospectively and consumer cannot be burdened due to utter failure of the petitioner to submit the present petition in time, hence the Commission considered the levelized tariff w.e.f. FY 2021-22 onwards with the useful life of respective solar plants from the date of commissioning as mentioned above. So, no benefit of tariff or carrying cost of levelized tariff shall be applicable to petitioner for FY 2016-17, FY 2017-18, FY 2018-19, FY 2019-20 and FY 2020-21 being a delay on part of petitioner only.
47. Levelized Tariff for Roof top Solar PV system and Ground Mounted Solar Plant commissioned after gazette notification dated 25<sup>th</sup> July, 2019 in respect of Joint Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2019:

The Commission has already determined the ceiling levelized tariff for Roof top Solar PV system and Ground Mounted Solar Plant (Commissioned during and after FY 2019-20) in

*Prasad*

its Generic Tariff Order for Renewable Energy Sources for FY 2019-2020 Dated 2<sup>nd</sup> September, 2019;

Accordingly, the ceiling levelized tariff shall be applicable for the plants commissioned after gazette notification dated 25<sup>th</sup> July, 2019 (as stated above) as follows:

Description	Date of Commissioning	Tariff Approved till Date	Petitioner Submission ₹ per KW	Commission Approved Tariff ₹ per KW
Ground Mounted Solar plant at Athal S/S (200 KWp)	01/10/2019	01/10/2044	8.97	4.98

48. Summary of Approved Tariff:

The approved levelized Tariff of the Commission for Roof top Solar PV system (485 KWp) and Ground Mounted Solar Plant at Kela (900 KWp), Ground Mounted Solar Plant at Velugam and Athal S/ S (3200 KWp) and Ground Mounted Solar plant at Athal S/S (200 KWp) are as under:

SL. No.	Description	COD	Approved Levelized Tariff
1	Rooftop Solar PV System (485 KWp)	30/09/2016	7.12
2	Ground Mounted Solar plant at Kala (900 KWp)	31/03/2017	7.12
3	Ground Mounted Solar Plant at Velugam and Athal S/ S (3200 KWp)	17/04/2017	6.82
4	Ground Mounted Solar plant at Athal S/S (200 KWp)	01/10/2019	4.98

Refer Annexure B1 for detailed calculation of SL. No 1&2, Annexure B2 for Sl. No. 2 and generic tariff order for renewable energy sources of FY 2019-2020 for Sl. No.4.

49. The Commission has noticed that petitioner has prayed for allowing power purchase cost for the solar units generated in the FY 2016-17, FY 2017-18, FY 2018-19 and FY 2019-20 in the True Up Petition of DNHPDCL filed for FY 2019-20 or True Up petition of any subsequent years as deemed fit.

*Devi*

50. The Commission has observed that petitioner has failed to file the petition for determination of Levelized tariff in time and submitted petition for these plants now. The Commission is of the view that tariff for these plants can be allowed to the petitioner only prospectively i.e. from 01/04/2021 onwards. Further the commission felt that the solar power tariff cannot be allowed retrospectively and consumer cannot be burdened due to utter failure of the petitioner to submit the present petition in time. So, the petitioner cannot be allowed the power purchase cost on these projects upto FY 2020-21 but shall be entitled to recover the power purchase cost for the solar units generated from these solar plants from 01<sup>st</sup> April 2021 onwards. The project life of each solar plant shall be valid for 25 years from the date of commissioning.
51. The Commission has noted that the Petitioner did not file this Petition immediately after commissioning of the said Projects and delayed the filing of the Petition which they failed to explain. The Commission has taken a serious view regarding the casual approach of the Petitioner and directed them that in future it should not be repeated at any cost.

Ordered accordingly.

-Sd-  
(Shri M.K Goel)  
Chairperson

(Certified copy)

  
(Rakesh Kumar)  
Secretary

Levelized Tariff for Rooftop Solar PV Plants of the capacity of 485 kWp  
and Ground Mounted Solar PV Plants of the capacity of 900 kWp  
(Submitted by Petitioner)

<b>Assumption for Solar PV Power Projects Parameters</b>					
<b>Sl. No.</b>	<b>Assumption Head</b>	<b>Sub-Head</b>	<b>Sub-Head (2)</b>	<b>Unit</b>	<b>Assumptions</b>
1.	Power Generation	Capacity	Installed Power Generation Capacity	MWp	1.39
			Auxiliary Consumption	%	0%
			Capacity Utilization Factor	%	18%
			Useful Life	Years	25
2.	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	581
3.	Financial Assumption	Debt Equity	Tariff Period	Years	25
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs. Lacs	407.00
			Total Equity	Rs Lacs	174.00
		Debt Component	Loan Amount	Rs. Lacs	407.00
			Moratorium Period	Years	0
			Repayment period (including moratorium)	Years	12
			Interest Rate	%	12.76%
		Equity Component	Equity Amount	Rs Lacs	174.00
			Return on Equity for first 10 years	%	20%
			Return on Equity 11 <sup>th</sup> year onwards	%	24.00%

			Weighted average of ROE	%	22.40%
4.	Financial Assumptions	Fiscal Assumptions	Income Tax	%	34.61%
		Depreciation	Depreciation rate for First 12 years	%	5.83%
			Depreciation rate for First 13 years	%	1.54%
5.	Working Capital	For Fixed Charges			
		O&M Charges		Months	1
		Maintenance Spares	(%age of O&M expenses)	%	15%
		Receivables For Debtors		Months	2
		For Variable Charges			
		Interest on Working Capital		%	13.26
6.	Operation and Maintenance	O&M Expenses		Rs Lacs/MW	13.00
		O&M Expenses escalation		%	5.72



Item	UoM	1	2	3	4	5	6	7	8	9	10	11	12
Installed Capacity	MWp	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385
Generation	MUs	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
Fixed Cost													
O&M Expenses	Rs/ Lacs	18.005	19.03	20.12	21.27	22.49	23.78	25.14	26.58	28.10	29.70	31.40	33.20
Depreciation	Rs/ Lacs	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90
Interest on Term Loan	Rs/ Lacs	71.86	65.87	59.89	53.90	47.92	41.93	35.95	29.96	23.98	18.00	12.01	6.03
Interest on WC	Rs/ Lacs	4.75	4.67	4.60	4.52	4.45	4.39	4.33	4.27	4.22	4.17	4.34	4.31
ROE	Rs/ Lacs	48.27	48.27	48.27	48.27	48.27	48.27	48.27	48.27	48.27	48.27	57.92	57.92
<b>Total Fixed Cost</b>	<b>Rs/ Lacs</b>	<b>189.79</b>	<b>184.75</b>	<b>179.78</b>	<b>174.90</b>	<b>170</b>	<b>165.3</b>	<b>160.6</b>	<b>156</b>	<b>151.47</b>	<b>147.04</b>	<b>152.58</b>	<b>148.36</b>
Total COG	Rs/ kWh	8.69	8.46	8.23	8.01	7.79	7.57	7.35	7.14	6.94	6.73	6.99	6.79
Discount Factor		1	0.892	0.796	0.710	0.633	0.563	0.504	0.450	0.401	0.358	0.319	0.285
<b>Levelized Tariff</b>	<b>Rs/ kWh</b>	<b>7.33</b>											

Item	UoM	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MWp	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385
Generation	MUs	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
Fixed Cost														
O&M Expenses	Rs/ Lacs	35.10	37.11	39.23	41.47	43.84	46.35	49.00	51.81	54.77	57.90	61.21	64.72	68.42
Depreciation	Rs/ Lacs	12.40	12.40	12.40	12.40	12.40	12.40	12.40	12.40	12.40	12.40	12.40	12.40	12.40
Interest on Term Loan	Rs/ Lacs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on WC	Rs/ Lacs	3.49	3.60	3.72	3.84	3.97	4.10	4.25	4.40	4.56	4.73	4.91	5.10	5.30
ROE	Rs/ Lacs	57.92	57.92	57.92	57.92	57.92	57.92	57.92	57.92	57.92	57.92	57.92	57.92	57.92
<b>Total Fixed Cost</b>	<b>Rs/ Lacs</b>	<b>108.92</b>	<b>111.03</b>	<b>113.27</b>	<b>115.64</b>	<b>118.14</b>	<b>120.78</b>	<b>123.58</b>	<b>126.53</b>	<b>129.65</b>	<b>132.96</b>	<b>136.45</b>	<b>140.14</b>	<b>144.04</b>
Total COG	Rs/ kWh	4.99	5.08	5.19	5.30	5.41	5.53	5.66	5.79	5.94	6.09	6.25	6.42	6.60
Discount Factor		0.254	0.227	0.202	0.180	0.161	0.144	0.128	0.114	0.102	0.091	0.081	0.072	0.065

**Levelized Tariff for Ground Mounted Solar PV Plants of the capacity of 3200 kWp  
(Submitted by Petitioner)**

<b>Assumption for Solar PV Power Projects Parameters</b>					
<b>Sl. No.</b>	<b>Assumption Head</b>	<b>Sub-Head</b>	<b>Sub-Head (2)</b>	<b>Unit</b>	<b>Assumptions</b>
1.	Power Generation	Capacity	Installed Power Generation Capacity	MWp	3.20
			Auxiliary Consumption	%	0%
			Capacity Utilization Factor	%	18%
			Useful Life	Years	25
2.	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	647
3.	Financial Assumption	Debt Equity	Tariff Period	Years	25
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs. Lacs	453.00
			Total Equity	Rs Lacs	194.00
		Debt Component	Loan Amount	Rs. Lacs	453.00
			Moratorium Period	Years	0
			Repayment period (including moratorium)	years	12
			Interest Rate	%	12.30%
		Equity Component	Equity Amount	Rs/lacs	194.00
			Return on Equity for first 10 years	%	20%
			Return on Equity 11 <sup>th</sup> year onwards	%	24.00%

			Weighted average of ROE	%	22.40%
4.	Financial Assumptions	Fiscal Assumptions	Income Tax	%	34.61%
		Depreciation	Depreciation rate for First 12 years	%	5.83%
			Depreciation rate for First 13 years	%	1.54%
5.	Working Capital	For Fixed Charges			
		O&M Charges		Months	1
		Maintenance Spares	(%age of O&M expenses)	%	15%
		Receivables For Debtors		Months	2
		For Variable Charges			
		Interest on Working Capital		%	12.80%
6.	Operation and Maintenance	O&M Expenses		Rs Lacs/MW	13.00
		O&M Expenses escalation		%	5.72

Item	UoM	1	2	3	4	5	6	7	8	9	10	11	12
Installed Capacity	MW	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200
Generation	MUs	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
Fixed Cost													
O&M Expenses	Rs/ Lacs	41.06	43.98	46.50	49.15	51.97	54.94	58.08	61.40	64.92	68.63	72.55	76.70
Depreciation	Rs/ Lacs	120.69	120.69	120.69	120.69	120.69	120.69	120.69	120.69	120.69	120.69	120.69	120.69
Interest on Term Loan	Rs/ Lacs	178.24	163.40	148.55	133.71	118.86	104.02	89.17	74.33	59.48	44.64	29.79	14.95
Interest on WC	Rs/ Lacs	11.40	11.20	11.01	10.82	10.65	10.48	10.32	10.17	10.03	9.90	10.33	10.22
ROE	Rs/ Lacs	124.21	124.21	124.21	124.21	124.21	124.21	124.21	124.21	124.21	124.21	149.05	149.05
<b>Total Fixed Cost</b>	<b>Rs/ Lacs</b>	<b>476.14</b>	<b>463.47</b>	<b>450.95</b>	<b>438.6</b>	<b>426.4</b>	<b>414.3</b>	<b>402.5</b>	<b>390.8</b>	<b>379.33</b>	<b>368.07</b>	<b>382.41</b>	<b>371.61</b>
Total COG	Rs/ kWh	9.44	9.19	8.94	8.69	8.45	8.21	7.98	7.75	7.52	7.29	7.58	7.36
Discount Factor		1	0.892	0.796	0.710	0.633	0.565	0.504	0.450	0.401	0.358	0.319	0.285
<b>Levelized Tariff</b>	<b>Rs/ kWh</b>	<b>7.93</b>											

Item	UoM	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200	3.200
Generation	MUs	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
Fixed Cost														
O&M Expenses	Rs/ Lacs	81.09	85.73	90.63	95.82	101.30	107.09	113.22	119.70	126.54	133.78	141.43	149.52	158.08
Depreciation	Rs/ Lacs	31.91	31.91	31.91	31.91	31.91	31.91	31.91	31.91	31.91	31.91	31.91	31.91	31.91
Interest on Term Loan	Rs/ Lacs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on WC	Rs/ Lacs	8.19	8.43	8.69	8.96	9.24	9.55	9.87	10.21	10.56	10.94	11.34	11.77	12.21
ROE	Rs/ Lacs	149.05	149.05	149.05	149.05	149.05	149.05	149.05	149.05	149.05	149.05	149.05	149.05	149.05
<b>Total Fixed Cost</b>	<b>Rs/ Lacs</b>	<b>270.24</b>	<b>275.12</b>	<b>280.28</b>	<b>285.74</b>	<b>291.51</b>	<b>297.60</b>	<b>304.05</b>	<b>310.87</b>	<b>318.07</b>	<b>325.69</b>	<b>333.74</b>	<b>342.25</b>	<b>351.25</b>
Total COG	Rs/ kWh	5.36	5.45	5.55	5.66	5.78	5.90	6.03	6.16	6.30	6.45	6.61	6.78	6.96
Discount Factor		0.254	0.227	0.202	0.180	0.161	0.144	0.128	0.114	0.102	0.091	0.081	0.072	0.065

**Levelized Tariff for Ground Mounted Solar Plant at Athal for the capacity of 200 kWp  
(Submitted by Petitioner)**

Item	UoM	1	2	3	4	5	6	7	8	9	10	11	12
Installed Capacity	MW	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
Generation	MUs	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Fixed Cost													
O&M Expenses	Rs/ Lacs	3.32	3.43	3.54	3.66	3.78	3.91	4.04	4.17	4.31	4.45	4.60	4.75
Depreciation	Rs/ Lacs	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67
Interest on Term Loan	Rs/ Lacs	13.24	12.14	11.04	9.93	8.83	7.73	6.62	5.52	4.42	3.32	2.21	1.11
Interest on WC	Rs/ Lacs	0.84	0.82	0.80	0.79	0.77	0.75	0.74	0.72	0.70	0.69	0.67	0.66
ROE	Rs/ Lacs	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88
<b>Total Fixed Cost</b>	<b>Rs/ Lacs</b>	<b>35.95</b>	<b>34.94</b>	<b>33.94</b>	<b>32.94</b>	<b>31.94</b>	<b>30.94</b>	<b>29.95</b>	<b>28.97</b>	<b>27.99</b>	<b>27.01</b>	<b>26.04</b>	<b>25.08</b>
Total COG	Rs/ kWh	11.40	11.08	10.76	10.44	10.13	0.81	9.50	9.19	8.87	8.57	8.26	7.95
Discount Factor		1	0.905	0.820	0.742	0.672	0.608	0.551	0.498	0.451	0.408	0.370	0.336
<b>Levelized Tariff</b>	<b>Rs/ kWh</b>	<b>8.97</b>											

Item	UoM	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
Generation	MUs	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Fixed Cost														
O&M Expenses	Rs/ Lacs	4.91	5.07	5.24	5.42	5.60	5.78	5.97	6.17	6.38	6.59	6.81	7.03	7.27
Depreciation	Rs/ Lacs	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57
Interest on Term Loan	Rs/ Lacs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on WC	Rs/ Lacs	0.49	0.50	0.51	0.52	0.52	0.53	0.54	0.55	0.56	0.58	0.59	0.60	0.61
ROE	Rs/ Lacs	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88	8.88
<b>Total Fixed Cost</b>	<b>Rs/ Lacs</b>	<b>16.84</b>	<b>17.01</b>	<b>17.91</b>	<b>17.37</b>	<b>17.56</b>	<b>17.76</b>	<b>17.96</b>	<b>18.17</b>	<b>18.38</b>	<b>18.60</b>	<b>18.83</b>	<b>19.07</b>	<b>19.317</b>
Total COG	Rs/ kWh	5.34	5.39	5.45	5.51	5.57	5.63	5.69	5.76	5.83	5.90	5.97	6.05	6.13
Discount Factor		0.303	0.274	0.248	0.225	0.204	0.184	0.167	0.151	0.137	0.124	0.112	0.101	0.092

## Annexure B1

**Levelized Tariff for Rooftop Solar PV Plants of the capacity of 485 kWp and Ground Mounted Solar PV Plants of the capacity of 900 kWp (Approved by Commission)**

Particular's	Unit	1	2	3	4	5	6	7	8	9	10	11	12
O&M Expenses	Rs Lakh	18.01	19.03	20.12	21.27	22.49	23.78	25.14	26.58	28.10	29.70	31.40	33.20
Depreciation	Rs Lakh	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93
Interest on term loan	Rs Lakh	68.85	62.87	56.89	50.90	44.92	38.93	32.95	26.97	20.98	15.00	9.02	3.03
Interest on working Capital	Rs Lakh	4.68	4.60	4.53	4.45	4.38	4.32	4.26	4.20	4.15	4.10	4.27	4.24
Return on Equity	Rs Lakh	48.30	48.30	48.30	48.30	48.30	48.30	48.30	48.30	48.30	48.30	57.96	57.96
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>	<b>186.7</b>	<b>181.7</b>	<b>176.7</b>	<b>171.8</b>	<b>167.0</b>	<b>162.2</b>	<b>157.5</b>	<b>152.9</b>	<b>148.4</b>	<b>144.0</b>	<b>149.5</b>	<b>145.3</b>
Installed Capacity	MW	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385
CUF	%	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Gross Generation	MU	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
Auxiliary Consumption	%	-	-	-	-	-	-	-	-	-	-	-	-
<b>Electricity Generation</b>	<b>MU</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>	<b>2.18</b>
Per unit Fixed Cost	Rs/k Wh	8.55	8.32	8.09	7.87	7.65	7.43	7.22	7.00	6.80	6.60	6.85	6.66
Discount Factor		1	0.91	0.82	0.75	0.68	0.61	0.56	0.51	0.46	0.42	0.38	0.34
Discounted Tariff		8.55	7.55	6.66	5.88	5.18	4.57	4.02	3.54	3.12	2.74	2.59	2.28

**Levellised Tariff**      **7.12**

**Discount factor Rate**      **10.23**  
%

Particular's	Unit	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	35.10	37.11	39.23	41.47	43.84	46.35	49.00	51.81	54.77	57.90	61.21	64.72	68.42
Depreciation	Rs Lakh	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41	12.41
Interest on term loan	Rs Lakh	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	3.49	3.60	3.72	3.84	3.97	4.10	4.24	4.40	4.56	4.73	4.91	5.10	5.30
Return on Equity	Rs Lakh	57.96	57.96	57.96	57.96	57.96	57.96	57.96	57.96	57.96	57.96	57.96	57.96	57.96
Total Fixed Cost	Rs Lakh	108.96	111.07	113.31	115.68	118.18	120.82	123.62	126.57	129.70	133.00	136.49	140.18	144.08
Installed Capacity	MW	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385	1.385
CUF	%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%
Gross Generation	MU	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
Auxiliary Consumption	%	-	-	-	-	-	-	-	-	-	-	-	-	-
Electricity Generation	MU	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
Per unit Fixed Cost	Rs/k Wh	4.99	5.09	5.19	5.30	5.41	5.53	5.66	5.80	5.94	6.09	6.25	6.42	6.60
Discount Factor		0.31	0.28	0.26	0.23	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.11	0.10
Discounted Tariff		1.55	1.43	1.33	1.23	1.14	1.06	0.98	0.91	0.85	0.79	0.73	0.68	0.64

**Levelized Tariff for Ground Mounted Solar PV Plants of the capacity of 3200 kWp  
(Approved by Commission)**

Particular's	Unit	1	2	3	4	5	6	7	8	9	10	11	12
O&M Expenses	Rs Lakh	41.60	43.98	46.50	49.15	51.97	54.94	58.08	61.40	64.92	68.63	72.55	76.70
Depreciation	Rs Lakh	104.01	104.01	104.01	104.01	104.01	104.01	104.01	104.01	104.01	104.01	104.01	104.01
Interest on term loan	Rs Lakh	147.21	134.42	121.63	108.83	96.04	83.25	70.45	57.66	44.86	32.07	19.28	6.48
Interest on working Capital	Rs Lakh	9.99	9.83	9.68	9.54	9.41	9.29	9.18	9.07	8.97	8.89	9.28	9.22
Return on Equity	Rs Lakh	107.04	107.04	107.04	107.04	107.04	107.04	107.04	107.04	107.04	107.04	128.45	128.45
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>	<b>409.86</b>	<b>399.29</b>	<b>388.86</b>	<b>378.59</b>	<b>368.47</b>	<b>358.53</b>	<b>348.76</b>	<b>339.19</b>	<b>329.81</b>	<b>320.65</b>	<b>333.58</b>	<b>324.88</b>
Installed Capacity	MW	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
CUF	%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%
Gross Generation	MU	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
Auxiliary Consumption	%	-	-	-	-	-	-	-	-	-	-	-	-
<b>Electricity Generation</b>	<b>MU</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>
Per unit Fixed Cost	Rs/kWh	8.12	7.91	7.71	7.50	7.30	7.11	6.91	6.72	6.54	6.35	6.61	6.44
Discount Factor		1	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.38	0.35
Discounted Tariff		8.12	7.19	6.37	5.63	4.98	4.41	3.90	3.44	3.04	2.69	2.54	2.25

**Levelled**

**Tariff**           **6.82**  
**Discount**       **10.02**  
**factor Rate**     **%**



Particular's	Unit	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	81.09	85.73	90.63	95.82	101.30	107.09	113.22	119.70	126.54	133.78	141.43	149.52	158.08
Depreciation	Rs Lakh	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50
Interest on term loan	Rs Lakh	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	7.64	7.88	8.14	8.41	8.70	9.00	9.32	9.66	10.02	10.40	10.80	11.22	11.67
Return on Equity	Rs Lakh	128.45	128.45	128.45	128.45	128.45	128.45	128.45	128.45	128.45	128.45	128.45	128.45	128.45
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>	<b>244.69</b>	<b>249.57</b>	<b>254.73</b>	<b>260.19</b>	<b>265.95</b>	<b>272.05</b>	<b>278.50</b>	<b>285.31</b>	<b>292.52</b>	<b>300.14</b>	<b>308.19</b>	<b>316.70</b>	<b>325.70</b>
Installed Capacity	MW	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
CUF	%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%
Gross Generation	MU	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
Auxiliary Consumption	%	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Electricity Generation</b>	<b>MU</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>	<b>5.05</b>
Per unit Fixed Cost	Rs/k Wh	4.85	4.95	5.05	5.16	5.27	5.39	5.52	5.65	5.80	5.95	6.11	6.28	6.45
Discount Factor		0.32	0.29	0.26	0.24	0.22	0.20	0.18	0.16	0.15	0.13	0.12	0.11	0.10
Discounted Tariff		1.54	1.43	1.33	1.23	1.14	1.06	0.99	0.92	0.86	0.80	0.75	0.70	0.65

