
Government of the People’s Republic of Bangladesh
Bangladesh Energy Regulatory Commission
TCB Bhaban,1 Karwan Bazar (3rd floor), Dhaka-1215

**BANGLADESH ENERGY REGULATORY COMMISSION (FEED IN TARIFF FOR
WIND & SOLAR ELECTRICITY) REGULATIONS, 2015 (DRAFT)**

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NOTIFICATION

BANGLADESH ENERGY REGULATORY COMMISSION (FEED IN TARIFF FOR WIND & SOLAR ELECTRICITY) REGULATIONS, 2015 (DRAFT)

No. S.R.O.....In exercise of the powers conferred by **section 59** of the Bangladesh Energy Regulatory Commission Act, 2003 (Act No.13 of 2003), read with **section 34** thereof, the Bangladesh Energy Regulatory Commission, after consultation with the Government, is pleased to make the following Regulations,namely:-

1. Short title and commencement

- 1.1 These Regulations shall be called the Bangladesh Energy Regulatory Commission (Feed in Tariff for Wind and Solar Electricity) Regulations, 2015.
- 1.2 These Regulations shall come into force from the date of their publication in the Official Gazette.

2. Definitions and Interpretation

- 2.1 In these Regulations, unless the context otherwise requires,-
- (a) “Act” means the Bangladesh Energy Regulatory Commission Act, 2003 (Act No. 13 of 2003);
- (b) “Auxiliary energy consumption” or “AUX” in relation to a period in case of a generating station means the quantum of energy consumed by auxiliary equipment of the generating station, and transformer losses within the generating station, expressed as a percentage of the sum of gross energy generated at the generator terminals of all the units of the generating station;
- (c) “Base Rate for Long Term” means benchmark yield for Bangladesh Government Treasury Bond with maturity of 10 years as prevalent on July 1 of each financial year and published by Bangladesh Bank;
- (d) “Base Rate for Short Term” means benchmark yield for Bangladesh Government Treasury Bond with maturity of 2 years as prevalent on July 1 of each financial year and published by Bangladesh Bank;
- (e) “Capacity Utilization Factor” or (CUF) is the ratio of gross annual electricity generation (in kWh) from RE generating plant divided by the product of installed nameplate capacity (in kW) of the RE generating plant, number of days in the year (365 or 366 days) and number of hours (24 hours) in a day.
i.e. Capacity utilisation factor (%) = $\frac{\text{Gross Annual Electricity Generation (kWh)}}{\text{Installed Capacity (kW) x 365 x 24}}$
- (f) “Capital Cost” means the capital expenditure incurred by the generating company within the original scope of the project as admitted by the Commission;
- (g) “Commission” means the Bangladesh Energy Regulatory Commission;

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- (h) “Control Period” or “Review Period” means the period during which the norms for determination of tariff specified in these Regulations shall remain valid;
- (i) “Date of Commissioning” means in relation to a unit of generating station shall mean the date declared by Generating Company.
- (j) ”Existing RE Project” means the renewable energy project whose date of commissioning falls prior to date of notification of these Regulations;
- (k) “Feed in Tariff” means tariff based on preferential returns for Renewable Energy Generators determined in accordance with the norms stipulated in this Regulation.
- (l) “Installed Capacity” or “IC” means the summation of the name plate capacities of all the Units of the generating station or the capacity of the generating station (reckoned at the generator terminals on alternating current AC terms), approved by the Commission from time to time;
- (m) “Levelized Tariff” shall represent the present value of annualised tariff stream over the useful life determined in accordance with the provisions of Regulation 10 outlined under these Regulations.
- (n) “Inter-connection Point” shall mean interface point of renewable energy generating facility with the transmission system or distribution system, as the case may be:
- i. In relation to wind energy projects and utility scale solar photovoltaic projects, inter-connection point shall be the line isolator on outgoing feeder on HV side of the pooling sub-station;

Provided that, the Pooling Sub-station shall mean the sub-station at project site of the windfarm or solar power plant, as the case may be, and shall constitute step-up transformer and associated switchgear, and to the LV side of which, multiple (more than one) generating unit(s) (i.e. wind turbine generators or solar PV modules/arrays/inverter units) are connected.
 - ii. In relation to small scale solar photovoltaic projects, inter-connection point shall be the line isolator on outgoing feeder on LV side of the distribution sub-station;
- (o) “Must Run Power Plant” means renewable energy generating plant which would be despatched by System Operator at all times to maximise generation from such renewable energy generating plant but shall be subjected to backing down due to system emergency conditions or transmission constraints, as the case may be, at the discretion of System Operator.
- (p) “Merit Order despatch Principle “ is a way of ranking available sources of electrical generating stations, based on ascending order of cost of generation. It means in case of high frequency condition where the grid cannot transmit any more power, the generating plant with the costliest cost of generation has to be backed down.
- (q) “New RE Project” means the renewable energy project whose date of commissioning shall be subsequent to the date of notification of these Regulations;
- (r) “Non-firm power” means the power generated from renewable sources, the hourly variation of which is dependent upon nature’s phenomenon like sun, cloud, wind, etc., that cannot be accurately predicted.
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- (s) "Operation and maintenance expenses" or 'O&M expenses' means the expenditure incurred on operation and maintenance of the project, or part thereof, and includes the expenditure on manpower, repairs, spares, consumables, insurance and overheads;
- (t) "Photovoltaic" or PV is a method of converting solar energy into direct current electricity using semiconductor materials that exhibit the photovoltaic effect. A Photovoltaic power system shall employ solar PV panels composed of a number of solar cells to generate and supply usable electric power harnessing solar energy.
- (u) "Project" means a generating station and the evacuation system upto inter-connection point, as the case may be,.
- (v) "Renewable Energy" means the grid quality electricity generated from renewable energy sources.
- (w) "Renewable Energy Power Plants" or RE power plant means the power plants other than the conventional power plants generating grid quality electricity from renewable energy sources.
- (x) "Renewable Energy Sources" means renewable sources such as wind, solar, as recognized or approved by the BPDB;
- (y) "Schedule" means the Schedule annexed to these regulations.
- (z) "Solar rooftop PV and other small solar power" means the Solar rooftop or other small solar Photo Voltaic power projects that uses Photo Voltaic technology for generation of electricity, which are mounted on rooftop of buildings or ground mounted installations, and satisfying any other eligibility criteria as may be specified by BPDB and approved by the Commission from time to time.
- (aa) "SREDA" means Sustainable and Renewable Energy Development Authority of Bangladesh formed pursuant to "Sustainable and Renewable Energy Development Act, 2012 (Act No. 48 of 2012)";.
- (bb) "System Operator" (SO) means an entity responsible for grid management, electric power system operation and day-to-day load generation balancing activity on real time basis for power system of Bangladesh.
- (cc) "Tariff" means the price rate of per unit of electricity generation cost along with the return determined in line with the norms specified under these Regulations.
- (dd) "Tariff period" means the period for which tariff is to be determined by the Commission on the basis of norms specified under these Regulations;
- (ee) "Consumer" means a person or organization who receives electricity distribution service as set out in the Schedule and mentioned in section 34 of the Act.
- (ff) "Useful Life" in relation to a unit of a generating station including evacuation system shall mean the following duration from the date of commercial operation (COD) of such generation facility, namely:-
- | | |
|------------------------------|----------|
| a) Wind energy power project | 25 years |
| b) Utility scale Solar PV | 25 years |
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- c) Solar rooftop PV systems and other small solar power 25 years
- (gg) “Utility scale Solar PV power” means the Solar Photo Voltaic power project that uses sunlight for direct conversion into electricity through Photo Voltaic technology and having installed capacity not lower than 1 MW (AC capacity) and connected to transmission or distribution system of Licensee, as the case may be. .
- (hh) “Year” means a financial year commencing from July 1 and ending on June 30 of each year.
- 2.2 Save as aforesaid and unless repugnant to the context or if the subject matter otherwise requires, words and expressions used in these Regulations and not defined, but defined in the Act, SREDA Act, or the Bangladesh Electricity Grid Code or the Bangladesh Energy Regulatory Commission (Electricity Generation Tariff) Regulations, 2008 and amendments thereof shall have the meanings assigned to them respectively in the Act, SREDA Act or the Bangladesh Electricity Grid Code or the Bangladesh Energy Regulatory Commission (Electricity Generation Tariff) Regulations, 2008 and subsequent amendments thereto.

3. Scope of Regulations and extent of application

- 3.1 These Regulations shall apply for all new RE power plants to be commissioned within Bangladesh for generation and sale of electricity from such RE power plants to any of the distribution licensee within Bangladesh subsequent to date of notification of these Regulations and where tariff, for a generating station or a unit thereof based on renewable sources of energy, is to be determined by the Commission.
- Provided that in case of wind, utility scale solar PV, Solar rooftop PV and other small solar power projects, these Regulations shall apply subject to the fulfilment of eligibility criteria specified in Regulation 4;
- 3.2 In case of existing RE power plants, applicable tariff and other terms and conditions, shall be governed by existing notifications subject to approval by the Commission.
- 3.3 The terms and conditions for requirement to avail generating license by renewable energy genertor shall be governed as per provisions of this Act and Renewable Energy Policy, 2008 and amendments thereof as notified by the Government from time to time.
- Provided that no licence fee shall be applicable for renewable energy power plant with installed capacity upto 1 MW.

4. Eligible Entities

- 4.1 **Wind power project** –Wind power project(s) to be commissioned subsequent to notification of these Regulations and located at the wind sites having minimum annual mean Wind Power Density (WPD) of 200 Watt/m² measured at hub height of 80 metres and using new wind turbine generators. All new wind power projects as may be approved by SREDA shall be eligible for availing Feed-in Tariff to be determined as per these Regulations.
- 4.2 **Utility scale Solar PV projects** - Utility Scale Solar PV projects to be commissioned subsequent to notification of these Regulations shall comprise grid connected PV systems with installed capacity of not lower than 1 MW (AC) and shall be based on PV technologies such as crystalline silicon or thin film, as case may be and approved by SREDA. All new

Utility scale Solar PV projects as may be approved by SREDA shall be eligible for availing Feed-in Tariff to be determined as per these Regulations.

- 4.3 **Solar Rooftop PV and other Small Solar power Projects:** Rooftop PV Solar and other Small Solar projects to be commissioned subsequent to notification of these Regulations shall comprise grid connected PV systems with installed capacity not exceeding 1 MW (AC) and shall be based on PV technologies such as crystalline silicon or thin film, as case may be and approved by SREDA. All new solar rooftop & other small solar power projects as may be approved by SREDA shall be eligible for availing Feed-in Tariff to be determined as per these Regulations.

Chapter 1: General Principles

5. Control Period or Review Period

- 5.1 The Control Period or Review Period under these Regulations shall be three (3) financial years. First year of the Control Period shall commence from the date of notification of these Regulations and shall cover upto the end of financial year 2015-16.

Provided further that the tariff determined as per these Regulations for the RE power plants commissioned during the Control Period, shall continue to be applicable for the RE power plants for the entire duration of the Tariff Period as specified in Regulation 6 below;

Provided also that the revision in Regulations for next Control Period shall be notified separately and in case Regulations for the next Control Period are not notified until commencement of next Control Period, the tariff norms as per these Regulations shall continue to remain applicable until notification of the revised Regulations subject to adjustments as per revised Regulations.

6. Tariff Period

- 6.1 The Tariff Period for Renewable Energy power plants such as Wind technology and Utility scale Solar PV shall be fifteen (15) years whereas in case of Solar rooftop PV and other small Solar power projects, the Tariff Period shall be twenty five (25) years.
- 6.2 Tariff Period under these Regulations shall be considered from the date of commercial operation of the renewable energy generating stations.
- 6.3 Tariff determined as per these Regulations shall be applicable for Renewable Energy power plants, only for the duration of the Tariff Period as stipulated under Regulation 6.1 and 6.2.

7. Procedure for determination of Generic Feed-in tariff

- 7.1 The Commission shall notify the generic preferential tariff on suo-motu basis pursuant to approval of the capital cost norm by Bangladesh Energy Regulatory Commission at the beginning of each year of the Control Period for renewable energy technologies for which norms have been specified under the Regulations.

Provided that for the first year of Control Period, (i.e. FY 2015-16), the generic tariff on suo-motu basis may be determined within a period not exceeding three months from the date of notification of these Regulations.

- 7.2 The proceedings for determination of tariff shall be in accordance with relevant clause as described in subsequent chapters.

8. Procedure for determination of Project Specific Feed-in Tariff

- 8.1 Project specific tariff, on case to case basis, shall be determined by the Commission for the following types of projects:
- i) Hybrid Solar Power plants (utility scale) as approved by SREDA;
 - ii) Utility scale Solar PV power project, if a project developer opts for project specific tariff:

Provided that the Commission while determining the project specific tariff for Utility scale Solar PV power project shall be guided by the provisions of Chapters 7 & 8 of these Regulations.

- 8.2 Determination of Project specific Tariff for generation of electricity from such renewable energy sources shall be in accordance with such terms and conditions as stipulated under relevant Orders of the Commission.

Provided that the financial norms as specified under these Regulations, except for capital cost, shall be ceiling norms while determining the project specific tariff.

- 8.3 A petition for determination of project specific tariff shall be accompanied by such fee as may be determined by Regulations and shall be accompanied by
- information in Forms 1.1 and 1.2 as the case may be, and as appended to these Regulations;
 - Detailed project report outlining technical and operational details, site specific aspects, premise for capital cost and financing plan.
 - A Statement of all applicable terms and conditions and expected expenditure for the period for which tariff is to be determined.
 - A statement containing full details of calculation of any subsidy and incentive received, due or assumed to be due from the Government of Bangladesh and/or Local Government. This statement shall also include the proposed tariff calculated without consideration of the subsidy and incentive
 - Any other information that the Commission requires the Generating Company to submit.

9. Tariff Structure and key components

- 9.1 The tariff for renewable energy technologies shall be single-part tariff consisting of the following fixed cost components:
- Return on equity;
 - Interest on loan capital;
 - Depreciation;
 - Interest on working capital;
 - Operation and maintenance expenses;

10. Tariff Design

- 10.1 The generic tariff shall be determined on levellised basis for the Tariff Period.
- 10.2 For the purpose of levellised tariff computation, the discount factor equivalent to normative weighted average cost of capital shall be considered.

$$T_1 = \frac{\sum T_i d_i}{\sum d_i}$$

Where,

T_1 is the levellised tariff determined in (Taka/kWh)

T_i is the tariff determined for (i)th year over the Tariff period (n) from $i = 1, 2, \dots, n$

d_i is the discount factor for (i)th year over the Tariff period (n) from $i = 1, 2, \dots, n$

$d(i) = \text{discount factor for (i)th year} = 1 / (1 + r)^i$

where $r = \text{rate of discount (in \%)} \text{ equivalent to weighted average cost of capital.}$

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- 10.3 Levellisation shall be carried out for the ‘useful life’ of the Renewable Energy project while tariff shall be specified for the period equivalent to ‘Tariff Period’.

11. Despatch principles for electricity generated from Renewable Energy Sources:

- 11.1 Wind energy power plant and Utility scale Solar PV power plant as covered under these Regulation, shall be treated as ‘MUST RUN’ power plants and shall not be subjected to ‘merit order despatch’ principles. However, the same shall be subjected to transmission constraints and system operation requirements governed by System Operator.

12. Grid Connectivity Framework

- 12.1 The distribution licensee or transmission licensee, as the case may be, shall be responsible for development of evacuation infrastructure beyond the inter-connection point while RE generating company will have to develop evacuation infrastructure from generation facility up to the inter-connection point at its own expense;

Provided that, the evacuation infrastructure cost beyond the Inter-connection Point shall be borne by the distribution licensee or the transmission licensee, as the case may be, and shall be recovered from the consumers as per suitable pricing framework developed by the Commission;

Provided further that in case of dispute between generating company and the distribution licensee or transmission licensee as the case may be, the same shall be referred to BERC appointed agency for arbitration and the decision of the agency, shall be final and binding on the parties.

Chapter 2: Financial Principles

13. Capital Cost

13.1 The norms for the Capital Cost as specified in the subsequent technology specific chapters shall be inclusive of all capital work including plant and machinery, civil work, erection and commissioning, financing costs, preliminary and pre-operative expenses, 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 8.

13.2 The capital cost admitted by the Commission after prudence check shall form the basis for determination of tariff:

Provided the prudence check may include scrutiny of reasonableness of the capital expenditure, financing plan, interest during construction, use of efficient technology, cost over-run, time over-run, and such other matters as may be considered appropriate by the Commission for determination of tariff.

13.3 In order to develop generic feed-in tariff for ensuring year, the Commission shall be guided by following principles for capital cost determination:

- (a) Benchmark capital cost norm for generic reference project case shall be developed based upon historical capital cost of the operational RE projects or RE projects under advanced stage of construction.
- (b) Advancements in the RE technology shall be factored in while developing the benchmark capital cost norm for the reference RE project case.
- (c) Feasibility reports and detailed project reports as approved by SREDA or any other competent authority shall be taken into consideration for evolving generic reference case.
- (d) Due weightage shall be given for inflation indices in the material and labour cost components forming part of capital cost norm.
- (e) Developments in the international RE markets and experiences gained thereof shall be taken into consideration.
- (f) Advice from Expert(s), Technical Agencies, Advisory Committee and Consumer Advocacy Groups may be taken into consideration.

14. Debt Equity Ratio

14.1 For suo-motu determination of generic tariff, the debt equity ratio shall be 70 : 30.

14.2 For project specific tariff, the following provisions shall apply:

If the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan.

Provided that where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff;

Provided further that the equity invested in foreign currency shall be denominated/ designated in Taka on the date of each investment.

15. Loan and Finance Charges

15.1 **Loan Tenure:** For the purpose of determination of tariff, loan tenure of 10 years shall be considered.

15.2 Interest Rate

The loans arrived at in the manner indicated above shall be considered as gross normative loan for calculation of interest on loan. The normative loan outstanding as on July 1st of every year shall be worked out by deducting the cumulative repayment up to June 30th of previous year from the gross normative loan.

Benchmark interest rate shall be linked to Base Rate for Long Term as published by Bangladesh Bank as prevalent on 1st July for each financial year plus 200 basis points

Notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed.

16. Depreciation

16.1 The value base for the purpose of depreciation shall be the Capital Cost of the asset admitted by the Commission. The salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset.

16.2 Annual Depreciation shall be based on 'Differential Depreciation Approach' using 'Straight Line Method', over two distinct periods comprising loan tenure and period beyond loan tenure over useful life. The depreciation rate for the first 10 years of the Tariff Period shall be 7% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 11th year onwards.

16.3 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.

17. Return on Equity

17.1 The value base for the equity shall be 30% of the capital cost or actual equity (in case of project specific tariff determination) as determined under Regulation 13.

17.2 The normative Return on Equity shall be:

Pre-tax 20% per annum

18. Interest on Working Capital

18.1 The Working Capital requirement in respect of wind energy projects, utility scale solar PV and rooftop solar PV and other small solar power projects shall be computed as under:

- a) Operation & Maintenance expenses for one month;
- b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilisation Factor (CUF);
- c) Maintenance spare @ 15% of operation and maintenance expenses

18.2 Benchmark interest rate for working capital requirement shall be linked to Base Rate for Short Term as published by Bangladesh Bank as prevalent on 1st July for each financial year plus 100 basis points.

19. Operation and Maintenance Expenses

19.1 'Operation and Maintenance or O&M expenses' shall comprise repair and maintenance (R&M), establishment including employee expenses, and administrative and general expenses including insurance.

19.2 Operation and maintenance expenses shall be determined for the Tariff Period based on normative O&M expenses specified by the Commission subsequently in these Regulations for the first Year of Control Period.

19.3 Normative O&M expenses allowed during first year of the Control Period (i.e. FY 2015-16) under these Regulations shall be escalated at the rate of 5% per annum over the Tariff Period.

20. Rebate

20.1 For payment of bills of the generating company through letter of credit, a rebate of 2% shall be allowed.

20.2 Where payments are made other than through letter of credit within a period of one month of presentation of bills by the generating company, a rebate of 1% shall be allowed.

21. Late payment surcharge

21.1 In case the payment of any bill for charges payable under these Regulations is delayed beyond a period of 60 days from the date of billing, a late payment surcharge at the rate of 1.25% per month shall be levied by the generating company.

22. Sharing of CDM Benefits

22.1 All risks, costs and efforts associated with the availing of carbon credits shall be borne by the generating company. Further, the entire proceeds of carbon credit from approved CDM project, if any, shall be retained by the generating company.

23. Subsidy or incentive by the Central / Local Government

23.1 The Commission shall take into consideration any incentive or subsidy offered by the Government, if availed by the generating company, for the renewable energy power plants while determining the tariff under these Regulations.

Provided further that in case any Government notification specifically provides for any Generation based Incentive over and above tariff, the same shall not be factored in while determining Tariff.

24. Taxes and Duties

Tariff determined under these Regulations shall be exclusive of taxes and duties on generation and sale of electricity from renewable energy project as may be levied by the Government, provided that the taxes and duties levied by the Government on generation and sale of electricity from renewable energy project shall be allowed as pass through on actual incurred basis.

Chapter 3: Technology specific parameters for Wind Energy

25. Capital Cost

- 25.1 The capital cost for wind energy projects shall include Wind turbine generator including its auxiliaries, land cost, site development charges and other civil works, transportation charges, evacuation cost up to inter-connection point, financing charges and Interest During Construction (IDC).
- 25.2 The Capital Cost Norm for wind energy projects for the first year of the Control Period (i.e. FY 2015-16) shall be as stipulated under **Schedule-1** and the same shall be revised for projects to be commissioned in each subsequent year as outlined under Regulation 13.

26. Capacity Utilisation Factor

- 26.1 Normative Capacity Utilisation Factor (CUF) for wind energy project in Bangladesh shall be considered as **20%**..

Provided that the Commission may adopt region-specific CUF norm for wind energy projects for different regions depending upon the wind resource assessment of various regions and shall be guided by inputs from SREDA in this respect.

Provided further that the Commission may deviate from above norm in case of project specific tariff determination in pursuance of Regulation 8.

- 26.2 A normative deration factor on CUF of 0.50% every year after the first ten years of the operation of wind project shall be considered.

Provided that the CUF norms specified herein may be revised through appropriate Order by the Commission on the basis of adequate and appropriate data as and when available.

- 26.3 In case of overachievement of the actual CUF, additional electricity generation exceeding normative CUF, shall attract only 70% of the applicable Feed-in Tariff Rate for that year.

27. Operation and Maintenance Expenses

- 27.1 Normative O&M expenses for the first year of the Control Period (i.e. FY 2015-16)) shall be as stipulated under **Schedule-2** (which is equivalent to 2% of normative Capital Cost).
- 27.2 Normative O&M expenses allowed at the commencement of the Control Period under these Regulations shall be escalated at the rate of 5% per annum over the tariff period for the purpose of determination of tariff.

28. Compliance Monitoring for Wind Energy Projects

- 28.1 SREDA shall maintain data, including technical and commercial details of wind projects in the country and shall make the data available in public domain by publishing the same in its website with quarterly updation.
- 28.2 The Wind Energy Generators shall submit all the required information to SREDA.
- 28.3 In addition to the above mechanism, the Wind Energy Generators shall also submit on an annual basis, such necessary financial Statements or documents as stipulated from time to time to enable the Commission to ascertain that the financial returns to the developers are in accordance with the regulated returns specified under these Regulations.

Chapter 4: Technology specific parameters for Utility Scale Solar PV Power Project

29. Technology Aspects

- 29.1 Norms for Solar Photovoltaic (PV) power under these Regulations shall be applicable for grid connected PV systems with installed capacity more than 1 MW that uses sunlight for direct conversion into electricity through Photo Voltaic technology as may be approved by BPDB.

30. Capital Cost

- 30.1 The Capital Cost for Utility scale Solar PV power projects shall include Solar PV modules, power conditioning units, mechanical works, cabling & instrumentation, civil & structural works, land cost, site development costs, transportation costs, power evacuation cost up to inter-connection point, financing charges and Interest During Construction (IDC).
- 30.2 The Capital Cost Norm for Utility scale Solar PV power projects for the first year of the Control Period (i.e. FY 2015-16) shall be as stipulated under **Schedule-1** and the same shall be revised for projects to be commissioned in each subsequent year as outlined under Regulation 13.

31. Capacity Utilisation Factor

- 31.1 Normative Capacity utilisation factor for Utility scale Solar PV power project in Bangladesh shall be considered as **19%**.
- Provided that the Commission may adopt region-specific CUF norm for Solar PV power projects for different regions depending upon the solar resource assessment of various regions and shall be guided by inputs from SREDA in this respect.
- Provided further that the Commission may deviate from above norm in case of project specific tariff determination in pursuance of Regulation 8.
- 31.2 A normative deration factor on CUF of 0.50% every year after the first ten years of the operation of Utility Scale Solar PV Power project shall be considered.
- Provided that the CUF norms specified herein may be revised through appropriate Order by the Commission on the basis of adequate and appropriate data as and when available.
- 31.3 In case of overachievement of the actual CUF, additional electricity generation exceeding normative CUF, shall attract only 70% of the applicable Feed-in Tariff Rate for that year.

32. Operation and Maintenance Expenses

- 32.1 Normative O&M expenses for the first year of the Control Period (i.e. FY 2015-16)) shall be as stipulated under **Schedule-2** (which is equivalent to 1.4% of normative Capital Cost).
- 32.2 Normative O&M expenses allowed at the commencement of the Control Period under these Regulations shall be escalated at the rate of 5% per annum over the tariff period for the purpose of determination of tariff.

33. Compliance Monitoring for Utility Scale Solar PV Power projects

- 33.1 SREDA shall maintain data, including technical and commercial details of Solar PV projects in the country and shall make the data available in public domain by publishing the same in its website with quarterly updation.

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- 33.2 The Utility Scale Solar PV Generators shall submit all the required information to SREDA.
- 33.3 In addition to the above mechanism, the Utility Scale Solar PV Generators shall also submit on an annual basis, such necessary financial Statements or documents as stipulated from time to time to enable the Commission to ascertain that the financial returns to the developers are in accordance with the regulated returns specified under these Regulations.

Chapter 5: Technology specific parameters for Rooftop Solar PV and other small solar Power Project

34. Technology Aspects

- 34.1 Small scale solar PV system installations may be either roof top mounted or ground mounted depending on the availability of space.
- 34.2 The capacity of eligible rooftop solar PV and other small scale grid connected system shall be classified into two categories viz., a) less than 10 kW, b) 10 kW to 1000 kW.

35. Capital Cost

- 35.1 The Capital Cost for Rooftop Solar PV and other small Solar PV power projects shall include Solar PV modules, power conditioning units, mechanical works, cabling & instrumentation, battery system with limited storage (if applicable), civil & structural works, land cost, site development costs, transportation costs, power evacuation cost up to inter-connection point, financing charges and Interest During Construction (IDC).
- 35.2 The Capital Cost Norm for Rooftop solar PV and other small solar power projects for the first year of the Control Period (i.e. FY 2015-16) shall be as stipulated under **Schedule-1**.
- 35.3 The Capital Cost Norm for Rooftop Solar PV and other small solar power projects shall be revised for projects to be commissioned in each subsequent year as outlined under Regulation 13.

36. Capacity Utilisation Factor

- 36.1 Normative Capacity utilisation factor for Rooftop Solar PV and other small solar PV power project in Bangladesh shall be considered as **18%**.
- Provided that the Commission may adopt region-specific CUF norm for Rooftop Solar PV and other small solar power projects for different regions depending upon the solar resource assessment of various regions and shall be guided by inputs from SREDA in this respect.
- 36.2 A normative deration factor on CUF of 0.50% every year after the first ten years of the operation of Rooftop Solar PV and other small solar power projects shall be considered.
- Provided that the CUF norms specified herein may be revised through appropriate Order by the Commission on the basis of adequate and appropriate data as and when available.

37. Operation and Maintenance Expenses

- 37.1 Normative O&M expenses for the first year of the Control Period (i.e. FY 2015-16) shall be as stipulated under **Schedule-2** (which is equivalent to 1.4% of normative Capital Cost).
- 37.2 Normative O&M expenses allowed at the commencement of the Control Period under these Regulations shall be escalated at the rate of 5% per annum over the tariff period for the purpose of determination of tariff.

38. Compliance Monitoring for Rooftop Solar PV and other small solar PV

- 38.1 SREDA shall maintain data, including technical and commercial details of rooftop solar PV and other small solar PV power projects in the country and shall make the data available in public domain by publishing the same in its website with quarterly updation.
- 38.2 The Rooftop PV system owners & other Small Solar Generators shall submit all the required information to SREDA.

Chapter 6: Miscellaneous

39. Deviation from norms

39.1 Tariff for sale of electricity by the generating company may also be determined in deviation from the norms specified in these Regulations subject to the conditions that the levellised tariff over the useful life of the project on the basis of the norms in deviation does not exceed the levellised tariff calculated on the basis of the norms specified in these Regulations.

Provided that the reasons for deviation from the norms specified under these Regulations shall be recorded in writing.

40. Dispute Resolution

40.1 In the event of any dispute between the RE Generating Company and the distribution licensee or the transmission licensee, as the case may be, shall be referred to BERC for arbitration.

41. Power to Relax

41.1 The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected may relax any of the provisions of these Regulations on its own motion or on an application made before it by an interested person.

42. Power to Amend

42.1 The Commission may, at anytime, vary, alter, modify or amend any provisions of these Regulations.

43. Power to remove difficulties

43.1 If any difficulty arises in giving effect to the provisions of these Regulations, the Commission may, by general or specific order, make such provisions not inconsistent with the provisions of the Act, as may appear to be necessary for removing the difficulty.

Dhaka (_____)

Dated: __ April, 2015

Secretary,
Bangladesh Energy Regulatory Commission

Glossary:

Abbreviation	Detailed Description
AC	Alternating Current
BPDB	Bangladesh Power Development Board
CUF	Capacity Utilization Factor
IDC	Interest during construction
FY	Financial Year
HV	High voltage
IDC	Interest during construction
LV	Low voltage
kW	kilowatt
MW	Megawatt
PV	Photo Voltaic
SREDA	Sustainable and Renewable Energy Development Authority
WPD	Wind power density

Schedule -1

Benchmark Capital Cost Norm for First Year of Control Period (FY 2015-16)

Sr. No.	Regulation Reference	RE Technology Description	Unit	Capital Cost Norm
1	25.2	Wind Power Project	Million Taka / MW	100
2	30.2	Utility Scale Solar Power Project	Million Taka / MW	112
3	35.2	Rooftop PV and other small solar power projects with installed capacity		
3A		- Upto 10 kW	Taka / kW	130,000
3B		- More than 10 kW and upto 1000 kW	Taka / kW	120,000

Schedule -2

Benchmark O&M Cost Norm for First Year of Control Period (FY 2015-16)

Sr. No.	Regulation Reference	RE Technology Description	Unit	O&M Cost Norm
1	27.1	Wind Power Project	Million Taka / MW	2.00
2	32.1	Utility Scale Solar Power Project	Million Taka / MW	1.54
3	37.1	Rooftop PV and other small solar power projects with installed capacity		
3A		- Upto 10 kW	Taka / kW	1820
3B		- More than 10 kW and upto 1000 kW	Taka / kW	1680

44. Annexures

44.1 Annexure : Wind (Assumptions)

Form Template for (Wind power projects): Parameter Assumptions

Assumptions Parameters		Wind Power Project				
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Tariff Parameter	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	20%	
			Deration Factor	%	0.50%	
			Auxiliary Consumption	%	0.50%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Million Taka /MW	100.00	
						95
3	Sources of Fund	Debt: Equity	Tariff Period	Years		
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Million Taka	70	
		Debt Component	Total Equity Amout	Million Taka	30	
			Loan Amount	Million Taka	70	
			Moratorium Period	years	0	
			Repayment Period(incld Moratorium)	years	10	
		Equity Component	Interest Rate	%	12.90%	
			Equity amount	Million Taka	30	
			Pre Tax Return on Equity	% p.a	20.00%	
		Income Tax	Corporate Tax Rate	%	27.50%	
			Tariff Rate of return (or WACC)	%	15.03%	
			Tax Exemption for power projects	years	15	
			Minimum Alternate Tax	%	0.30%	
Depreciation	Depreciation Rate					
		first 10 years	%	7.00%		
		11 to 20 years	%	2.00%		
	Salvage value	%	10%			
4	Operation & Maintenance	power plant (First year) Total O & M Expenses Escalation	%age of capital cost	%	2.00%	
						5.00%
5	Working Capital	Material and Supplies	1% of capital cost	Million Taka	1	
		Cash Working capital	2 month receivables	Million Taka		
		O&M expense	1 month O&M	Million Taka	0.17	
		Interest on working capital	Interest rate on working capital	%	12.40%	

Form-1.2 Form Template for (Wind power projects): Parameter Illustration

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Gross Generation	MU		1.752	1.752	1.752	1.752	1.752	1.752	1.752	1.752	1.752	1.752	1.743	1.735	1.726	1.717	1.709	1.700	1.692	1.683	1.675	1.666	1.658	1.650	1.641	1.633	1.625
Aux. Consumption	MU		0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
Net Generation	MU		1.743	1.743	1.743	1.743	1.743	1.743	1.743	1.743	1.743	1.743	1.735	1.726	1.717	1.709	1.700	1.692	1.683	1.675	1.666	1.658	1.650	1.641	1.633	1.625	1.617

Fixed Cost Components	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Million Taka		2.00	2.10	2.21	2.32	2.43	2.55	2.68	2.81	2.95	3.10	3.26	3.42	3.59	3.77	3.96	4.16	4.37	4.58	4.81	5.05	5.31	5.57	5.85	6.14	6.45
Depreciation	Million Taka		7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Int. on term loan	Million Taka		8.58	7.68	6.77	5.87	4.97	4.06	3.16	2.26	1.35	0.45	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	0.00	0.00
Int. on working capital	Million Taka		0.65	0.63	0.61	0.60	0.58	0.57	0.55	0.54	0.52	0.51	0.40	0.40	0.41	0.41	0.42	0.43	0.43	0.44	0.45	0.46	0.46	0.47	0.48	0.49	0.50
Return on Equity	Million Taka		6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Total Fixed Cost Components	Million Taka		24.22	23.40	22.59	21.78	20.98	20.18	19.39	18.61	17.83	17.06	11.66	11.82	12.00	12.19	12.38	12.58	12.80	13.02	13.26	13.51	13.77	14.04	14.33	14.63	14.95

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
PU O&M expn	Taka / kWh		1.15	1.20	1.26	1.33	1.39	1.46	1.54	1.61	1.70	1.78	1.88	1.98	2.09	2.21	2.33	2.46	2.59	2.74	2.89	3.05	3.22	3.39	3.58	3.78	3.99
PU Depreciation	Taka / kWh		4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	1.15	1.16	1.16	1.17	1.18	1.18	1.19	1.19	1.20	1.21	1.21	1.22	1.22	1.23	1.24
PU Int. on term loan	Taka / kWh		4.92	4.40	3.89	3.37	2.85	2.33	1.81	1.30	0.78	0.26	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	0.00	0.00
PU Int. on working cap.	Taka / kWh		0.37	0.36	0.35	0.34	0.33	0.33	0.32	0.31	0.30	0.29	0.23	0.23	0.24	0.24	0.25	0.25	0.26	0.26	0.27	0.27	0.27	0.28	0.29	0.30	0.31
PU Return on Equity	Taka / kWh		3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.46	3.48	3.49	3.51	3.53	3.55	3.56	3.58	3.60	3.62	3.64	3.66	3.67	3.69	3.71
PU Total COG	Taka / kWh		13.90	13.43	12.96	12.50	12.04	11.58	11.12	10.68	10.23	9.79	6.72	6.85	6.99	7.13	7.28	7.44	7.60	7.78	7.96	8.15	8.35	8.56	8.77	9.00	9.25

Discount Factor		15.03%	1.00	0.869	0.756	0.657	0.571	0.497	0.432	0.375	0.326	0.284	0.247	0.214	0.186	0.162	0.141	0.122	0.106	0.093	0.080	0.070	0.061	0.053	0.046	0.040	0.035
Levallised Tariff	11.32	Taka/kWh																									

Feed-in Tariff (Wind) - levellised	Taka / kWh		11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32	11.32
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44.2 Annexure : Solar PV projects-Utility scale (Assumptions)

Solar PV power project (Utility Scale)			
Sub-Head	Sub-Head (2)	Unit	Tariff Parameter
<u>Capacity</u>	Installed Power Generation Capacity	MW	1
	Capacity Utilization Factor	%	19%
	Deration Factor	%	0.50%
	Auxiliary Consumption	%	
	Useful Life	Years	25
Capital Cost/MW	Power Plant Cost	Million Taka /MW	112.06
<u>Debt: Equity</u>	Tariff Period	Years	
	Debt	%	70%
	Equity	%	30%
	Total Debt Amount	Million Taka	78
<u>Debt Component</u>	Total Equity Amout	Million Taka	34
	Loan Amount	Million Taka	78
	Moratorium Period	years	0
	Repayment Period(incld Moratorium)	years	10
<u>Equity Component</u>	Interest Rate	%	12.90%
	Equity amount	Million Taka	34
	Pre Tax Return on Equity	% p.a	20.00%
	Income Tax	Corporate Tax Rate	%
<u>Depreciation</u>	Tariff Rate of return (or WACC)	%	15.03%
	Tax Exemption for power projects	years	15
	Minimum Alternate Tax	%	0.30%
<u>power plant (First year)</u>	Depreciation Rate		
	first 10 years	%	7.00%
	11 to 20 years	%	1.33%
<u>Total O & M Expenses Escalation</u>	Salvage value	%	10%
	%age of capital cost	%	1.37%
Material and Supplies	1% of capital cost	Million Taka	1.12
	Cash Working capital	Million Taka	
	O&M expense	Million Taka	0.13
	Interest on working capital	%	12.40%

Form-2.2 Form Template for (Utility scale solar PV power projects): Parameter Illustration

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Gross Generation	MU		1.664	1.656	1.648	1.640	1.631	1.623	1.615	1.607	1.599	1.591	1.583	1.575	1.567	1.559	1.552	1.544	1.536	1.528	1.521	1.513	1.506	1.498	1.491	1.483	1.476
Aux. Consumption	MU		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Net Generation	MU		1.664	1.656	1.648	1.640	1.631	1.623	1.615	1.607	1.599	1.591	1.583	1.575	1.567	1.559	1.552	1.544	1.536	1.528	1.521	1.513	1.506	1.498	1.491	1.483	1.476

Fixed Cost Components	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Million Taka		1.54	1.62	1.70	1.78	1.87	1.96	2.06	2.16	2.27	2.39	2.51	2.63	2.76	2.90	3.05	3.20	3.36	3.53	3.70	3.89	4.08	4.29	4.50	4.73	4.96
Depreciation	Million Taka		7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49
Int. on term loan	Million Taka		9.61	8.60	7.59	6.58	5.57	4.55	3.54	2.53	1.52	0.51	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	0.00	0.00
Int. on working capital	Million Taka		0.70	0.68	0.66	0.64	0.63	0.61	0.59	0.57	0.55	0.54	0.39	0.40	0.40	0.41	0.41	0.42	0.42	0.43	0.43	0.44	0.44	0.45	0.46	0.46	0.47
Return on Equity	Million Taka		6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72	6.72
Total Fixed Cost Components	Million Taka		26.42	25.47	24.52	23.57	22.63	21.69	20.76	19.83	18.91	18.00	11.12	11.25	11.38	11.53	11.68	11.83	12.00	12.17	12.35	12.54	12.74	12.95	13.18	13.41	13.65

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
PU O&M expn	Taka / kWh	0.92	0.98	1.03	1.09	1.15	1.21	1.28	1.35	1.42	1.50	1.58	1.67	1.76	1.86	1.96	2.07	2.19	2.31	2.43	2.57	2.71	2.86	3.02	3.19	3.36
PU Depreciation	Taka / kWh	4.71	4.74	4.76	4.78	4.81	4.83	4.86	4.88	4.91	4.93	0.94	0.95	0.95	0.96	0.96	0.97	0.97	0.98	0.98	0.99	0.99	1.00	1.00	1.01	1.01
PU Int. on term loan	Taka / kWh	5.78	5.19	4.61	4.01	3.41	2.81	2.19	1.57	0.95	0.32	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	0.00	0.00
PU Int.on working cap.	Taka / kWh	0.42	0.41	0.40	0.39	0.38	0.37	0.36	0.36	0.35	0.34	0.25	0.25	0.26	0.26	0.27	0.27	0.27	0.28	0.28	0.29	0.30	0.30	0.31	0.31	0.32
PU Return on Equity	Taka / kWh	4.04	4.06	4.08	4.10	4.12	4.14	4.16	4.18	4.20	4.23	4.25	4.27	4.29	4.31	4.33	4.35	4.38	4.40	4.42	4.44	4.47	4.49	4.51	4.53	4.56
PU Total COG	Taka / kWh	15.87	15.38	14.88	14.38	13.87	13.36	12.85	12.34	11.83	11.31	7.02	7.14	7.26	7.39	7.52	7.66	7.81	7.96	8.12	8.29	8.46	8.65	8.84	9.04	9.25

Discount Factor		15.03%	1.00	0.869	0.756	0.657	0.571	0.497	0.432	0.375	0.326	0.284	0.247	0.214	0.186	0.162	0.141	0.122	0.106	0.093	0.080	0.070	0.061	0.053	0.046	0.040	0.035
Levillised Tariff	12.72	Taka/kWh																									

Feed-in Tariff (Wind) - levillised	Taka / kWh	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72
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44.3 Annexure : Small scale solar PV projects : Assumptions

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Tariff Parameter	<=10 kW system	>10 kW-500 kW system	
1	Power Generation	Capacity	Installed Power Generation Capacity	kW	1	1	1	
			Capacity Utilization Factor	%	18.00%	18%	18%	
			Deration Factor	%	0.50%	0.50%	0.50%	
			Auxiliary Consumption	%				
			Useful Life	Years	25	25	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost (without battery)	Taka /kW	120000	130,000	120,000	
3	Sources of Fund	Debt: Equity	Tariff Period	Years				
			Debt	%	70%	70%	70%	
			Equity	%	30%	30%	30%	
			Total Debt Amount	Taka	84000	91000	84000	
			Total Equity Amout	Taka	36000	39000	36000	
			Debt Component	Percentage Soft loan offered	%	0%	0%	0%
				Loan Amount	Taka	0%	0	0
				Moratorium Period	years	0	0	0
				Repayment Period(incld Moratorium)	years	10	10	10
				Interest Rate	%	6.00%	6.00%	6.00%
			Percentage loan catered by other Fis	Loan Amount	Taka	58800	63700	58800
				Moratorium Period	years	0	0	0
				Repayment Period(incld Moratorium)	years	0.10	0.10	0.10
				Interest Rate	%	12.90%	12.90%	12.90%
			Equity Component	Equity amount	Million Taka	36000	39000	36000
				Pre Tax Return on Equity	% p.a	20.00%	20.00%	20.00%
			Income Tax	Corporate Tax Rate	%	0.00%	0.00%	0.00%
				Weighted average cost of capital	%	15.03%	15.03%	15.03%
				Tax Exemption for power projects	years	0.00	0	0
				Minimum Alternate Tax	%	0.00	0.00%	0.00%
Depreciation	Depreciation Rate							
	first 10 years	%	7.00%	7.00%	7.00%			
	11 to 25 years	%	1.33%	1.33%	1.33%			
	Salvage value	%	10.00%	10%	10%			
4	Operation & Maintenance	power plant (First year)	Percentage of capital cost	%	1%	1.4%	1.4%	
		Total O & M Expenses Escalation		%	5%	5%	5%	
5	Working Capital	Material and Supplies	1% of capital cost	Taka	1200	1300	1200	
		Cash Working capital	2 month receivables	Taka				
		O&M expense	1 month O&M	Taka	137	149	137	
		Interest on working capital	Interest rate on working capital	%	12.40%	12.40%	12.40%	

Form-3.2 Form Template for (Small scale solar PV power projects): Parameter Illustration

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	kW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	kWh		1,577	1,569	1,561	1,553	1,545	1,538	1,530	1,522	1,515	1,507	1,500	1,492	1,485	1,477	1,470	1,463	1,455	1,448	1,441	1,434	1,426	1,419	1,412	1,405	1,398
Aux. Consumption	kWh		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Generation	kWh		1,577	1,569	1,561	1,553	1,545	1,538	1,530	1,522	1,515	1,507	1,500	1,492	1,485	1,477	1,470	1,463	1,455	1,448	1,441	1,434	1,426	1,419	1,412	1,405	1,398

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Taka		1,648	1,730	1,816	1,907	2,003	2,103	2,208	2,318	2,434	2,556	2,684	2,818	2,959	3,107	3,262	3,425	3,596	3,776	3,965	4,163	4,371	4,590	4,819	5,060	5,313
Depreciation	Taka		8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Int. on term loan	Taka		10,294	9,211	8,127	7,043	5,960	4,876	3,793	2,709	1,625	542	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Int. on working capital	Taka		751	751	752	753	754	755	756	757	759	760	761	763	764	766	767	769	771	773	774	777	779	781	783	786	788
ROE	Taka		7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200
Total Fixed Cost	Taka		28,292	27,292	26,296	25,304	24,317	23,334	22,357	21,385	20,418	19,458	12,245	12,380	12,523	12,672	12,829	12,994	13,167	13,349	13,539	13,740	13,950	14,171	14,403	14,646	14,902

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
PU O&M expn	Taka/kWh	1.04	1.10	1.15	1.21	1.27	1.33	1.40	1.47	1.54	1.62	1.70	1.79	1.88	1.97	2.07	2.17	2.28	2.39	2.51	2.64	2.77	2.91	3.06	3.21	3.37
PU Depreciation	Taka/kWh	5.33	5.33	5.33	5.33	5.33	5.33	5.33	5.33	5.33	5.33	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
PU Int. on term loan	Taka/kWh	6.53	5.84	5.15	4.47	3.78	3.09	2.41	1.72	1.03	0.34	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	0.00	0.00
PU Int. on working capital	Taka/kWh	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.50	0.50	0.50	0.50
PU RoE	Taka/kWh	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57
Total COG	Taka/kWh	17.94	17.31	16.68	16.05	15.42	14.80	14.18	13.56	12.95	12.34	7.77	7.85	7.94	8.04	8.14	8.24	8.35	8.47	8.59	8.71	8.85	8.99	9.13	9.29	9.45

Discount Factor		15.03%	1.000	0.869	0.756	0.657	0.571	0.497	0.432	0.375	0.326	0.284	0.247	0.214	0.186	0.162	0.141	0.122	0.106	0.093	0.080	0.070	0.061	0.053	0.046	0.040	0.035
Levallised Tariff	14.13	Taka/kWh																									

Feed-in Tariff (Small Solar) - level	Taka / kWh	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13	14.13
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