

ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN,
UNIT – VIII, BHUBANESWAR – 751 012
*** **

Present : Shri S.P Nanda, Chairperson
Shri B.K. Misra, Member
Shri S. P. Swain, Member

Case No.1 of 2012

**In the matter of : Suo-motu proceeding for re-determination of generic tariff
in respect of Solar PV and Solar Thermal power.**

A n d

In the matter of : OERC, represented by Director (Tariff) - Petitioner
- Vrs. -

- 1) Commissioner-cum-Secretary to Govt.,
Dept. of Energy, Odisha, Bhubaneswar
- 2) Commissioner-cum-Secretary to Govt.,
Dept. of Science & Technology, Odisha, Bhubaneswar
- 3) O&M Solutions, S-32, Phase-2,
Maitri Vihar, Bhubaneswar-751023
- 4) Project Development Consultant,
F-6, BJB Nagar, Bhubaneswar-751014
- 5) Shri R.P. Mohapatra, 775, Lane-3,
Jayadev Vihar, Bhubaneswar-751013
- 6) Shri Rajinder Kumar Kaura,
Secretary General, Solar Energy Society of India
A-14, Mohan Co-operative Industrial Estate, Mathura Road
New Delhi - 110044
- 7) Orissa Power Generation Corporation Ltd.,
Zone-A, 7th Floor, Fortune Towers,
Bhubaneswar-751023
- 8) Grid Corporation of Orissa Ltd.,
Janpath, Bhubaneswar-751022
- 9) Orissa Renewable Energy Development Agency,
S/59, Mancheswar Industrial Estate,
Bhubaneswar-751010
- 10) Orissa Power Transmission Corporation Ltd. (OPTCL)
Janpath, Bhubaneswar-751022

- 11) Orissa Hydro Power Corporation Ltd.,
Janpath, Bhubaneswar-751022.
- 12) The Confederation of Indian Industry (CII),
8, Forest Park, Bhubneswar-751 009
- 13) The Chief Project Manager,
Rural Electrification Corporation (REC),
Deen Dayal Bhawan, 5th Floor, Ashok Nagar,
Janpath, Bhubaneswar-751014
- 14) M/s Power Tech Consultant,
A/6, Swati Villa, Surya Vihar,
Link Road, Cuttack-753012
- 15) Chairman-cum-CEO,
CESU, IDCO Tower, Bhubaneswar
- 16) Managing Director,
NESCO, Januganj, Balasore
- 17) Managing Director,
SOUTHCO, Courtpetta, Berhampur
- 18) Managing Director,
WESCO, Burla, Sambalpur
- 19) Chief Load Despatcher,
SLDC, Bhubaneswar
- 20) M/s Canyon Consultancy Pvt. Ltd.,
Plot No.2101, Subhashree Complex, Govinda Prasad,
Bomikhal, Bhubaneswar.
- 21) M/s. Solitaire Energies Pvt. Ltd.
213-B, Okhla Industrial Estate Phase-III, New Delhi-110 020
- 22) M/s. Sahara India Corporation Ltd., Sahara India Centre, 5th
Floor, 2 Kapoor Thala Complex, Aliganj, Lkhknow – 226024
(UP)
- 23) Mr. R.S. Raju, CEO, M/s. Apollo Renewable Energy (P) Ltd.
H 1-5-3/2c, St 8/20, Habshiguda, Hyderabad, AP – 500007
- 24) Mr. Romesh Moliya, Sr. Manager, Business Development PLG
Power Ltd.,139, A-1, Shah & Nahar Industrial Estate, Lower
Parel (W), Mumbai – 400013
- 25) M/s. Photon Solar Systems (India) P. Ltd.,Unit-19, Mount
View Enclave Road No.12, Banjara Hills, Hyderabad – 500032

- 26) Mr. Manoj Kumar Panda, Sr. GM, Energy & Utilities, Power M/s. Enzen Global Solutions Pvt. Ltd., 5th Floor, Zone-A/5, Fortune Tower, Chandrasekharpur, Bhubaneswar-23
- 27) M/s. LANCO Solar Pvt. Ltd., 397, Udyog Vihar, Phase-III Gurgaon, Haryana – 122106
- 28) M/s. New Era Power Corporation Ltd., 18A/19, Doddanekundi Industrial Area, Mahadevapura Post, Bangalore – 560 048, Fax : 080-28524191
- 29) Mr. N.C. Jana, Head – Projects, Bhaskar Silicon Pvt. Ltd., 60 A, Diamond Harbour Road, PO : Thakurpukur, Kolkata – 700 063
- 30) Mr. S. Arun Kumar, Project Incharge, Malaxmi Infra Ventures (India) Pvt. Ltd., ‘Malaxmi House’, 8-2-583/3, Road #9, Banjara Hills, Hyderabad, AP – 500034
- 31) Mr Pranay Ku. Sureka, Director, Alex Solar Pvt. Ltd., 30, S N Roy Road, Suite 1A/1B, Kolkata -38

- Respondents

Date of Hearing: 02.5.2012

Date of Order: 20.06.2012

ORDER

1. The Commission had initiated a Suo-moto proceeding for redetermination of generic tariff in respect of Solar PV and Solar Thermal Projects. The Commission in its Order in Case No. 37/2008 (Suo Motu) dtd. 14.09.2010 determined the generic tariff for various renewable sources of energy for the control period 2010-11 to 2012-13 including Solar PV and Solar Thermal Projects. In the said order the Commission mentioned that in case of Solar PV and Solar Thermal Projects the bench mark cost may be reviewed by the Commission annually. This proceeding was accordingly initiated to re-determine the generic tariff of Solar PV and Solar Thermal Projects in view of the falling capital cost of Solar Projects in the world market including India.
2. The Commission therefore published the suo-moto petition in the website www.orierc.org with a notice in the newspapers to invite news/suggestions/opinions from all the Stakeholders, solar power developers, Govt. of Odisha, Science & Technology department, Department of Energy, GRIDCO, OREDA and public in general regarding Solar Projects to be set up in the State of Odisha.
3. Commission conducted 1st hearing on the matter on 1st February, 2012 and its Interim Order dated 03.4.2012 observed the following:-

“10. The Govt. of Odisha Department of Science & Technology & OREDA have not submitted their views on the development of Roof-top / Ground-mounted SPV Projects during the hearing on 01.02.2012.

In view of the above developments, we direct that the next date of hearing may be fixed preferably during 1st week of May 2012 to conduct another hearing to take a final view for re-determination of generic tariff for Roof-top, Ground-mounted SPV Projects & Solar Thermal Power Projects.

We direct that a Notice may please be served to all the respondents, GRIDCO, OREDA, EIC (Electricity) Odisha, EIC (WR), Govt. of Odisha Deptt. of Water Resources, Deptt. of Science & Technology & Deptt. of Energy to submit their views by 21st April 2012 on our observations mentioned in Para 6-10 above.

We further direct that this Interim Order may be posted in OERC website www.orienc.org for information of all concerned.”

4. In view of the above observation in its Interim Order dated 03.4.2012, Commission conducted another hearing on 02.5.2012.
5. Shri K. P. Mohapatra, representative of Project Development Consultant submitted that in order to encourage the consumers to set up Solar Roof Top Projects 50% subsidy may be extended of the project cost which can be managed from coal subsidy which govt. of India is collecting @ Rs.50 per tonne and the Odisha state is contributing Rs.500 crore annually for this purpose. Besides, Department of Energy, Govt. of Odisha also collects Rs.700 crore towards Electricity Duty (ED) charges out of which Rs.100 crore may be diverted towards the green energy development. He also suggested that the target from co-generation under Renewable Purchase Obligation may be revised by increasing Solar generation. Govt. of Odisha has also not shown any commitment towards fulfilling of RP Obligation and they may be advised to make greater efforts in this regard.
6. Shri R P Mohapatra from general public submitted that for installing Roof Top Solar Projects by the consumers the project's financial aspect is critical. He advised that the consumers who install the Roof Top Solar PV in their premises should be recognised publically and may be honoured by giving them green batch in order to encourage other consumers to go for the Solar PV installations at their home.

He pointed out that OERC has no mechanism to determine the capital cost of Solar PV and Solar Thermal since very limited development of Solar Projects has taken place in Odisha that too confined only to the Roof Top Projects. CERC has the advantage of ascertaining the capital cost and other input parameters required for determining the generic tariff for Solar PV and Solar Thermal Projects due to their proximity to the Govt. of India and the manufacturers of solar equipments. In view of this, CERC Regulation should be followed mutasis mutandis by OERC since OERC has not made any regulation towards the Renewable Power Projects. Reduction of

capital cost is the major factor for determination of the tariff and OERC has no mechanism to ascertain this. The capital cost determined by the CERC for 2009-10 was Rs.18.44 crore, for 2010-11 was Rs.17.91 crore, for 2011-12 was Rs.15.39 crore and for 2012-13 is Rs.10.39 crore. The OERC in its Order No.37/2008 (Suo-moto) dated 14.9.2010 had determined the capital cost for the Solar Projects at Rs.16.90 lakhs.

As regard to the CUF (Capacity Utilisation Factor) OERC had taken it to be 19% while determining the generic tariff for the Solar PV Projects. In its latest suo moto petition, OERC had suggested the CUF of 18% with performance de-gradation of 1% annually. This should however be still reduced to 17% taking into account the solar insolation in the state of Odisha. The Commission should obtain the data from 1 MW plants which have already been set up in Odisha in order to ascertain the CUF.

The Interconnection point has been one of the major issue between the developer and GRIDCO. As per CERC Regulations and OERC Order dated 14.9.2010 the Interconnection point is the line isolator on outgoing feeder on the HV side of pooling substation. However, in the OERC (Renewable and Co-generation Purchase Obligation and its Compliance) Regulations, 2010 it is provided that the delivery point shall be the nearest grid substation having 132 KV / 33 KV / 11 KV voltage system. This provision would require the RE developer to construct the feeder and other facilities for supply of power to the grid. This contravenes the concept of determination of levelised generic tariff based on normative capital cost. This is also contravenes to the provisions of OERC Order dated 14.9.2010 and CERC Regulation, 2012.

As regards the concept of ceiling price of the generic tariff this should not be adhered to since this gives a scope to GRIDCO to re-negotiate the tariff with the developers in order to pull it further downwards. Govt. of Odisha has no policy on the management of waste land which could be effectively used for development of Solar Projects in Odisha. Govt. of Odisha may be advised accordingly to formulate policy on utilisation of waste land. Hydro Power Stations in Odisha have large waste land which can be used for development of Solar Projects. The Commission may also consider to give differential tariff by dividing the entire period of 25 years into two periods 12 years (higher tariff) and 13 years (lower tariff) respectively, in order to encourage Developer and Financial Institutions. No Solar Projects in Odisha has utilised auxiliary power and hence this should be scrapped.

7. Shri B. C. Swain represented M/s Power Tech Consultants welcomed the idea of encouraging Solar Roof Top programme initiated by the Commission. However, according to their calculation for 1 MW SPV Power plant the levelised tariff is Rs.11.82 p.u. whereas the DISCOMs would pay only Rs.5.30 p.u. Therefore, no consumer would be eager to offset the difference in the cost of generation and the

receipt from the DISCOMs and the concept of net metering is not a win win situation for either of them. In order to encourage the consumer to install Roof Top the differential amount can be paid by GRIDCO or CGP owner to the consumer directly in order to meet the Solar Obligation of the obligated entities. This scheme is beneficial for GRIDCO and DISCOMs as it will reduce the distribution loss and would help to improve the voltage and frequency profile of the distribution network. The CERC has determined the forbearance and floor price for the REC framework. The roof top SPV power plant owner should be paid minimum floor price of the solar REC. This payment towards solar component can be made by OREDA from the money deposited by obligated entities who have failed to meet its solar RPO. They have proposed to adopt a RESCO (Renewable Energy Saving Company) model in which it will be responsible for installation, O&M of solar roof top power plant and other functions required to make the projects going.

8. Canyon Consultancy Private Limited was represented by Shri Chandrasekhar Mishra, who submitted that PPA for 8 Nos. of 1 MW Solar Power Plants commissioned under Roof Top PV and Small Solar Power Generation (RPPSSGP) have not been approved. These PPAs should be approved on projects specific parameters. The CUF for solar projects in Odisha should be considered at 17%. In Odisha there are no testing centres available for testing efficacy of solar films. Odisha should consider replicating Govt. of Gujarat model of setting up of solar panel on irrigation canals. OREDA the Nodal Agency for development of renewable power in Odisha should improve technically to handle growing demand of renewable power and to guide developers to set up their plants. He also proposed to set up a Solar Corporation of Odisha in order to facilitate solar development in the State.
9. Shri B S Mishra who represented Sachidananda Consultancy, submitted that they have installed a 2 KW power plant on experimental basis. He suggested that use of battery in these plants should not be banned as they have found out that inverter without battery does not work properly. Therefore, battery backup is a must for a small Solar PV plant to work efficiently.
10. OCL India was represented by Shri R Pandey who submitted that net metering would not work for this small solar plants but Commission should consider double metering mechanism to reduce the billing discrepancy.
11. Govt. of Odisha, Department of Energy was represented by Ms Niharika Pattnaik. Commission during the hearing wanted to know whether solar power plants to be set up in Odisha have been given industry status under I&PR. Ms. Pattnaik submitted that they have no information in this regard.
12. Shri N. K. Mishra, CE PP(F) appeared on behalf of EIC, Water Resources, Govt. of Odisha. He informed that a pilot project is considered to be taken up for building solar panels atop by canals/distributaries to examine the suitability and cost effectiveness of Gujarat model in the context of Odisha and if found suitable the Gujarat model shall be replicated in Odisha.

13. OREDA was represented by Shri Mahinath Beuria submitted that there has been some progress in obtaining solar power through competitive bidding. He submitted that in the recently concluded Request for Selection (RfS) for selection of 5 X 5 MW (25 MW) SPV Power plant in Odisha, M/s Alex Green Energy Pvt. Ltd. of Kolkata was the lowest bidder and to whom Letter of Intent(LoI) has been issued for the 1st Unit of 5 MW SPV Project out of which the initial 5 units they have confirmed their acceptance. M/s Alex Green Energy Pvt. Ltd., declined the offer for the remaining four units which has now been offered to the next lowest bidder, M/s Acme Tele Power Ltd., at the L1 tariff of Rs.7/Kwh. Their acceptance is awaited. OREDA has also proposed a model for development of Roof Top/Ground Mounted SPV Projects. As per MNRE the benchmark cost of SPV Power plants with and without battery storage are Rs.270/- per Wp and Rs.190/- per Wp respectively. The CFA would be 30% of the project cost limited to Rs.81/- per Wp for PV systems with battery back-up support and Rs.57/- for systems without battery back-up support. So the capital cost of a 1 KW SPV Roof top installation will be Rs.1,90,000/- without capital subsidy and Rs.1,33,000/- with 30% capital subsidy from MNRE. Based on the capital expenditure the tariff for roof top system comes to around Rs.11/Kwh for systems without batteries. OREDA has further submitted that with the present proposal of consumption of solar power of about 650 KW per month there would be a viability gap of Rs.1486. In order to make the proposal more viable the tariff of solar electricity may be increased to Rs.14.81 and with incentive of 360 units of conventional power free in every month.
14. Rural Electrification Corporation (REC) was represented by Shri S. K. Sahoo, who submitted that REC can fund such projects to a Co-operative Society only. There should be a Regulation regarding solar power in Odisha. He also suggested that tariff for solar power should be split into two periods of 12 and 13 years respectively.
15. M/s Solitaire Energies Private Limited in its written submission has submitted to review the Solar Purchase Obligation fixed by OERC in its OERC (Renewable and Co-generation Purchase Obligation and its Compliance) Regulations, 2010 in view of the amendment to tariff policy notified by Govt. of India dated 20.01.2011 which provides a lower SPO percentage at 0.25% of total consumption by end of FY 2012-13. He has further submitted that procurement of solar power through the competitive bidding route may not be resorted to since the bidding route is still at its infancy stage of solar technology/market development. The distribution companies should procure power from such technologies at preferential tariff determined by the Commission till the requisite level of maturity to have competition is at place. At the present stage it may be possible that some of the developers may quote lower tariff for the sake of grabbing projects for some reasons and use cheaper / poor quality products. Section 63 of the Electricity Act, 2003 states that Commission shall adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with guidelines issued by the Central Govt. The Govt. of India is yet to formularise the tariff bidding process as required in the Section 63 of the E.A. Act, 2003.

Commission's Observation and Direction

16. The Commission heard the parties and also have gone through the written submissions given by the objectors. The Commission in this case in its Order dated 03.4.2012 had given a Scheme for implementation of Roof Top Solar Photo Volatic (SPV) plant in Odisha due to specific advantage and vast scope of its application. Commission had also illustrated two cases of different consumption pattern which can be effectively offset with the net solar power energy sent out and consumed at home. Commission in such scheme had not considered any subsidy either capital or generation based incentive and was basically aimed at promoting green solar energy by the consumers who can afford solar installations of 5 KW and below set up at their homes.
17. The Commission agrees with some of the objectors to recognise and commend users of such green energy in public forums and felicitating them with green badges. One of the objectors pointed out that it appears that battery backup is not being allowed in this Scheme. Commission observes that incurring of huge costs in procuring batteries defeats the very purpose of green energy and there have been instances reported elsewhere in the country that some of the consumers have resorted to injecting power through diesel and battery generation in order to avail the higher cost of solar power. Commission is not therefore keen on a large scale battery backup for the solar power but limited batteries can be used for proper working of invertors.
18. This suo-moto petition basically aims at redetermining the solar tariff in view of the falling capital cost of solar panels in the market. The reduction in the capital cost of the solar panels is reflected in the cost notified by the CERC over the years depicted in the following table:-

| Financial Year | Capital cost (CERC) Rs. In Crore | | CERC Tariff (without accel. Deprn.) Rs./Kw/hour | | OERC Tariff (without accel. Deprn.) Rs./Kw/hour | |
|----------------|-------------------------------------|---------------|---|---------------|---|---------------|
| | Solar PV | Solar Thermal | Solar PV | Solar Thermal | Solar PV | Solar Thermal |
| 2009-10 | 17.00 | 15.30 | - | - | - | - |
| 2010-11 | 16.90 | 15.30 | 17.91 | 15.31 | 17.80 | 14.73 |
| 2011-12 | 14.42 | 15.00 | 15.39 | 15.04 | 17.80 | 14.73 |
| 2012-13 | 10.00 | 13.00 | | | | |

19. The Commission while notifying the generic tariff for solar power in its Order dated 14.9.2010 for the control period from 2010-11 to 2012-13 considered the capital cost of Solar PV at Rs.16.90 crore and for Solar Thermal at Rs.15.30 crore. The CERC has now approved the new capital cost of Solar PV at Rs.10.00 crore and Solar Thermal at Rs.13.00 crore for FY 2012-13. In view of the reduced Capital cost approved by the CERC it is also relevant for us also to consider reduction in the Capital cost for solar

power generation in the State of Odisha and consequent reduction in solar tariff. The lowering of capital cost and the reduction of tariff is also warranted due to price discovery through competitive bidding process taken up by OREDA and in the 2nd phase competitive bidding by NVVNL for 350 MW SPV plant under phase one JNNSM programme during January 2012. OREDA discovered the price of Rs.7 Kwh and lowest bid for 5 MW power plant in Rajasthan was quoted by M/s Solar Direct India at Rs.7.49 Kwh.

20. The Commission in its Order No.37/2008 (Suo moto) dated 14.9.2010 determined the generic tariff for various renewable sources of energy for the control period 2010-11 to 2012-13 including Solar PV and Solar Thermal. In the said Order the Commission mentioned that in case of Solar PV and Solar Thermal Projects the benchmark costs may be reviewed by the Commission annually. The Commission have not reviewed the benchmark cost of Solar PV and Solar Thermal Projects during the first two years of the control period i.e. FY 2010-11 and FY 2011-12. However, Commission have initiated this proceeding to review the benchmark cost for FY 2012-13. The review of the benchmark capital cost was necessitated due to rapidly falling capital cost. Commission while determining the generic tariff for Solar PV and Solar Thermal Projects had taken certain technical and financial parameters including the capital cost, basing on the studies made by the Consultant, WISE, Pune and CERC Renewable Regulation, 2009.
21. CERC has now notified the latest Renewable Regulation, CERC (Terms & Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012. CERC Regulations notifies the changes of certain financial and technical parameters in order to determine the generic tariff for Solar PV and Solar Thermal Projects to be set up in the country during 2012-13. Commission in its Order dated 14.9.2010 had also taken certain financial and technical parameters in order to determine generic tariff for Solar PV and Solar Thermal Projects to be set up in the State of Odisha. In view of changes of certain parameters by CERC Regulations, there is a necessity to take into account these parameters for determination of our generic tariff for Solar PV and Solar Thermal Projects for Odisha. The parameters which we have considered to be changed are discussed below:-
22. The technology specific input parameters for Solar PV and Solar Thermal Projects shall be as follows:-
 - (a) **Capital Cost:** The normative Capital Cost for setting up of Solar PV Projects shall be Rs.1,000.00 lakh/MW for the year FY 2012-13. This Capital Cost has been determined basing on the normative capital cost notified by in the CERC Renewable Regulation, 2012. The Capital Cost for Solar Thermal Projects shall be 13 lakh /KW for FY 2012-13 in line with recommendation of CERC Renewable Regulation, 2012.
 - (b) **Capacity Utilisation Factor (CUF):** The Capacity Utilisation Factor (CUF) for the Solar PV Projects shall be 18%. This is based on the submission made by the State Nodal Agency, OREDA and preliminary data available from the 1 MW Projects recently set up in Odisha. CERC had considered CUF for Solar PV Projects at 19%. However, considering the quality of insolation in the State of Odisha the CUF of 18% would be prudent for the Solar PV Projects. As regards CUF of Solar Thermal Projects, Commission had considered CUF of 24% in its Order dated 14.9.2010. However, CERC in its Renewable

Regulation 2012 have recommended CUF of 23% for Solar Thermal Projects. We now also consider the same CUF of 23% for Solar Thermal projects to be set up in Odisha for FY 2012-13.

- (c) **Operation and Maintenance Expenses:** OERC in its Order dated 14.9.2010 had considered O & M expenses for the 1st year of the control period at Rs.9.514 lakh/MW which shall be escalated at the rate of 5.72% per annum in the subsequent years. CERC in its Renewable Regulation, 2012 has considered O & M expenses of Rs.11.00 lakh/MW for the 1st year of operation which shall be escalated at the rate of 5.72% per annum in the subsequent years of the tariff period. Commission now accepts the Operation and Maintenance Expenses as per the CERC Regulation for FY 2012-13. As regards O & M expenses for Solar Thermal Projects Commission in its Order dated 14.9.2010 had considered O & M expenses of Rs.13.74 lakh per MW for the first year which shall be escalated at the rate of 5.72% per annum. CERC in its Renewable Regulation, 2012 has considered O & M expenses of Rs.15 lakh/MW for 1st year of operation which shall be escalated at the rate of 5.72% per annum. Commission now approves the O & M expenses for Solar Thermal Projects in Odisha same as approved in CERC Renewable Regulation, 2012.
- (d) **Annual Deration:** Commission in its interim Order dated 03.4.2012 has considered performance degradation of 1% annually while analysing performance parameter for determining tariff for Solar PV Projects. Commission had not considered any performance degradation for Solar PV and Solar Thermal Projects in its Order dated 14.9.2010 while determining generic tariff.
Commission now after analysing all the aspects of the performance of Solar Panel is of view that there is performance degradation of the quality of solar equipments over the years. Hence, Commission is inclined to allow 1% annual deration of both Solar PV and Solar Thermal projects while determining their generic tariff for FY 2012-13.
- (e) **Interest Rate on Term Loan:** The CERC Renewable Regulation, 2012 stipulates that for the purpose of computation of tariff the normative interest rate shall be considered as average State Bank of India(SBI) base rate prevalent during the 1st six months of the previous year plus 300 basis points. As ascertained from the SBI website the base rate prevalent during the previous six months was 10%. By adding 300 basis points (3%) to this base rate the total interest rate is now determined at 13%. The Commission in its Order dated 14.9.2010 has considered base rate of 12.5%.
- (f) **Return on Equity(ROE):** The Commission in its Order dated 14.9.2010 had considered the normative Return on Equity (ROE) as follows:-
- Pre-Tax 19% per annum for first 10 years
 - Pre-Tax 24% per annum 11th years onwards
- The CERC Renewable Regulation, 2012 have revised the normative Return on Equity as follows:-
- 20% per annum for 1st 10 years
 - 24% per annum 11th years onwards
- OERC now considers the revised CERC rate as above towards ROE for computation of the generic solar tariff for FY 2012-13.
- (g) **Levelling tariff for Solar PV and Solar Thermal Power Projects:** The Levelling Tariff over the useful life of the Solar PV Projects and Solar Thermal Projects are accordingly determined based on the financial and

operating parameters as discussed above and will be applicable for two sub periods of 12 years and 13 years respectively, from the date of commercial operation. The other technical and financial parameters which have not been considered for any change now would continue to be as such provided in our Order dated 14.9.2010. The benefit of accelerated depreciation has also been recomputed based on the Capital Cost as approved now.

Generic Tariff for Solar PV Projects (FY 2012-13)

| No | Technical Parameters | Value | Unit |
|-----------|--|--------------|-------------|
| 1 | Capacity of the Power Project | 1 | MW |
| 2 | Capacity Utilization Factor | 18.00% | % |
| 3 | Annual Gross Generation | 15.77 | Lakh kWhs |
| 4 | Auxiliary consumption | 1.00% | % |
| 5 | Annual Net Generation | 15.61 | Lakh kWhs |
| 6 | Annual Deration | 1.00% | |
| 7 | Life of Plant and Machinery / Project Life | 25 | years |

| No | Financial Parameters | Value | Unit |
|-----------|---|--------------|-------------------|
| 1 | Cost of Solar PV Project | 1000 | Rs Lacs |
| 2 | Non - Depreciable Amount | 10.00% | % of Capital Cost |
| 3 | Depreciable Amount (Cap Cost Less non-depreciable Cost) | 900 | lacs |
| 4 | Debt Fraction | 70.00% | % |
| 5 | Debt | 700.00 | lacs |
| 6 | Equity | 300.00 | lacs |
| 7 | TOTAL | 1000.00 | lacs |
| 8 | Interest Rate on Term Loan | 13.00% | % |
| 9 | Repayment Period | 10 | years |
| 10 | No of installments for Interest on Term Loan | 10 | years |
| 11 | Moratorium Period | 0 | years |
| 12 | Term loan period for principal payment | 10 | years |
| 13 | Depreciation (Straight Line Method, Company Law) - for first 10 years | 7.00% | % |
| 14 | Discount Rate | 15.70% | % |
| 15 | O&M and insurance cost | 11.00 | Rs. Lakhs |
| 16 | O&M and insurance Cost Escalation | 5.72% | % |
| 17 | Return on Equity - pretax (1-10 years) | 20.00% | % |
| 18 | Return on Equity - pretax (11-25 years) | 24.00% | % |
| 19 | Interest on working capital | 12.00% | % |

| | | | |
|---|--|--------------------------------|-----------------------|
| Levelling Tariff of Solar PV Projects (Rs./kWh) | Benefit of Accelerated Depreciation (if availed) (Rs./kWh) | Net Levelling Tariff (Rs./kWh) | Tariff Period (Years) |
|---|--|--------------------------------|-----------------------|

| | | | |
|-------|------|-------|----|
| 13.34 | 1.75 | 11.59 | 12 |
| 8.74 | - | 8.74 | 13 |

Generic Tariff for Solar Thermal Projects(FY 2012-13)

| No | Technical Parameters | Value | Unit |
|-----------|--|--------------|-------------|
| 1 | Capacity of the Power Project | 1 | MW |
| 2 | Capacity Utilization Factor | 23.00% | % |
| 3 | Annual Gross Generation | 20.15 | Lakh kWhs |
| 4 | Auxiliary consumption | 10.00% | % |
| 5 | Annual net energy generation | 18.13 | kWh/kWp |
| 6 | Annual Deration | 1% | % |
| 7 | Life of Plant and Machinery / Project Life | 25 | years |

| No | Financial Parameters | Value | Unit |
|-----------|---|--------------|-------------------|
| 1 | Project Cost of 1 MW Solar Thermal Plant on pro-rata basis | 1300 | Rs Lacs/MW |
| 2 | Non depreciable cost | 10.00% | % of Capital Cost |
| 3 | Depreciable Amount | 1170.00 | lacs |
| 4 | Debt Fraction | 70.00% | % |
| 5 | Debt | 910.00 | lacs |
| 6 | Equity | 390.00 | lacs |
| 7 | TOTAL | 1300.00 | lacs |
| 8 | Interest Rate on Term Loan | 12.50% | % |
| 9 | Repayment Period | 10 | years |
| 10 | No of installments for Interest on Term Loan | 10 | years |
| 11 | Moratorium Period | 0 | years |
| 12 | Term loan period for principal payment | 10 | years |
| 13 | Depreciation (Straight Line Method, Company Law) (for first 10 years) | 7.00% | % |
| 14 | Discount Rate | 15.35% | % |
| 15 | O&M + Insurance Cost | 15.00 | Rs lakhs/MW |
| 16 | O&M + Insurance Cost Escalation | 5.72% | % |
| 17A | Return on Equity (Pre Tax) - in case of MAT (1-10 year) | 20.00% | % |
| 17B | Return on Equity (Pre Tax) - in case of corporate tax (11-25 year) | 24.00% | % |
| 18 | Interest on working capital | 12.00% | % |

| Levellers Tariff of Solar Thermal Projects (Rs./kWh) | Benefit of Accelerated Depreciation (if availed) (Rs./kWh) | Net Levellers Tariff (Rs./kWh) | Tariff Period (Years) |
|--|--|--------------------------------|-----------------------|
| 14.81 | 1.96 | 12.85 | 12 |
| 10.91 | - | 10.91 | 13 |

23. The Commission has determined the above generic tariff for Solar PV and Solar Thermal Projects to be set up in Odisha as a ceiling tariff for FY 2012-13. GRIDCO and OREDA are advised to continue their efforts to procure the solar power through competitive bidding process as the price discovered through the process have been found to be falling rapidly. These Agencies should encourage the serious players who want to set up Solar Power Plants in Odisha as we have fallen behind other progressive states like Gujarat, Rajasthan, Maharashtra etc., in setting up off Solar Plants in the State.
24. As regards the interconnection point it is clarified that GRIDCO and Developer should agree to define connection point in the specific PPA for such project. In case there is disagreement relating to such interconnection point from where energy is to be drawn, the Commission would study the specific case relating to such disagreement and address the issue while approving the PPA. GRIDCO/OPTCL are however advised to accommodate the developers as far as possible on this account in order to encourage the Solar Power development in the State.
25. The other terms and conditions as stipulated in Para 36 to 40 of the Commission's Order dated 14.9.2010 shall remain in force.
26. Accordingly the case is disposed of.

Sd/-
(S.P. Swain)
Member

Sd/-
(B.K. Misra)
Member

Sd/-
(S. P. Nanda)
Chairperson