

2019

Project Implementation Review (PIR)

**SREPGen**

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# Basic Data

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| **Project Information** | |
| UNDP PIMS ID | 3948 |
| GEF ID | 4459 |
| Title | Development of Sustainable Renewable Energy Generation (SREPGen) |
| Country(ies) | Bangladesh, Bangladesh |
| UNDP-GEF Technical Team | Energy, Infrastructure, Transport and Technology |
| Project Implementing Partner | Government |
| Joint Agencies | *(not set or not applicable)* |
| Project Type | Full Size |

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| **Project Description** |
| The objective of the Project is to reduce the annual growth rate of GHG emissions from the fossil fuel-based power generation by exploiting Bangladesh’s renewable energy resources for electricity generation. The basic approach of the Project will be to promote renewable energy in Bangladesh through the recently established Sustainable and Renewable Energy Development Authority (SREDA). For Bangladesh to achieve a greater share of renewable energy (RE) in its energy mix, the Project will support activities that will (i) transform SREDA into a strong RE project facilitation center to bring confidence to private RE investors and increase the number of approved RE projects; (ii) increase the capacities of appropriate government agencies to generate, process, obtain and disseminate reliable RE resource information for use by potential project developers and investors; (iii) increase the affordability of photo-voltaic solar lanterns (PVSLs) for low income households by supporting pilot PVSL diffusion activities; and (iv) increase the share of RE in Bangladesh’s power mix through facilitating the financing, implementation and operation of pilot (RE) energy projects using rice husk and solar panels. The lessons learned from the pilot plants will be utilized to scale-up the dissemination of PVSLs and investment in on-grid RE projects and RE technologies. |

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| **Project Contacts** | |
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| GEF Operational Focal Point | Mr. Abdullah Al Mohsin Chowdhury (secretary@moef.gov.bd) |
| Project Implementing Partner | Mr. Helal Uddin (chairman@sreda.gov.bd) |
| Other Partners | *(not set or not applicable)* |

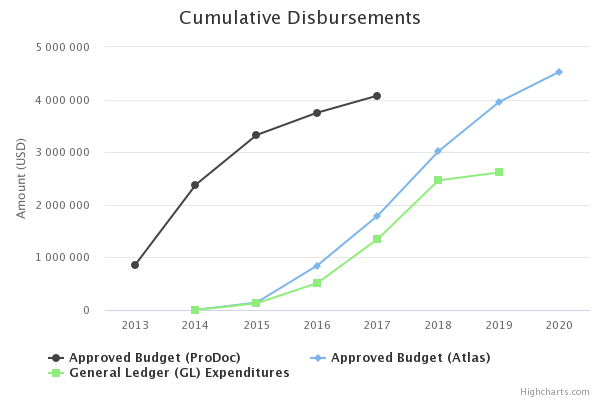
# Overall Ratings

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| Overall DO Rating | Highly Satisfactory |
| Overall IP Rating | Highly Satisfactory |
| Overall Risk Rating | Substantial |

# Development Progress

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| **Description** | | | | | | |
| **Objective**  **Reduction in the annual growth rate of GHG emissions from fossil fuel-fired power generation through the exploitation of Bangladesh’s renewable energy resources for power generation** | | | | | | |
| **Description of Indicator** | **Baseline Level** | **Midterm target level** | **End of project target level** | **Level at 30 June 2018** | **Cumulative progress since project start** |
| • Cumulative direct post-project CO2 emission reductions resulting from the RE technical assistance and investments by end-of-project (EOP), Mtons CO2.      • % share of RE in the power generation mix of Bangladesh (MW of RE power generation in Bangladesh, including on and off grid)    Per the MTR, this indicator was slightly updated, with reference to no. of MW. | • 0                        • 1  (200) slightly updated, with reference to no. of MW | *(not set or not applicable)* | • 1.64                          • 6  (1,000) slightly updated, with reference to no. of MW | -0.88 million Mtons for 10 years and the aggregate direct GHG reduction is calculated for PVSLs, SHS, SIP, solar boat and solar charging station (the exact figure on GHG emission reduction is underway of revision by the expert)      -In this tenure, the share of renewable energy is 2.90%. (The credibility of this achievement is not only attributed through the support of SREPGen project but it’s worthy to mention that the project is playing a catalytic role to accelerate the desired progress to be achieved) (Total RE power generation: 486.6 MW in 2017 and 518.6 MW for 2018) | -1.2 million Mtons for 10 years and the aggregate direct GHG reduction is calculated for photovoltaic systems, Solar Home System, solar roof top under Net Energy Metering (NEM), Solar Irrigation Pump (SIP), Waste to energy, mini-grid, solar-wind hybrid mini-grid, solar boat, solar charging station, solar ice-cube plant, hydro power plant    --In this reporting period, the share of renewable energy has been increased to 3.08%. (The credibility of this achievement is not only attributed through the support of SREPGen project but it’s important to mention that the project is playing a catalytic role to accelerate the desired progress to be achieved) (Total RE power generation: 486.6 MW in 2017, 518.6 MW in 2018 and 585.12 MW in 2019). Important to note that despite 3.08% share of RE, around 12% of the population are served by RE and of which 90% are from hard to reach areas. |
| **The progress of the objective can be described as:** | | **On track** | | | | |
| **Outcome 1**  **SREDA evolves into a facilitation center to support private sector RE investment development, enable regulators to determine fair flexible tariff structures, bring confidence to private RE investors, and increase the number of approved RE projects** | | | | | | |
| **Description of Indicator** | **Baseline Level** | **Midterm target level** | **End of project target level** | **Level at 30 June 2018** | **Cumulative progress since project start** |
| • Number of on-grid RE projects approved based on studies of improved RE policy and tariffs and RE grid integration and SREDA operational rules (in KW)  Per the MTR, this indicator was slightly updated, with reference to KW    • Number of on-grid RE projects facilitated by SREDA operational rules  Per the MTR, this indicator was revised to "Number of utility scale RE projects approved/pipeline (MW)"    • Number of RE development project proponents that were assisted by SREDA staff in the technical design and approval of their projects | • 0                                • 0                    • 0 | *(not set or not applicable)* | • 4  (40,000) slightly updated, with reference to no. of KW                  • 4  (200) slight updated, with reference to no. of MW              • 6 | -6 (532 MW) (6 PPAs have been signed during 2016-2018; yet to be operational)          -10 (583 MW+600 MW+80 MW) (LOIs have been issued for 10 projects during 2016-2018 for 583 MW; Government Utilities have planned 600 MW RE project; Upcoming Solar Park 80MW); SREDA is also facilitating a 30 MW on-grid Wind project which is awaiting Prime Minister’s approval))      -5 | -6 (532 MW) (6 PPAs have been signed during 2016-2018; yet to be operational)    -10 (583 MW+600 MW+80 MW) (LOIs have been issued for 10 projects during 2016-2018 for 583 MW; Government Utilities have planned 600 MW RE project; Upcoming Solar Park 80MW); SREDA is also facilitating a 30 MW on-grid Wind project which is awaiting Prime Minister’s approval)  -6 |
| **The progress of the objective can be described as:** | | **Achieved** | | | | |
| **Outcome 2**  **Increased capacities of relevant government agencies to generate, process, obtain and disseminate reliable RE resource information for use by GoB and potential project developers and investors** | | | | | | |
| **Description of Indicator** | **Baseline Level** | **Midterm target level** | **End of project target level** | **Level at 30 June 2018** | **Cumulative progress since project start** |
| • Number of implemented wind energy projects that were designed based on the wind maps      • Number of RE resource assessments and data gathering that were carried out by the private sector  Per the MTR, the indicator was revised to "RE assessments coverage area of the country for identification of potential utility scale RE projects including private sector)"      • Number of biomass-based power generation projects that were designed based on the biomass resource assessment data | • 0                  • 1  revised to  0% (biomass)  0% (solar PV)  0% (Wind)                          • 0 | *(not set or not applicable)* | • 1                  • 7  revised to  100% (biomass)  100% (solar PV)  10% (Wind)                        • 4 | - 0 (Wind resource assessment has been completed in nine locations by GoB. SREPGen is planning to support installing a wind turbine in Manpura which is southern coastal belt of Bangladesh which is not covered).    - 20% (Waste to Energy feasibility study for municipality has been published; Bio-mass study covering 100% area has been commissioned and will be completed by June 2019)    0% (Solar Irradiance study covering 100% area has been commissioned and will be completed by June 2019)    0% (Wind resource study covering 10% area has been planned as 90% has been covered already)    - 3 (- SREPGen project is underway of piloting a W2E project in Kushtia municipality converting 25 tons of MSW to produce electricity 400 kW.    -2 Biogass and 1 bio-mass project by private sector have been established | - 0 (Wind resource assessment has been completed in nine locations by GoB. SREPGen has agreed to finance integrating a wind turbine with a mini-grid in Manpura which is would also serve as wind assessment location in the coastal belt of Bangladesh. This will be implemented by 2019 through IDCOL      -100% (biomass): the compilation of data of total supply and demand of biomass fuels of 64 districts for the base year 2015 and projections up to the year 2040 has been completed    100% (solar PV) National Solar PV Action Plan from 2019 to 2041 has been completed    10 % wind resource study will be completed by December 2019 to be located at Monpura)    - - 4 (SREPGen project is underway of piloting a W2E project in Kushtia municipality to be started by August 2019 with revised capacity of 100 kW based on in-depth survey of MSW availability through a private sector and IDCOL)  - 1 Biogas and 1 biomass project have been implemented |
| **The progress of the objective can be described as:** | | **On track** | | | | |
| **Outcome 3**  **Increased affordability of photovoltaic solar LED lanterns (PVSLs) for low income households**  **The Outcome is updated to "Increased affordability of photovoltaic solar (including LED lanterns (PVSLs)) and other Renewable Energy Power system for low income households" (based on MTR recommendation, the outcome is broadened)** | | | | | | |
| **Description of Indicator** | **Baseline Level** | **Midterm target level** | **End of project target level** | **Level at 30 June 2018** | **Cumulative progress since project start** |
| • Number of government-certified PVSL models that meet international standards for functionality and durability that are imported into the country      • Number of low income households that have new access to RE power are able to afford monthly payments from established and operational financial mechanisms for the purchase and use of PVSLs  Per the MTR, "have new access to RE power" was added to the description for clarity.    • Number of PVSL supply and delivery chains that also provide product support and credit collection by Year 2      • Number of PVSL supply and delivery chains that also provide product support and credit collection by Year 2  (This indicator is no longer tracked as it is a mistake in the ProDoc, a duplication of the above indicator)    • Number of PVSLs disseminated to rural households outside of the project by EOP  Per the MTR, the indicator was revised to "Number of households with direct and improved quality of access to electricity and productivity using renewable energy technology outside of the project by EOP)" | • 1                        • 0                                          • 0                    • 0                            • 0 | *(not set or not applicable)* | • 5                        133,000 (Yr 2)  423,000  revised to  Direct  • 6000 (Tier 1)  • 2500 (Tier 3+)  Indirect  • 50000 (Tier 1)  • 40000 ( Tier 3)                • 3                    • 1                              • 423,000  revised to  • 400,000 (Tier 1 & 2)  • 62,500 (Tier 3) | - 5                      Direct  - 3230 (Tier1)    - 0(Tier 3) (One 379.5 kW Solar-Wind hybrid mini-grid targeting 2500 direct HH beneficiary has been agreed in principle. Solar part has been approved (279.5 kW). Wind part is under appraisal at the moment)  Indirect  -50000 HH has been covered by Tier 1 access indirectly  -0 (40000 HH will be covered with Tier 3 access through hybrid project as mentioned above)      -3              - Duplication              - 320,000  (120000 PVSL + 200000 SHS; Tier1& 2)  - 0 (Tier 3 access will be operational by June 2019) | - 5,                      Direct  - 6000 (Tier1)  -2500 (Tier 3+) Solar mini-grids in Manpura Island with capacities of 279 kw+218.5 kW have stated its trial run and full fledge execution will be started by August 2019 and another 100/225 kW wind turbine will be integrated into the solar mini-grid which is underway of approval by IDCOL board/PSC.  Indirect  -50000 HHs have been covered by Tier 1 access indirectly  --30000 Tier 3; ( Total 40000 HHs will be covered with Tier 3 access through hybrid project after full-fledged commissioning)                  - 400,000  (120000 PVSL + 280,000 SHS; Tier1& 2)  - 62,500 (Tier 3 access will be operational by August 2019) |
| **The progress of the objective can be described as:** | | **Achieved** | | | | |
| **Outcome 4**  **Renewable energy accounts for an increased share of Bangladesh’s power generation mix** | | | | | | |
| **Description of Indicator** | **Baseline Level** | **Midterm target level** | **End of project target level** | **Level at 30 June 2018** | **Cumulative progress since project start** |
| • Number of RE projects that are financed through RE funds where SREDA has had involvement in operationalization      • MW of RE on-grid projects installed by EOP      • MW of RE off-grid projects installed by EOP      • % increase of RE in Bangladesh’s power generation mix by EOP      • MW capacity of RE generation projects (on-grid and off-grid) in planning and design stages by EOP | • 0                  • 1.9          • 162          • 1.5            • 0 | *(not set or not applicable)* | • 2                  • 1392 (SREDA RE Plan)      • 395 (SREDA RE Plan)      • 9.2 (SREDA RE Plan)          • 1,790 (SREDA RE Plan) | -2 (RE projects have been financed through a specialized financing institution called IDCOL and SREDA has involvement with that; besides Bangladesh Bank has opened an window to finance RE projects)    -248.25 (attribution to SREPGen is at best remotely indirect; this includes 230 from Hydro which was installed before 1990)    -240.14 (Total contribution at the moment; SHS-218.48 + Mini-grid 2.94 + Solar Irrigation-18.72) (attribution to SREPGen is at best remotely indirect)    -2.90% (Total generation capacity has been increased tremendously, thus RE contribution (519 MW) is less in terms of %)    -1875 (Total including currently running facilities; attribution to SREPGen is at best remotely indirect; SREDA Road Map targets 1971 by 2020, thus we assumed 1875 by 2019 which is EOP) | -2, Achieved          -302.76 on 28 August 2019 Source: SREDA’s database - Net increase of this year is 54.51 (this includes 230 from Hydro which was installed before 1990)    -299.05 on 28 August 2019; Source :SREDA’s Website) (Total contribution at the moment; solar- 295.63, biogas- 0.68 and biomass-0.40) (SREPGen Project is playing a catalytic role at micro and macro level in terms of innovation, demonstration, testing of ideas, knowledge sharing, advocacy influencing, capacity building, replication, scaling out and scaling up of project, policy and market strategy which might happen often after project, or by another project)    -2.89% on 28 August 2019 following SREDA’s Website (Total power generation capacity has been increased tremendously, thus RE contribution has been increased (54.51 MW this year) though in terms of % of total generation it decreases slightly) |
| **The progress of the objective can be described as:** | | **On track** | | | | |

# Implementation Progress



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| Cumulative GL delivery against total approved amount (in prodoc): | 64.13% |
| Cumulative GL delivery against expected delivery as of this year: | 64.13% |
| Cumulative disbursement as of 30 June (note: amount to be updated in late August): | 2,614,955 |

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| **Key Financing Amounts** | |
| PPG Amount | 150,000 |
| GEF Grant Amount | 4,077,272 |
| Co-financing | 49,600,000 |

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| **Key Project Dates** | |
| PIF Approval Date | Nov 10, 2011 |
| CEO Endorsement Date | Aug 15, 2013 |
| Project Document Signature Date (project start date): | Nov 26, 2013 |
| Date of Inception Workshop | Mar 5, 2015 |
| Expected Date of Mid-term Review | May 26, 2016 |
| Actual Date of Mid-term Review | Nov 30, 2017 |
| Expected Date of Terminal Evaluation | Feb 26, 2020 |
| Original Planned Closing Date | Nov 26, 2018 |
| Revised Planned Closing Date | May 26, 2020 |

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| **Dates of Project Steering Committee/Board Meetings during reporting period (30 June 2018 to 1 July 2019)** |
| 2018-10-18 |

# Critical Risk Management

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| Current Types of Critical Risks | Critical risk management measures undertaken this reporting period |
| Operational | Financing Solar Mini-grid and Wind Turbine Installation in Monpura: Delay in the wind component of the proposed pilot.    A proposal from IDCOL was received to finance a Wind-Solar Hybrid mini-grid in Manpura Upazilla of Bhola district with 279.5+100 = 379.5 kW capacity. The proposal of this hybrid mini-grid was received from IDCOL on July 2018 after their board approval of solar part. The project was supposed to be completed by December, 2018. However, it took 7 more months to become operational in July 2019. Total estimated grant portion for solar part of this mini-grid was 635000 USD (which is 50% of total cost of this mini-grid) and for wind portion it is around 500000 USD (100% support as envisaged earlier). The proposal for financing 100% grant for wind portion within the approved business model of IDCOL (50% Grant + 30% soft Loan + 20% Equity) needed detail justification and a feasibility study as well. A study was conducted on “Feasibility of Wind Energy and Integration of Wind Energy into Solar Mini-Grid in Monpura Island” to facilitate informed decision in financing wind portion of the project. . The study report was also reviewed for its compliance to UNDP-GEF guidelines. It was noted that the project could cover technical assistance costs and the capital costs to be borne by the Govt. (if there is viability gap after considering private sector investments). A detail discussion was held with stakeholders to find out various options of financing for wind turbine part to be integrated with mini-grid system as wind is the untapped potential in the country. There is a consensus on the rationale for the wind pilot project at Manpura with SREPGen project support. The pilot as per the approved business model could receive upto 50% of total costs from the project and the remaining 50% amount would be financed by North West Power Generation Company Ltd. (NWPGCL) and ownership of the system would belong to Bangladesh government (e.g. SREDA, NWPGCL) if private sector could not be mobilized. In order to make it more sustainable, alongside, the grant portion of the NWPGCL, it would seek participation of entrepreneur, if any to invest into solar-wind hybrid mini-grid project besides exploring other sources of funding the pilot and these has been agreed in the fifth (5th) Project Steering Committee (PSC) meeting held on 18 October 2018  One of the key critical risk of this project was to find an investor/sponsor to contribute 50% equity for this project to make it more sustainable which delayed the whole process. SREPGen, SREDA and IDCOL looking for investors in this regard received another proposal from Greentech Megawatt Bangladesh Pvt (GMBPL) to install a 225 kW wind project at South Sakuchia Union of Monpura, Bhola. The proposed project cost is BDT 5.65 crore out of which 50% will be injected as equity by Greentech Megawatt Bangladesh Pvt. Ltd. (GMBPL) and the remaining 50% will be provided as grant by SREPGen through IDCOL. The proposed wind project will be integrated with the 279.5 kW mini-grid project.  Earlier, a 100 kW wind turbine was proposed to be installed at the site. However, considering the future prospect and economies of scale, a 225 kW wind turbine was considered. Further, the partnership agreement between wind part investor (GMBPL) and solar part investor (WREL) took some time and was facilitated by SREPGen, SREDA and IDCOL for operation of solar-wind hybrid mini-grid project. |
| Operational | Delays in Financing Waste to Energy Project:  A pilot Waste to Energy (W2E) project was planned to be implemented under SREPGen Project. A proposal for such pilot Waste to Energy (W2E) project had been received for Kustia which was reviewed by SREDA and IDCOL.  SREPGen is considering to provide grant financing to a 100 KW Municipal Solid Waste (MSW) to Electricity Generation Plant at Kushtia by Waste Power Pty Ltd (WPPL). The proposed project will use gasification technology to produce electricity which will be sold to Bangladesh Rural Electrification Board (BREB). The plant will be installed, operated and maintained by WPPL for a term of 20 years. It will be located at the municipal waste dumping ground of Kushtia. The municipality has agreed to provide 29.63 decimal land to WPPL for implementing the project under a Land Lease Agreement. It has agreed to take responsibility for garbage collection and delivery to the project site.  The main risk here was to find a business case for waste to energy project in small municipality so that it can be replicated in 500 such municipalities in the country. Power Division verbally informed that it could at best offer 15 BDT per kW electricity to be generated from this W2E project to keep the market stable. As per IDCOL analysis, this tariff can make the project viable only if 65% grant can be provided from SREPGen and high-powered IDCOL board approved this accordingly.  A Memorandum of Understanding (MoU) has been executed between SREDA and Kushtia Municipality in this regard. A Power Purchase Agreement (PPA) will be executed between WPPL and BREB under which the latter will purchase electricity from the project company. The proposed tariff of BDT 15 per kWh for a 20 years term is under consideration of Power Division. Power Division is expected to approve the tariff proposal shortly.  SREDA will facilitate to issue a Power Purchase Agreement (PPA) for this waste to energy project in Kushtia through Power Division which is the critical issue right now.  Total cost of this pilot project is BDT 5.38 Crore which will be financed with a combination of grant and equity. The financial structure of Grant (65%): Equity (35%) will be presented in the SREPGen Steering board scheduled on 11-09-2019. IDCOL will be involved to provide monitoring and evaluation (M&E) services to SREDA for this waste to energy project for the duration required by SREDA. SREPGen Project will commission IDCOL following appropriate method (e.g. Single Source Selection) in this regard.  Two critical issues are thus: approval of the proposed financial structure of Grant (65%): Equity (35%) for this waste to energy project by the SREPGen Steering board and PPA signing with the power off-taker at the rate of 15 BDT per kW. |

# Adjustments

**Comments on delays in key project milestones**

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| **Project Manager: please provide comments on delays this reporting period in achieving any of the following key project milestones: inception workshop, mid-term review, terminal evaluation and/or project closure. If there are no delays please indicate not applicable.** |
| Not applicable |

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| **Country Office: please provide comments on delays this reporting period in achieving any of the following key project milestones: inception workshop, mid-term review, terminal evaluation and/or project closure. If there are no delays please indicate not applicable.** |
| Not applicable |

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| **UNDP-GEF Technical Adviser: please provide comments on delays this reporting period in achieving any of the following key project milestones: inception workshop, mid-term review, terminal evaluation and/or project closure. If there are no delays please indicate not applicable.** |
| Not applicable for this period. However, it is noted that the mid term review recommendations have been considered for implementation during this reporting period. |

# Ratings and Overall Assessments

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| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **Project Manager/Coordinator** | Highly Satisfactory | *- IP Rating provided by UNDP-GEF Technical Adviser and UNDP Country Office only -* |
| Overall Assessment | The DO rating for this tenure is ‘Highly Satisfactory’ as the project is very close to exceed its end-of-project target and is likely to achieve transformational change by the end of the project. The project has already demonstrated some outstanding practices to achieve sustainable growth in the renewable energy share of power generation and the GoB’s vision of universal access to energy for all the year 2021. Objective level achievement of the project is on-track and the project has already achieved outcome-1 and outcome-3. The remaining outcome-2 and outcome -4 are also on-track. In this reporting period, the following outstanding practices are observed to make transformational changes in the renewable energy sector of the country:  Outcome 1: Policy Support and Capacity Building (DO Rating-Achieved):  This component addresses the barrier concerning the lack of appropriate policy and regulatory framework for RE (Renewable Energy) power investment. The following outputs are contributed to achieve this outcome:  1.1 Renewable Energy (RE) power generation action plan 2019-2041  1.2 Net Energy Metering Guideline  1.3 Feasibility study for Waste to Energy (W2E) generation in six (6) municipalities  1.4 Regulations for standards of PV system parts and guidelines for preferred PV system parts  1.5 Regulations and institutional plans for disposal of PV systems wastes (e.g. panels, batteries)  1.6 Guideline for grid integration of solar PV-diesel hybrid mini-grid  1.7 Grid integration of solar PV water pumps  1.8 Assessment of base-level standard tariff for utility-scale solar Independent Power Producer (IPP) projects considering the local climatic, geographic and grid condition and power evacuation facilities  1.9 Template agreements for rooftop solar and its grid integration  Outcome 2: Resource Assessment Support Program  2.1 National Photovoltaic (PV) Resource Assessment Study  2.2 Study on comprehensive assessment of biomass fuels for power generation  2.3 Wind resource assessment through Solar - Wind Hybrid System in Monpura, Bhola  Outcome 3: Affordable Photovoltaic Power for Low-income Households and Associated Livelihood Enhancement  3.1 Solar mini-grids in Manpura Island with capacities of 281 kW and 218.5 kW  3.2 Distribution of 5000 solar lanterns to low-income households  Outcome 4: Renewable Energy Investment Scale-up  4.1 Piloting of five solar boats; A business model for commercial scaling up of solar boats has been prepared and five boats have been handed over to SREDA  4.2 A pilot Waste to Energy (W2E) project in Kushtia (100 kW)  4.3 Energy assisted ice plant in Char Montaz, Rangabali, Patuakhali  4.4 Piloting of ‘Pico Hydro Power Plant’ project in NaitongPara Village, Ruma, Bandarban  4.5 Charging stations in Gazipur and Mymensingh (for tri-wheeler)    1.1 RE(Renewable Energy) power generation action plan 2019-2041: This action plan will assist to develop a systematic approach and fix a benchmark that could be followed for solar PV project planning and formulation in Bangladesh.    1.2 Net Energy Metering Guideline & Handbook: It is developed to support the Government of Bangladesh to develop a net metering policy and prepare a guideline for individual solar electricity generation. Net energy metering (NEM) is allowing prosumers (producer + consumer) to connect their renewable energy systems to the distribution grid. The mechanism allows for the export of energy (e.g. electricity) generated from distributed renewable energy sources in exchange of credits in the form of energy or money. This method of sharing energy is often termed as ‘Energy Banking’. It is popularizing RE (Renewable Energy) based rooftop or grid-tie system in the country. At least 600 MW of the prospective capacity will be installed within 2020 under net metering,    1.3 Regulations for standards of PV system components and guidelines for preferred PV system parts: The ultimate objective of this guideline is to allow the government to control the quality of the solar PV products in the country, which will eventually boost up the customer’s confidence and will make the PV system component market sustainable.  1.4 Regulations and institutional plans to enforce the proper disposal of PV system wastes (e.g. panels, batteries): The waste management of solar photovoltaic (PV) systems is more difficult in rural areas where the systems are generally placed in isolated and underdeveloped areas that are difficult to access, making collection very problematic. Another major challenge in PV waste management is that the main components of PV panels and batteries demand their own waste management strategy. PV panels and batteries are entering the waste cycle at different times, panels after more than 25 years and batteries usually in five years; the amount of waste generated is different, and their components need specific treatment to avoid environmental impacts. It will be assisting SREDA to develop regulations and institutional plan to enforce the proper disposal of PV system wastes, including batteries and panels.  1.5 Guideline for grid integration of solar PV-diesel hybrid mini-grids: It is apparent that grid integration will reduce the utilization of the battery storage. But at the same time, the cost breakdown of off-grid solar mini-grid projects in Bangladesh shows that the storage system (batteries and protection units) has the highest cost contribution (~20.5%). Therefore, technically reliable and financially viable solutions should be devised well ahead of time to address challenges of solar powered mini-grid integration, particularly the ones with battery backup. It will address the issue of devising technical and financial solutions for integrating solar PV mini-grids with battery backup into the national grid. The potential impacts are substantial contribution in reduction of battery cost and considerable amount of reduction of CO2 emission. The highest tariff is needed after grid parity in three years which is BDT 24. The lowest tariff is observed after 11th years to be BDT 16 when IDCOL’s repayment is over    1.6 Grid integration of solar PV water pumps: Around 1.31 million or 81% of the total irrigation units are powered by diesel, resulting in an annual consumption of 1 million tons of diesel worth nearly 770 million US$. Currently, 1158 nos. of solar irrigation pump with capacity 22.25 MW are in operation in Bangladesh. It reduces the consumption of 884 tons of diesel and 1045 tons of CO2 emission annually. To work towards this end, a new target has been set of installing 50,000 solar irrigation pumps by 2025. It will assist Sustainable Renewable Energy Development Authority (SREDA) to develop technical and financial solutions for the national grid integration of solar irrigation pumps during off-season. It will support existing policy, technology and applications of solar irrigation pumps to devise possible grid connection modes providing interconnection requirements, protection schemes and safety guidelines for the safe and efficient operation of grid-connected SIPs.  1.7 Assessment of base-level standard tariff for utility-scale solar IPP projects considering the local climatic, geographic and grid condition and power evacuation facilities: Bangladesh aims to achieving universal access to electricity for joining the ranks of middle-income countries by 2021. The government has targeted an increase in its power generation capacity to 24 Gw by 2021. Electricity generation now largely relies on fossil fuels, the stock and supply of which is limited in Bangladesh. In view of the challenges of primary fuel sourcing and supply, the Government of Bangladesh has recently developed the power generation strategy based on fuel diversification to enhance energy security. Alongside the conventional energy sources, renewable energy will play a significant role in meeting the future demand of electricity as well as fulfilling environmental obligations. It will assist Ministry of Power, Energy and Mineral Resources (MoPEMR) to develop a suitable tariff structure for unsolicited private sector IPPs’ attempting to develop large-scale solar PV projects in Bangladesh.  1.8 Template agreements for rooftop solar and its grid integration: To date, the installed capacity of solar energy installations is 339 MW where most of the recent installed capacity consist of standalone solar home systems (SHSs). Altogether, there are nearly 5.2 million SHSs installed mainly in the off-grid and remote areas of Bangladesh. Despite huge potential, grid-connected electricity consumers are yet to reap the benefits of solar energy. Every on-grid household, commercial or industrial consumer can utilize solar energy to produce electricity by installing solar photovoltaic (PV) panels on their own roofs. By doing that they can meet their own electricity demand by themselves either partly or fully and can sell any excess electricity to the distribution utilities if appropriate policies are in place. It will assist Ministry of Power, Energy and Mineral Resources (MoPEMR) to develop and finalize an agreement template for rooftop solar PV systems for net metering scheme in Bangladesh as well as will be applicable for large scale Build Own Operate Model (BOO) rooftop systems. The approved systems to sell excess electricity to the grid under the scope of net energy metering scheme promoted by the Government of Bangladesh (GOB)    Outcome 2: Resource Assessment Support Program (DO rating-On-track): This component is intended to address the barriers associated with the lack of reliable RE data that can be used by prospective RE project developers and investors.  2.1 National Photovoltaic (PV) Resource Assessment Study: This project facilitates both private and public-sector investments in renewable energy projects and scale up contributions existing renewable energy-based electricity production through installation of solar irradiance monitoring stations at multiple location across Bangladesh. Generally, the design of solar energy systems needs to be tailored depending upon the solar energy availability at a specific location. Hence, the knowledge of the availability of solar radiation and its intensity distribution at the place of interest are the primary requirements for the designer of solar energy systems. Until now in Bangladesh, there is no such monitoring program which continuously monitor the solar irradiance at high temporal and spatial resolution. The project will install solar irradiance monitoring stations at seven different locations in Bangladesh apart from this National Photo Voltaic (PV) Resources Assessment study will be conducted, which will inform the spatial and temporal patter of solar irradiance in Bangladesh. Subsequently, SREDA officials will be trained also to handle the equipment to be installed under this project and other related software. Established web-based solar irradiance site will provide near-real time data for the public. The National PV resources assessment studies will provide detail insight about the PV resources, its intensity over large spatial extent, which will support the policy makers as well as investors to find the optimal and suitable locations for solar PV investment projects.      2.2 Study on comprehensive assessment of biomass fuels for power generation In Bangladesh, about 95% of households gather or purchase biomass energy for cooking whereas in rural areas mostly use fuel wood, cow dung in the form of cake or stick, jute sticks or other agricultural wastes for cooking. Since Bangladesh is an agrarian country, biomass is one of the potential renewable energy sources for further exploration. The estimated total amount of biomass resource available for energy in Bangladesh in 2012-2013 is 90.21 million tons with the annual energy potential of 45.91 million tons of coal equivalent. So under this activity, it has been planned to study the availability of different type of Biomass fuels (e.g. tree residue, agriculture residues and animal dung & poultry litters, municipal solid wastes, industrial wastes etc.) and to assess their actual availability after meeting the countrywide demand and prospects for generation of electricity. The recoverable amount of biomass (90.21 million tons) in 2012-2013 has an energy potential of 1344.99 petajoule (PJ) [equivalent to 373.71 trillion watt-hour (TWh) of electricity]    2.3 Wind resource assessment through Solar - Wind Hybrid System in Monpura, Bhola: It is essential to investigate the potential for wind energy utilization in Bangladesh in further detail for storage and the challenges in maintaining the mini-grid system. Wind resource has been underutilized in Bangladesh until now. Therefore, an initiative has been taken under SREPGen project to study various aspects related to the integration of a 100 kW wind turbine into the solar mini-grid at Monpura Island, Bhola. The island, with an area of 373 km2, is located in the southern coastal region of Bangladesh and is inhabited by 67,304 people as per the census of 2001. This hybrid system will supply electricity to surrounding 1200 households, 444 shops, 58 social and government institutions and 276 other industrial customers. Wind resources assessments study will be conducted also along with synchronizing of solar-wind system. It is a Introduction of first of its kind hybrid system (e.g. Solar-wind hybrid system) in the country which is more cost effective compared to wind-alone system or PV alone system resulting low tariff rate    Outcome 3: Affordable Photovoltaic Power for Low-income Households and Associated Livelihood Enhancement(DO rating-achieved).  3.1 Solar mini-grids in Manpura Island with capacities of 281 and 218.5 kW: Solar mini-grids provide low-emission grid quality electricity to households and small commercial users and thereby encourage commercial activities in the project areas. The per unit production cost of electricity is Tk 30. Currently, 20 mini-grids are in operation in off-grid areas of the country. 50% of the mega-infrastructural production cost comes from grants with an equity 20% and remaining 30% of funding is being provided by Infrastructure Development Company Ltd. (IDCOL) at a low interest rate. One mini-grid will increase access to electricity to 1200 households, 444 shops, 58 social and government institutions and 276 other industrial customers along with creating local level jobs both directly and indirectly    Outcome 4: Renewable Energy Investment Scale-up(DO rating-on-track).  4.1 Solar energy assisted ice plant in Char Montaz, Rangabali, Patuakhali  The fisheries sector plays a very important role in the national economy, contributing 3.69% to the Gross Domestic Product (GDP) of the country. More than 17 million people including about 1.4 million women depend on the fisheries sector for their livelihoods through fishing, farming, fish handling, and processing. Due to a lack of electricity or any other source of energy, there is no ice plant on the island to produce ice for the preservation of the fish before selling in the market, resulting in lower prices for fish. Upokulio Biddutayan O Mohila Unnayan Samity (UBOMUS) has selected Char Montaz Island for installing a solar powered ice plant so that the local fishing community can get ice easily at a minimum price. People will be directly benefited through the project by saving their time and money in getting ice for preserving fish. Capacity building of UBOMUS will support island community in improving their livelihood by making ice available. Also, the quality of fish will be better for a longer time. The project will produce 2.5 tons of ice per day for the fishing community to preserve their fish to improving livelihood condition of the local poor fishing community (about 10,000 vulnerable households) by increasing the level of income along with creating new income earning source for the fishing community particularly for women.  4.2 Piloting of ‘Pico Hydro Power Plant’ project in NaitongPara Village, Ruma, Bandarban  The project will develop a decentralized track for sustainable electrification in the remote areas of Chittagong Hill Tracts’ districts based on renewable energy generation through micro- and mini-hydro power plants in order to improve the living condition of indigenous people. A total of 62 households will have access to electricity including community establishments (e.g. temple, primary school and community rice mill), which will also help them to creating employment opportunity among the local community through small handicraft item making and handloom activity.  Piloting W2E project at Kushtia Pourashava through private sector and implementation of Solar-Wind Hybrid Mini-grid at Manpura Upazila of Bhola district were the big risk factors for this project but the problems have been overcome through consultation with wide range of stakeholders such private investors (national and international), Danish Embassy and different government entity as well.    SREPgen is a thought provoking and knowledge driven first of its kind project pertaining to renewable energy sector in the country, where every interventions are unique and innovative. The project has already demonstrated wide range of outstanding practices to make transformative change in the RE sector of Bangladesh. The project is about to reach its desired objective making a balance progress in all component within a couple of month which will have a catalyzing replication of RE based power generation project in the country. | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **UNDP Country Office Programme Officer** | Highly Satisfactory | Highly Satisfactory |
| Overall Assessment | During this reporting period, the project has made substantial stride to achieve its desired objective and a well-balanced progress has been made in major components. The overall DO rating in this tenure is ‘Highly Satisfactory’. Components wise progress ratings are as follows: Overall – Satisfactory, Objective Achievement –Highly satisfactory, Outcome 1 (Policy/ SREDA Promotion) Achievement - Highly Satisfactory (as project is on-track to exceed its end of project target), Outcome 2 (Resource Assessment) Achievement – Satisfactory, Outcome 3 (PV Power for the Poor without Electricity) Achievement – Highly satisfactory, Outcome 4 (RE Investment Scale-up) Achievement – Satisfactory. Project implementation and adaptive management rating is Satisfactory. The potential project risks related to Piloting W2E project at Kushtia Pourashava through private sector engagement and installation of Solar-Wind Hybrid Mini-grid at Manpura Upazila of Bhola district have been identified through taking care of proper mitigation measures in time. IDCOL is assessing proposals and will be placed before IDCOL board soon. Such piloting of 100 kW Waste to Energy (W2E) project will be implemented in Kustia as per current decision. Pursuing the sponsor and IDCOL is the main strategy here. Solar mini-grid in Manpura Upazila of Bhola district with 279.5 kWh capacity has been financed from SREPGen and will be operational by July. This mini-grid will be converted as Solar-Wind hybrid system and IDCOL is currently assessing proposals and will be placed before IDCOL board soon. Pursuing the sponsor and IDCOL is the main strategy here. SREPgen has opened up new window of opportunity in terms of policy and regulation development, resource assessment, providing RE power to the ultra-poor and investment and scale up. Progress rating under each component is as follow:  Component 1: Progress Rating (Achieved):  Component 1, the “RE Policy and Regulatory Support Program,” is the component that has achieved satisfactory progress since the inception of the project and the output documents which are developed under this component are such as Renewable Energy (RE) power generation action plan 2019-2041, Net Energy Metering Guideline, Regulations for standards of PV system parts and guidelines for preferred PV system parts, Regulations and institutional plans for disposal of PV systems wastes (e.g. panels, batteries), Guideline for grid integration of solar PV-diesel hybrid mini-grid, Grid integration of solar PV water pumps, Assessment of base-level standard tariff for utility-scale solar Independent Power Producer (IPP) projects considering the local climatic, geographic and grid condition and power evacuation facilities and Template agreements for rooftop solar and its grid integration  Component 2: Resource Assessment Support Program (Progress rating-On-track):  i. National Photovoltaic (PV) Resource Assessment Study: This National Photo Voltaic (PV) Resources Assessment study will inform the spatial and temporal patter of solar irradiance in Bangladesh to find the optimal and suitable locations for solar PV investment projects.  ii. Study on comprehensive assessment of biomass fuels for power generation: The recoverable amount of biomass (90.21 million tons) in 2012-2013 has an energy potential of 1344.99 petajoule (PJ) [equivalent to 373.71 trillion watt-hour (TWh) of electricity]  iii. Wind resource assessment through Solar - Wind Hybrid System in Monpura, Bhola: It is a first of its kind hybrid system (e.g. Solar-wind hybrid system) in the country which is more cost effective compared to wind-alone system or PV alone system resulting low tariff rate      Component 3: Affordable Photovoltaic Power for Low-income Households and Associated Livelihood Enhancement (Progress rating-achieved):  i. Solar mini-grids in Manpura Island with capacities of 281 and 218.5 kW: These mini-grids will provide access to grid quality electricity to the nearby households, shops, social and government institutions and other industrial customers along with creating local level jobs both directly and indirectly    Component 4: Renewable Energy Investment Scale-up (Progress rating-on track):  I. Solar energy assisted ice plant in Char Montaz, Rangabali, Patuakhali: About 10000 vulnerable households particularly women will get new income earning source in the fishing community.  II. Piloting of ‘Pico Hydro Power Plant’ project in NaitongPara Village, Ruma, Bandarban A total of 62 households will have access to electricity including community establishments (e.g. temple, primary school and community rice mill).  The project is proving support to women headed households, indigenous people and people who are hard to reach area with particular focus on women empowerment. Environmental and social safeguards issues are properly addressed during this reporting tenure. The cumulative GL delivery against expected delivery as of this year: 63.3% and cumulative disbursement as of 30 June (USD):2,581,006.    First solar freezer/ ice making plant has first started its operation in July 2019. It has been planned to install a solar-wind hybrid ice making plant in the coming year as a second venture. Currently, consultation and proposal seeking process have been undergoing. There is some risk for this item in this year due to new and innovative nature of such system.  RE online and map based database development initiative has undertaken which will be the unique online map based database for Bangladesh. Two ToRs for two ICs (GIS with 70 working days and ICT with 60 working days) have been prepared. Procurement process will start shortly through quick procurement process.  Mobilizing private sector for innovative technology oriented business takes lot of time. Procurement for viability gap financing for such business is highly challenging and new in UNDP system. Blended financing modality needs to be incorporated in UNDP's procurement system. Currently, Only IDCOL is exercising this blended equity+loan+grant financing model. SREPGen is also mobilizing through IDCOL. Renewable energy sector is experiencing innovation every now and then therefore flexibility and pro-innovation are the main lessons of this project. | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **GEF Operational Focal point** | *(not set or not applicable)* | *- IP Rating provided by UNDP-GEF Technical Adviser and UNDP Country Office only -* |
| Overall Assessment | *(not set or not applicable)* | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **Project Implementing Partner** | *(not set or not applicable)* | *- IP Rating provided by UNDP-GEF Technical Adviser and UNDP Country Office only -* |
| Overall Assessment | *(not set or not applicable)* | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **Other Partners** | *(not set or not applicable)* | *- IP Rating provided by UNDP-GEF Technical Adviser and UNDP Country Office only -* |
| Overall Assessment | *(not set or not applicable)* | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **UNDP-GEF Technical Adviser** | Highly Satisfactory | Highly Satisfactory |
| Overall Assessment | The project is justified for Highly Satisfactory DO and IP ratings as explained below:    The project faced initial challenges due to changed market context and commissioned MTR to address those challenges and considered mid-course corrections. Accordingly, the project received extension for another 18 months until May, 2020 with a renewed strategy and is thus in its final year of implementation.    During the reporting period, the project managed to expedite major activities in line with the MTR recommendations and demonstrated exceptional adaptive capacity and instituted several innovations through partnerships with private sector and IDCOL, the financial institution and civil society partners.    The project aims for reduction in the annual growth rate of GHG emissions from fossil fuel-fired power generation through the exploitation of Bangladesh’s renewable energy resources for power generation.    Against the EOP target level of GHG reduction of 1.6 million tons, the project has achieved 1.2 million tons. The share of renewable energy in the energy mix stands at 3.08% against the EOP level of 6%. It is noted that the installed capacity of 585 MW is serving 12% of the total population of which 90% is from hard to reach areas. Hence the DO rating of “highly satisfactory” can be endorsed even though the financial delivery is at 63% but with a year of implementation remaining. SREDA, the implementing partner has pursued the engagement of private sector in pilot projects including a Waste to energy project among others and thus demonstrating different business models for promoting the RE sector.    The following presents the progress of the 4 components in the project:    Outcome 1: SREDA evolves into a facilitation center to support private sector RE investment development, enable regulators to determine fair flexible tariff structures, bring confidence to private RE investors, and increase the number of approved RE projects  The Outcome relates mainly relates to Policy support and capacity building component of the project. Under this Component, the project has supported a comprehensive capacity needs assessment along with a three-year training plan for SREDA and development of RE power generation action plan 2019-2041; and is continuing consultations with Public and other stakeholders for streamlining the interventions for RE sector. Specific outputs included finalization of the Energy Net Metering Guideline, Net Metering Action Plan and technical studies and assessments related to tariffs for Solar IPP projects, grid integrated solar pumps and roof tops and regulations on solar waste disposal and standards. The EoP target for this outcome has been achieved.    Outcome 2: Increased capacities of relevant government agencies to generate, process, obtain and disseminate reliable RE resource information for use by Government of Bangladesh and potential project developers and investors relates to Resource Assessment Support Program component    This Outcome again relates to Policy support and capacity building component of the project. The compilation of data for national level resource assessment studies for the supply and demand of biomass fuels in 64 districts for base year 2015 with projections till 2020 has been completed along with National solar action plan from 2019-2041. Since wind resources assessment has been carried out by Government of Bangladesh for 90% of the regions, the project supports a study for the remaining 10% of the wind resources assessment study at Monpura and targeting completion by Dec 2019. The project is also piloting a W2E project in Kushtia municipality and exploring innovative business models for its implementation. Hence, the Outcome is on track.    Outcome 3: The Outcome is updated to "Increased affordability of photovoltaic solar (including LED lanterns (PVSLs)) and other Renewable Energy Power system for low income households" (based on MTR recommendation, the outcome is broadened)  The outputs under this outcome were enhanced to include RE systems at large as solar lanterns alone could not reach the targeted population. Hence, offgrid systems were included and potentially providing direct access to power to 6000 households (Tier1) and 2500 (Tier 3+) and with two Solar mini-grids in Manpura Island with capacities of 279 kw and 218.5 kW that started its trial run during this reporting period. Further, a 225 kW wind turbine will be integrated into the solar mini-grid with cofinancing from IDCOL. Indirect Tier 1 and Tier 3 access to power have been estimated at 50000 and 30000 households, which will be 40000 HH after the wind -solar hybrid is functional. The EoP targets have been achieved.    Outcome 4: Renewable energy accounts for an increased share of Bangladesh’s power generation mix related to Renewable energy investment scale-up component  For several of innovative investment pilots considered and demonstrated with potential scale up under this project, appropriate business models have been pursued for replication through mainstreamed IDCOL financing structures. Notable pilots included many areas/subsectors: a) operationalizing solar boats b) Solar Charging Stations in Gazipur and Mymensingh for charging electric easy –rides with 21 kW capacity each c) Waste to Energy (W2E) generation feasibility study in 6 municipalities conducted; d) Arsenic removing solar PV pumps and e) Solar freezers/ ice makers; these applications of RE form possible ways for integrated load for mini-grids to enhance its viability. Hence, the risks of replication of some of these pilots as noted in the earlier reporting period are being addressed with appropriate partnership efforts. While this outcome is considered on track, it is recommended that the efforts may be intensified for replication of proven innovative business models to manage the noted operational risks earlier.  .  Overall, the project team has made considerable efforts in this extended period for bringing the project back on track and already achieving the target set out in the two out of the four Components with satisfactory cumulative financial delivery. The project may continue to address the risks of pilot replication and institutionalize the support needed for accelerated replication of the pilots towards achieving the EOP targets as well as increased shared of renewables in the overall energy mix. The enabling framework with specific policy, institutional and capacity development elements have provided a basis towards market transformation. Some of the innovative renewable energy applications such as ice making are considered best practices for enhanced impact of livelihood in offgrid areas benefiting marginal, poor people and women, in particular.    Once again, DO and IP ratings for this period are thus considered Highly Satisfactory. | |

# Gender

**Progress in Advancing Gender Equality and Women's Empowerment**

This information is used in the UNDP-GEF Annual Performance Report, UNDP-GEF Annual Gender Report, reporting to the UNDP Gender Steering and Implementation Committee and for other internal and external communications and learning.  The Project Manager and/or Project Gender Officer should complete this section with support from the UNDP Country Office.

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| **Gender Analysis and Action Plan:** *not available* |
| **Please review the project's Gender Analysis and Action Plan. If the document is not attached or an updated Gender Analysis and/or Gender Action Plan is available please upload the document below or send to the Regional Programme Associate to upload in PIMS+. Please note that all projects approved since 1 July 2014 are required to carry out a gender analysis and all projects approved since 1 July 2018 are required to have a gender analysis and action plan.** |
| *(not set or not applicable)* |

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| **Please indicate in which results areas the project is contributing to gender equality (you may select more than one results area, or select not applicable):** |
| Contributing to closing gender gaps in access to and control over resources: No |
| Improving the participation and decision-making of women in natural resource governance: No |
| Targeting socio-economic benefits and services for women: Yes |
| Not applicable: No |

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| **Atlas Gender Marker Rating** |
| **GEN1:** some contribution to gender equality |

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| **Please describe any experiences or linkages (direct or indirect) between project activities and gender-based violence (GBV). This information is for UNDP use only and will not be shared with GEF Secretariat.** |
| Not applicable |

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| **Please specify results achieved this reporting period that focus on increasing gender equality and the empowerment of women.**    **Please explain how the results reported addressed the different needs of men or women, changed norms, values, and power structures, and/or contributed to transforming or challenging gender inequalities and discrimination.** |
| Gender Impacts of Energy Access  The energy poverty has serious consequences on individual’s living and social conditions and undermines educational and business opportunities. Energy poverty has four major consequences on women such as health, safety, education and economic development and empowerment.  Indoor electricity stops the burning of candles, kerosene and other highly polluting fuels and permits the use of refrigerators for food conservation and watching televisions provide information to improve health and hygiene standard. Electrification at toilet has a positive impact on women’s security because it decreases the crime rate and physical and sexual violence. Having electricity at home and in schools allows for studying and reading at night, watching TV and therefore accessing multiple information sources.  Access to electricity, reduces working hour of women as well as women get more opportunities to invest their time in income generating activity. As women contribute to the household’s income, they also benefit from personal empowerment, increase their bargaining and decision-making power domestically and improve their social status outside the home.  SREPGen Project has made available following support for gender equality;  -Distribution of 6170 PVSLs: The lives of women in rural low-income households been changing with the dissemination of PVSLs. PVSLs is improving indoor air quality and allow women and children to do other activities in the evening such as reading, learning, or performing tasks that may generate additional income for these families such as handicraft work. The improved quality of light from PVSLs is also providing women more security at night against theft and intrusion. In the long term, women will have more available income to spend on other essentials such as foods and other household needs.  -Micro hydro power plant project is giving access to electricity to 62 female headed households of indigenous community  - Solar irrigation pump project is giving focus on the female headed households who are facing constraints without access to energy for irrigation. The project also gave special attention to people with disabilities. The participation of women in local management of resources were ensured.  - Solar ice plant project is covering 10,000 households of Char Montaz Islands annually including 8,000 female headed household who are involved in fishing but unable to collect ice from distant areas. The project will focus on the female headed household who mainly face the barriers to collect ice from far distance. 80% direct beneficiaries of the project will be female and they will be given preferences. The project will also give special attention to people with disabilities. On the other hand, the female members of UBOMUS will be engaged in project management in their own locality. |

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| **Please describe how work to advance gender equality and women's empowerment enhanced the project's environmental and/or resilience outcomes.** |
| Project is giving alternative livelihood supports to women headed households which is ultimately building capacities of poor women and marginalized people. |

# Social and Environmental Standards

**Social and Environmental Standards (Safeguards)**

The Project Manager and/or the project’s Safeguards Officer should complete this section of the PIR with support from the UNDP Country Office. The UNDP-GEF RTA should review to ensure it is complete and accurate.

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| **1) Have any new social and/or environmental risks been identified during project implementation?** |
| No |

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| **If any new social and/or environmental risks have been identified during project implementation please describe the new risk(s) and the response to it.** |
| *(not set or not applicable)* |

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| **2) Have any existing social and/or environmental risks been escalated during the reporting period? For example, when a low risk increased to moderate, or a moderate risk increased to high.** |
| No |

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| **If any existing social and/or environmental risks have been escalated during implementation please describe the change(s) and the response to it.** |
| 100 kW waste to energy project will be implemented in Kushtia municipality. Besides, wind turbine will be integrated with solar mini-grid in Monpura island. For both of these pilots. The EIA and Social management plan preparation for these projects have been initiated already. |

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| **SESP:** *not available*  **Environmental and Social Management Plan/Framework:** *not available* |
| **For reference, please find below the project's safeguards screening (Social and Environmental Screening Procedure (SESP) or the old ESSP tool); management plans (if any); and its SESP categorization above. Please note that the SESP categorization might have been corrected during a centralized review.** |
| *(not set or not applicable)* |

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| **3) Have any required social and environmental assessments and/or management plans been prepared in the reporting period? For example, an updated Stakeholder Engagement Plan, Environmental and Social Impact Assessment (ESIA) or Indigenous Peoples Plan.** |
| No |

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| **If yes, please upload the document(s) above. If no, please explain when the required documents will be prepared.** |
| *(not set or not applicable)* |

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| **4) Has the project received complaints related to social and/or environmental impacts (actual or potential )?** |
| No |

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| **If yes, please describe the complaint(s) or grievance(s) in detail including the status, significance, who was involved and what action was taken.** |
| *(not set or not applicable)* |

# Communicating Impact

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| **Tell us the story of the project focusing on how the project has helped to improve people’s lives.**  **(This text will be used for UNDP corporate communications, the UNDP-GEF website, and/or other internal and external knowledge and learning efforts.)** |
| Signature solution 1: Keeping people out of poverty  SREPGen project has operationalized two new partnership funding through IDCOL led by SREDA for setting up mini-grid (about 500MW) electricity in off grid Monpura Island through private entity like Western Renewable Energy limited and a women group managed ‘Upokulio Biddutayan O Mohila Unnayan Samity’ (UBOMUS) to install an environment friendly solar PV based ice making plant in off-grid remote island fishing community. These partnership and funding contributed towards sustainable energy solutions targeting disadvantaged and marginalized communities. Micro-Capital Grant (Non-Credit related Activities) is provided to UBOMUS for capacity development of poor women members of UBOMUS to operate and maintain an environment friendly renewable energy.  Signature solution 5: Close the energy gap  SREPGen project has operationalized two new partnership funding through IDCOL led by SREDA for setting up mini-grid (about 500MW) electricity in off grid Monpura Island through private entity like Western Renewable Energy limited and a women group managed ‘Upokulio Biddutayan O Mohila Unnayan Samity’ (UBOMUS) to install an environment friendly solar PV based ice making plant in off-grid remote island fishing community. Financing model of mini-grid is comprised of 20% sponsor’s equity, 30% concessionary loan (for 10 years from IDCOL) and 50% grants support (this case from SREPGen), which is the viable and acceptable business model for a mini-grid project in the country. Other lenders and investors are following this model for promoting renewable energy.  Approved Energy Net Metering Guideline has been supported by SREPGen which has already brought about 2.5 MW of electricity through private sector roof-top solar program into the national grid system where government is the single buyer from individual owner. This has potential of saving 4000 MW of electricity by 2030. Net-metering can potentially drive widespread implementation of distributed generation by incentivizing end-users to adopt localized power generation through renewable energy technologies such as solar. |

**Knowledge Management, Project Links and Social Media**

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| **Please describe knowledge activities / products as outlined in knowledge management approved at CEO Endorsement /Approval.**    **Please also include: project's website, project page on the UNDP website, blogs, photos stories (e.g. Exposure), Facebook, Twitter, Flickr, YouTube, as well as hyperlinks to any media coverage of the project, for example, stories written by an outside source. Please upload any supporting files, including photos, videos, stories, and other documents using the 'file lirbary' button in the top right of the PIR.** |
| Knowledge management is one of the key activities of this project. Several knowledge products have been produced with national level importance.    A. Knowledge Products    Sl# Title of Knowledge Products Type of Publication, Final draft date Publication date  1. Brochure Brochure 30 March 2018 15 April 2018  2. Internship guideline Guideline 30 March 2018 15 April 2018  3. Video documentary Audio-video 30 March 2018 15 April 2018  4. Net Metering Action Plan Action Plan 30 June 2018 15 July 2018  5. Technical and financial solutions for grid integration of solar PV water pumps Guideline 30 October 2018 15 December 2018  6. Technical and financial solutions for grid integration of solar PV mini-grids Guideline 30 October 2018 15 December 2018  7. Template agreements for rooftop solar and its grid integration Guideline 30 October 2018 15 December 2018  8. Regulations for standards for PV system parts Regulation 30 October 2018 15 December 2018  9. Guidelines for preferred PV system parts Guideline 30 October 2018 15 December 2018  10. Regulations and institutional plans for disposal of PV systems wastes (e.g. panels, batteries) Regulation 30 October 2018 15 December 2018  11. Investment grade PV resource assessment Report 30 October 2018 15 December 2018  12. RE Power Generation Action Plan for 2019-2040 (incl. PV, wind, and biomass roadmaps) Action Plan 30 June 2018 15 July 2018  13. Publication of training report Report 15 September 2018 30 November 2018  14. Workshop proceedings Report 15 September 2018 30 November 2018  15. Study report on Waste energy conversion Report 30 August 2018 30 September 2018  16. SREDA website Website 15 April 2018 30 June 2018      B. Event (Training/Workshop/Seminar/Conference/Roundtable/Dialogue/Consultation)  Sl No. Title of Event Type of event No. of Participants Tentative Date  1. High Level Policy Workshop  Renewable Energy and Energy Efficiency & Conservation: Engagement with Korean Energy Agency on Energy Audit Workshop At least 100 participants for each event 18 January 2018  2. Training on energy audit by KEA in Bangladesh Training At least 30 participants for each training 15-17 January 2018  3. Public consultations on existing Net Metering Policy and revisions Consultation program At least 100 participants for each event 30 September 2018  4. Six-week RE training program for government officials and private sector persons Training At least 30 participants for each training 15 June 2018  5. Workshops and seminars related to RE power generation Workshop At least 100 participants for each event 30 May 2018  6. Study tour to abroad Training At least 10 participants for each training 20 July 2018  7. Promotion of SREDA to press, via materials and outreach to school children Training At least 500 participants for each event 15 June 2018  8. Two to three SREDA Innovation Lab competitions Competition At least 100 participants for each event 15 October 2018  9. Exchange between government officials/ utility scale PV investors/ identification of barriers/ solutions Workshop At least 100 participants for each event 30 October 2018    Facebook page of SREPGen Project:  https://www.facebook.com/SREPGen/?ref=br\_rs    Twitter Page:  Media Coverage on Solar Boat:  https://www.youtube.com/watch?v=tkGqcduckgI  https://www.youtube.com/watch?v=kxX5RotPMTI  https://www.youtube.com/watch?v=ILiNUqwiLL8&feature=youtu.be  Blog:  http://www.bd.undp.org/content/bangladesh/en/home/presscenter/articles/2018/08/08/Photovoltaic\_boats.html |

# Partnerships

**Partnerships & Stakeholder Engagment**

Please select yes or no whether the project is working with any of the following partners. Please also provide an update on stakeholder engagement. This information is used by the GEF and UNDP for reporting and is therefore very important!  All sections must be completed by the Project Manager and reviewed by the CO and RTA.

|  |
| --- |
| **Does the project work with any Civil Society Organisations and/or NGOs?** |
| Yes |

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| --- |
| **Does the project work with any Indigenous Peoples?** |
| Yes |

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| --- |
| **Does the project work with the Private Sector?** |
| Yes |

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| --- |
| **Does the project work with the GEF Small Grants Programme?** |
| No |

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| --- |
| **Does the project work with UN Volunteers?** |
| No |

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| --- |
| **Did the project support South-South Cooperation and/or Triangular Cooperation efforts in the reporting year?** |
| No |
| Yes |

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| --- |
| **CEO Endorsement Request:** [PIMS 3948 BD SREPGen CEO Endorsement Request 070813.docx](https://undpgefpims.org/attachments/3948/212947/1643137/1643418/PIMS%203948%20BD%20SREPGen%20CEO%20Endorsement%20Request%20070813.docx) |
| **Provide an update on progress, challenges and outcomes related to stakeholder engagement based on the description of the Stakeholder Engagement Plan as documented at CEO endorsement/approval (see document below). If any surveys have been conducted please upload all survey documents to the PIR file library.** |
| List of Stakeholders and Proposed Roles on the SREPGen Project  Stakeholder Role  Government Stakeholders Update on progress  Ministry of Power Energy and Mineral Resources (MoPEMR) Role on the SREPGen Project  MoPEMR through its Power Division will be the Project implementing partner accountable to the Government of Bangladesh and UNDP for: (i) the successful implementation of the Project; (ii) mobilization of all resources including needed co-financing for the project implementation; (iii) the proper coordination among all related ministries, agencies, provinces and stakeholders involved in the project implementation; (iv) managing the day-to-day operations of the Project implementation as per approved work plans.  The Power Division will be responsible for developing a functional SREDA to promote RE&EE programs of the Government; provide guidance on RE&EE policy and its implementation; and oversight of demonstration programs of the Project. The fifth(5th) PSC (Project Steering Committee) meeting of Development of Sustainable Renewable Energy Power Generation (SREPGen) Project was held on 18 October 2018 in the conference room of Power Division, 10th Floor, Bidyut Bhaban, Dhaka-1000. Dr. Ahmad Kaikaus, Secretary, Power Division and Chairperson of the committee chaired the meeting.  After threadbare discussion following noteworthy decisions were made at the meeting:  1.SREPGen Project is recommended to finance grant portion (50% of total cost as per IDCOL’s practiced business model) for two solar mini-grid projects with each capacity of 279.5 kWp and 218 kWp to be implemented by the Western Renewable Energy Limited at South Sakuchia Union and South Monpura Union of Monpura Upazila under Bhola district respectively based on the Financing Agreement signed between IDCOL and SEREPGen on 20 November 2017.  2 North West Power Generation Company Ltd. (NWPGCL) will contribute 50% of the total cost for integrating preliminary planned 100 kw wind-turbine with the 279.5 solar mini-grid project at South Sakuchia Union, Monpura Upazila and SREPGen will provide rest 50% of the total cost. In such case, GoB (SREDA & NWPGCL) will own the wind turbine system and will consider leasing it to the mentioned solar mini-grid owner for smooth operation or any other appropriate operation model after construction of such system.  A baseline study will be commissioned to provide an information base to monitor and assess the activity's progress and effectiveness to be tracked by the SDG indicators after the operationalization of the planned mini-grid at Manpura.  SREPGen will consider financing waste to energy (W2E) for Kushtia municipality or elsewhere and SREPGen, SREDA and IDCOL will work together to materialize this target. SREDA and Power Division will working together for setting a suitable business tariff for the electricity produced from W2E project and to be purchased by the REB or PDB.  Sustainable and Renewable Energy Development Authority (SREDA) Role on the SREPGen Project  SREDA will be the responsible partner for development of RETs in Bangladesh. This includes development and recommendation of policies, regulations, tariffs and incentives; raising awareness on RE incentives for investors, capacity building, technical assistance and other programs approved by the Government; developing, maintaining and disseminating knowledge resources; monitoring implementation of programs, compliance with policies and regulations, and results of RET activities; and recommending to the Government actions to correct problems with compliance or other results. The seventh (7th) meeting of Development of Sustainable Renewable Energy Power Generation (SREPGen) Project was held on 1 April 2019 in SREDA. Md Helal Uddin, Chairman (Additional Secretary), SREDA and National Project Director, SREPGen Project chaired the meeting.  After threadbare discussion following decisions were made at the meeting:  1. A complete national solar irradiation study report using the installed monitoring stations will be prepared.  2. A common web-based platform will be developed for all the four datasets on solar, biomass, biogas and possibly wind so that anyone can access those produced data using user friendly interface.  3. IDCOL will galvanize the effort involving all relevant and potential stakeholders considering trade-off and synergies among multiple actors to implement the wind-Solar-hybrid project at Manpura and will evaluate and approve any of such investment proposal (e.g. proposal of a Danish Company) and approve through its board.  4. UNDP CO will be requested to initiate the bidding process at soonest for selecting investor/sponsor for 100 kWh waste to energy project at Kushtia municipality.  5. UNDP will be requested to process MCG support for implementing SIP project through Bright Green Energy Foundation (BGEF).  6. Commercialization of solar boats in the country will be promoted and a technical evaluation committee will be formed to evaluate the technical performance and effectiveness of five solar boats to have directives to take further initiative in this regard.  7. A submersible mini-hydro plant with a capacity of 20 KW in Thanchi, Bandarban will be implemented and UNDP will be requested to evaluate the feasibility of MCG modality in this regard.    Donor Agencies  UNDP A low emissions green development programme is being scoped and designed for UNDP programming during the 2014-18 period coinciding with SREPGen. This low emissions green programme will augment and support SREPGen activities to promote and sustain development of renewable energy projects and technologies in Bangladesh. Low Carbon Urban Development in Bangladesh project has been approved to be implemented soon.  Private Sector Entities and Academic Institutes  Other private investment Private investment into RETs on this project will be undertaken on 3 levels:  • Independent power producers (IPPs) who will need to have a 50% equity stake in power plants or any other on-grid power plant. SMEs or small entrepreneurs in rural areas who will have a minimum 20% equity stake in solar irrigation pumps. SREPGen is considering to provide grant financing to a 100 KW Municipal Solid Waste (MSW) to Electricity Generation Plant at Kushtia by Waste Power Pty Ltd (WPPL). The proposed project will use gasification technology to produce electricity which will be sold to Bangladesh Rural Electrification Board (BREB).  A Power Purchase Agreement (PPA) will be executed between WPPL and BREB under which the latter will purchase electricity from the project company.  Financial Entities  IDCOL IDCOL is the Government-owned infrastructure finance company. With regards to RE development, IDCOL have been continually engaged on the SHS program and other on-grid and mini-grid RE projects. IDCOL is a financial entity setup for RE financing. The proposed role of IDCOL on SREPGen is to provide financing support for on-grid power projects and solar irrigation pumps in Component 4 as well as refinancing support for entrepreneurs involved with the PVSL dissemination program in Component 3. IDCOL is responsible to assess technical and financial proposal of different Renewable Energy (RE) system along with providing follow up support, Monitoring & Evaluation responsibility and conduction research study for outcome analysis as a results of different RE system installation and development.  Civil Social Organizations  Labor unions, women’s unions and youth unions The project will closely coordinate its activities with labor unions, women’s unions and youth unions, particularly on the training of workers at plants, micro hydro power plant and solar irrigation pumps plant. -Solar irrigation pump project has engaged different local stakeholders including locally elected Bodies, Upazila department, LGED office, department of women and children affairs etc. from the designing of the project. BGEF held a number of consultations with the different stakeholders in site selection and also its implementation strategy and process. In addition, it also consulted the issue with its partner IDCOL, SREDA and UNDP from time to time. During implementation, BGEF will form a committee engaging stakeholders to monitor the progress and implementation of the project as required.  -Oporajeo and DPOD also engaged different stakeholders including locally elected bodies and Border Guard Bangladesh. Several officials of the Union and Upazila level including Chairman, ThanchiUpazila, Chairman, RumaUpazila, Mohila vice chairman; ThanchiUpazila, Headman; Thanchisadar and Tindu Area and officials from BGB and Army including CO 38 battalion, BGB, Commanding officer 16 Engineering Constriction Brigade, Bangladesh Army have been supporting the project from the very beginning with their consultation and logistic support. A graduate team of Ahsanullah University of Engineering and Technology will also join the project as a part of their coursework. |

# Annex - Ratings Definitions

**Development Objective Progress Ratings Definitions**

(HS) Highly Satisfactory: Project is on track to exceed its end-of-project targets, and is likely to achieve transformational change by project closure. The project can be presented as 'outstanding practice'.

(S) Satisfactory: Project is on track to fully achieve its end-of-project targets by project closure. The project can be presented as 'good practice'.

(MS) Moderately Satisfactory: Project is on track to achieve its end-of-project targets by project closure with minor shortcomings only.

(MU) Moderately Unsatisfactory: Project is off track and is expected to partially achieve its end-of-project targets by project closure with significant shortcomings. Project results might be fully achieved by project closure if adaptive management is undertaken immediately.

(U) Unsatisfactory: Project is off track and is not expected to achieve its end-of-project targets by project closure. Project results might be partially achieved by project closure if major adaptive management is undertaken immediately.

(HU) Highly Unsatisfactory: Project is off track and is not expected to achieve its end-of-project targets without major restructuring.

**Implementation Progress Ratings Definitions**

(HS) Highly Satisfactory: Implementation is exceeding expectations. Cumulative financial delivery, timing of key implementation milestones, and risk management are fully on track. The project is managed extremely efficiently and effectively. The implementation of the project can be presented as 'outstanding practice'.

(S) Satisfactory: Implementation is proceeding as planned. Cumulative financial delivery, timing of key implementation milestones, and risk management are on track. The project is managed efficiently and effectively. The implementation of the project can be presented as 'good practice'.

(MS) Moderately Satisfactory: Implementation is proceeding as planned with minor deviations. Cumulative financial delivery and management of risks are mostly on track, with minor delays. The project is managed well.

(MU) Moderately Unsatisfactory: Implementation is not proceeding as planned and faces significant implementation issues. Implementation progress could be improved if adaptive management is undertaken immediately. Cumulative financial delivery, timing of key implementation milestones, and/or management of critical risks are significantly off track. The project is not fully or well supported.

(U) Unsatisfactory: Implementation is not proceeding as planned and faces major implementation issues and restructuring may be necessary. Cumulative financial delivery, timing of key implementation milestones, and/or management of critical risks are off track with major issues and/or concerns. The project is not fully or well supported.

(HU) Highly Unsatisfactory: Implementation is seriously under performing and major restructuring is required. Cumulative financial delivery, timing of key implementation milestones (e.g. start of activities), and management of critical risks are severely off track with severe issues and/or concerns. The project is not effectively or efficiently supported.