المجلس العالمي للبصمة الكربونية
GLOBAL CARBON COUNCIL

Project Submission Form

V4.0- 2022

CONTENTS

COVER PAGE- Project Submission Form (PSF)	
Complete this form in accordance with the instructions attached at the end of this form.	
BASIC INFORMATION	
Title of the Project Activity as per LON/LOA	**Huai'an Diliutun Phase I 20MW Solar Power Project**
PSF version number	Version 1.1
Date of completion / Updating of this form	28/09/2022
Project Owner(s) as per LON/LOA (Shall be consistent with De-registered CDM Type B Projects)	Beijing BOE Energy Technology Co., Ltd.
Country where the Project Activity is located	People's Republic of China
GPS coordinates of the project site(s)	The geographical coordinates of the proposed project is: Longitude: 114.5236~114.5397E (114°31'25''-114°32'23''E) Latitude: 40.5981~40.6075N (40°35′53″ ~ 40°36′27″N)
Eligible GCC Project Type as per the Project Standard (Tick applicable project type)	☒ **Type A:** ☐ Type A1 ☒ Type A2 ☒ Sub-Type 1 ☐ Sub-Type 2 ☐ Sub-Type 3 ☐ Sub-Type 4 ☐ Type A3 ☐ **Type B – De-registered CDM Projects:**[1]

[1] Owners of Type B projects shall fill in the form provided in Appendix 7.

	☐ Type B1 ☐ Type B2
Minimum compliance requirements	☒ Real and Measurable GHG Reductions ☒ National Sustainable Development Criteria (if any) ☒ Apply credible baseline and monitoring methodologies ☒ Additionality ☒ Local Stakeholder Consultation Process ☒ Global Stakeholder Consultation Process ☒ No GHG Double Counting ☒ Contributes to United Nations Sustainable Development Goal 13 (Climate Action)
Choose optional and additional requirements (Tick applicable label categories)	☒ Do-no-net-harm Safeguards to address Environmental Impacts ☒ Do-no-net-harm Safeguards to address Social Impacts ☒ Contributes to United Nations Sustainable Development Goals (in addition to Goal 13)
Applied methodologies including version No. (Shall be approved by the GCC or the CDM)	ACM0002: Grid-connected electricity generation from renewable sources" (Version 20.0)
GHG Sectoral scope(s) linked to the applied methodology(ies)	GHG Sectoral Scope 1: Energy industries (renewable - / non-renewable sources)

Applicable Rules and Requirements for Project Owners

(Tick applicable Rules and Requirements)

Rules and Requirements		Version
☒ ISO 14064-2		2nd edition, 2019-04
☒ Applicable host country legal requirements /rules		
☒ GCC Rules and Requirements[2]	☒ Project Standard	V3.1
	☐ Approved GCC Methodology (XXXXX)	
	☒ Program Definitions	V3.1
	☒ Environment and Social Safeguards Standard	V2.0
	☒ Project Sustainability Standard	V3.0
	☒ Instructions in Project Submission Form (PSF)-template	V4.0
	☒ Clarification No. 01	V1.3
	☒ Clarification No. 02	V1.0
	☒ Clarification No. 03	V1.0
	☒ Clarification No. 04	V1.0
	☐ Clarification No. 05	
	☐ Standard on avoidance of double counting	
	☐ Add rows if required	
☒ CDM Rules[3]	☒ Approved CDM Methodology (ACM0002)	V20.0
	☒ TOOL 1- Tool for the demonstration and assessment of additionality	V7.0.0
	☐ TOOL 02- Combined tool to identify the baseline scenario and demonstrate additionality	
	☒ TOOL 07- Tool to calculate the emission factor	V7.0

[2] GCC Program rules and requirements: http://www.globalcarboncouncil.com/resource-centre/
[3] CDM Program rules: https://cdm.unfccc.int/Reference/index.html

		for an electricity system	
		☐ TOOL 19- Demonstration of additionality of microscale project activities	
		☐ TOOL 21- Demonstration of additionality of small-scale project activities	
		☐ TOOL 23- Additionality of first-of-its-kind project activities	
		☒ TOOL 24- Common practice	V3.1
		☒ TOOL 27- Investment analysis	V11.0
		☐ TOOL 32- Positive lists of technologies	
		☐ Guidelines for objective demonstration and assessment of barriers	
		☐ Add rows if required	
Choose Third Party Project Verification by approved GCC Verifiers[4] (Tick applicable verification categories)	☒ GHG emission reductions (i.e., Approved Carbon Credits **(ACCs)**) ☒ Environmental No-net-harm Label (**E+**) ☒ Social No-net-harm Label (**S+**) ☒ United Nations Sustainable Development Goals (**SDG+**) ☐ Bronze SDG Label ☐ Silver SDG Label ☒ Gold SDG Label ☐ Platinum SDG Label ☐ Diamond SDG Label ☒ CORSIA requirements (**C+**) ☐ Host Country Attestation on Double counting		

[4] **Note:** GCC Verifiers under the Individual Track are not eligible to conduct verifications for GCC Project Activities whose owners intend to supply carbon credits (ACCs) for use within CORSIA.

Declaration by the 'Authorized Project Owner[5] and focal point' (Tick all applicable statements[6])	The Project Owner(s) declares that: **Generic Requirements applicable to all Project Types:** ☒ We confirm that the Project Activity complies with the eligibility of the applicable project type (A1, A2, A3, B1 or B2) as stipulated by the Project Standard and relevant clarifications. ☒ We confirm that the Project Activity shall start or have started operations, and shall start or have started generating emission reductions, on or after 1 January 2016. ☒ We confirm that the Project Activity is eligible to be registered under the GCC program. We shall ensure the following for the Project Activity (tick at least one of the two options): ☒ No outcomes (e.g. emission reductions, environmental attributes) generated by the Project Activity under GCC will be claimed as carbon credits or environmental attributes under any other GHG/non-GHG[7] program, either for compliance or voluntary purposes, during the entire GCC crediting period; or ☒ If the project activity has been issued with carbon credits or environmental attributes of compensating nature[8] by any other GHG/ non-GHG program, either for compliance or voluntary purposes, the ACCs will be claimed only for the remaining crediting period (subject to a maximum of 10 years of crediting period including the periods under other programs and GCC program) for which carbon credits/ environmental attributes of compensating nature have not been issued by any other GHG/ non-GHG program. **Specific requirements applicable to respective Project Types:** ***For Project Type A1:*** ☐ For Project Type A1, we confirm that the Project Activity is NOT registered as a GHG Project Activity in any other GHG/non-GHG program or any other voluntary program and has not issued or will not issue credits under any other program.

[5] The Project Owner means the legal entity or organization that has overall control and responsibility for the Project Activity

[6] **Consequences in case of Non-compliance with declaration statements:**
If at any point of time non-compliance with the declared statements is established as a result of negligence, fraud or wilful misconduct of the GCC Project Owner/s the GCC project activity will be disqualified and the registration of the proposed Project Activity will be rejected.

[7] Non-GHG program could be such as I-REC facilitating reliable energy claims with Renewable Energy Certificate (REC) schemes

8 The environment attributes of compensating nature are those which are used by captive users (e.g. corporates/industries) for offsetting their GHG emissions

For Project Type A2 (Sub-Type 1):

☒ For Project Type A2 Sub-Type 1, we confirm that the Project Activity is NOT registered as a GHG Project Activity in any other GHG/non-GHG program or any other voluntary program and has not issued or will not issue credits under any other program.

For Project Type A2 (Sub-Type 2 or Sub-Type 3):

For Project Type A2 Sub-Type 2 or Project Type A2 Sub-Type 3, we confirm that for Project Activity, which has been registered with CDM or any GHG/non-GHG Program and we shall (tick at least one of the two options):

☐ Submit a proof for deregistration from CDM; or

☐ Submit a signed & stamped public undertaking, stating that the Project Owner will never submit any request for Issuance of ACCs or request for renewal of crediting period to CDM-EB or under article 6.4 or any authority after submission to GCC Program and shall formally inform CDM-EB or authority under article 6.4 or any authority after submission to GCC Program.

☐ For Project Type A2 Sub-Type 2 or Project Type A2 Sub-Type 3, we confirm that the Project Activity is NOT included as a component Project Activity (CPA) in any registered GHG Programme of Activities (PoA) or any other functionally equivalent grouped/aggregated activities under any GHG program (such as the CDM or any other voluntary program).

For Project Type A2 (Sub-Type 4):

For Project Type A2 Sub-Type 4, we confirm that the Project Activity has been included in a registered CDM-POA and we shall (tick at least one of the two options):

☐ Submit the proof for exclusion of CPA(s) from registered CDM-POA prior to the date of initial submission to the GCC Program; or

☐ Submit the proof of exclusion of CPA(s) from the registered CDM-PoA after the request for registration has been submitted to GCC Program but before the final decision is made by the GCC Steering Committee.

For Project Type A3:

☐ For Project Type A3, we confirm that the Project Activity is NOT registered as a GHG Project Activity in any other GHG/non-GHG program or any other voluntary program and has not issued or will not issue credits under any other program.

For Project Type B1 or B2:

For Project Type B1 or Project Type B2, we confirm that for Project Activity, which has been registered with CDM or any GHG/non-GHG Program and we shall (tick at least one of the two options):

☐ Submit a proof for deregistration from CDM; or

	☐ Submit a signed & stamped public undertaking, stating that the Project Owner will never submit any request for Issuance of ACCs or request for renewal of crediting period to CDM-EB or under article 6.4 or any authority after submission to GCC Program and shall formally inform CDM-EB or authority under article 6.4 or any authority after submission to GCC Program. **Requirements to avoid double counting:** We intend to submit or have submitted a written attestation[9] (Host Country Letter of Authorisation - HCLOA) from the host country's national focal point or focal point designee for CORSIA eligible units generated beyond 31 December 2020 at the following stages[10] (tick at least one of the three options): ☐ The initial submission for GSC; or ☐ Along with the submission for a request for registration (after Project Verification is completed); or ☒ Along with the submission for a request for the first or subsequent issuance of ACCs. **Project specific requirements:** ***CORSIA specific requirements:*** ☐ We confirm that bundled projects or grouped projects shall have registered crediting period starting on or after 1 Jan 2016 for the grouped/aggregated project as a whole. ☒ We confirm that the Project Activity meets all the requirement of the CORSIA Eligible Emissions Units[11] required for GCC projects and does not fall under the excluded unit types, methodologies, programme elements, and/or procedural classes. ☒ We confirm that the Project Activity aims to achieve at least Silver or higher SDG+ label (i.e. positively impact at least 3 or more United Nations Sustainability Development Goals). ☒ We confirm that the Project Activity will be implemented in a country which is UN member state[12]. Provide details (if any) below for the boxes ticked above:

9 In case of any change of Host Country Letter of Authorisation (HCLOA) the project owner shall inform the GCC operations team immediately

10 If the host country attestation is not submitted at the initial submission of GSC, the project can be tagged with an indicative CORSIA flag if its confirmed to be submitted later. If the host country attestation is not submitted at the request for registration, the project can be tagged with an indicative CORSIA flag if at least the PSF and Verification Report confirms to submit this letter, at first issuance. If the host country attestation is not submitted at request for first issuance, the ACCs will not be tagged as CORSIA (C+) compliant if this letter is not submitted.

11 CORSIA Eligible Emissions Units containing approval and conditions for GCC Program: https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Emissions-Units.aspx

12 The list of UN member states countries can be found at https://www.un.org/en/about-us/member-states

	The Project Owner(s) declares that: ☒ All of the information provided in this document, including any supporting documents submitted to the GCC or its registry operator IHS Markit at any time, is true and correct; ☒ They understand that a failure by them to provide accurate information or data, or concealing facts and information, can be considered as negligence, fraud or wilful misconduct. Therefore, they are aware that they are fully responsible for any liability that arises as a result of such actions. Provide details below for the boxes ticked above
Appendixes 1-9	Details about the Project Activity are provided in Appendixes 1 through 9 to this document.
Name, designation, date and signature of the Focal point (as per LON/LOA)	Ms. Zhang xiaomeng On behalf of Beijing BOE Energy Technology Co., Ltd.  28/09/2022

1. PROJECT SUBMISSION FORM

Section A. Description of the Project Activity

A.1. Purpose and general description of the Project Activity

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Huai'an Diliutun Phase I 20MW Solar Power Project (hereafter referred to as “the project”) is a newly built solar power project with total installation of 19.95MWp, consisting of 63838 PV modules. It is developed by Hebei Huanda Trading Co., Ltd and located in Diliutun Town, Huai'an County, Zhangjiakou city, Hebei Province, China.

The purpose of the Project is to utilize the solar energy at the project site to generate and supply electricity to Northern China Power Grid (NCPG). The spatial extent of the project boundary includes the project power plant and all power plants connected physically to NCPG that the project is connected to.

Prior to the implementation of the Project, the electricity delivered to the grid by the project activity would be generated by the operation of grid-connected power plants and by the addition of new generation sources into the NCPG. This is also the baseline scenario.

The Project is a renewable energy project and is expected to supply an annual average of 29,551MWh of zero-emission electricity to NCPG during the fixed 10-year crediting period, which will replace power generation of those fossil fuel-fired power plants delivered to the NCPG under the baseline scenario. The project is expected to achieve a green-house gas emission reduction of 24,435tCO_2e annually. The total emission reductions during the fixed 10-year crediting period will be 244,353tCO_2e.

The project is expected to contribute to 4 SDGs which are SDG 7, 8, 9,13.

SDG 7 Energy: The Project contributes SDG Target 7.2 “By 2030, increase substantially the share of renewable energy in the global energy mix” by the utilization of solar power as a renewable energy source.

SDG 8 Economic Growth: The Project creates direct and indirect employment opportunities during construction and operation phases, so it contributes to SDG Target 8.5 “By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities and equal pay for work of equal value”.

SDG 9 Infrastructure, Industrialization: SDG Target 9.4 requires “By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities”. The project helps the Target 9.4 by implementing a clean, reliable and environmental-friendly infrastructure for clean energy production.

SDG 13 Climate Change: The project produces clean renewable energy by diminishing CO_2 emissions. Therefore, it contributes SDG Target 13.3 “Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning”.

A.2. Location of the Project Activity

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Address and geodetic coordinates of the physical site of the Project Activity		
Physical address	**Latitude***	**Longitude***
Diliutun Town, Huai'an County, Zhangjiakou, city, Hebei Province, China.	40°35′53″ ~ 40°36′27″N (40°35′53″ ~ 40°36′27″N)	114°31’25’’-114°32’23’’E (114°31’25’’-114°32’23’’E)

Note: Geo-coordinates to presented in degree minute seconds as well in decimal place format (4 decimal places)

Figure 1 Location of the Project

A.3. Technologies/measures

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Grid connected solar PV power generation system mainly consists of Solar PV arrays, DC-to-AC converter (inverter) and substation.

The Project involves installation and operation of 63838 photovoltaic modules. Different modules with different nominal capacity were adopted including 305/310/330/325/335 for. Total capacity of the project is 20 MWp. The power generated by the Project is boosted to 35kV, and connected to

NCPG via Huai'an Diliutun 35kV substation. The electricity meters are installed at the inlet of Diliutun 35kV substation to monitor electricity export and import by the project.

The expected lifetime of the project is 25 years. The project is expected to supply an annual average of 27862.7 MWh of electricity to NCPG during the 25 years' lifetime.

Table 1 provides the main technical information of photovoltaic modules and inverters used in the Project.

The technologies employed in the project activity are advanced domestic technologies, which is no technology transfer activity involved.

Table 1 Key technological parameters of key equipment

Photovoltaic Modules					
Type	quantity	Rated maximum power (Pmp)	Optimum Operating voltage (Vmp)	Optimum Operating current (Imp)	Open circuit voltage (Voc)
TP672P-305	23250	305	36.2	8.43	45.1
TP672P-310	24954	310	36.3	8.55	45.2
TP672P-325	789	330	37.9	8.72	45.9
TP672M-330	11382	325	37.5	8.67	45.7
TP672M-335	3463	335	38.2	8.77	46

Inverters			
Quantity	Max input voltage (V)	Rated output power (kW)	Life time
33	1000	500/630	25

A.4. Project Owner(s)

Location/ Country	Project Owner(s)	Where applicable[13], indicate if the host country has provided approval (Yes/No)
P.R.China	Beijing BOE Energy Technology Co., Ltd.	No

A.5. Declaration of intended use of Approved Carbon Credits (ACCs) generated by the

[13] For example, *Project Coordination Form* is to be filled-in by Project Owners for projects located in Qatar. A written attestation from the host country's national focal point or the focal point's designee, as required by CORSIA (Refer section A.5 of the PSF guidelines).

Project Activity

>> The Project Activity is expected to generate ACCs for a full 10-year crediting period and supply the credits to offset the following GHG emissions:

Period		Name of the Entities	Purpose and Quantity of ACCs to be supplied
From	To		
13/06/2016	12/06/2026	To be determined	To be determined

ACCs from the Project will be used to create additional revenue stream for the investment and for reducing the Project financial risks and thus enabling the sustainability of the Project. No double counting will occur in the scope of this project since GCC is the only program applied.

A.6. Additional requirements for CORSIA

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Please see Section E and F.

Section B. Application of selected methodology(ies)

B.1. Reference to methodology(ies) and tools applied in the project

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Applied approved CDM methodology:

ACM0002 Grid-connected electricity generation from renewable sources (Version 20.0)

Applied CDM tools:

am-tool-01-v7.0.0 Tool for the demonstration and assessment of additionality.

am-tool-07-v7.0 Tool to calculate the emission factor for an electricity system.

am-tool-24-v03.1 Common practice.

am-tool-27-v11.0 Investment analysis.

Please refer to the following link for applied methodology and tools:

https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG

https://cdm.unfccc.int/Reference/tools/index.html

B.2. Applicability of methodology(ies) and tools applied in the project

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The project activity is grid-connected solar power projects. Version 20.0 of ACM0002 methodology is applicable to the project activities that:

Comparison of project activity characteristics and eligibility criteria of version 20.0 of ACM0002

Para No.	Applicability criteria	Justification
1	This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant. (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units. (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).	Applicable. The Project is a greenfield solar PV power plant.
2	The project activity may include renewable energy power plant/unit of one of the following types: ▪ Hydro power plant/unit with or without reservoir, ▪ Wind power plant/unit, ▪ Geothermal power plant/unit, ▪ Solar power plant/unit, ▪ Wave power plant/unit or ▪ Tidal power plant/unit.	Applicable. The Project is a grid connected solar PV power plant.
3	In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	This condition is not relevant, as the Project does not involve capacity additions, retrofits, rehabilitations or replacement.
4	In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (7), is greater than 4 W/m^2; or (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (7), is greater than 4 W/m^2; or (d) The project activity is an integrated hydro power project	This condition is not relevant, as the Project is not the installation of a hydro power plant.

	involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (7), is lower than or equal to 4 W/m^2, all of the following conditions shall apply. (i) The power density calculated using the total installed capacity of the integrated project, as per equation (8), is greater than 4 W/m^2; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity. (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m^2 shall be a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	
5	In the case of integrated hydro power projects, project proponent shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum of five years prior to the implementation of the CDM project activity.	This condition is not relevant, as the Project is not the installation of a hydro power plant.
6	The methodology is not applicable to the following: ▪ Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; ▪ Biomass fired power plants/units;	The Project does not involve any of the given criteria hence methodology is applicable for the project activity.
7	In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.	This condition is not relevant, as the Project does not involve capacity additions, retrofits, replacement or rehabilitations.

Tool	Applicability criteria	Justification
Tool for the demonstration and assessment of additionality (Version 07.0.0)	The use of the "Tool for the demonstration and assessment of additionality" is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool. Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	The methodology selected for the proposed project requires the use of this tool.
Tool to calculate the emission factor for an electricity system (Version 07.0)	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	Applicable The Project replaces grid power supply and uses this tool to calculate the values of OM, BM and CM of the Project.
	Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in "Appendix 1: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Applicable The emission factor for the Project electricity system was calculated for grid power plants.
	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	This condition is not relevant, there is no part of the power system of this project located in Annex I countries.
	Under this tool, the value applied to the CO_2	This condition is not relevant,

	emission factor of biofuels is zero.	this project is a solar PV power project.
Investment analysis (Version 11.0)	This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", the guidelines "Non-binding best practice examples to demonstrate additionality for SSC project activities", or baseline and monitoring methodologies that use the investment analysis for the demonstration of additionality and/or the identification of the baseline scenario	Applicable The Project apply the methodological tool "Tool for the demonstration and assessment of additionality".
	In case the applied approved baseline and monitoring methodology contains requirements for the investment analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	The methodology ACM0002 (Version 20.0) applied in this project requires the use of this tool to demonstrate the investment analysis of this project.
Common practice (Version 03.1)	This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality.	Applicable The Project apply the methodological tool "Tool for the demonstration and assessment of additionality".
	In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	The methodology ACM0002 (Version 20.0) applied in this project requires the use of this tool to demonstrate the common practice of this project.

B.3. Project boundary, sources and greenhouse gases (GHGs)

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The table below provides an overview of the emissions sources included or excluded from the project boundary for determination of baseline and project emissions.

Electricity generated by the project is supplied to NCPG since project started operation. Therefore, the spatial extent of the project boundary includes the project and all power plants connected physically to the NCPG that the proposed project is connected to. According to ACM0002 (version

20.0), the Greenhouse Gases ("GHG") and emission sources included in or excluded from the project boundary are shown in the following table:

Source		GHG	Included?	Justification/Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO_2	Yes	The major source of emissions in the baseline
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small
Project Activity	For dry or flash steam geothermal power plants, emissions of CH4 and CO2 from non-condensable gases contained in geothermal steam.	CO_2	No	Not Applicable. The Project is not a geothermal power plant.
		CH_4	No	Not Applicable. The Project is not a geothermal power plant.
		N_2O	No	Not Applicable. The Project is not a geothermal power plant.
	For binary geothermal power plants, fugitive emissions of CH4 and CO2 from non-condensable gases contained in geothermal steam.	CO_2	No	Not Applicable. The Project is not a geothermal power plant.
		CH_4	No	Not Applicable. The Project is not a geothermal power plant.
		N_2O	No	Not Applicable. The Project is not a geothermal power plant.
	For binary geothermal power plants, fugitive emissions of hydrocarbons such as n-butane and isopentane (working fluid) contained in the heat exchangers.	Low GWP hydrocarbon/refrigerant	No	Not Applicable. The Project is not a geothermal power plant.
	CO_2 emission from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants.	CO_2	No	Not Applicable. The Project is a solar PV power plant.
		CH_4	No	Not Applicable. The Project is a solar PV power plant.
		N_2O	No	Not Applicable. The Project is a solar PV power plant.
	For wind power plants, emissions of CH_4 from the reservoir.	CO_2	No	Not Applicable. The Project is not a hydro power plant.
		CH_4	No	Not Applicable. The Project is not a hydro power plant.
		N_2O	No	Not Applicable. The Project is not a hydro power plant.

The Project boundary is shown in the following flow diagram.

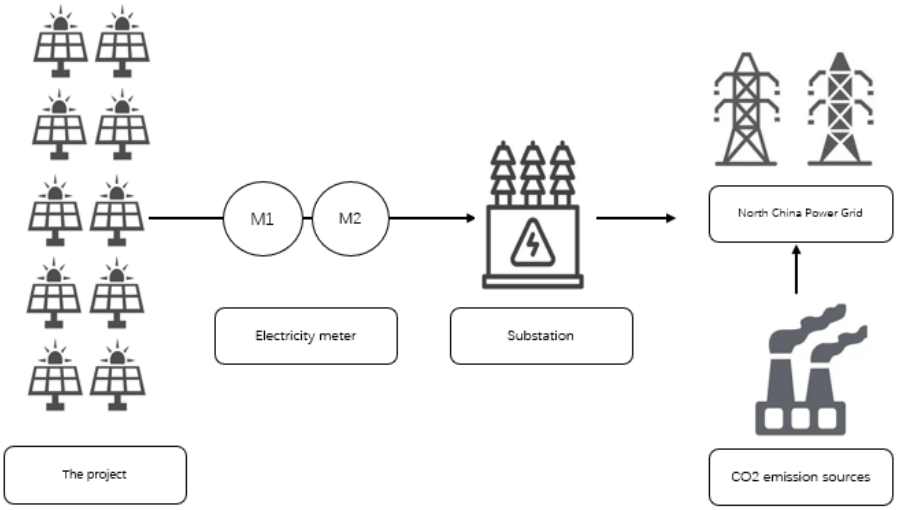

Figure 2 Project boundary

B.4. Establishment and description of the baseline scenario

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The relevant national and/or sectoral policies, regulations and circumstances are taken into account for the implementation of the project activity.

Implementation of solar PV power generation project is not enforced by any laws and regulations in China. There are no enforced laws, statutes, regulations, court orders, environmental-mitigation agreements, permitting conditions of other legally binding mandates requiring its implementation. The Project is a voluntary action.

The project is connected to NCPG. As per the latest version of China Electric Power Yearbook, NCPG is still dominated by fossil fuels fired power plant. The fossil fuels fired power plants generated 89.89% of the total electricity provided by NCPG. Despite the gradual increase in renewable energy sources in power sector, NCPG is still a CO_2-intensive power grid.

According to the methodology ACM0002 (version 20.0), as the Project is the installation of a Greenfield solar power plant, the baseline scenario of the Project is the following: Electricity delivered to NCPG by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool 07 to calculate the emission factor for an electricity system”.

B.5. Demonstration of additionality

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As per GCC Project Standard, the GCC applies the following approach for demonstrating additionality, consisting of two components:

(a) A Legal Requirement Test; and

(b) An Additionality Test either based on a Positive List test or a projects-specific additionality test.

The proposed project is not enforced by law. The Project passes the legal requirement test since there are no enforced laws, statutes, regulations, court orders, environmental-mitigation agreements, permitting conditions of other legally-binding mandates requiring its implementation. Furthermore, as per para. 46 of Project Standard, voluntary commitments/agreements within a sector or by an entity do not constitute the legal requirement. An Additionality Test is further applied as follows.

Additionality of the Project is demonstrated by using the approved CDM tool am-tool-01-v7.0.0 Tool for the demonstration and assessment of additionality.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Define realistic and credible alternatives to the project activity(s) through the following Sub-steps.

Sub-step 1a: Define alternatives to the project activity

Alternatives available to the project participant or similar project developers that provide outputs or services comparable with the project activity are identified below:

Alternative (a) The proposed project activity undertaken without being registered as a GCC project activity.

Alternative (b) Continuation of the current situation (no project activity or other alternatives undertaken).

Sub-step 1b: Consistency with mandatory laws and regulations

Both alternatives (a) and (b) are realistic and credible alternatives to the project which are consistent with mandatory laws and regulations.

Step 2: Investment analysis

Sub-step 2a: Determine appropriate analysis method

According to ACM0002 (version 20.0), if the project activity and the alternatives identified in Step 1 generate no financial or economic benefits other than carbon related income, then apply the simple cost analysis (Option I). Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III).

For this project, the alternative to the project activity is the supply of electricity from a grid which is not considered as an investment by project participant, so the benchmark analysis (Option III) will be used.

Sub-step 2b: Option III. Apply benchmark analysis

According to the “Economical assessment and parameters for construction project, 3rd edition”, which was joint published by National Development and Reform Commission and Ministry of Housing and Urban Rural Development of China, a project will be financially acceptable when the project Internal Return Rate (project IRR) is higher than the sectoral benchmark IRR.

According to clause 1.11 of “Interim Rules on Economic Assessment Electrical Engineering Retrofit Projects ” published by State Power Grid Company, for greenfield or retrofit projects in Chinese electric power industry, the financial benchmark is 8% for project IRR (after tax) or 10% for equity IRR (after tax). Since the Project is a solar power project and project IRR (after tax) is evaluated in the FSR, the project IRR (after tax) of 8% is adopted by the Project as the benchmark. Based on above benchmark, calculation and comparison of financial indicators are carried out in sub-step 2c.

Sub-step 2c: Calculation and comparison of financial indicators

The main financial parameters and IRR of the project are shown in Table B-1.

Table B-2 Parameters used in the calculation of the project IRR

Parameter	Amount	Unit
Installed capacity	20	MW
Total investment	20771.69	10,000 Yuan
Long-term loan interest rate	4.9%	-
Short-term loan interest rate	4.35%	-
Annual electricity delivered to the grid in 25 years	2786.27	10,000 kWh
Period of depreciation	20	Year
Residual value rate	5%	-
Number of employees	10	Person
Average annual salary	10	10,000 Yuan
Welfare rate	60%	-
Insurance rate	0.4%	-
Material cost	30	Yuan / kW
Miscellaneous expenses	30	Yuan / kW
Repair and maintenance expenses rate	1%	-
Plant load factor	15.9%	-
Electricity tariff (including VAT)	0.95 (year 2-21)	Yuan/kWh
	0.4316 (year 22-26)	Yuan/kWh
VAT rate	17%	-
City maintenance and construction tax rate	5%	-

Education surtax rate	5%	-
Income tax rate	25%	-
Period of assessment	26	Including one construction year

Data source: FSR

The Feasibility Study report of the project was designed by the authoritative, professional and independent third party, and the FSR was subsequently approved when the project activity obtained an official project approval on 16/12/2015 by Development and Reform Commission of Hebe province. As the FSR was issued by a certified and independent design institute, and subsequently approved by the government, the values in this document can be considered independent, appropriate and realistic.

Based on the data above, without the revenue from carbon credit sales, the project IRR is 6.45%, which is lower than the benchmark (8%). The Project is not financially attractive.

Sub-step 2d: Sensitivity analysis

The 'Tool for the demonstration and assessment of additionality' requires that a sensitivity analysis be conducted to check whether the financial attractiveness remains unaltered for reasonable variations in the critical assumptions. The following parameters were used as critical assumptions:

- Fixed asset investment
- Electricity tariff
- Annual O&M costs
- Annual electricity delivered to the grid

In the sensitivity analysis, variations of ±10% have been considered in the critical assumptions. Such variation is considered appropriate as it is in accordance with the general guidance provided by the "Document for Registered Engineering Consultants in China", published by the China Planning Press under the supervision of the National Development & Reform Commission.

Table B-4 summarizes the results of the sensitivity analysis, while Figure 3 provides a graphic depiction.

Table B-4 Results of the sensitivity analysis – impact of variations in critical assumptions on IRR

Parameter	-10%	-5%	0%	+5%	+10%
Fixed asset investment	7.85%	7.12%	6.45%	5.83%	5.26%
Annual average O&M cost	6.80%	6.62%	6.45%	6.27%	6.09%
Electricity tariff (including VAT)	4.94%	5.70%	6.45%	7.18%	7.90%
Annual electricity delivered to the grid	4.94%	5.70%	6.45%	7.18%	7.90%

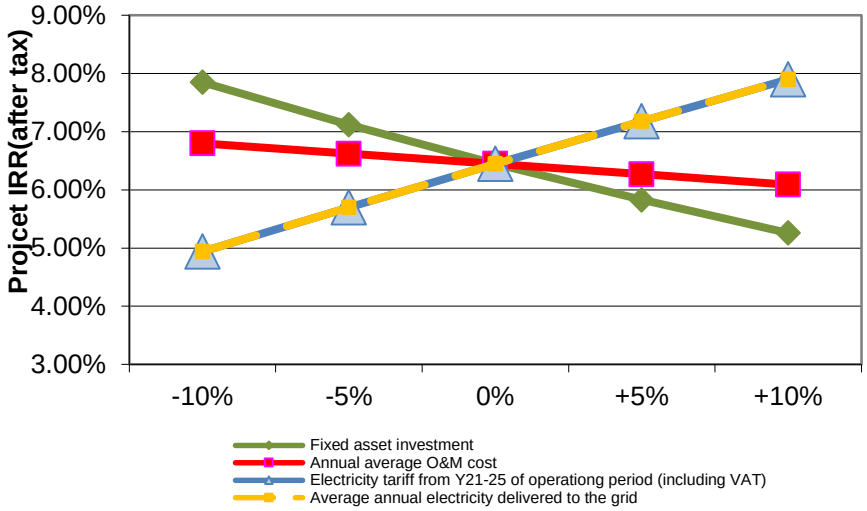

Figure 3 Results of the sensitivity analysis

The sensitivity analysis of the Internal Rate of Return of the proposed project activity without ACC revenues remains below the 8% benchmark which confirms that the Project remains commercially unattractive without ACC revenues.

Step 3: Barrier analysis

The proposed project does not employ the barrier analysis. Then proceed to Step 4.

Step 4: Common practice analysis

As the project applies power generation based on renewable energy which is one of the measure(s) listed in the definitions section above, proceed to Sub-step 4a.

Sub-step 4a: The proposed project activity(ies) applies measure(s) that are listed in the definitions section above

Common practice analysis is carried out as per CDM tool am-tool-24-v1 Common practice.

Sub-Step 4a-1: calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity

The install capacity of the project is 20MW, so the applicable capacity range as +/-50% of the total design capacity is10 ~ 30 MW.

Sub-Step 4a-2: identify similar projects which fulfil all of the following conditions:

a. The projects are located in the applicable geographical area;

Considering the size of the P.R. of China and the geographical differences (e.g. access to natural resources, climate, terrain) as well as social-economic differences (e.g. regulatory framework, infrastructure, economic development levels, economic structure, access to technology, access to financing, tariff levels) between the provinces, the applicable geographic area is Hebei Province where the project located.

b. The projects apply the same measure as the proposed project activity;

The applicable measure is power generation based on renewable energy, same as the project.

c. The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;

d. The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;

The applicable project is to produce electricity power, same as the project.

e. The capacity or output of the projects is within the applicable capacity or output range calculated n Step 1;

As defined in Step 4a-1, the applicable capacity range is from 10 to 30MW.

f. The projects started commercial operation before the PSF is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

The start date of the proposed project is 20/06/2016 which is earlier than the PSF published, so the applicable commercial operation starting date is 20/06/2016.

Projects that need to be considered in common practice are listed in table below:

Project name	Installed capacity	Project owner	Project type
Dingzhou 10 MW photovoltaic roof grid connected power generation project	10MW	Yingli Energy (China) Co., Ltd	CCER
Pingquan Yangshuling 30MW grid connected photovoltaic power generation project	30MW	China Three Gorges New Energy Company	CCER
Quyang PV Power Station Phase I 19.8 MW Project	19.8MW	Three Gorges New Energy Quyang Power Generation Co., Ltd	CCER
Quyang PV Power Station Phase II 29.7 MW Project	29.7MW	Three Gorges New Energy Quyang Power Generation Co., Ltd	CCER
Quyang PV Power Station Phase III 29.7 MW Project	29.7MW	Three Gorges New Energy Quyang Power Generation Co., Ltd	CCER
Shidaogou 20 MW Project of Laiyuan Photovoltaic Power Station	20MW	Three Gorges New Energy Laiyuan Power Generation Co., Ltd	CCER
Yingli Fuping 10 MW photovoltaic grid connected power generation project	10MW	Fuping Yingli Photovoltaic Power Development Co., Ltd	CCER

Sub-Step 4a-3: within the projects identified in Step 2, identify those that are neither registered project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all}.

According to the available statistics[14] and relevant project information on CDM[15], VCS[16] and GS[17] website, $N_{all} = 0$.

Sub-Step 4a-4: within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number N_{diff}.

Since $N_{all} = 0$, also $N_{diff} = 0$, Nall = N_{diff}.

Sub-Step 4a-5: calculate factor F=1-N_{di}ff/N_{al}l representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

As stated before, $N_{all} = N_{diff}$, $F = 1 - N_{diff}/N_{all} = 1 - 1 = 0<0.2$, therefore the project activity is NOT a "common practice" within a sector in the applicable geographical area, according to the guideline.

B.6. Estimation of emission reductions

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B.6.1. Explanation of methodological choices

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The GHG emission reduction calculation of the Project was based on the applied methodology ACM0002 (version 20.0).

1.Baseline emission

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y=EG_{PJ,y}\times EF_{grid,CM,y} \qquad (1)$$

Where:

BE_y = Baseline emission in year y (tCO_2e)

[14] China Electric Power Yearbook
[15] http://cdm.unfccc.int/Projects/projsearch.html
[16] http://www.vcsprojectdatabase.org/
[17] http://www.goldstandard.org/about-us/project-registry

$EG_{P,J,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh/yr)

$EF_{grid,CM,y}$ = Combined margin emission factor of NCPG, calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2e/MWh)

The project is a Greenfield solar power plant, then:

$$EG_{P,J,y} = EG_{facility,y} \quad (2)$$

Where:

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr).

Following ACM0002 (version 20.0), the baseline emission factor (EF_y) is calculated as a combined margin emission factor of NCPG ($EF_{grid,CM,y}$), consisting of the combination of operating margin emission factor of NCPG ($EF_{grid,OM,y}$) and build margin emission factor of NCPG ($EF_{grid,BM,y}$) according to the following six steps defined in the "Tool to calculate the emission factor for an electricity system" (version 7.0). Data for the calculations are based on official national statistics books: China Energy Statistical Yearbook and China Electric Power Yearbook.

According to the latest version of the "Tool to calculate the emission factor for an electricity system", $EF_{grid,CM,y}$ is calculated by following six steps:

- Step 1: Identify the relevant electricity systems;
- Step 2: Choose whether to include off-grid power plants in the project electricity system (optional);
- Step 3: Select a method to determine the operating margin (OM);
- Step 4: Calculate the operating margin emission factor according to the selected method;
- Step 5: Calculate the build margin (BM) emission factor;
- Step 6: Calculate the combined margin (CM) emission factor.

As China authority has published the calculation method for emission factor of grid, the published data and method have been applied for this project to calculate operating margin (OM) and build margin, as following steps:

Step 1: Identify the relevant electricity systems;

This project site is in Hebei Province of China, which belongs to NCPG according to the public delineation of Chinese authority[18], so NCPG is identified as the relevant electric system.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional);

For this project, Option I (only grid power plants are included in the calculation) is chosen.

[18] https://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/202012/W020201229610353340851.pdf

Step 3: Select a method to determine the operating margin (OM);

Calculation of Operating Margin should be based on one of the four following methods according to the tool:

(a) Simple OM, or

(b) Simple adjusted OM, or

(c) Dispatch Data Analysis OM, or

(d) Average OM.

As the low-cost / must-run resources constituted less than 50% of total electricity generation of NCPG in recent five years (respectively 10.10%, 8.94%, 7,21%,6,39% and 5,92% in 2017, 2016, 2015, 2014 and 2013)[19], the Simple OM (a) method is selected and the following data vintage is chosen to calculate the emission factor:

Ex ante option: use a 3-year generation-weighted average, based on the most recent data available, without requirement to monitor and recalculate the emissions factor during the crediting period. And according to the tool, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required.

Step 4: Calculate the operating margin emission factor according to the selected method;

The Simple OM emission factor ($EF_{OM,y}$) is calculated as the generation-weighted average emissions per electricity unit (tCO_2e/MWh) of all generating sources serving in the system, excluding low-operating cost and must-run power plants. It may be calculated:

Option A: Based on the net electricity generation and a CO_2 emission factor of each power plant / unit, or

Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Option B can only be used if:

(a) The necessary data for Option A is not available; and

(b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and

(c) Off-grid power plants are not included in the calculation.

In this project, all of the above conditions can be met, so Option B was chosen.

Under this option, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

[19] China Electric Power Yearbook (2014, 2015, 2016, 2017, 2018)

$$EF_{grid,OM,simple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_y} \quad (3)$$

Where:

$EF_{grid,OMsimple,y}$	=	Simple operating margin CO_2 emission factor in year y (t CO_2/MWh)
$FC_{i,y}$	=	Amount of fuel type i consumed in the project electricity system in year y (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (energy content) of fuel type i in year y (GJ/mass or volume unit)
$EF_{CO2,i,y}$	=	CO_2 emission factor of fuel type i in year y (tCO_2/GJ)
EG_y	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh)
i	=	All fuel types combusted in power sources in the project electricity system in year y
y	=	The relevant year as per the data vintage chosen in Step 3.

Based on the most recent three years (2015-2017) where the data are the latest and available at the time of this PSF submission, the calculation result of $EF_{grid,OM,y}$ is 0.9419 tCO_2e/MWh. Please refer to ER calculation sheet for detailed calculation.

Step 5: Calculate the build margin (BM) emission factor;

As per Section 6.5 of TOOL07 (version 07.0), in terms of vintage of data, project participants can choose between one of the following two options:

(a) Option 1 - for the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the GCC Verifier for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to theGCC Verifier. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period;

(b) Option 2 - For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

In line with China's Baseline emission factors of regional grids 2019 (BEF_{2019}) published by Ministry of ecology and environment of China[20], Option 1 is chosen for the project; the BM emission factor is calculated ex ante based on the most recent information available on units already built for sample group m at the time of this project description submission.

The sample group of power units m used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

(a)Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ($SET_{5\text{-units}}$) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-}units}$, in MWh);

(b)Determine the annual electricity generation of the proposed project electricity system, excluding power units registered as CDM project activities ($AEG_{total,}$ in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) (SET≥20%) and determine their annual electricity generation ($AEG_{SET\geq 20\%}$, in MWh);

(c) From $SET_{5\text{-units}}$ and SET≥20% select the set of power units that comprises the larger annual electricity generation (SET_{sample});

Identify the date when the power units in SET_{sample} started to supply electricity to the grid. If none of the power units in SET_{sample} started to supply electricity to the grid more than 10 years ago, then use SET_{sample} to calculate the build margin. In this case ignore Steps (d), (e) and (f).

Otherwise:

(d) Exclude from SET_{sample} the power units which started to supply electricity to the grid more than 10 years ago. Include in that set the power units registered as CDM project activities, starting with power units that started to supply electricity to the grid most recently, until the electricity generation of the new set comprises 20% of the annual electricity generation of the proposed project electricity system (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) to the extent is possible. Determine for the resulting set ($SET_{sample\text{-}CDM}$) the annual electricity generation ($AEG_{SET\text{-}sample\text{-}CDM}$, in MWh); If the annual electricity generation of that set comprises at least 20% of the annual electricity generation of the proposed project electricity system (i.e. $AEG_{SET\text{-}sample\text{-}CDM} \geq 0.2 \times AEG_{total}$), then use the sample group $SET_{sample\text{-}CDM}$ to calculate the build margin. Ignore steps (e) and (f).

Otherwise:

(e)Include in the sample group $SET_{sample\text{-}CD}$M the power units that started to supply electricity to the grid more than 10 years ago until the electricity generation of the new set comprises 20% of the annual electricity generation of the proposed project electricity system (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation);

[20] https://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/202012/W020201229610354442145.pdf

(f)The sample group of power units m used to calculate the build margin is the resulting set ($SET_{sample\text{-}CDM\text{->}10yrs}$).

The BM emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year y for which electricity generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,M,y}}{\sum_m EG_{m,y}} \quad (4)$$

Where:

$EF_{grid,BM,y}$	=	Build margin emission factor of NCPG (tCO_2/MWh)
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	=	CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m	=	Power units included in the build margin
y	=	The most recent year for which the generation data is available

As it is difficult to obtain the detailed data on the power generation, fuel consumption and thermal efficiency of each newly built power unit from public documents, a deviation of TOOL07 (07.0) is adopted following the clarifications[21] given by the CDM EB concerning the BM emission factor calculation:

(1)The CDM EB suggested using the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption to estimate the build margin.

(2)The EB agreed the use of capacity additions during last 1 ~ 3 years for estimating the build margin emission factor for grid electricity.

(3)The EB also agreed to use of weights estimated using installed capacity in place of annual electricity generation.

The newly built power plants in the past few years are bundled into “grouped new power plant” according to their construction year, their province and their fuel type. The annual net electricity generation in the year y of each “grouped new power plant” $EG_{m,}$ is estimated according to their total capacity and the average utilization hours, as the following equation:

$$EG_{m,y} = CAP_m \times H_{m,y} \quad (5)$$

Where:

$EG_{m,y}$	=	Annual net electricity generation the unit m in year y (MWh)

[21] “Request for clarification on use of approved methodology AM0005 for several projects in China”, the EB’s guidance on DNV deviation request.
http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_QEJWJEF3CFBP1OZAK6V5YXPQKK7WYJ

CAP_m	=	Installed capacity of the unit m (MW)
$H_{m,y}$	=	Utilization hour of the unit m in the year y (h), determined according to the average utilization hour of the same type of unit in the same province
y	=	The most recent year for which the generation data is available. For the calculation of BM in 2019, y = 2017
m	=	grouped new power plant

Since the newly built power plants in the same province (A), in the same year (t) and using the same fuel type (k) are grouped into "a grouped new power plant", $CAPm$ represents the total installed capacity of fuel type k power plants located in the provinces A and in the year t:

$$CAP_m = CAP_{A,t,k} \quad (6)$$

Where:

CAP_m	=	Installed capacity of the unit m (MW), with m representing the specified combination of A, t, and k
$CAP_{A,t,k}$	=	Total installed capacity of fuel type k power plants located in the province A and in the year t
A	=	Provinces covered by the NCPG, namely, Beijing City, Tianjin City, Hebei Province, Shanxi Province, Shandong Autonomous Region and Inner Mongolia Autonomous Region .
t	=	Years related to the grouped new power plants, for the 2019 calculation, t represents 2017, 2016, 2015…Until the aggregated electricity generation of the grouped new power plants reaches 20% of the total electricity generation of the NCPG
k	=	Fuel type of the grouped new power plants, including hydro, thermal (coal, gas, oil, waste incineration, other thermal), nuclear, wind, solar and others.

The emission factors of each fuel type $EF_{EL,,}$ are determined according to the Option A2 in the TOOL07, as the following equation:

$$EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} \times 3.6}{\eta_{m,y}} \quad (7)$$

Where:

$EF_{EL,m,y}$	=	CO_2 emission factor of power unit m in year y (tCO_2/MWh)
$EF_{CO2,m,I,y}$	=	Average CO_2 emission factor of fuel type i used in power unit m in year y (tCO_2/GJ)
$\eta_{m,y}$	=	Average net energy conversion efficiency of power unit m in year y (ratio)

m	=	All power units serving the grid in year y except low-cost / must-run power units
3.6	=	Conversion factor (GJ/MWh)

Among the fuel types, the emission factors of hydro, nuclear, wind, other thermal and others are 0. Concerning the emission factors of coal, gas, oil and waste incineration, Equation takes the following form due to conservativeness:

$$EF_{best,m,y} = \frac{EF_{CO2,m,i,y} \times 3.6}{\eta_{best,y}} \quad (8)$$

Where:

$EF_{best,m,y}$	=	Emission factor of power unit m with the best technology commercially available in year y (tCO_2/MWh)
$\eta_{best,y}$	=	Power generation efficiency of the best technology commercially available in year y
m	=	Power units serving the grid with coal, gas, oil or waste incineration in year y

According to the latest and available data at the time of this PSF submission, $EF_{grid,BM,y}$ is calculated to be 0.4819 tCO_2e/MWh. Please refer to ER calculation sheet for the details of calculation.

Step 6: Calculate the combined margin (CM) emission factor.

The calculation of the combined margin emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

(a)Weighted average CM; or

(b)Simplified CM.

The weighted average CM method (option A) should be used as the preferred option. The simplified CM method (option b) can only be used if:

a)The project activity is located in: (i) a Least Developed Country (LDC); or in (ii) a country with less than 10 registered CDM projects at the starting date of validation; or (iii) a Small Island Developing States (SIDS); and

b)The data requirements for the application of step 5 above cannot be met.

This PSF choose option A.

The combined margin emissions factor is calculated as follows:

$$EF_{grid,,} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \quad (9)$$

Where:

$EF_{grid,OM,y}$	=	operating margin emission factor of NCPG (tCO_2e/MWh)
$EF_{grid,BM,y}$	=	build margin CO_2 emission factor of NCPG (tCO_2e/MWh)

ω_{OM} = the weighting of operating margin emission factor (%)
ω_{BM} = the weighting of build margin emission factor (%)

According to Tool, the default weights of solar power projects are as follows:

ω_{OM} = 0.75 and ω_{BM} = 0.25

Therefore, $EF_{grid,CM,,y}$ = 0.9419×0.75 + 0.4819×0.25 = 0.8269 tCO_2e/MWh

2.Project Emissions

As a solar power generation project, according to ACM0002 (version 20.0), the project emissions PE_y = 0.

3.Leakage

According to ACM0002 (version 20.0), no leakage emissions are considered.

4.Net GHG Emission Reductions

Net GHG Emission Reductions are calculated as follows:

$$ER_y = BE_y - LE_y - PE_y \quad (10)$$

Where:

ER_y = Emission reductions in year y (tCO_2e)
BE_y = Baseline emissions in year y (tCO_2e)
LE_y = Project emissions in year y (tCO_2e)
PE_y = Leakage emissions in year y (tCO_2e)

B.6.2. Data and parameters fixed *ex ante*

>>

Data / Parameter Table 1.

Data / Parameter:	$EF_{grid,y}$ ($EF_{grid,CM,y}$)
Methodology reference	ACM0002 (Version 20.0)
Data unit	tCO_2/MWh
Description	Combined margin emission factor of NCPG
Measured/calculated /default	Calculated
Data source	2019 Baseline Emission Factors for Regional Power Grids in China, published by Chinese authority
Value(s) of monitored parameter	0.8269 The value is Ex-ante determined and fixed for the crediting period.

Measurement/ Monitoring equipment (if applicable)	<table><tr><td colspan="2"></td></tr><tr><td>Type of meter</td><td>NA</td></tr><tr><td>Location of meter</td><td>NA</td></tr><tr><td>Accuracy of meter</td><td>NA</td></tr><tr><td>Serial number of meter</td><td>NA</td></tr></table>
Calculation method (if applicable)	Calculated as per am-tool-07-v7.0 Tool to calculate the emission factor for an electricity system.
QA/QC procedures	Official data from Chinese authority
Purpose of data	Baseline emission calculation
Additional comments	The detailed calculation process of $EF_{grid,OM,y}$ and $EF_{grid,BM,y}$ can be found at the following link: http://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/202012/t20201229_815386.shtml

B.6.3. Ex-ante calculation of emission reductions

>>

1.Baseline emission

The average baseline emission BE_y is calculated as formula (1):

BEy = 0.8269×29551＝24435tCO_2e/year

2. Project Emission

PE_y = 0.

3.Leakage

LE_y=0

4. Emission Reduction

The average Emission Reductions (ER_y) per year for the proposed project activity could be calculated as the formula (10):

ER_y =24435-0-0 = 24435tCO_2e/year

B.6.4. Summary of ex ante estimates of emission reductions

>>

Year	Baseline	Project	Leakage	Emission

	emissions ($t CO_2e$)	emissions ($t CO_2e$)	($t CO_2e$)	reductions ($t CO_2e$)
20/06/2016-19/06/2017	25,328	0	0	25,328
20/06/2017-19/06/2018	25,125	0	0	25,125
20/06/2018-19/06/2019	24,924	0	0	24,924
20/06/2019-19/06/2020	24,725	0	0	24,725
20/06/2020-19/06/2021	24,527	0	0	24,527
20/06/2021-19/06/2022	24,331	0	0	24,331
20/06/2022-19/06/2023	24,136	0	0	24,136
20/06/2023-19/06/2024	23,943	0	0	23,943
20/06/2024-19/06/2025	23,752	0	0	23,752
20/06/2025-19/06/2026	23,562	0	0	23,562
Total	244,353	0	0	244,353
Total number of crediting years	10 years			
Annual average over the crediting period	24,435	0	0	24,435

B.7. Monitoring plan

>>

B.7.1. Data and parameters to be monitored *ex-post*

>>

Data / Parameter Table 2.

Data / Parameter:	$EG_{facility,y}$ ($EG_{P,J,y}$)
Methodology reference	ACM0002 (Version 20.0)
Data unit	MWh
Description	Net Electricity generated and delivered to the grid by the power plant in year y
Measured/calculated /default	Calculated

Data source	Calculated
Value(s) of monitored parameter applied with basis	24,435 (average value, ex-ante estimated)
Measurement/ Monitoring equipment	<table><tr><td colspan="2"></td></tr><tr><td>Type of meter(s)</td><td>NA</td></tr><tr><td>Location of meter(s)</td><td>NA</td></tr><tr><td>Accuracy of meter(s)</td><td>NA</td></tr><tr><td>Serial number of meter(s)</td><td>NA</td></tr><tr><td>Calibration frequency</td><td>NA</td></tr><tr><td>Date of Calibration/ validity</td><td>NA</td></tr><tr><td>Reference No. of Calibration Certificates</td><td>NA</td></tr><tr><td>Calibration Status</td><td>NA</td></tr></table>
Frequency of Measuring/reading	Calculated when verification occured
Recording frequency	Monthly recorded by GCC team
Calculation method (if applicable)	Calculated based on the electricity delivered to the grid by the project ($EG_{out,y}$) and the electricity consumed by the project which is imported from the grid ($EG_{in,y}$). $EG_{facility,y} = EG_{out,y} – EG_{in,y}$
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comments	-

Data / Parameter:	$EG_{export,y}$
Methodology reference	ACM0002 (Version 20.0)
Data unit	MWh
Description	Quantity of the electricity delivered to the grid by the project in year y
Measured/calculated /default	On-site measurement
Data source	On-site measurement
Value(s) of monitored parameter applied with basis	24,435 (average value, ex-ante estimated)

<table>
<tr><td>Measurement/ Monitoring equipment</td><td>
<table>
<tr><td colspan="2"></td></tr>
<tr><td>Type of meter(s)</td><td>ZMQ202C.6r4af6</td></tr>
<tr><td>Location of meter(s)</td><td>Main meter, Inlet of Huai’an Diliutun Substation</td></tr>
<tr><td>Accuracy of meter(s)</td><td>0.2s</td></tr>
<tr><td>Serial number of meter(s)</td><td>96087760
Backup meter:</td></tr>
<tr><td>Calibration frequency</td><td>6 years</td></tr>
<tr><td>Date of Calibration/ validity</td><td>09/05/2016-08/05/2022</td></tr>
<tr><td>Reference No. of Calibration Certificates</td><td>DC/Dianbiao-118-2016</td></tr>
<tr><td>Calibration Status</td><td>calibrated</td></tr>
</table>
<table>
<tr><td colspan="2"></td></tr>
<tr><td>Type of meter(s)</td><td>ZMQ202C.6r4af6</td></tr>
<tr><td>Location of meter(s)</td><td>Backup meter, Inlet of Huai’an Diliutun Substation</td></tr>
<tr><td>Accuracy of meter(s)</td><td>0.2s</td></tr>
<tr><td>Serial number of meter(s)</td><td>96087759</td></tr>
<tr><td>Calibration frequency</td><td>6 years</td></tr>
<tr><td>Date of Calibration/ validity</td><td>09/05/2016-08/05/2022</td></tr>
<tr><td>Reference No. of Calibration Certificates</td><td>DC/Dianbiao-117-2016</td></tr>
<tr><td>Calibration Status</td><td>calibrated</td></tr>
</table>
</td></tr>
<tr><td>Frequency of Measuring/reading</td><td>Measured continuously and recorded monthly</td></tr>
<tr><td>Recording frequency</td><td>Monthly recording</td></tr>
<tr><td>Calculation method (if applicable)</td><td>-</td></tr>
<tr><td>QA/QC procedures</td><td>The measurement will be in compliance with the national guidelines and requirements of the grid company for accuracy and reliability. The calibration will be carried out according to relevant national standards and regulations by authorized organization.</td></tr>
<tr><td>Purpose of data</td><td>Used for $EG_{PJ,y}$ calculation</td></tr>
<tr><td>Additional comments</td><td>Double checked by sold electricity records(ETNs, Electricity Transaction Notes) or sales receipts from local grid company.</td></tr>
</table>

Data / Parameter:	$EG_{import,y}$
Methodology reference	ACM0002 (Version 20.0)
Data unit	MWh
Description	Quantity of the electricity consumed by the project which is imported

<table>
<tr><td></td><td>from the grid in year y</td></tr>
<tr><td>Measured/calculated /default</td><td>On-site measurement</td></tr>
<tr><td>Data source</td><td>On-site measurement</td></tr>
<tr><td>Value(s) of monitored parameter applied with basis</td><td>0(ex-anti estimated)</td></tr>
<tr><td>Measurement/ Monitoring equipment</td><td>
<table>
<tr><td colspan="2"></td></tr>
<tr><td>Type of meter(s)</td><td>ZMQ202C.6r4af6</td></tr>
<tr><td>Location of meter(s)</td><td>Main meter, Inlet of Huai’an Diliutun Substation</td></tr>
<tr><td>Accuracy of meter(s)</td><td>0.2s</td></tr>
<tr><td>Serial number of meter(s)</td><td>96087760
Backup meter:</td></tr>
<tr><td>Calibration frequency</td><td>6 years</td></tr>
<tr><td>Date of Calibration/ validity</td><td>09/05/2016-08/05/2022</td></tr>
<tr><td>Reference No. of Calibration Certificates</td><td>DC/Dianbiao-118-2016</td></tr>
<tr><td>Calibration Status</td><td>calibrated</td></tr>
</table>
</td></tr>
</table>

	<table><tr><td></td><td></td></tr><tr><td>Type of meter(s)</td><td>ZMQ202C.6r4af6</td></tr><tr><td>Location of meter(s)</td><td>Backup meter, Inlet of Huai'an Diliutun Substation</td></tr><tr><td>Accuracy of meter(s)</td><td>0.2s</td></tr><tr><td>Serial number of meter(s)</td><td>96087759</td></tr><tr><td>Calibration frequency</td><td>6 years</td></tr><tr><td>Date of Calibration/ validity</td><td>09/05/2016-08/05/2022</td></tr><tr><td>Reference No. of Calibration Certificates</td><td>DC/Dianbiao-117-2016</td></tr><tr><td>Calibration Status</td><td>calibrated</td></tr></table>
Frequency of Measuring/reading	Measured continuously and recorded monthly
Recording frequency	Monthly recording
Calculation method (if applicable)	-
QA/QC procedures	The measurement will be in compliance with the national guidelines and requirements of the grid company for accuracy and reliability. The calibration will be carried out according to relevant national standards and regulations by authorized organization.
Purpose of data	Used for $EG_{PJ,y}$ calculation
Additional comments	Double checked by sold electricity records(ETNs, Electricity Transaction Notes) or sales receipts from local grid company.

For Parameters to be monitored for E+/S+ assessments and SDG labels (positive impacts)

Data / Parameter:	**Generation of waste water (EW03)**
Purpose:	*To demonstrate positive impacts of aspects wrt baseline scenario / BAU / pre-existing scenario and to demonstrate that they do not cause any net harm to environment / society or have an impact on SDG as per selected indicators.*
Describe the related environment /social/ SDG risk or SDG impact as a function of likelihood of occurrence and severity of impact.	Waste water discharged without treatment will cause soil and underground water pollution. Septic tank or other waste water treatment facility would be installed for waste water management to avoid such pollution. Location of the project is arid zones, waste water could be reused for watering plants and reduce usage of new water.

Describe the parameters to be monitored to demonstrate compliance with requirements to demonstrate "harmless" condition or demonstrate Impact on SDG	<table><tr><td colspan="2"></td></tr><tr><td>Parameter to be monitored</td><td>Facility management records</td></tr><tr><td>Frequency of monitoring</td><td>At least once a year</td></tr><tr><td>Legal /regulatory / corporate limits (if any)</td><td><Environmental Quality Standard of Surface Water> (GB3838- 2002)</td></tr><tr><td>QA/QC</td><td>NA</td></tr></table>
Remarks	NA

Data / Parameter:	**Replacing fossil fuels with renewable sources of energy (ENR07)**
Purpose:	*To demonstrate positive impacts of aspects wrt baseline scenario / BAU / pre-existing scenario and to demonstrate that they do not cause any net harm to environment / society or have an impact on SDG as per selected indicators.*
Describe the related environment /social/ SDG risk or SDG impact as a function of likelihood of occurrence and severity of impact.	Without construction of the project, air pollution and GHG emission will be cause by fossil fuel power plants at baseline scenario. The project will not cause relevant pollution during operation period.
Describe the parameters to be monitored to demonstrate compliance with requirements to demonstrate "harmless" condition or demonstrate Impact on SDG	<table><tr><td colspan="2"></td></tr><tr><td>Parameter to be monitored</td><td>Net electricity supplied to the grid</td></tr><tr><td>Frequency of monitoring</td><td>Continuously measured and monthly recording</td></tr><tr><td>Legal /regulatory / corporate limits (if any)</td><td>No legal limit on construction of solar power project.</td></tr><tr><td>QA/QC</td><td>NA</td></tr></table>
Remarks	NA

Data / Parameter:	**Long-term jobs (> 10 year) created/ lost (SJ01)**
Purpose:	*To demonstrate positive impacts of aspects wrt baseline scenario / BAU / pre-existing scenario and to demonstrate that they do not cause any net harm to environment / society or have an impact on SDG as per selected indicators.*
Describe the related environment /social/ SDG risk or SDG impact as a function of likelihood of occurrence and severity of impact.	Construction of the project could bring a number of long-term jobs to local area, which would not happen with the project.

Describe the parameters to be monitored to demonstrate compliance with requirements to demonstrate "harmless" condition or demonstrate Impact on SDG	<table><tr><td></td><td></td></tr><tr><td>Parameter to be monitored</td><td>Workers' contract and roster</td></tr><tr><td>Frequency of monitoring</td><td>When the project under verification by GCC verifier</td></tr><tr><td>Legal /regulatory / corporate limits (if any)</td><td>Labor Law of P. R. China</td></tr><tr><td>QA/QC</td><td>NA</td></tr></table>
Remarks	NA

Data / Parameter:	**Avoiding discrimination when hiring people from different race, gender, ethnics, religion, marginalized groups, people with disabilities (SJ04) (human rights)**
Purpose:	*To demonstrate positive impacts of aspects wrt baseline scenario / BAU / pre-existing scenario and to demonstrate that they do not cause any net harm to environment / society or have an impact on SDG as per selected indicators.*
Describe the related environment /social/ SDG risk or SDG impact as a function of likelihood of occurrence and severity of impact.	Operation of the project could bring a number of long-term jobs for qualified woman workers, which would not happen with the project.
Describe the parameters to be monitored to demonstrate compliance with requirements to demonstrate "harmless" condition or demonstrate Impact on SDG	<table><tr><td></td><td></td></tr><tr><td>Parameter to be monitored</td><td>Women workers' contract and roster</td></tr><tr><td>Frequency of monitoring</td><td>When the project under verification process by GCC verifier</td></tr><tr><td>Legal /regulatory / corporate limits (if any)</td><td>Labor Law of P. R. China</td></tr><tr><td>QA/QC</td><td>NA</td></tr></table>
Remarks	NA

B.7.2. Data and parameters to be monitored for E+/S+ assessments (negative impacts)

>>

Data / Parameter:	**NA**
Purpose:	*To demonstrate compliance of XXXX aspects to legal/regulatory/corporate requirements or to demonstrate that they do not cause any net harm to environment / society or have an impact on SDG as per selected indicators.*

<table>
<tr><td>Describe the related environment /social/ SDG risk or SDG impact as a function of likelihood of occurrence and severity of impact.</td><td>NA</td></tr>
<tr><td>Describe the parameters to be monitored to demonstrate compliance with requirements to demonstrate “harmless” condition or demonstrate Impact on SDG</td><td>
<table>
<tr><td>Parameter to be monitored</td><td>NA</td></tr>
<tr><td>Frequency of monitoring</td><td>NA</td></tr>
<tr><td>Legal /regulatory / corporate limits (if any)</td><td>NA</td></tr>
<tr><td>QA/QC</td><td>NA</td></tr>
</table>
</td></tr>
<tr><td>Program of Risk Management Actions to mitigate risk related to aspect (if any for aspects assessed to be harmful)</td><td>
<table>
<tr><th>S.No.</th><th>Action and targets</th><th>Responsibility</th><th>Resource Requirement</th><th>Target to be Achieved by (insert date)</th><th>Key Performance Indicators (KPI)</th><th>Targets achieved on (insert date)</th></tr>
<tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="7"></td></tr>
<tr><td colspan="3">Date of Closing the Program:</td><td></td><td colspan="3"></td></tr>
</table>
</td></tr>
</table>

B.7.3. Sampling plan

>>

NA

B.7.4. Other elements of the monitoring plan

>>

1. Operation and management structure

Overall responsibility for daily monitoring and reporting lies with the project owner. A monitoring group will be established within the project company to carry out the monitoring work. The structure of the monitoring group is as Figure 4.

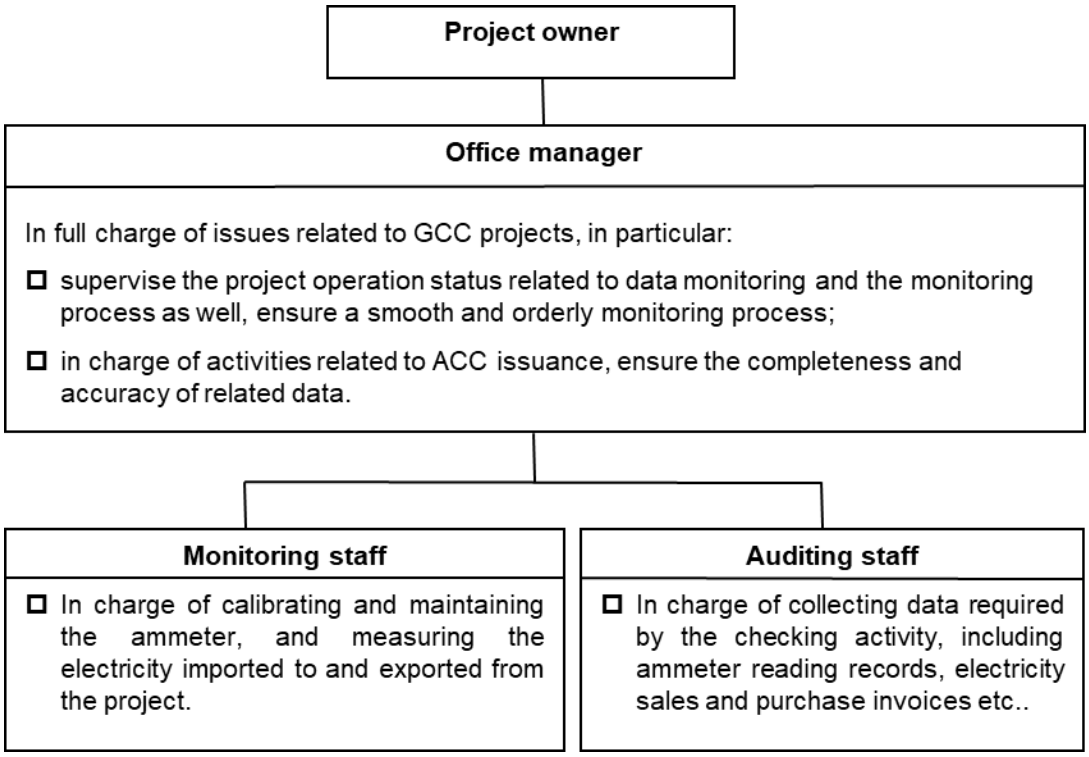


Figure 4 Organization structure of the monitoring team

2. Monitoring equipment and installation

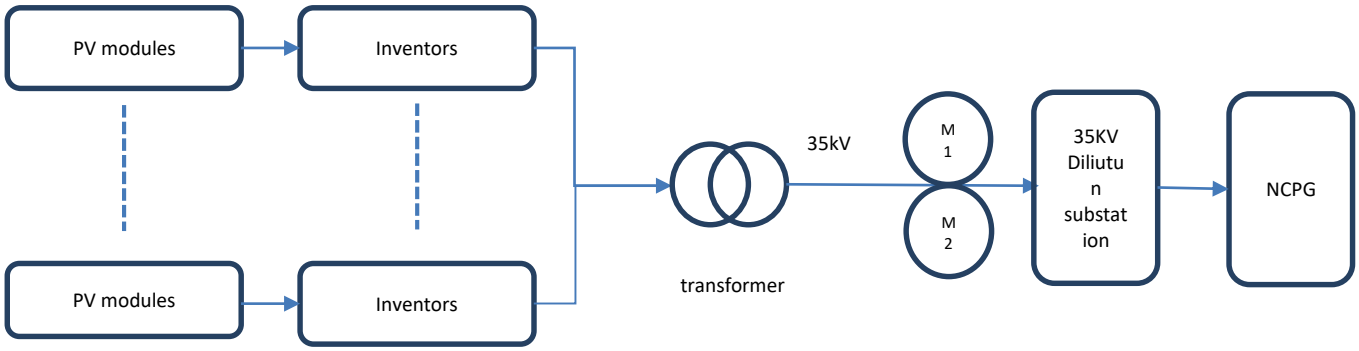
The electricity generated by the Project was boosted to 35kV at project site, and sent to Huai'an 35kV Diliutun Substation, and then merged into the NCPG.

Two bi-directional meters M1, M2 are installed in the outlet of transformer to measure the electricity delivered to the grid by the project ($EG_{export,y}$) and the electricity consumed by the project from grid ($EG_{import,y}$)

$EG_{export,y}$ and $EG_{import,y}$ are recorded by readings from main meter M1, when the main meters are out of order, the readings from the back-up meter M2 shall be used for reference. The total electricity delivered to the grid by the project: $EG_{facility,y}= EG_{export,y} - EG_{import,y}$.

The meters were configured to meet the technology requirements that accepted by local authority. These meters installed for power measurement should reach 0.5s or above in accuracy degree. And before the electric energy metering equipment was put into operation, the project owner and power grid company should check and accept the equipment according to the regulation.

The power line diagram of the project is shown as follow:



3. Quality control

The calibration of meters conducted by qualified organization must comply with national standard or sectoral regulations, which is accepted by local authority. Project owner should keep the calibration records for auditors to check on site.

4. Data management

All monitoring data and records should be archived in electronic document and hard copy. The project owners will also keep copies of sales receipts and prepare a monitoring report at the end of each year, which includes the net electricity generation, the calibration records, the emission reductions calculation and other documents need for verification.

5. Monitoring Report

Monitoring report should be prepared and submitted before each verification process. The report should include the monitoring of grid-connected power generation, report on calculation of the emission reductions and records of monitoring instrument repair and calibration, etc.

Section C. Start date, crediting period type and duration

C.1. Start date of the Project Activity

>>

20/06/2016 (the date the project was put into operation).

C.2. Expected operational lifetime of the Project Activity

>>

25 years 0 month.

C.3. Crediting period of the Project Activity

>>

C.3.1. Start and end date of the crediting period

>>

Start date of crediting period: 20/06/2016

End date of crediting period: 19/06/2026

C.3.2. Duration of crediting period

>>

10 years 0 months

Section D. Environmental impacts

D.1. Analysis of environmental impacts

>>

The Environmental Impact Assessment (EIA) for proposed project was approved by Environmental Protection Bureau of Zhangjiakou City, Hebei Province. According to the EIA report of the Project, environmental impacts possibly caused by the Project and the corresponding measures adopted by the project owner are analyzed as follows:

Noise pollution. During the construction, running of construction machines and transportation vehicle will bring noise pollution. No residential area and other sensitive buildings 1000m around the project site, and the workers should be protected from the noise with some appliance. The project does not have any mechanical transmission components during operation period, and the noise source is only the transformer and inverters which are composed of electronic components, and the noise during operation is very small. Damping measures will be implemented on the equipment. After the house is damped and soundproofed, the noise contribution value can meet the requirements of Category 2 of the "Boundary Noise Emission Standard for Industrial Enterprises" (GB12348-2008). Noise has less impact on the surrounding environment.

Air pollution. The waste gas in construction period is mainly tail gas and dust caused by transportation and equipment's operation, e.g. earthwork, material stacking and waste cleaning. According to the requirement of EIA, The construction site should be sprinkled regularly to reduce dust. During operation period, no waste gas is produced.

Water pollution. The wastewater during both the construction and operation period involves equipment washing wastewater and domestic sewage. The solar panels cleaning wastewater includes mainly dust, which does not require treatment. After flowing to the ground, it will evaporate naturally. The buried sewage treatment device will be built to treat the domestic wastewater, and it will be disposal when it reaches the disposal standard.

Solid waste pollution. The solid wastes in the construction period mainly are construction garbage, which should be land filled on site to avoid soil erosion. The others couldn't be land filled should be piled at the designated site without thrown randomly. The solid waste in operation period mainly includes used solar panels and waste transformer oil. Waste solar panels will be recycled by the manufacturer; waste transformer oil is hazardous waste, and it will be temporarily stored in the hazardous waste temporary storage room after being collected by special facilities and treated by qualified company.

In conclusion, the environmental impact of the project will be minor. The Project owner has taken appropriate measures to minimize adverse environmental impacts.

D.2. Environmental impact assessment and management action plans

>>

EIA the project was approved by the Environmental Protection Bureau of Zhangjiakou city before construction started.

The EIA report has identified all possible environmental impacts by the project and recommended proper measures to minimize adverse environmental impacts, which have been fully described in section D.1 above. The EIA approval from the government official states that all the environmental protection measures recommended in the EIA reports shall be adopted by the project to ensure that all environmental impacts and pollutants emissions comply with national standards and regulations.

Section E. Environmental and social safeguards

>>

E.1. Environmental safeguards

>>

Impact of Project Activity on		Information on Impacts, Do-No-Harm Risk Assessment and Establishing Safeguards								Project Owner's Conclusion		GCC Project Verifier's Conclusion (to be included in Project Verification Report only)
		Description of Impact *(positive or negative)*	**Legal/ voluntary corporate requirement / regulatory/ voluntary corporate threshold Limits**	**Do-No-Harm Risk Assessment (choose which ever is applicable)**			**Risk Mitigation Action Plans for aspects marked as Harmful**		**Performance indicator for monitoring of impact**	***Ex-ante* scoring of environmental impact**	***Explanation of the Conclusion***	**3rd Party Audit**
				Not Applicable	**Harmless**	**Harmful**	**Operational Controls**	**Program of Risk Management Actions**	**Monitoring parameter and frequency of monitoring**	**Ex- Ante scoring of the environmental impact (as per scoring matrix Appendix-02)**	**Ex- Ante description and justification/explanation of the scoring of the environmental impact**	**Verification Process**
Environmental Aspects on the identified categories [22] ***indicated below.***	*Indicators for environmental impacts*	*Describe and identify anticipated and actual significant environmental impacts, both positive and negative from all sources (stationary and mobile) during normal and abnormal/emergency conditions, that may result from the construction and operations of the Project Activity, within and outside the project boundary, over which the Project Owner(s) has/have control.*	*Describe the applicable national regulatory requirements /legal limits / voluntary corporate limits related to the identified risks of environmental impacts.*	*If no environmental impacts are anticipated, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as* ***Not Applicable***	*If environmental impacts exist, but are expected to be in compliance with applicable national regulatory /stricter voluntary corporate requirements and will be within legal/ voluntary corporate limits by way of plant design and operating principles, then the Project*	*If negative environmental impacts exist that will not be in compliance with the applicable national legal/ regulatory requirements or are likely to exceed legal limits, then the Project Activity is likely to cause harm*	*Describe the operational controls and best practices, focusing on how to implement and operate the Project Activity, to reduce the risk of impacts that have been identified as '****Harmfu'l*** *at least to a level that is in compliance with applicable legal/regulator requirements or industry best practice or stricter voluntary corporate*	*Describe the Program of Risk Management Actions (refer to Table 3), focusing on additional actions (e.g., installation of pollution control equipment) that will be adopted to reduce or eliminate the risk of impacts that have been identified as* ***Harmful****.*	*Describe the monitoring approach and the parameters (KPI) to be monitored for each impact irrespective of whether it is harmless of harmful. The frequency of monitoring to be specified as well including the data source.*	*-1* *0* *+1*	*Confirm the score of environmental impact of the project with respect to the aspect and its monitored value in relation to legal /regulatory limits (if any) including basis of conclusion.*	*Describe how the GCC Verifier has assessed that the impact of the Project Activity against the particular aspect and in case of "harmful impacts" how has the project adopted Risk Mitigation Action Plans to mitigate the risks of negative environmental impacts to levels that are unlikely to cause any harm as well as the net positive impacts of the project with respect to the most likely baseline alternative.* .

[22] sourced from the CDM SD Tool and the sample reports are available (https://www4.unfccc.int/sites/sdcmicrosite/Pages/SD-Reports.aspx)

					Activity is unlikely to cause any harm (is safe) and shall be indicated as ***Harmless*** */If the project has an positive impact on the environment mark it as "harmless" as well.*	*(may be un-safe) and shall be indicated as* ***Harmful***	*requirements*					
Reference to paragraphs of Environmental and Social Safeguards Standard		*Paragraph 12 (a)*	*Paragraph 13 (c)*	*Paragraph 13 (d) (i)*	*Paragraph 13 (d) (ii)*	*Paragraph 13 (d) (iii)*	*Paragraph 13 (e) (i)*	*Paragraph 13 (e) (ii)*	*Paragraph 12 (c) and Paragraph 13 (f)*	*Paragraph 22*		*Paragraph 24 and Paragraph 26 (a) (i)*
Environment - *Air*	*SO_x emissions (EA01)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	NO_x emissions (EA02)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	CO_2 emissions (EA03)	The Project reduces the CO_2 emissions by generating power from solar energy which would have been otherwise generated from the fossil fuel based power plants in the absence of Project.	No national regulatory requirement or legal limits related the construction of solar power plant.	NA	The project reduces CO_2 emissions; hence the Project will not cause any harm.	N/A	The impact is positive and not CO_2 emission risk will be caused.	The impact is positive. No need to take risk management actions.	Net electricity amount fed into the grid could be monitored, which is to be used for CO_2 emission reduction calculation. It'll be monitored by electricity meter continuously and recording monthly.	+1	The Project uses solar power generation to replace the equivalent amount of electricity provided by the national power grid, thereby reducing CO_2 emissions, which will be regularly monitored and verified ex-post and therefore is eligible to be scored.	
	CO emissions (EA04)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Suspended	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

	particulate matter (SPM) emissions (EA05)											
	Fly ash generation (EA06)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Non-Methane Volatile Organic Compounds (NMVOCs) (EA07)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Odor (EA08)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Noise Pollution (EA09)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Others (EA10)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Add more rows if required and corresponding notation with EA as prefix)											
Environment - *Land*	*Solid waste Pollution from Plastics (EL-01)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Solid waste Pollution from Hazardous	The solid waste pollution from hazardous wastes comes from waste transformer oil, and it will be temporarily stored in	Hazardous waste storage is in accordanc	NA	Solid waste pollution from Hazardous	NA	Generally the hazardous waste should be	Hazardous waste will be properly collected and temporarily	Management records should be monitored irregularly.	0	The hazardous waste will be managed but treatment result is not available due	

	wastes(EL 02)	the hazardous waste temporary storage room after being collected by special facilities and treated by qualified company .	e with "Hazardous Waste Storage Pollution Control Standard" (GB 18597-2001)		wastes is properly disposed as per regulations , hence the project is deemed Harmless		stored temporarily stored and managed by authorized entity.	stored. It will be regularly managed by authorized entity and properly treated.			to the treatment entity is not owned by project owner. Therefore the score is 0.	
	Solid waste Pollution from Bio-medical wastes (EL03)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Solid waste Pollution from E-wastes (EL04)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Solid waste Pollution from Batteries (EL05)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Solid waste Pollution from end of life products/ equipment (EL06)	PV modules that changed during operation period are main E-waste. Waste PV modules will be collected and managed by the special facility and treated by qualified agency.	Measures for the Administration of the Prevention and Control of Environmental Pollution by Electronic Waste is issued by national environment protection bureau on 27th Sep 2007,	NA	Waste PV modules after life time of the project will be well managed by qualified entity, which no harm will caused by the project.	NA	E- waste is managed by qualified entity.	Waste PV modules after life time of the project will be well managed by qualified entity, which no harm will caused by the project.	Contract and handover records between project owner and the qualified entity should be monitored by the end of project life time.	0	Pollution will not be caused by E-waste. Therefore the score is 0.	

			provides the utilization and dispose method of electronic waste.									
	Soil Pollution from Chemicals (including Pesticides, heavy metals, lead, mercury) (EL07)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	land use change (change from cropland /forest land to project land) (EL08)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Others (EL09)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Add more rows if required		NA	NA	NA	NA	NA	NA	NA	NA	NA	
Environment - *Water*	*Reliability/ accessibility of water supply (EW01)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Water Consumption from ground and other sources (EW02)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

	Generation of wastewater (EW03)	The project generates wastewater caused due to daily life of working staff during operation period and condensate, but it is treated according to national regulations. During operation period, waste water mainly produced by cleaning the solar panel.	Class III of <Environmental Quality Standard of Surface Water> (GB3838-2002)	NA	The domestic sewage will be treated during the buried sewage treatment device during operation. Then it will be used for green irrigation. The rain will be used to clean the out layer of the cell naturally. Waste water generated due to solar panel cleaning contained just dust and not harmful. Therefore waste water produced by the project is harmless.	NA	After proper treatment, waste water could be discharged or reused by the project owner.	Septic tank or other waste water treatment facility should be installed for waste water management.	The solar panel cleaning and wastewater discharging jobs is recorded by the operating team. The domestic sewage will be managed by Sanitation company periodically and the records could be used to prove treatment on domestic sewage.	+1	Reuse of waste water is benefit for local environment. Therefore the score is +1.	
	Wastewater discharge without/with insufficient treatment (EW04)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Pollution of Surface, Ground and/or Bodies of water (EW05)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

	Discharge of harmful chemicals like marine pollutants / toxic waste (EW06)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Others (EW07)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Add more rows if required											
Environment – *Natural Resources*	*Conserving mineral resources (ENR01)*	*NA*	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Protecting/ enhancing plant life (ENR02)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Protecting/ enhancing species diversity (ENR03)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Protecting/ enhancing forests (ENR04)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Protecting/ enhancing other depletable natural resources (ENR05)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Conserving energy (ENR06)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Replacing fossil fuels	The project is a renewable power plant	No legal limit on	NA	No fossil fuel will be	NA	Electricity imported or	Meters should be	Electricity imported or exported	+1	Benefit to local power supply and	

	with renewable sources of energy (ENR07)	replacing the usage of fossil fuel.	constructi on of solar power project.		used during operation period which is positive impact for local environme nt.		exported monitored by meters of the project.	properly installed to monitor electricity imported or exported.	monitored by meters of the project.		reduce GHG emission.	
	Replacing ODS with non-ODS refrigerant s (ENR08)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Others (ENR09)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Add more rows if required											

Net Score:	**+3**	The Project Activity will not cause any net harm to Environment.
Project Owner's Conclusion in PSF:	+3	The Project Owner confirms that the Project Activity will not cause any net harm to Environment.
GCC Project Verifier's Opinion:		The GCC Verifier certifies that the Project Activity [is not likely to cause any] or [is likely to cause] net harm to the environment...

E.2. Social Safeguards

>>

Impact of Project Activity on	**Information on Impacts, Do-No-Harm Risk Assessment and Establishing Safeguards**	**Project Owner's Conclusion**	**GCC project Verifier's Conclusion** **(to be included in Project Verification**

											Report only)
		Description of Impact (*positive or negative*)	**Legal requirement /Limit, Corporate policies / Industry best practice**	**Do-No-Harm Risk Assessment (choose which ever is applicable)**			**Risk Mitigation Action Plans (for aspects marked as Harmful)**	**Performance indicator for monitoring of impact.**	**Ex-ante scoring of environmental impact**	**Explanation of the Conclusion**	**3rd Party Audit**
				Not Applicable	**Harmless**	**Harmful**	**Operational / Management Controls**	**Monitoring parameter and frequency of monitoring (as per scoring matrix Appendix-02)**	**Ex- Ante scoring of social impact of the project**	**Ex- Ante description and justification/explanation of the scoring of social impact of the project**	**Verification Process** **Will the Project Activity cause any harm?**
Social Aspects on the identified categories[23] indicated below.	*Indicators for social impacts*	*Describe and identify actual and anticipated impacts on society and stakeholders, both positive or negative, from all source during normal and abnormal/emergency conditions that may result from constructing and operating of the Project Activity within or outside the project boundary, over which the project Owner(s) has/have control*	*Describe the applicable national regulatory requirements / legal limits or organizational policies or industry best practices related to the identified risks of social impacts*	*If no social impacts are anticipated, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as* ***Not Applicable***	*If social impacts exist, but are expected to be in compliance with applicable national regulatory requirements/ stricter voluntary corporate limits by way of plant design and operating principles then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as* ***Harmless****), project having positive impact on society wrt. To the BAU / baseline scenario must also mark their aspect as* ***"harmless"***	*If negative social impacts exist that will not be in compliance with the applicable national legal/ regulatory requirements or are likely to exceed legal limits then the Project Activity is likely to cause harm and shall be indicated as* ***Harmful***	*Describe the operational or management controls that can be implemented as well as best practices, focusing on how to implement and operate the Project Activity, to reduce the risk of impacts that have been identified as* ***Harmful****.*	*Describe the monitoring approach and the parameters (KPI) to be monitored for each impact irrespective of whether it is harmless of harmful. The frequency of monitoring to be specified as well. Monitoring parameters can be quantitative or qualitative in nature along with the data source*	*-1* *0* *+1*	*Confirm the score of the social impacts of the project with respect to the aspect and its monitored value in relation to legal/regulatory limits (if any) including basis of conclusion*	*Describe how the GCC Verifier has assessed that the impact of Project Activity on social aspects (based on monitored parameters, quantitative or qualitative) and in case of "harmful aspects how has the project owner adopted Risk Mitigation Action / management actions plans and policies to mitigate the risks of negative social impacts to levels that are unlikely to cause any harm.* *Also describe the positive impacts of the project on the society as compared to the baseline alternative or BAU scenario.*
Reference to paragraphs of Environmental and Social Safeguards Standard		*Paragraph 12 (a)*	*Paragraph 13 (c)*	*Paragraph 13 (d) (i)*	*Paragraph 13 (d) (ii)*	*Paragraph 13 (d) (iii)*	*Paragraph 13 (e) (i)*	*Paragraph 12 (c) and Paragraph 13 (f)*	*Paragraph 23*		*Paragraph 24 and Paragraph 26 (a) (ii)*

[23] sourced from the CDM SD Tool and the sample reports are available (https://www4.unfccc.int/sites/sdcmicrosite/Pages/SD-Reports.aspx)

Social - *Jobs*	*Long-term jobs (> 10 year) created/ lost (SJ01)*	According to the FSR, the Project is expected to create 10 long-term job opportunities.	Project should follow "Labor Law of P. R. China" and protect the legal rights of workers at project site.	NA	The Project is expected to increase employment and benefit for local people, hence it is harmless.	NA	Sign contract with employee or outsourced management team in line with "Labor Law of P. R. China" to protect workers' legal rights.	Workers' contract and roster can be monitored.	+1	Project owner follower the law and benefit to local labor market. Therefore the score is +1.	
	New short-term jobs (< 1 year) created/ lost (SJ02)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Sources of income generation increased / reduced (SJ03)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Avoiding discrimination when hiring people from different race, gender, ethnics, religion, marginalized groups, people with disabilities (SJ04) *(human rights)*	At least 2 female employees are working in the project according to their working ability.	"LABOUR LAW OF THE PEOPLE'S REPUBLIC OF CHINA" is applicable for the project. People hired by the project owner will not be discriminated in the employment, regardless of their ethnic community, race, gender, or religious belief.	NA	Women are hired equally in the project and it's harmless.	NA	Contract will be signed with project owner or operation and maintenance company to protect the working rights of female employees.	Number of female employees by the Project will be monitored through the roster.	+1	The indicator is harmless. Employment of female employees will increase the employment rate of local women. Therefore the score is +1.	
Social -	*Disease preventio*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	

Health & Safety	*n (SHS01)*										
	Occupational health hazards (SHS02)	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	
	Reducing / increasing accidents /Incidents/fatality (SHS03)	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	
	Reducing / increasing crime (SHS04)	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	
	Reducing / increasing food wastage (SHS05)	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	
	Reducing / increasing indoor air pollution (SHS06)	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	
	Efficiency of health services (SHS07)	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	
	Sanitation and waste management (SHS08)	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	
	Other health	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	

	and safety issues (SHS09)										
	Add more rows if required										
Social - *Education*	*specialized training / education to local personnel (SE01)*	*NA*	NA	NA	NA	NA	NA	NA	NA	NA	
	Educational services improved or not (SE02)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Project-related knowledge dissemination effective or not (SE03)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Other educational issues (SE03)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Add more rows if required (SE04)										
Social - *Welfare*	*Improving/ deteriorating working conditions (SW01)*	*NA*	NA	NA	NA	NA	NA	NA	NA	NA	

	Community and rural welfare (indigenous people and communities) *(SW02)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Poverty alleviation (more people above poverty level) (SW03)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Improving / deteriorating wealth distribution/ generation of income and assets (SW04)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Increased or / deteriorating municipal revenues (SW05)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Women's empowerment (SW06) *(human rights)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Reduced /	NA	NA	NA	NA	NA	NA	NA	NA	NA	

	increased traffic congestion (SW07)										
	Exploitation of Child labour *(human rights)* *(SW08)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Minimum wage protection *(human rights) (SW09)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Abuse at work place.(with specific reference to women and people with special disabilities / challenges) *(human rights) (SW10)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Other social welfare issues (SW11)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Avoidance of human traffickin g and	NA	NA	NA	NA	NA	NA	NA	NA	NA	

	forced labour *(human rights)* *(SW12)*										
	Avoidance of forced eviction and/or partial physical or economic displacement of IPLCs *(human rights)* *(CW13)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Provisions of resettlement and human settlement displacement *(human rights)* *(CW14)*	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Add more rows if required										
Net Score:		+2									
Project Owner's Conclusion in PSF:		The Project Owner confirms that the Project Activity will not cause any net harm to society.									

GCC Project Verifier's Opinion:	The GCC Verifier certifies that the Project Activity [is not likely to cause any] or [is likely to cause] net harm to society.

Section F. United Nations Sustainable Development Goals (SDG)

>>

UN-level SDGs	**UN-level Target**	**Declared Country-level SDG**	**Defining Project-level SDGs**				**GCC Project Verifier's Conclusion** (to be included in Project Verification Report only)	
			Project-level SDGs	**Project-level Targets/Actions**	**Contribution of Project-level Actions to SDG Targets**	**Monitoring**	**Verification Process**	**Are Goal/ Targets Likely to be Achieved?**
Describe UN SDG targets and indicators *See: https://unstats.un.org/sdgs/indicators/indicators-list/*	*Describe the UN-level target(s) and correspo-nding indicator no(s)*	*Has the host country declared the SDG to be a national priority? Indicate Yes or No*	*Define project-level SDGs by suitably modifying and customizing UN/ Country-level SDGs to the project scope or creating a new indicator(s). Refer to previous column ofr guidance.*	*Define project-level targets/actions in line with nee project level indicators chosen. Define the target date by which the project Activity is expected to achieve the project-level SDG target(s).*	*Describe and justify how actions taken under the Project Activity are likely to result in a direct positive effect that contributes to achieving the defined project-level SDG targets*	*Describe the monitoring approach and the monitoring parameters to be applied for each project-level SDG indicator and its correspondi ng target, frequency of monitoring and data source*	*Describe how the GCC Verifier has verified the claims that the project is likely to achieve the identified Project level SDGs target(s).*	*Describe whether the project-level SDG target(s) is likely to be achieved by the target date (Yes or No)*
Goal 1: End poverty in all its forms everywhere								

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture									
Goal 3. Ensure healthy lives and promote well-being for all at all ages									
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all									
Goal 5. Achieve gender equality and empower all women and girls									
Goal 6. Ensure availability and sustainable management of water and sanitation for all									
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all	SDG Target 7.2 " By 2030, increase substantially the share of renewable energy in the global energy mix " by the utilization of solar power as a renewable energy	Yes	The project generates electricity from the sustainable and renewable resource and contributes to increase renewable energy supply in Chinese power system. No fossil fuel will be used during operation period and no harmful pollutants will be produced by the operation. Project activity could promotes investment into the cleaner technology-based power generation projects. By	The Project provide average 29551MWh renewable energy generation annually in crediting period. Such contribution started since project started commissioning.	Project has commissioned and the target has achieved.	The Project increases the renewable energy share in local grid and average 29551MWh of clean energy could be supplied to the grid annually clean in crediting period, which will be benefit	Project operation team will continuously monitor the quantity of net electricity generation supplied by the project according to ETN or invoice. The parameter is	Check ETNs of invoices.	Yes

	source.		installing advanced PV technology project owner also promotes upgraded cleaner technology solutions and infrastructure in the power generation sector in the host country. This will lead to a lower total cost for solar power generation project in the future, which will benefit for local people to access affordable green energy.			for Chinese residents to achieve affordable clean energy,	measured continuously by meter and recording monthly by project staff.		
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	SDG Target 8.5 "By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value"	Yes	The project supports creation of short term and long-term job opportunities during the construction and operation of the Project. The Project also supports economic productivity through technology upgradation and innovation through training of labour in intensive sector. Project protects labour rights and promotes safe and secure working environments.	The Project is expected to create 10 long-term job opportunities. The Project also promote the local economic development by creating opportunities to other allied services and indirect employment.	Project started operation and target achieved.	Jobs created by the project can increase the employment and accommodating more labour force. Staff are well trained about new technology on renewable energy. They will be well paid with salary and relevant welfare as per national regulations. Besides, tax will be paid to local government during operation period which will be great help to local economic growth.	Roster will show the number of workers employed by the project during operation and could be checked when verification happened.	Roster and could be checked to confirm the indicator.	Yes
Goal 9. Build resilient infrastructure, promote inclusive	SDG Target 9.4 By 2030, upgrade infrastructure	Yes	The Project involves upgradation to advanced solar technology which is clean and resilient infrastructure from the	The Project involves installation of 20MW solar	Project owner operates the plant and	The Project helps adaptation of clean energy	The Project operation team continuously	Check ETNs or invoices.	Yes.

and sustainable industrialization and foster innovation	and retrofit industries to make them sustainable, with increased resource use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.		conventional fossil fuel based power plant technology. Supports advanced industrialization by providing zero greenhouse gas and non-polluting clean electricity. Support industrialization through local hiring, procurement, and training and skills development.	project in China.	complies with targeted SDGs so far.	technologies by implementing solar power generation plant.	monitors the quantity of net electricity generation supplied to NCPG by the Project.		
Goal 10. Reduce inequality within and among countries									
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable									
Goal 12. Ensure sustainable consumption and production patterns									
Goal 13. Take urgent action to combat climate change and its impacts	SDG Target 13.3 Improve education, awareness raising and human and institutional capacity on climate change	Yes	The Project generates renewable energy based electricity and mitigates the CO_2 emissions which would have been generated from the fossil fuel based power plants.	The Project involves installation of 20MW solar project in China.	Project owner operates the plant and complies with targeted SDGs so far.	The Project helps adaptation of clean energy technologies by implementing solar power generation plant and	Monitoring the supplied electricity to NCPG by the project. The GHG emission reduction is calculated accordingly.	Check ETNs or invoices for ER calculation.	Yes

	mitigation, adaptation, impact reduction and early warning.					ensure optimum generation from the plant to the grid.			
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development									
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss									
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels									
Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development									

SUMMARY	Targeted	Likely to be Achieved
Total Number of SDGs	**4**	**4**
Certification label (Bronze, Silver, Gold, Platinum, or Diamond) for the ACCs as defined in the PSF	**Gold**	**Gold**

Section G. Local stakeholder consultation

G.1. MODALITIES FOR LOCAL STAKEHOLDER CONSULTATION

>>

Stakeholder consultation was held in 04/2016 to collect comments by pasting poster around project. Local stakeholder consultation (LSC) was conducted for the Project to introduce the project to the local stakeholders.

A total of 50 questionnaires were distributed and 41 copies were received successfully from the stakeholder representatives, respectively from the local government, and surrounding villages. The representatives covered different ages, different occupations and different education levels.

The questions in the questionnaires including:

Do you aware of this project?

What is your opinion on the project and do you support the construction of the project?

What do you think of the impact of the project on the local environment?

What do you think the influence on your life quality and income?

What do you think of the environmental impact during the construction and operation should be paid attention to?

From the perspective of environmental protection and residents' interest, do you have any suggestions about the project construction and operation?

G.2. SUMMARY OF COMMENTS RECEIVED

>>

100% surveyed stakeholders aware of and support the construction of the proposed project;

38 responders think the environment impact can be ignored; 40 responders think not severe environment impact will be caused by the project which can be managed.

3 responders think there is no impact to the local economy. 38 think the income will or possibly will be increased by the project and 100% think the life quality will be increased or possibly increased.

Most of them think there will be a little negative influence of dust, noise, waste water and solid waste during the construction period and will be a little negative influence of noise and waste water during the operation period. All stakeholders surveyed think the little negative environment influence can be negligible or managed by project owner.

No comments received.

G.3. CONSIDERATION OF COMMENTS RECEIVED

>>

According to the questionnaire received all residents knew the project and are supportive to the construction of the Project. No negative comments have been received during the investigation.

At the same time, most of the stakeholders interviewed expressed the project will benefit the local economy, social development and people life, some of them thought there is no significant impact on those, and no negative impact were raised by stakeholders.

For the problems of noise, waste water, solid waste which the public mainly concerns as mentioned in Section D.1 and Section E.1, project owner plan to take effective measures to avoid these influences as following:

- Choose instruments with less noise; Limit the speed and no tooting of the vehicles; Take some noise reduction such as damping measures;
- The wastewater will be used for greening water when it reaches the disposal standard in the buried integrated domestic sewage treatment facility.
- After the completion of the project, restore the topsoil and original vegetation, maintain the soil level in the refill and backfill, and green the surrounding areas.

Section H. Approval and authorization

>>

HCLOA is to be submitted along with the submission for a request for the first or subsequent issuance of ACCs.

APPENDIX 1. CONTACT INFORMATION OF PROJECT OWNERS

Project Owner name (as per LON/LOA)	Beijing BOE Energy Technology Co., Ltd.
Country	P. R. China
Address	No. 12 Xihuanzhong Rd., Beijing Economic & Technological Development Zone, Beijing, China
Telephone	8618210303317
Fax	-
E-mail	zhangxiaomeng@boe.com.cn
Website	-
Contact person	Zhang xiaomeng

APPENDIX 2. AFFIRMATION REGARDING PUBLIC FUNDING

>>

No public funding from Annex I parties are involved in this project activity.

APPENDIX 3. APPLICABILITY OF METHODOLOGY(IES)

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Please refer Section B.2

APPENDIX 4. FURTHER BACKGROUND INFORMATION ON EX ANTE CALCULATION OF EMISSION REDUCTIONS

>>
NA

APPENDIX 5. FURTHER BACKGROUND INFORMATION ON MONITORING PLAN

>>

NA

APPENDIX 6. SUMMARY REPORT OF COMMENTS RECEIVED FROM LOCAL STAKEHOLDERS

>>

Please refer section G.2

APPENDIX 7. SUMMARY OF DE-REGISTERED CDM PROJECT OR PROJECTS FROM OTHER GHG / NON-GHG PROGRAMS (TYPE B)

>>

Complete this form in accordance with the instructions attached at the end of this form.	
Program Name	**NA**
Project registration number	
Date of registration in the program	
Title of the Project Activity	
Projectde-registration reference number	
Date of de-registration of the Project	
Project Participants (authorized by the host / annex 1 country letter of approval)	
Country where the project is located	
Applied methodology(ies) (provide reference and version number(s))	

Pre-registration changes to the Project Activity

(Tick as applicable)

Pre-registration Changes	Reference number	Approved	Provide a summary of pre-registration changes
Deviations from approved baseline and monitoringmethodology		☐	
Deviations from applied Tool & Guidance		☐	
Deviations from the rules		☐	
Other…….		☐	

Post-registration changes to the Project Activity

(Tick as applicable)

Post registration Changes	Reference number	Approved	Provide a summary of post-registration changes
Change in project design		☐	
Request for revision of monitoring plan		☐	
Request for change in start date of crediting period		☐	
Renewal of crediting period		☐	
Temporary deviations		☐	
Other…….		☐	

Crediting Period(s)

Crediting period(s)			Period (start & end dates)	ERs as per registered PDD/MR/Project documents	Credits issued
Crediting Period (shall start on or after 1 Jan 2016)	Fixed 10 year				
	Renewable (7 years, with 2 approved renewals)	1st			
		2nd			
		3rd			
Period for which Credits have been issued					
Period for which Credits have been requested but not issued					-
Period for which Credits have never been requested for issuance (no monitoring reports submitted)					-
Period for which Credits have never been requested for issuance prior to CDM de-registration					-
Remaining Crediting period, after de-registration, for which Credits have not been issued by the program , subject to a ceiling of 10 years as allowed under the GCC Program					-

Details of Previous Issuance Requests

Issuance Request	Period (start & end dates)	ERs as per registered PDD	Quantity of Credits requested to be issued	Quantity of Credits issued
1st				
2nd				
3rd				
4th				
5th				
Add rows …….				
Total				

List any open issues in the Validation and last Verification Report (e.g., FARs, if any) and how they have been addressed	
Any other relevant information that has not been reported in the registered documents and that may have adverse impacts on the environmental integrity of the Project Activity	
Provide the list of all the registered documents related to this project, as available on the programs website and the corresponding URLs.	

Appendix 8. FURTHER INFORMATION ON DETERMINATION OF BUNDLE IN PROJECT ACTIVITY.

>>

NA. The project is not a bundle project.

Appendix 9. PUBLIC DECLARATION FOR A2 (Sub Type 2 and 3), B1 & B2 PROJECTS ON NON CONTINUATION FROM CDM/GHG/NON-GHG PROGRAMS.

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NA.

DOCUMENT HISTORY

Version	Date	Comment
V 4.0	27/09/2022	▪ Revised version released on approval by Steering Committee as per GCC Program Process; ▪ Revised version contains following changes: ○ Introduced A3 type projects A2 project sub-types; ○ Included revised Declaration by the 'Authorized Project Owner and focal point' on GCC requirements; ○ Included modified format for E+/S+/ SDG assessment; ○ Revised instructions for filling in the PSF; ○ Editorial changes to the document.
V 3.2	31/12/2020	▪ The name of GCC Program's emission units has been changed from "Approved Carbon Reductions" or ACRs to "Approved Carbon Credits" or ACCs.
V 3.1	17/08/2020	▪ Editorial revisions made ○ Revised Table in section B.7.2 on Monitoring-program of risk management actions ○ Revised Table in section E.1 on Environmental Safeguards ○ Revised Table in section E.1 on Social Safeguards ○ Revised Table in section F on United Nations Sustainable Development Goals (SDG)
V 3.0	05/07/2020	▪ Revised version released on approval by Steering Committee as per GCC Program Process; ▪ Revised version contains following changes: ○ Change of name from Global Carbon Trust (GCT) to Global Carbon Council (GCC); ○ Considered and addressed comments raised by Steering Committee: ➢ during physical meeting (SCM 01, dated 29 Oct 2019, Doha Qatar); and ➢ electronic consultations EC01-Round 01 (15.09.2019 – 25.09.2019), EC01-Round 02 (27.03.2020 – 27.06.2020). ○ Feedback from Technical Advisory Board (TAB) of ICAO on GCC submission for approval under CORSIA[24];

[24] See ICAO recommendation for conditional approval of GCC at https://www.icao.int/environmental-protection/CORSIA/Documents/TAB/Excerpt_TAB_Report_Jan_2020_final.pdf

V 2.0	25/06/2019	▪ Revised version released for approval by the GCC Steering Committee. ▪ Revised version includes additional details and instructions on the information to be provided, consequent to the latest developments world-wide (e.g., CORSIA EUC).
V 1.0	01/11/2016	Initial version released under the GCC Program Version 1

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