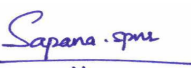




**Validation report form for
CDM project activities
(Version 04.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title of the project activity	BIM Solar Farm
Scale of the project activity	☒ Large-scale / Non Microscale (GS Classification) ☐ Small-scale
Version number of the validation report	1.1
Completion date of the validation report	12/01/2020
Version number of the PDD to which this report applies	Version 01 – 13/05/2019 Version 02 – 09/08/2019 Version 03 – 10/12/2019
Date when PDD was uploaded for global stakeholder consultation	Not Applicable as this is GS project
Project participants	BIM Renewable Energy Joint Stock Company (BIMRE) – Vietnam BIM Energy Joint stock Company (BIME) – Vietnam C&W Services (S) Pte. Ltd.
Host Party	Socialist Republic of Vietnam
Applied methodologies and standardized baselines	ACM0002: Grid-connected electricity generation from renewable sources (Version 19.0)
Mandatory sectoral scopes	TA 1.2
Conditional sectoral scopes, if applicable	Not Applicable
Estimated amount of annual average GHG emission reductions or GHG removals by sinks	461,636 tCO ₂ /Annum
Name and UNFCCC reference number of the DOE	Bureau Veritas
Name, position and signature of the approver of the validation report	 Sapana Pednekar – Global Quality Manager

SECTION A. Executive summary

Bureau Veritas has made the validation of the BIM Solar Farm on the basis of specific criteria i.e. Gold Standard GS4GG as well UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the GS Secretariat, CDM Executive Board, as well as the host country criteria.

The main purpose of the project activity is to generate electrical energy through sustainable means using solar power, to utilize the generated output for selling it to the grid and to contribute to climate change mitigation efforts. This renewable energy will partially substitute the electricity currently evacuated into the grid by the thermal power plants, thus contributing to the sustainable development of the region socially, environmentally and economically.

The proposed project activity has an installed capacity of 330 MW with 999,210 number of solar PV Panels connected to central inverter technology through DC arrays consist of solar photovoltaic modules with monocrystalline cells. A dedicated substation with a power transformer rated at 40MVA to step up the grid to 22kV to 110kV. The transmission voltage to the grid shall be at 110kV.

The annual estimated electricity generation by the Project Activity, also referred to as "Power Generation Capacity", is 543,613 MWh and the annual estimated emission reductions are 461,636 tCO₂e.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas internal procedures.

The first output of the validation process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Appendix 4. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas opinion that the project correctly applies the baseline and monitoring methodology ACM 0002 version 19.0 and meets all the relevant GS4GG and UNFCCC requirements for the CDM and the relevant host country criteria. Bureau Veritas thus requests the registration of the project as a Gold Standard project activity.

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Validation findings
1.	Team Leader	IR	Desai	Ram Madhukar	Bureau Veritas	X	X	X	X

					Brunei				
3.	Translator	OR	Pham	Duong	Vietnam			X	

B.2. Technical reviewer and approver of the validation report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Ngyuen	Hong Linh	BV Vietnam
2.	Approver	IR	Pednekar	Sapana	BV India

SECTION C. Means of validation

C.1. Desk/document review

>> The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas' internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, according to the version 02.0 of the Clean Development Validation and Verification Standard /Ref-B10/ for Project Activity, issued by the CDM Executive Board at its 93rd meeting on 03/03/2017. The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

Document review:

The Project Design Document (PDD) /**Ref-P1**/ submitted by the PP BIM Renewable Energy Joint Stock Company (BIMRE) – Vietnam for the BIM Solar Farm Project and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for Completing the Project Design Document (CDM-PDD), Approved methodology, GS4GG, Kyoto Protocol, Clarifications on Validation Requirements to be checked by a Designated Operational Entity were reviewed.

To address Bureau Veritas' corrective action and clarification requests, PP revised the PDD and other supporting documents i.e. Emission Reduction Spreadsheet, Investment Analysis and resubmitted to VVB for verification and final closure in January 2020.

C.2. On-site inspection

Duration of on-site inspection: 30/10/2019 – 01/11/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Management Interview: • Project Design and implementation; • Technical Equipment and operation • Compliance with National Laws and regulations. • Early consideration • Additionality • Local stakeholder consultation and resolution of their concerns • Supporting data, evidences and documentation • Environmental Impacts • Monitoring System at site	BIM Solar Project Office	16/09/2019	Ram M. Desai
2.	Site Visit: - Meeting Local Stakeholders to understand their views and concerns about the Project Activity	BIM Solar Project Office and Site	17/09/2019	Ram M. Desai

	- Confirming that BIM Solar Farm Project Authority had conducted a formal Stakeholder Consultation Meeting. - Project Site Round – Plant Room, Substations, Transformer yard, Solar panel field. Etc.			
3.	Document Review: - Pre-project documents like FSR, various Approvals, Environmental Assessment Study documents, etc; - Financial Additionality documents; - Prior consideration; - PLF study report; - Implementation - QA/QC procedures - Qualification & Training - Monitoring records - Cross-check data - ER calculations	BIM Solar Project Office	17/09/2019	Ram M. Desai
4.	Stakeholder interview – With General People and group of experts	BIM Solar Project Office	18/09/2019	Ram M. Desai
5.	Stakeholder interview – Authorities	Commune Office	18/09/2019	Ram M. Desai
6.	Stakeholder Interview – NGO's	BIM Solar Project Office	18/09/2019	Ram M. Desai
7.	Close Meetings - Summary of Findings - Follow up actions	BIM Solar Project Office	18/09/2019	Ram M. Desai

C.3. Interviews

No.	Interviewee		Date	Subject	Team member
	Name of Stakeholder	Affiliation			
1.	Mr. Nam	Common Stakeholder	18/09/2019	LSC Process / Concerns / Feedback etc.	Ram M. Desai
2.	Phạm Thị Thu Hương	Common Stakeholder			
3.	Nguyễn Thị Bé Hoàn	Common Stakeholder			
4.	Nguyễn Thị Thanh Thủy	Common Stakeholder			
5.	Bùi Thị Nụ	Common Stakeholder			
6.	Tăng Thị Mỹ Nhung	Common Stakeholder			
7.	Nguyễn Thị Hương	Common Stakeholder			
8.	Tô Thị Nguyệt	Common Stakeholder			
9.	Nguyễn Phước Nhung	Common Stakeholder			
10.	Trần Ích Phong	Common Stakeholder			
11.	Lưu Vũ Nam	Common Stakeholder			
12.	Trần Ích Phòng	Common Stakeholder			
13.	Duong Lan	Common Stakeholder			
14.	Mr. Thuy	BIM Solar Farm	16 - 17/09/2019	Project Implementation and Technical Requirement	Ram M. Desai
15.	Mr. Lam	BIM Solar Farm			
16.	Mr. Huy	Sub Leader – BIM3			
17.	Mr. Thanh	Leader – BIM3			
18.	Mr. Pluc	AMI Energy Khanh Hoa JSC			
19.	Tran Minh Sang	ERS Vietnam JSC	18/09/2019	Legal Requirement and LSC Process Concerns	Ram M. Desai
20.	Mr. Lai	Government - Land Office – Phuoc Ninh Commune			
21.	Mr Quang	Phuoc Minh Commune (Chairman)			
22.	Mr Thuy	Phuoc Ninh Commune (Deputy chairman)			
23.	Ms Tam	Phuoc Ninh Commune (Land authority office)			
24.	Mr Trung	Phuoc Ninh Commune (Land authority office)			
25.	Ms Thanh	Phuoc Minh Commune (Fatherland Front)			
26.	Mr. Chinh	Maintenance Team Leader	17/09/2019		Ram M. Desai
27.	Mr. Hien	Grass Cutter			
28.	Ms. Nguyen	Grass Cutter			
29.	Mr. Lan	Grass Cutter			
30.	Mr. Thu	Grass Cutter			
31.	Mr. Hoa	Grass Cutter			
32.	Mr. Huong	Grass Cutter			

C.4. Sampling approach

>>>> There was no sampling followed for validation.

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
A.1 Purpose and general description of project			

A.2 Eligibility of the project under Gold Standard			
A.3 Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project			
A.5 Technologies and/or measures	2	1	
A.6 Scale of the project			
A.7 Funding sources of project		1	
A.8 Assessment that project complies with 'gender sensitive' requirements			
B.1 Reference of approved methodology			
B.2 Applicability of methodology			
B.3 Project boundary			
B.4 Establishment and description of baseline scenario		1	
B.5 Demonstration of additionality	1	1	
B.6 Relevant target for each of the three SDGs	1		
B.6.2 Explanation of methodological choices/approaches for estimating the SDG outcome			
B.6.3 Data and parameters fixed ex-ante for monitoring contribution to each of the three SDGs			
B.6.4 Ex-ante estimation of outcomes linked to each of the three SDGs			
B.6.5 Summary of ex-ante estimates of each SDG outcome		1	
B.7.1 Data and parameters to be monitored	1	1	
B.7.2 Sampling plan			
B.7.3 Other elements of monitoring plan	1	1	
C.2.1 Start Date of Crediting Period		1	
D.1. Analysis of social, economic and environmental impacts			
E.1 Solicitation of comments from stakeholders			
E.2 Summary of comments received			
E.3 Report on consideration of comments received			
Total	6	8	0

SECTION D. Validation findings

D.1. Demonstration of prior consideration of the CDM

Means of validation	From the PDD submitted for validation it was noted that the Project is the Retroactive Type of Project and as per the GS4GG PRINCIPLES & REQUIREMENTS /Ref-B3/, section Prior Consideration 4.1.49 (b) if the Project Type is Retroactive project, then PP shall submit the required documents for preliminary review (time of first submission) within one year of the project start date. From the project time line it was noted that PP has submitted documents for the preliminary review to Gold Standard in the month of June 2019 /Ref-P8/. The start date of the project was validated using the EPC Contract /Ref-P35/ Dated 20th July 2018, which is the legal document signed between PP and the EPC Contractor where PP has committed to invest for the project activity. The start date identified is found in accordance with the definition of the start date. The Preliminary review was completed by GS in June 2019 /Ref-P8/ , which is within One year from the Start date of Project Activity and hence the Condition 4.1.49 (b) is satisfied and hence it is concluded that project participant is serious in considering this project for the Gold standard certification.
Findings	NIL
Conclusion	Based on the above assessment, in line with Section 4.1.49 (b) of GS4GG Principles and Requirements as well as paragraph 46 of VVS version 02 for project activity, the Bureau Veritas hereby confirms that the proposed CDM project activity complies with the requirements of the prior consideration of CDM.

D.2. Identification of project type

Means of validation	The Project Participant has correctly identified the project activity as Large Scale Project Activity in accordance with paragraph 34 of CDM Project Standard Version
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	2 for project activity / Ref-B11 /. The template of the PDD used by the Project Participant at the time of Preliminary review is found to be latest and the version is 1.1 – August 2017. Validation team noted that all relevant sections of the PDD are completed correctly using appropriate instructions provided in the PDD form.
Findings	NIL
Conclusion	In accordance with paragraph section 7.3 of VVS version 02 of the project activity, the Bureau Veritas confirms that the type of the project activity is appropriately determined. Also the PDD is completed in the latest available form using correct instructions provided therein the PDD form.

D.3. Description of project activity

Means of validation	BIM Solar Farm is a greenfield grid-connected photovoltaic solar power plant project which is constructed on approximately 300-hectare property in Thuan Nam District, Ninh Thuan Province Vietnam. The land on which the project is implemented belongs to BIM Group. The project is implemented on three different land pockets situated within 10 KM radius. PP has identified these three land pockets as 18N, 18S and 18E, the installed capacity against each land pocket is validated using project specification document and number of Solar panels installed there.															
	<table><tr><th>Plant Name</th><th>Location</th><th>Installed Capacity (MWp)</th></tr><tr><td>18N</td><td>Phuoc Ninh Commune</td><td>250</td></tr><tr><td>18S</td><td>Highway 1A, Lac Tien Hamlet, Phuoc Minh Commune</td><td>50</td></tr><tr><td>18E</td><td>Highway 1A, Quan The Hamlet, Phuoc Minh Commune</td><td>30</td></tr><tr><td></td><td>Total</td><td>330</td></tr></table>	Plant Name	Location	Installed Capacity (MWp)	18N	Phuoc Ninh Commune	250	18S	Highway 1A, Lac Tien Hamlet, Phuoc Minh Commune	50	18E	Highway 1A, Quan The Hamlet, Phuoc Minh Commune	30		Total	330
	Plant Name	Location	Installed Capacity (MWp)													
	18N	Phuoc Ninh Commune	250													
	18S	Highway 1A, Lac Tien Hamlet, Phuoc Minh Commune	50													
	18E	Highway 1A, Quan The Hamlet, Phuoc Minh Commune	30													
		Total	330													
	The project has a total installed capacity of 330 MW, with a predicted power generation of 543,613 MWh per annum.															
	The entire electricity generated by the solar farm will be fed into the Vietnam national grid without any Greenhouse Gas (GHG) emissions. The operational lifetime of the solar farm is 25 years. Currently the electricity supplied by the grid is relatively carbon intensive, with a combined margin emission factor of 0.8492 tCO ₂ /MWh. The electricity generation through this project will be resulted in the emission reductions on account of electricity generation by 461,636 tCO ₂ e/year and total emission reduction for the 1 st crediting period 5 years will be 2,308,180 tCO ₂ e.															
	The purpose of the project activity is to generate electricity based on renewable and clean energy source i.e. by utilizing the Solar power potential available in the Ninh Thuan Province of Vietnam and to supply the same to meet the energy demand in host country Vietnam. The technology involved in the project is Photovoltaic (PV) which converts sunlight directly into electricity using semiconductors that exhibit the photovoltaic effect. PV power generation employs solar panels composed of a number of solar cells containing a photovoltaic material. The materials presently used for PV include monocrystalline silicon, polycrystalline silicon, amorphous silicon, cadmium telluride and copper indium selenide/sulphide.															
The project design includes central inverter technology connected to the DC arrays consist of solar photovoltaic modules with monocrystalline cells. A dedicated substation with a power transformer rated at 40MVA to step up the grid to 22kV to 110kV. The transmission voltage to the grid shall be at 110kV.																
The installed 330 MWp solar plant is divided into 156 Photovoltaics Station (PVS), each station is connected to the central inverter, MV transformer and a MV switchgear. The DC array connected to each PVS will be divided in several String Combiner Boxes (SCB) which consist of PV strings connected in parallel, each of the string consists of 30 modules which are connected in series.																
The Solar PV modules are mounted on galvanized steel structure with aluminium sub rails, with 4 modules in portrait orientation at 7° tilt angle. A supervisory Control																

	and Data Acquisition (SCADA) system controls the plant and monitors the health status of the solar power plant to ensure the solar plant operates under optimum conditions. The project activity is expected to result in a reduction in the anthropogenic emissions of greenhouse gases (GHG's) into the atmosphere, which is estimated to be approximately 461,636 tCO_{2e} per year, by displacing the equivalent amount of electricity generation through the operation of fossil fuels based power plants in grid. The validation team hereby confirms that the project description in latest PDD /Ref P3/ is accurate and complete in all respects and that there are no major changes to the project activity/design or boundary as compared to the webhosted PDD.
Findings	CL 01 / CAR 01 / CAR 02
Conclusion	In accordance with paragraph 56 of VVS Version 2 for Project Activity, Bureau Veritas hereby confirms that the project description in latest PDD is accurate and complete in all respects and that there are no major changes to the project activity/design or boundary as compared to the webhosted PDD. All CL's and CAR's raised during validation as mentioned above are closed satisfactorily based on the relevant corrections and evidences submitted by PP. and PDD version 3 is found to be addressing all reported findings.

D.4. Assessment of eligibility of Project under Gold standard as well as Application and selection of methodologies and standardized baselines

D.4.1. Assessment of eligibility of Project under Gold Standard

Means of validation	The steps taken to assess the relevant information contained in the PDD against each eligibility criteria of Gold Standard for the Project as per Section 3.1.1 of GS4GG Principles & Requirements /Ref-B3/ are described below. PP has described how BIM Solar Farm meets the eligibility criteria in the PDD section A.2. PP has assessed all the criteria and relevant justifications are provided to demonstrate the eligibility of project. Eligibility criteria as per GS4GG principles and requirements : <i>A Project type is automatically eligible for Gold Standard Certification if there are approved Gold Standard Activity Requirements and/or Gold Standard Impact Quantification Methodologies associated with it or as referenced in Gold Standard Product Requirements. These are published to the Gold Standard website and shall be followed where provided for a given Project type</i> Based on the validation of PDD and site visit observations it is confirmed that the project implemented is Renewable Energy Project i.e. Solar power plant connected to the Vietnam Grid. The Project capacity is 330 MW and hence it is classified as Large scale project. In order to develop the project PP has used ACM 0002 as an Approved CDM Methodology. All these project implementation aspects are found to be in accordance with 1.1.1 a) and 1.1.1 b) of the Eligible Project Types & Scope under Renewable Energy Activity Requirements. Hence it is concluded that the project activity meets the eligibility criteria. <i>For Project types that are not automatically eligible, a Project Developer may submit to Gold Standard for approval. This shall be done at minimum as part of the Preliminary Review, though it is recommended to engage with Gold Standard earlier to establish the criteria and requirements for approval;</i> As confirmed in the above eligibility criteria, Project activity is automatically eligible for the Gold standard certification, it is not required to submit the project activity to Gold standard for approval, and however PP has submitted the project to gold standard for the Preliminary review in the month of June 2019. <i>Project types applying for Gold Standard approval are referred to the Gold Standard Vision and Mission. The Project Developer shall demonstrate how the</i>
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	<i>Project would contribute to these and how the Gold Standard for the Global Goals Requirements would be met in their application for approval</i> This eligibility criteria is not applicable for this project activity as the implemented project is a Photovoltaic Solar project which is an approved project type as per “GS Activity Requirements” and does not require any prior approval from Gold Standard. This is found correct and hence accepted. <i>In reviewing a new Project type for approval, Gold Standard may establish new Requirements to be met by the Project in order to achieve Gold Standard Design Certification and ongoing Gold Standard Certified Project status. Where required, Gold Standard shall engage expert peer reviewers to establish these Requirements, at the Project Developer’s expense</i> This eligibility criteria is not applicable for this project activity as the implemented project is a Photovoltaic Solar project which is an approved project type as per “GS Activity Requirements” and does not require any prior approval from Gold Standard. This is found correct and hence accepted. <i>Gold Standard does not support Project types associated with geo-engineering or energy generated from fossil fuel or nuclear, fossil fuel switch, or any project that supports, enhances or prolongs such energy generation. In certain cases, concerning energy efficiency involving fossil fuels (for example, LPG stoves), an exception is made. This is captured in the relevant Activity Requirements, Gold Standard Approved Methodologies and/or Product Requirements</i> Based on the Validation of PDD, relevant supporting documents and site visit, it is confirmed that the implemented project is a renewable energy project which generates electricity using solar radiation i.e. Photovoltaic technology, and hence it is concluded that the project activity is not associated with geo-engineering or energy generated from fossil fuel or nuclear, fossil fuel switch, or any project that supports, enhances or prolongs such energy generation. Hence it is concluded that the project is eligible under this criteria.
Findings	NIL
Conclusion	The validation team hereby confirms that the project activity implemented by the PP is in accordance with Section 3.1.1 of GS4GG Principles & Requirements as well as Renewable Energy Activity Requirements.

D.4.2. Application of methodologies and standardized baselines

Means of validation	The steps taken to assess the relevant information contained in the PDD against each applicability condition are described below. The proposed Gold Standard Project Activity “BIM Solar Farm” project uses the approved methodology ACM 0002 version 19.0 /Ref B8/. Applicability of the methodology: <i>Applicability Condition 3:</i> <i>This methodology is applicable to grid-connected renewable energy power generation project activities that:</i> <i>(a) Install a Greenfield power plant;</i> <i>(b) Involve a capacity addition to (an) existing plant(s);</i> <i>(c) Involve a retrofit of (an) existing operating plants/units;</i> <i>(d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or</i> <i>Involve a replacement of (an) existing plant(s)/unit(s).</i> The project activity is an implementation of 330 MW Solar power plant using photovoltaic technology. This solar power plant is a greenfield project, hence
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condition (a) is satisfied. Validation Team has confirmed this through various documented evidences i.e. EPC contract /**Ref-P35**/, and government approvals on the project implementation.

The project activity is a Greenfield Solar Power Plant /**Ref-P20**/. There was no existing Solar Power Plant at the site (as physically verified by the validation team during the site visit). Thus, this applicability condition is applicable to the project activity.

Applicability Condition 4(a):

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;

This condition is applicable as the project activity involves implementation of greenfield Solar power Plant, which is considered as renewable energy generation plant. This was confirmed during site visit as well using Technical Specifications /**Ref-P20**/ of the project equipment's installed at the project site.

Applicability Condition 4(b):

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 applicable as the project activity is a greenfield Solar power plant and there is no capacity additions, retrofits, rehabilitations or replacements are involved. The same has been verified during the physical site visit carried out by the validation team. This project activity is a Greenfield project. No Solar Power plant existed at the project site earlier. The information has been physically verified by the validation team during the site visit.

Applicability Condition 5:

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 (3), is greater than 4 W/m²; or

(c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m²; or

(d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m², all of the following conditions shall apply:

(i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m²;

(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/m² 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.

This condition is not applicable as the project implemented is not a Hydro Power Plant.

	<i>Applicability Condition 6:</i> <i>In the case of integrated hydro power projects, project proponent shall:</i> <i>(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</i> <i>(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 five years prior to implementation of CDM project activity.</i> This condition is not applicable as the project implemented is not a Hydro Power Plant. <i>Applicability Condition 7:</i> <i>The methodology is not applicable to:</i> <i>(a) 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;</i> <i>(b) Biomass fired power plants/units.</i> This condition is not applicable as this is a Solar Power plant project and does not involves Switching of fuels. It is an exclusively renewable energy project. <i>Applicability Condition 9:</i> <i>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".</i> The project activity implemented is a greenfield solar power plant and hence this condition is not applicable.
Findings	NIL
Conclusion	The validation team hereby confirms that the selected baseline and monitoring methodology, ACM 0002, Version 19.0 / Ref B3 / which is previously approved by the CDM Executive Board, is applicable to the project activity which complies with all the applicability conditions therein.

D.4.3. Deviation from methodology and/or methodological tool

Means of validation	There was no deviation from the selected methodology ACM0002 version 19 sought by the Project Participant for the proposed project activity from UNFCCC Secretariat.
Findings	Not applicable
Conclusion	Bureau Veritas confirms that there was no deviation from the selected methodology.

D.4.4. Clarification on applicability of methodology, tool and/or standardized baseline

Means of validation	There was no clarification on applicability of methodology, tool and/or standardised baseline to the proposed project activity has been issued.
Findings	Not applicable
Conclusion	Bureau Veritas confirms that there was no clarification on applicability of methodology, tool and/or standardised baseline.

D.4.5. Project boundary, sources and GHGs

Means of validation	GS4GG Principles and Requirements Version 1.1, March 2018, VVS Version 02 for Project activity (paragraph 69 – 74) The validation team has validated the project boundary against the guidance provided in the methodology ACM 0002 version 19.0 /RefB8/. The methodology refers that “<i>The spatial extent of the project boundary includes the project power plant/unit and all power plants/units connected physically to the electricity system that the CDM project power plant is connected to</i>”. The spatial extent of the project boundary was assessed through the site visit, and the description in the PDD submitted at the time of site visit. As per the description it is observed that the project is connected to the national grid of Vietnam which is covered in the project boundary. The structure of the National Grid was verified through EVN website as well as through the report on “The Analysis of Emission Factor of Vietnam Grid” the Climate Change Department, Ministry of Natural Resource and Environment (MONRE) /Ref-P18/. The geographical boundary of the project includes Solar Panels, Inverters, Transformer and transmission lines etc. The physical site inspection was carried out on 16/09/2019 – 18/09/2019 during which the project boundary description in the PDD /Ref-P1/ was validated. At the time of the site visit, the validation team observed that the project is already installed and operational to supply electricity to grid.
Findings	NIL
Conclusion	PP has described the boundary correctly and the demonstration of the Project boundary found in accordance with the following criteria - GS4GG Principles and Requirements Version 1.1, March 2018 - VVS Version 02 for Project activity (paragraph 69 – 74) - Approved Large Scale methodology ACM 0002 version 19.0

D.4.6. Baseline scenario

Means of validation	The steps taken to assess the requirement given in paragraph 76 - 83 of the VVS for Project activity are described below: Validation team assessed the baseline identification by the project participant using the provisions of the applied methodology. As per the identification of Baseline scenario of the applied methodology ACM 0002, version 19.0 /Ref-B8/, the baseline scenario is “electricity delivered to the grid 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 to calculate the emission factor for an electricity system”/Ref-B9/. The project activity involves the installation and operation of a greenfield solar power plant which will be supplying the power to the Vietnam National grid. The baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants connected to Vietnam National Grid that are displaced due to the proposed project activity. Thus, Baseline emissions are calculated as the product of electricity produced by the power plant, multiplied by the grid emission factor, i.e. Combined Margin Emission Factor. $BE_y = EG_{PJ, y} * EF_{grid, CM, y}$ Where, BE_y baseline emissions in year y (t CO₂/yr); EG_{PJ,y} quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh/yr); EF_{grid,CM, y} Combined margin CO₂ emission factor for grid connected power generation in year y (t CO₂/MWh) The Emission Factor has been calculated in a transparent and conservative manner as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the
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'Tool to calculate the emission factor for an electricity system', version 07.0 (Ref B9).

Project participant has used official data from the Climate Change Department, Ministry of Natural Resource and Environment (MONRE) /**Ref-P18**/ on generation and emissions of power plants in Vietnam Dtd. 29/03/2019, which was the latest available officially published database at the time of site Visit.

In section B.4 of the PDD, the project participant has explained the Grid Composition i.e. Share of different types of Generation plants i.e. Import of electricity from China, hydro power 37.6%, Coal fired power 34.3%, Gas fired 17.3%, Oil fired 3.3% others included diesel, small hydro, renewables 5.8%. This itself indicates that the share of renewable energy in the grid is negligible and this makes the National Grid of Vietnam as carbon intensive grid.

The statement is in accordance with the methodological choice provided in ACM 0002 Version 19.0. The detailed computation of the power generation by the power plants during 2016 - 2018 is provided in the PDD. This information was cross checked through publically available information i.e.

- The Analysis of Emission Factor of Vietnam Grid" report issued by Climate Change Department, Ministry of Natural Resource and Environment (MONRE) /**Ref-P18**/
- Vietnam Electricity (EVN) – Annual report 2017 /**Ref-P23**/

The validation of Operating margin and Build margin emission factors was carried out by the team and the same is explained as below:

1. The Operating Margin emission factor for Vietnam National grid (0.8336 tCO₂/MWh)

The operating margin emission factor provided by the project participant is based on the Simple Operating Margin i.e. as per option (a) in the Tool. This option is selected as the total electricity output of the power sources has low operating cost or has to run (i.e. Low Costs must run resources) 50% of the electricity output of the entire electricity system. This conclusion is made based on the average of last 5 years energy generation. The data provided in the report is found transparent and can be cross checked with the authority i.e. Climate Change Department, Ministry of Natural Resource and Environment (MONRE) /**Ref-P18**/.

The method adopted to calculate the Simple Operating Margin is in accordance with the Tool to calculate emission factor for an electricity system. Hence, the same was accepted by the validation team. PP has used the latest data available for the past three recent years 2015, 2016 and 2017. The Ministry of Natural Resource and Environment (MONRE) has obtained the historical data from "National electricity system regulation centre" and calculated the emission factor.

2. The Build Margin emission factor for combined grid (0.8961 tCO₂/MWh)

The build margin emission factor provided by the project participant is based on the past three recent years 2015, 2016 and 2017 and it is in accordance with the "Tool to calculate emission factor for an electricity system" /**Ref-B9**/. The project participant has used the latest available officially published data from The Ministry of Natural Resource and Environment (MONRE) has obtained the historical data from "National electricity system regulation centre".

3. Combined margin CO₂ emission factor for combined grid in year y. (0.8492 tCO₂/MWh)

The combined margin emission factor provided by the project participant is based on the operating margin and build margin emission factors of the combined NEWNE and Vietnam grid as reported above.

The project participant has correctly applied the weightage for Operating margin as wOM = 0.75 and weightage for build margin as wBM = 0.25, as the project activity involves installation and operation of Solar Power plant. These applied weights are found suitable owing to their intermittent and non-dispatchable nature. This is also in accordance with Para 86(a) of the Tool 07, "Methodological tool: Tool to calculate the emission factor for an electricity system", Version 07.0. /**Ref-B9**/.

	The Combined margin emission factor is the Ex-ante fixed parameter as stated in the PDD and it will be fixed for the crediting period, as stated in the PDD section B.6.3 as well as in B.7.1 (Monitoring plan). This is as per the monitoring methodology ACM 0002, Version 19.0 /Ref-B8/ The validation team has also confirmed that the computation of the operating and build margin and the combined margin, carried out by the Project Participant in the PDD and the ER spread sheet /Ref-P10/, is in accordance with the latest version of the Tool to calculate the emission factor for an electricity system, version 7.0 /Ref B9/. The validation team further notes that the background data used for the baseline emission factor computation is provided by DNA of host Country Vietnam. The provisions of paragraph 64 of EB 43 in this regard are therefore not applicable. Also, validation team cross verified from public domain about any National and/or sectoral policies available in the Host Country which give comparative advantages to less emissions-intensive technologies over more emissions-intensive technologies. However, no such policies were found to be available for proposed project activity.
Findings	CAR 03
Conclusion	Based on the above assessment, Bureau Veritas Certification hereby confirms that: - All the assumptions and data used by the project participants are listed in the PDD, including their references and sources; - All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD; - Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable; - Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD, if applicable; - The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity. Hence it is concluded that the Baseline identification is complying to the following criteria - GS4GG Principles and Requirement, Version 1.1, March 2018, Section 3.1.2 Definition of Baseline and Project Scenarios - VVS paragraph 76 - 83 - Approved Large Scale Methodology ACM0002, Version 19.0

D.4.7. Demonstration of additionality

Means of validation	The steps taken and sources of information used, to cross-check the information contained in the PDD on this matter are described below: The additionality of the Project activity was assessed on the basis of the review of Tool 1- Tool for the demonstration and assessment of additionality, Version 07.0.0 / Ref-B13/ and documents indicated in the assumptions in post-tax Equity IRR spread sheet with default benchmark as prescribed in the Annex A of EB 62 Annex 05 i.e. "GUIDELINES ON THE ASSESSMENT OF INVESTMENT ANALYSIS"/Ref-B19/ as well as Methodological Tool 27 for Investment Analysis, Version 10.0 /Ref-14/. Investment Analysis The project participant has demonstrated the additionality of the project activity using the investment analysis approach. The proposed Gold Standard project activity is a grid connected renewable energy generation project that will supply electricity to the Vietnam National grid. Electricity generated by the project activity would be sold at a tariff rate agreed and hence, revenue additional from the gold standard revenues would accrue from such sale. Hence, applying the simple cost analysis (of Option I of the Sub-Step 2(a) of the Tool for the demonstration and assessment of additionality is not considered. The comparison method of investment analysis as per Option II of the Sub-step 2(a) is also not appropriate as the Project participant's investment decision was not based on the selection of competing alternatives. The only alternative to the project activity would have been the generation of power in the grids from connected fossil fuel plants, which is a continuation of the situation that already prevailed at the time of the decision. The project participant has selected benchmark analysis (as per Option III prescribed in the Tool) for the demonstration of additionality. The alternative to the project activity is the supply of electricity from the grid, hence the choice of investment benchmark analysis is appropriate. The financial indicator selected for the investment analysis is post-tax Equity IRR and is compared with a nominal benchmark calculated using Default value for the cost of equity (Expected return on Equity) for the host country Vietnam under Group 1. Hence, the validation team has concluded that the choice of Benchmark analysis by the project participant is appropriate and in accordance with Tool for the demonstration and assessment of additionality version 7 of EB 70 Annex 8, in line with the Tool for Investment Analysis version 8.0 of EB 97 Annex 8 and "Guidelines on the Assessment of Investment Analysis", EB 62 Annex 05. Validation of Input Parameters (as required by paragraph 102 a of the VVS version 2.0 of EB 101 Annex 2): Before assessment of the IRR calculations /Ref-P9/, the validation team has validated the basic input parameters listed in the PDD and spread sheet of investment analysis in accordance with VVS requirements. All the assumptions made in the investment analysis are listed below along with supporting validation justification for each of those assumptions. The decision of setting up BIM Solar Farm was taken on 10/10/2017. This was validated using the Investment Certificate /Ref-P30/ issued by the Department of Planning and Investment, this is clearly mentioned that the PP i.e. BIM Renewable Energy Joint Stock Company (BIMRE) – Vietnam is officially investing in the Solar Farm project on approximately 6500 Sq Meter area in Thuan Nam District, Ninh Thuan Province. The assumptions made in the investment analysis are from sources available to the project participant at the time of the decision date. This was validated by the Bureau Veritas team. All the assumptions considered by the project participant are obtained from various documents. The date of decision for setting up the project activity is 10/10/2017 and the date on which EPC contract is signed is 20/07/2018 and this is regarded as the start date of the project activity. The input values presented in the PDD can be regarded as valid
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and applicable at the time of the PP's investment decision. The PDD has used the same values for the investment analysis presented. This was confirmed by the validation team through a review of various source documents. The validation team confirms that the input values considered in the investment analysis meet the requirements of paragraph 10 of the EB 101 Annex 11 Tool for Investment Analysis and also the paragraph 102 (a) of the VVS version 2.0.

Parameter, Value	Validation Justification
Project Capacity in MW 330.00	Based on the assessment of following supporting documents it is confirmed that the Project capacity is 50 MW, which is the installed capacity. - Investment Certificate issued by the Department of Planning and Investment, Peoples Committee of Ninh Thuan Province /Ref-P30/ - Appendix B of PPA signed by PP with the EVN./Ref-P12/ - PVsyst Report on simulation of Power generation issued by the ERS (EPC Contractor) /Ref-P14/ - Technical Specifications of Solar panels /Ref-P20/
Project Cost (termed as Capex) in million USD 331.71 (Approx 332.00 Million USD)	The Project cost is determined based on the EPC Agreement /Ref-P-35/ signed by PP with the EPC contractor ERS Energy Sdn Bhd on 24th September 2019 and two separate Project Loan Facility Agreements signed by PP with Rizal Commercial Banking Corporation and Rizal Commercial Banking Corporation – Trust & Investment Group on 3rd July 2018 for 18E and 10th August 2018 for 18N and 18S. In the Loan agreement /Ref-P17/ with bank it is seen that PP borrowed sum of total approximately Two Hundred thirty two million united states Dollar (232,200,000 USD) (i.e. 20.70 Million USD for 18E and 211.50 Million USD for 18N & 18S) And the total Equity Share by the Project participant is 99.51 Million USD (i.e. 8.87 Million USD for 18E and 90.64 Million USD for 18N & 18S). Hence the total project cost = Debt amount + Equity amount 232.20 Million USD + 99.51 Million USD = 331.71 Million USD. Further the Project cost is crosschecked based on the theoretical assumptions against the Solar Photovoltaic Technology brief published by IEA-ETSAP and IRENA © Technology Policy Brief E11 – January 2013 - www.etsap.org - www.irena.org, it is confirmed that the cost of investment is in the range of USD 920/kW – USD 950/kW, if it is extrapolated to the 3300000 kW which is the project installed capacity it comes to 303.60 Million USD to 313.50 Million USD. Based on this crosscheck it is concluded that the project cost provided in the IRR spreadsheet is found to be conservative and real. The evidences provided by the PP to justify the Project cost found satisfactory and hence acceptable.
Annual Energy Generation, in Million KWh 544.00	Total annual energy generation is sourced from the Technical Document i.e. Simulation report generated using PVsyst Software where several project specific inputs are provided i.e. number of sunny days in year, Ambient Temperature, Annual irradiances, Project Locations etc. PVsyst software calculates the power outcome considering system losses for all three Plants i.e. 18E, 18N and 18S, PP has presented a conservative value of 544.00 Million KWh (i.e. 49.00 Million KWh for 18E plant + 495 Million KWh for 18N and 18S plants.) as the annual energy generation by the Solar power plant. This report is generated by the EPC contractor ERS Energy Sdn Bhd. /Ref-P14/ This is also supported by the Technical Specifications of Solar Panel provided by the manufacturer.
Annual degradation in Power Generation per year 0.5%	For a Solar power plant the energy generation is depending on the productive life of solar panels and the electricity production from these panels over time depend on factors such as climate, module type, and racking system, among others. The reduction in solar panel output over time is called degradation. And this degradation is generally accounted as 5% per annum. This is confirmed using the publically available research paper on Solar power plant. https://www.nrel.gov/state-local-tribal/blog/posts/stat-faqs-part2-lifetime-of-pv-panels.html This is also compared with the Technical specification of Solar panel /Ref-P21/ where it is reported that the productive lifetime of the solar is 25 years and by that time it is generating only 88% of

		the design power output. The Value of degradation considered by the PP is found to be conservative and hence acceptable.
	Maintenance, 1.66 Million USD + Security Contract 0.08 Million USD (Only for 18N and 18S)	PP has considered 1.74 Million USD as the total maintenance cost per annum. This cost includes - <u>Plant Operation & Maintenance cost</u> - PP has signed three contracts with two different contractors and contract values assigned to each contract is validated as below. 1. For BIM (18E) Plant – O&M Contract signed with contractor Juwi Renewable Energies Pte Ltd. On 8th August 2018. The contract value agreed with contractor is 0.14 Million USD per annum. The cost applied is before Tax. The contractual conditions also has Schedule 6 where PP has agreed to pay Bonus every year based on the plant performance and a specific formula to calculate bonus. PP has applied only the annual charges which are fixed in the investment analysis as the performance evaluation shall be calculated at the end of the year. Based on this validation the cost identified is accurate and it is conservative. – Hence acceptable. 2. For BIMRE (18N) Plant – O&M Contract signed with contractor Bouygues Energies & Services. On 31st January 2019. The Contract value agreed with contractor is 1.28 Million USD per annum. The cost applied is before Tax. The contractual conditions also has Schedule 6 where PP has agreed to pay Bonus every year based on the plant performance and a specific formula to calculate bonus. PP has applied only the annual charges which are fixed in the investment analysis as the performance evaluation shall be calculated at the end of the year. Based on this validation the cost identified is accurate and it is conservative. – Hence acceptable. 3. For BIMRE (18S) Plant – O&M Contract signed with contractor Juwi Renewable Energies Pte. Ltd. Services. On 8th August 2018. The Contract value agreed with contractor is 0.235 Million USD per annum. The cost applied is before Tax. The contractual conditions also has Schedule 6 where PP has agreed to pay Bonus every year based on the plant performance and a specific formula to calculate bonus. PP has applied only the annual charges which are fixed in the investment analysis as the performance evaluation shall be calculated at the end of the year. Based on this validation the cost identified is accurate and it is conservative. – Hence acceptable. - <u>Security Guard (monthly payment)</u> - PP considered an Annual calculated cost for IRR calculation. This cost is calculated based on the contract signed between PP and Nam Do-Minh Thuan BV Services Co. Ltd. in July 2019 /Ref-P45 /. The Monthly cost of the provision of security services to the BIMRE plant i.e. for 18N and 18S solar power plants is 142,560,000 VND / Month. The Annual cost in USD is calculated using exchange rate 1 USD = 22,635 VND. The Annual cost of security services is presented as 0.08 Million USD. - PP has applied this cost only for 2 Plants i.e. 18N & 18S as the area is very large and it is situated remotely. For 18E the security is not required as it is properly gated and CC TV Cameras are also deployed. - Based on the review of the Contract Document No. 205/HD-DVBV it is concluded that the cost of security services presented in the investment analysis is found real and based on the current minimum wage rates prevailing in the host country Vietnam. The Total O&M Cost presented by PP as 1.74 Million USD is further cross checked using Theoretical maintenance cost determined by Solar Photovoltaic Technology brief published by IEA-ETSAP and IRENA © Technology Policy Brief E11 – January 2013 - www.etsap.org - www.irena.org. As per this technology brief document average maintenance cost per annum for Solar power plant is estimated as 1% of the total investment cost. Hence the theoretically calculated cost based on this estimation is 3.32 Million USD which is higher than that of the cost which is considered by the PP. Based on the cross verification it is concluded that the maintenance cost assumed by the PP as 1.74 Million USD is conservative and appropriate to the project technology and hence it is acceptable.

Inflation rate 3.80%	The inflation rate is determined from the International Monetary Fund Website for the host country Vietnam. PP has applied average of three year inflation rate i.e. Year 2016 – 2018. https://www.imf.org/external/datamapper/PCPIPCH@WEO/WEO_WORLD/VNM The Approach is found satisfactory and conservative hence accepted.
Power Tariff, 0.0935 USD/kWh	PP has signed three different Power Purchase Agreements with Vietnam Electricity Group /Ref-P12/ on 15th October 2018. Validation Team Verified the Signed contract Number 2018/HD-NMDT-BIM (18E) / 2018/HD-NMDT-BIM (18N) and 2018/HD-NMDT-BIM (18S), where the Power tariff is mentioned as 0.0935 USD / kWh. This is the real and agreed figure which is available for the investment analysis. The rate is fixed much in advance and hence there is no change found in the Tariff rate. At the time of Validation site visit validation team took few month samples of electricity bills/ invoices raised by the PP to EVN towards the sales of the power to grid. In these invoices PP has applied the agreed rate of tariff i.e. 0.0935 USD/ kWh /Ref-P25-27/
Debt-Equity ratio, 70:30	The Debt-Equity ratio is referred from Loan Facility Agreement signed between PP and the Rizal Commercial Bank Corporation (RCBC) where bank has agreed to sanction total loan of 232.20 Million USD for both registered entities of project i.e. BIM (18E) and BIMRE (18N & 18S). Out of this total 232.20 Million USD 20.70 Million is sanctioned for entity 18E /Ref-P17/, which is implementing 18E Solar Power plant and rest i.e. 211.50 Million USD is sanctioned to BIMRE, which is implementing 18S & 18N solar power plants /Ref-P17/. Equity share of the project is demonstrated through official documents i.e. Notice to Deposit where PP's Management has agreed to deposit the equity funds for the purpose of implementation of this project. There were 2 such notices are seen which officially endorsed by the management and thus they have instructed the bank to release the funds. This transactions happened through two notice to deposits Dtd. 28th February 2019 and 26th April 2019. From these notice to deposits it is confirmed that PP will be investing 99.51 Million USD as Equity Share. Thus the ratio of Debt to Equity comes to 70:30. /Ref-P30/ & /Ref-P16/
Loan Interest Calculation For BIM 18E - Base Interest Rate (Rate-10) 3.1% - LIBO Rate (on 12-Oct-2018) -2.77% - Fixed Interest Rate (Base Rate + 2.9%) – 6.0% - Floating Interest Rate (LIBO + 2.9%) – 5.67% For BIM 18N & 18S - Base Interest Rate (Rate-10) 3.1% - LIBO Rate (on 12-Oct-2018) -2.82% - Fixed Interest Rate (Base Rate + 2.9%) – 6.0% Floating Interest Rate (LIBO + 2.9%) – 5.72%	Interest Calculation is done as per the provision of Section 6 of Project Loan Facility Agreement signed between PP and Rizal Commercial Banking Corporation (RCBC). Monthly interest calculation provided in the “Loan Repayment” sheet of IRR Calculation document (excel File), it is clear that PP has used the Loan repayment schedule “Schedule 6”. The interest rates are clearly mentioned in the Section 6 of Project Loan Facility agreement document. It is understood that PP has applied two types of interest rates i.e. - Fixed Interest Rate – The fixed interest rate is applicable for the first 50% of loan amount which is to be re-paid within 8 years from the start of the loan period. The interest rate applicable for the fixed interest is 6% and this is calculated as Base interest rate i.e. 3.1% + 2.9% - Floating interest rate – Floating Interest Rate shall be applicable on the remaining 50% of loan amount which is to be paid from 96th Month onward till the end of loan period. The floating interest rate shall be calculated based on LIBO Rate + 2.9%. The LIBO Rate is fixed as 3.06% as of 12/10/2018. The interest calculation is found transparently provided in the IRR calculation and it is in accordance with the Project Loan Facility Agreement Document.
Project lifetime, 25 years	25 years and 00 months – Life time of project is identified by PP is found correct. The Life time of the project equipment is determined based on the Technical Specification /Ref-P21/ of the Solar Panels provided by the Manufacturer i.e. SERAPHIM SOLAR SYSTEM CO. LTD, The Value obtained is based on the Linear Power Output Warranty curve in the Specification. Which mentions that the Power output of 88.68 can be achieved up to 25 years after installation of Solar Panel.

Corporate Income Tax Rate
20%

The Income Tax considered by project participant is the tax rate applicable in the host country Vietnam wherein the project activity is located in the Thuan Nam District, Ninh Thuan Province. As per the Corporate tax Law in the host country Vietnam it is mandatory to ensure that 20% of investment cost is to be paid by the project participant as corporate income Tax.

This was confirmed using Law on Corporate Income Tax Pursuant to the 1992 Constitution of the Socialist Republic of Vietnam, which was amended and supplemented according to Resolution No. 51/2001 / QH10;

https://translate.google.com/translate?hl=en&sl=vi&u=https://moj.gov.vn/vbpg/lists/vn%2520bn%2520php%2520ut/view_detail.aspx%3Fitemid%3D12821&prev=search

Financial indicator (IRR)

The arithmetical accuracy in computation of Equity IRR was found to be correct. The Equity IRR calculations were provided to the team in a spreadsheet /Ref-P16/. The computations are transparently presented in the spreadsheet and were verified by the validation team. All the cells of the spreadsheets can be accessed and the data and formulae in the cells can be viewed, as the cells are unprotected. The investment analysis is therefore in line with paragraph 12 of the EB 101 Annex 11 tool for investment analysis, Version 8.0

Equity IRR was computed for a period of 25 years, which reflects the period of expected operation of the underlying project activity (technical lifetime) and hence was found to be appropriate. The period considered for the investment analysis is therefore as per requirement in paragraph 6 of the EB 101 Annex 11 tool for investment analysis Version 8.0

The project participant has taken into account profit after tax in the computation of the equity IRR. The principle adopted in making projections and computing IRR conforms to the accepted and standard accounting and taxation principles.

The validation team concludes that underlying assumptions are appropriate, accounting principles adopted in calculations, the calculations per se are correct and the requirements of paragraphs 96 to 101 of the VVS version 2.0 as well as the EB 101 Annex 11 Tool for Investment Analysis Version 8.0 have been met.

PP has calculated two separate IRR's for two equity organizations i.e. BIM and BIMRE. The post-tax Equity IRR for the proposed project activity is worked out using standard financing standard and IRR's for these two Equity organizations is presented in below table.

Equity Organization	Equity IRR
BIME (18E)	14.15%
BIMRE (18N / 18S)	14.93%

The investment analysis, including the appropriateness of input values, financial computations and adherence to accepted and standard accounting principles and practice was validated by the financial specialist within the team. The team confirms that the analysis presented in the PDD is consistent with the IRR spread sheet /Ref-P9/ submitted by the PP.

Benchmark

The project participant has considered Cost of equity (expected return on equity) and selected default value for the host country Vietnam provided in the Appendix; applicable at the time of investment decision as the investment benchmark for the project activity. As per EB 101 Annex 11 Investment tool paragraph 19. PP has selected 14.00 as the default value under Group 1 as the project activity is classified as an Energy Industry, i.e. the project generates renewable energy and exports the same to the Vietnam national Grid. This selection is found satisfactory and in accordance with the Investment Tool, Version 8.0, EB101 Annex 11.

The default value is in the real term and hence PP has converted it to nominal term by adding inflation rate applicable for the host country. PP has provided transparent calculation of the nominal benchmark in the IRR calculation spreadsheet. The method applied for calculating the nominal benchmark is proven and it referring to the published book on Corporate Finance, Second Edition by Aswath Damodaran.

The Formulae used for the calculation is

$$\text{Nominal Benchmark} = \{(1 + \text{Real Benchmark}) * (1 + \text{Inflation Rate})\} - 1$$

Where:

Real Benchmark - is sourced from Appendix. Default values for cost of equity (expected return on equity) in publically available document i.e. Tool 27 – “Methodological Tool”, EB101 Annex 11, Version 8.0 and the value applied is 12.79.

Inflation Rate – is sourced from the International Monetary Fund Website. As per latest information available on website

https://www.imf.org/external/datamapper/PCPIPCH@WEO/WEOWOR_LD/VNM, it is confirmed that the inflation rate applied i.e.3.80% is correct and applicable at the time of investment decision.

With the above values considered, the Cost of Equity (Expected Return on Equity) is computed in the PDD as **18.33%**. The detailed computation is provided in an excel spreadsheet /Ref-P16/ which was validated and found to be correct and also meets the requirement of paragraph 102 (b) of the VVS version 2.0.

The project IRR values mentioned above as **14.15%** and **14.93%** for BIME and BIMRE respectively are thus much lower than the benchmark computed (**18.33%**). The investment analysis, in the opinion of the validation team, demonstrates that the project activity is not economically viable for the PP without revenues that could supplement those only from the sale of power generated.

The investment analysis therefore demonstrates the project activity to be additional as required by paragraph 96 of the VVS version 2.0.

Sensitivity Analysis

In order to demonstrate the robustness of the conclusion arrived at above, viz., that the project is additional, the project participant has subjected the four critical input parameters to the investment analysis- PLF, Project cost, O & M cost, Power tariff rate to a sensitivity of +/-20% in the IRR spreadsheet /Ref-P15/ and B.5 of the webhosted PDD.

It has been noted that the above four parameters are likely to affect the project IRR computation significantly because they contribute to 20% of either the project costs or the project revenues. The criteria adopted meet the requirement of paragraph 27 of the EB 101 Annex 11 Tool for investment analysis.

The range of variations (+/-20%) on which the sensitivity analysis has been carried out is in accordance with paragraph 28 of the EB 101 Annex 11 Tool for Investment Analysis version 8.0, which requires that at least a range of variation from -10% to +10% be covered by such an analysis.

The results of the sensitivity analysis for the IRR computation are as follows:

1. Sensitivity Analysis for BIME (18E Plant)

Variations		-20%	-10%	-5%	0%	5%	10%	20%
Total Project Investment		18.03%	15.92%	15.00%	14.15%	13.36%	12.62%	11.27%
Electricity Tariff		4.66%	9.47%	11.81%	14.15%	16.54%	19.01%	24.35%
Power Generation		4.66%	9.47%	11.81%	14.15%	16.54%	19.01%	24.35%
O&M Costs		14.45%	14.30%	14.22%	14.15%	14.07%	14.00%	13.85%
Benchmark		18.33%	18.33%	18.33%	18.33%	18.33%	18.33%	18.33%

2. Sensitivity Analysis for BIMRE (18N & 18S Plant)

Variations	-20%	-10%	-5%	0%	5%	10%	20%
Total Project Investment	19.72%	17.06%	15.94%	14.93%	13.99%	13.13%	11.59%
Electricity Tariff	4.29%	9.66%	12.28%	14.93%	17.65%	20.51%	26.78%
Power Generation	4.29%	9.66%	12.28%	14.93%	17.65%	20.51%	26.78%
O&M Costs	14.94%	14.93%	14.93%	14.93%	14.92%	14.92%	14.91%
Benchmark	18.33%	18.33%	18.33%	18.33%	18.33%	18.33%	18.33%

The results indicate that the IRR value continues to remain below the benchmark, even with the parameters undergoing the range of variation of +/-20%, except for Two cases for BIME (18E Plant) and three cases for BIMRE (18N & 18S Plant) i.e.

- Case 1 - if the Electricity Tariff increases by 10% then the Benchmark will be 19.01% for BIME and 20.51% for BIMRE - This situation will not occur as the Power tariff is fixed for entire period and there is no escalation possible in the agreed price of electricity. Hence 10% increase in the power tariff is totally ruled out for both plants based on the terms and condition of Power Purchase Agreement contract Number 2018/HD-NMDT-BIM /Ref-P12/ signed between PP and Electricity corporation of EVN.
- Case 2 – if the power generation is increased by 10% then the Benchmark will be 19.01% for BIME and 20.51% for BIMRE - This situation will never happen due to the characteristic of the Solar power plants. The maximum power generation output is largely dependent on several meteorological parameters i.e ambient air temperature, relative humidity, barometric pressure, wind speed, gust, and direction & precipitation as well as Direct Normal Irradiance (DNI). In order to generate electricity the level of irradiance is the most important parameter which is directly proportional to the generated electricity from a solar power plant.
- Based on the PVSyst software estimation /Ref-P14/ maximum possible energy generation from the project solar power plant is approximately 4% higher than the actual power generation on the Maximum Sunny days with all favourable meteorological conditions.
- Hence it is impossible to achieve 10% increase in the Energy generation per annum.
- Case 3 – If the total Project investment cost is reduced by 20% of actual project investment cost in case of only BIMRE (18N & 18S plant)
This situation is not possible as the EPC contract is already signed and plant is already installed and in operation. The project cost is verified using various documents i.e. EPC contract /Ref-P35/

The validation team, therefore, concludes that the sensitivity analysis carried out in the section B.5 of the revised PDD and in the IRR spreadsheet serves to establish that the analysis is robust over a range of variations in the input values. The validation team concludes that the additionality of the project activity is established in accordance with paragraph 99 (e) of the VVS version 2.0, as it is established that the project activity remains additional even when there is a range of variations in the principal input values.

The validation team, supported by the assessment by its financial expert hereby confirms that the underlying assumptions are appropriate, the financial calculations are correct and that the project is additional (Refer paragraph 102 c of the VVS version 2.0).

Barrier analysis

There is no barrier analysis is considered by the PP and the hence the Step3 is skipped. This decision was validated by the validation team using the applied Tool i.e. Tool for Demonstration and assessment of Additionality, Version 07.0.0. As per Tool the barrier analysis is optional and the Barrier analysis can be done if after the

sensitivity analysis both conditions given below are not met.

1. It the proposed project activity is unlikely to be the most financially attractive
2. Or is unlikely to be financially attractive

Since Sensitivity analysis results in the situation where the project activity is neither unlikely to be most financially attractive nor it is unlikely to be financially attractive, the barrier analysis is not required.

Common Practice Analysis (CPA)

The Tool for the Demonstration and Assessment of Additionality Version 7.0.0 requires the project participant to demonstrate that the project activity is not common practice. For this purpose, the Tool refers to latest CDM guidelines on common practice which must be applied. The latest guideline [version 3.1] on demonstrating common practice is also another methodological tool of EB 84 Annex 7 viz., Common Practice Tool. The latter has specified a step-wise approach to test whether or not a proposed CDM project activity could be regarded “common practice”.

PP has described the Common Practice Analysis in the PDD and the validation team has reviewed the same. The projects that must be taken for comparison with the project activity are those that

1. Fall within +/-50% of the output capacity of the project activity. This range is therefore 165 MW to 495 MW, since the capacity of the project activity is 330 MW. (Step 1 of EB 84 Annex 7 tool for Common Practice)
2. Are identified as similar CDM as well as non-CDM projects that are located in the same geographical area (in the case of the project activity, this area is the host country Vietnam); use the same energy source as the proposed project activity (considered “Solar Power plants” in the case of the PP project activity); produce services with comparable quality, properties and application areas as the proposed project activity (in the case of the proposed project activity, the Solar Power Plants taken for comparison are those generating electric power which is exported to the grid and can therefore be regarded as producing services of comparable quality, properties and application); fall within the capacity range identified at Step 1, (viz., 165 MW to 495 MW) and lastly have begun commercial operation before the date of publishing of the PDD or the start date of the project activity, whichever is earlier. (Step 2 of EB 84 Annex 7 tool for common practice)

The PP has identified Zero projects that satisfy the criteria of Step 2 of the Common Practice tool. As there is no project which is implemented in the range of 165 MW – 495 MW before the start date of the proposed project activity i.e. BIM Solar Farm. All projects which are implemented or in the process of implementation and construction are above the selected range i.e. above 330 MW capacity.

This information is validated using publically available information i.e. Press release issued by EVN and EVN website for the list of projects which are operational in the Capacity range 165MW – 495 MW.

Based on validation conclusion it is confirmed that there is no project found implemented in the capacity range 165MW – 495 MW in the Host Country before the Start date of the proposed Gold standard project i.e. BIM Solar Farm.

3. **Are neither registered CDM project activities, nor project activities submitted for registration, nor project activities undergoing validation (Step 3 of the EB 84 Annex 7 tool for common practice).** - From the background check on the following authentic information sources it is concluded that there is no project in the capacity range of 165MW – 495 MW which either registered / Submitted for registration or project undergoing validation. – Hence the description provided by the PP i.e. No projects identified under Step 2 and therefore,

	$N_{all} = 0$ Background check is performed on following information sources - UNFCCC Website - Gold Standard Project Registry - VCS Project Registry - CD4CDM Website for the CDM Projects and CDM PoA Projects. 4. Are identified as applying technologies different from the proposed project activity, and their number designated N_{diff}, as per Step 4 of the EB 84 Annex 7 Common practice tool). – Since there is no project is identified under Step 2, hence in Step 3 also there is no project identified which is different in applying the technology than the proposed project activity. therefore, $N_{diff} = 0$ As per the Step 5 it is required to check two conditions to confirm whether the proposed project is a common practice or not. PP has checked these conditions and the resultant outcome is 1. $F=1-N_{diff}/N_{all}$ - since N_{diff} and N_{all} are equal to zero, based on the assessment results of Step 3 and Step 4, the resultant F value is equal to infinity, which is lesser than 0.2 and hence it is concluded that the proposed project is not a common practice in a given sector. 2. The difference $N_{all} - N_{diff}$ - since N_{diff} and N_{all} are equal to zero, based on the assessment results of Step 3 and Step 4, the difference between N_{diff} and N_{all} is also Zero. This confirms the condition prescribed in the Para 18 of Methodological Tool “Common Practice” Version 03.1 as the result is lesser than 3, the project is not a Common Practice.
Findings	CL 02 / CAR 06
Conclusion	Based on the assessment described above, the validation team of Bureau Veritas confirms that the project activity of PP is additional and is demonstrated to be additional in line with the requirements of - EB 70 Annex 8 Tool for the demonstration and assessment of additionality version 7.0 and - According to paragraph 86 of the EB 101 Annex 2 VVS version 2.0. - Guidelines on the assessment of investment analysis- Ver 05.0 EB 62 Annex 5 - Tool For Investment Analysis Version 8.0 and Version 9.0 - Tool for Common Practice Analysis Version 3.1 - Guidelines for Objective Demonstration and assessment of Barriers, Version 01. All the above findings raised by the validation team were closed and the latest PDD i.e. PDD Version 3 is addressing these findings correctly.

D.4.8. Estimation of emission reductions or net anthropogenic removals

Means of validation	The project emission has been discussed in the revised PDD. For ex-ante estimation of the emission reductions, the project emissions have been considered as zero in the PDD being submitted for registration. This is because of the following reasons: The project activity involves installation and operation of greenfield Solar Power Plant. No leakage emissions have been considered for the project activity in accordance with the relevant guidance provided in the applied methodology ACM 0002, version 19.0. The algorithm to calculate the emission reductions from the project activity is described as; $ER_y = BE_y - PE_y$ Where,
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	ERy = Emission Reduction in tCO₂/year BEy = Baseline emission in tCO₂/year PEy = Project emissions in tCO₂/year The estimated annual average emission reduction is 461,636 tCO₂e. The validation team confirms that the estimates of baseline emissions can be replicated using the information provided in the revised PDD and emission reduction spread sheet being submitted for registration. The validation team further confirms that assumptions have been consistently applied in both emission reduction calculations and investment analysis spread sheet.
Findings	NIL
Conclusion	Based on the Assessment of emission reduction calculation approach as presented in PDD by the PP, it is confirmed that the information presented on the Emission reduction calculation approach is correct and this also demonstrates the compliance towards the methodological requirements The Calculation requirements were assessed against following requirements ✓ Para 110 – 113 of validation and verification standard for Project of activities Version [CDM-EB93-A05-STAN – Version 02.0] ✓ GOLD STANDARD FOR THE GLOBAL GOALS PRINCIPLES & REQUIREMENTS, Version 1.1 – Published March 2018 ✓ Approved Large Scale CDM Methodology ACM 002, Version 19.0

D.4.9. Monitoring plan

Means of validation	PP has established and described the monitoring plan in the PDD section B.7.1. From the assessment of the monitoring plan it is concluded that PP has identified all those relevant parameters which are required by the Applied large scale methodology to develop the project activity i.e. ACM 0002 version 19.0 as well as relevant SDG indicators prescribed by the Gold Standard in GS4GG Principle and Requirements. PP has selected following SDG indicators for the monitoring - 7.2.1 – Renewable energy share in the total final energy consumption - 8.5.1 – Average hourly earnings of female and male employees, by occupation, age and persons with disabilities - 8.8.1 – Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status - 13.3.2 – Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions According to the methodology, and GS4GG, the relevant monitoring parameters for this project activity are EG_y : Quantity of net electricity generation supplied by the project plant to the grid in the monitoring period (this parameter as per the methodology has to be monitored according to the “EB 96 Annex 5 Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” v3) This parameter is also helps in monitoring the contribution towards SDG 7.2.1 i.e. renewable energy share in the total final energy consumption – Since the Electricity generated and exported to grid is equal to the EG_y . The validation team confirms that the above parameter, required by ACM 0002, is included by the project participant in the monitoring plan of the PDD at section B.7.1 therein The monitoring plan has stated that measurement of EG_y will be done by bi-directional energy meters installed at the sub-station located at the project site. Bi-directional energy meters monitors both electricity supplied to and drawn from the grid and the energy meters record value of net electricity export by the project activity (i.e. export minus import from grid). The measurement is on a continuous basis and is recorded every month. The energy meter readings are further crosschecked with the EVN Sub Station Meters and then the monthly bill is raised. The export Electricity meters will undergo calibration according to procedures that follow industry standard practice; EC_{Pj,i,y} : Quantity of electricity consumed by the project activity form grid. This
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parameter will be monitored to support the SDG indicator 7.2.1. PP has established bidirectional energy meters at the power plant. These meters monitors the electricity exported from the plant to the grid as well as electricity imported from grid to the plant for axillary consumption i.e. lighting, Air conditioning etc.

The monitoring requirements against this parameter is defined in the section B.7.1 and this information is found in accordance with the methodological requirements as well as SDG monitoring requirement.

The monitoring is done on continuous basis and it is found correct.

Under SDG 8.5.1- Employees' monthly wages –

To demonstrate how the project activity helps in contributing sustainability in terms of To demonstrate contribution to SDG8- 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’. PP has selected Employees Monthly wages as the monitoring parameter and monitors the Gender wise wages provided during project phase as well as operation phase. The arrangement for the monitoring found satisfactory. This also provides opportunity of employment for the local people residing in the province and neighbouring area of BIM SOLAR FARM Plant.

Under SDG 8.8.1 - No of Fatal & Non-fatal injuries

The purpose of this parameter is “Monitoring the health and safety records of employees to demonstrate contribution to SDG 8.8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment” – This is monitored from the data of Accidents and incidents occurring during operational phase. PP has relevant HSE Reporting arrangement where monthly analysis of accident and incidents happening at the project is done and reviewed by the management. Based on the Accident and incident rate management initiate actions to prevent recurring incidents and accidents. The Implementation of monitoring arrangement found satisfactory and hence acceptable.

Under SDG 13.3.2 - No of awareness programmes

The purpose of this parameter is to monitor “Climate Action - Take urgent action to combat climate change and its impacts”, PP has decided to create awareness amongst the key stakeholders regarding the climate change and mitigation measures. This will be monitored through Training attendance records and number of training conducted. The monitoring arrangement found to be satisfactory.

The monitoring plan described in the PDD meets the monitoring requirements of the Gold Standard GS4GG Principles and Requirements as well as ACM 0002 methodology version 19.0 along with the tools referred to by the methodology.

Apart from the Monitoring parameters to be monitored Ex-post, there are few parameters which PP has fixed Ex-ante and this parameters are defined in the PDD section B.6.3. PP has identified following parameters which are fixed Ex-ante and does not need monitoring.

- **EF_{grid,OM,y}** - Operating Margin CO₂ emission factor for the electricity system in year y – PP has applied value 0.8336 tCO₂/MWh, this value is obtained from the Published Report on Grid Emission Factor for Vietnam Grid and the report is published by the DNA of Vietnam i.e. The Ministry of Natural Resource and Environment (MONRE), by using the latest data available for the past three recent years 2015, 2016 and 2017. The historical data on electricity generation in the Vietnam Grid is sourced from “National electricity system regulation centre”. Based on the assessment of the published report by MONRE it is confirmed that the Calculation of the Operating Margin emission Factor is correct, please refer to the Section D.4.6 above in this report for the validation of Grid Emission Factor. The Calculation presented in the MONRE report is in accordance with the “Tool to calculate the emission factor for an electricity system, version 07.

	- EF_{grid,BM,y} - Build Margin CO₂ emission factor for the electricity system in year y – PP has applied value 0.8961 tCO₂/MWh, this value is obtained from the Published Report on Grid Emission Factor for Vietnam Grid and the report is published by the DNA of Vietnam i.e. The Ministry of Natural Resource and Environment (MONRE), by using the latest data available for the past three recent years 2015, 2016 and 2017. The historical data on electricity generation in the Vietnam Grid is sourced from “National electricity system regulation centre”. Based on the assessment of the published report by MONRE it is confirmed that the Calculation of the Build Margin emission Factor is correct, please refer to the Section D.4.6 above in this report for the validation of Grid Emission Factor. The Calculation presented in the MONRE report is in accordance with the “Tool to calculate the emission factor for an electricity system, version 07. - EF_{grid,CM,y} - Combined Margin CO₂ emission factor for the electricity system in year y – PP has applied value 0.8492 tCO₂/MWh, this value is obtained from the Published Report on Grid Emission Factor for Vietnam Grid and the report is published by the DNA of Vietnam i.e. The Ministry of Natural Resource and Environment (MONRE), by using the latest data available for the past three recent years 2015, 2016 and 2017. The historical data on electricity generation in the Vietnam Grid is sourced from “National electricity system regulation centre”. Based on the assessment of the published report by MONRE it is confirmed that the Calculation of the Combined Margin emission Factor is correct, please refer to the Section D.4.6 above in this report for the validation of Grid Emission Factor. The Calculation presented in the MONRE report is in accordance with the “Tool to calculate the emission factor for an electricity system, version 07.
Findings	CL 03 / CAR 05
Conclusion	All the findings raised were responded to satisfactorily by PP. The validation team confirms that the monitoring plan in the PDD is in compliance with the ACM 0002 methodology applied to the project activity. The provision of measuring instruments such as energy meters described in the monitoring plan are assessed to be at appropriate points of measurement and thus it can also be confirmed that the monitoring arrangements are feasible within the project design and can be implemented by the PP. PP has identified and described the relevant arrangement for Monitoring of SDG indicator in the PDD and it is found in accordance with the Gold Standard Safeguarding Principles and Requirement Version 1.2, 23/10/2019

D.5. Start date, crediting period type and duration

Means of validation	The Start Date, crediting period type and duration was validated by the validation team using primary information provided in the PDD section C.1 and C.2. PP has provided secondary information i.e. supporting evidences to arrive at Start Date of project activity as well as Start date of Crediting period. The Information validated during site visit and found credible and in accordance with the Applicable Validation criteria. The Validation conclusions are provided in the below table. <table border="1" data-bbox="448 439 1406 1675"> <thead> <tr> <th data-bbox="448 439 775 472"></th><th data-bbox="775 439 1406 472">BIM Solar Farm</th></tr> </thead> <tbody> <tr> <td data-bbox="448 472 775 891">Start Date</td><td data-bbox="775 472 1406 891"> 20/07/2018 The Start date of the project was validated using the “Engineering, Procurement & Construction – EPC”, agreement /Ref-P35/. PP signed this agreement on 20/07/2018 and hence it is considered as the real action towards the project implementation as the PP has made the commitment to make the expenditure for the construction and installation of 330 MW solar Power plant at project location in Thuan Nam District, Ninh Thuan Province, The EPC agreement was signed between BIM Renewable Energy Joint Stock Company (BIMRE) / BIM Energy Joint stock Company (BIME) (PP) and ERS Energy Sdn Bhd (EPC Contractor) </td></tr> <tr> <td data-bbox="448 891 775 1196">Expected Operational Life time</td><td data-bbox="775 891 1406 1196"> 25 years and 00 months – Life time identified by PP is found correct. The Life time of the project equipment is determined based on the Technical Specification /Ref-P21/ of the Solar Panels provided by the Manufacturer i.e. SERAPHIM SOLAR SYSTEM CO. LTD, The Value obtained is based on the Linear Power Output Warranty curve in the Specification. Which mentions that the Power output of 88.68 can be achieved up to 25 years after installation of Solar Panel. </td></tr> <tr> <td data-bbox="448 1196 775 1261">Type and Duration of crediting period</td><td data-bbox="775 1196 1406 1261">Renewable - 15 years, 0 months</td></tr> <tr> <td data-bbox="448 1261 775 1675">Start Date of the crediting period.</td><td data-bbox="775 1261 1406 1675"> 01/06/2019 Start Date of Crediting period is the date on which project start generating and exporting electricity to the Grid. Although the Actual Commissioning of solar power plant was completed on 22/04/2019,11/05/2019 and 07/05/2019 /Ref-P36/ however for the conservative purpose and to streamline the Crediting period duration PP has Identified the Start Date of Crediting period as 01/06/2019. These dates were verified using Commissioning Certificates /Ref-P36/, issued by the EPC Contractor ERS Energy Sdn Bhd. This is found correct and hence it is acceptable. </td></tr> </tbody> </table>		BIM Solar Farm	Start Date	20/07/2018 The Start date of the project was validated using the “Engineering, Procurement & Construction – EPC”, agreement / Ref-P35 /. PP signed this agreement on 20/07/2018 and hence it is considered as the real action towards the project implementation as the PP has made the commitment to make the expenditure for the construction and installation of 330 MW solar Power plant at project location in Thuan Nam District, Ninh Thuan Province, The EPC agreement was signed between BIM Renewable Energy Joint Stock Company (BIMRE) / BIM Energy Joint stock Company (BIME) (PP) and ERS Energy Sdn Bhd (EPC Contractor)	Expected Operational Life time	25 years and 00 months – Life time identified by PP is found correct. The Life time of the project equipment is determined based on the Technical Specification / Ref-P21 / of the Solar Panels provided by the Manufacturer i.e. SERAPHIM SOLAR SYSTEM CO. LTD, The Value obtained is based on the Linear Power Output Warranty curve in the Specification. Which mentions that the Power output of 88.68 can be achieved up to 25 years after installation of Solar Panel.	Type and Duration of crediting period	Renewable - 15 years, 0 months	Start Date of the crediting period.	01/06/2019 Start Date of Crediting period is the date on which project start generating and exporting electricity to the Grid. Although the Actual Commissioning of solar power plant was completed on 22/04/2019,11/05/2019 and 07/05/2019 / Ref-P36 / however for the conservative purpose and to streamline the Crediting period duration PP has Identified the Start Date of Crediting period as 01/06/2019. These dates were verified using Commissioning Certificates / Ref-P36 /, issued by the EPC Contractor ERS Energy Sdn Bhd. This is found correct and hence it is acceptable.
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Findings	NIL										
Conclusion	The validation team concludes that the project participants have correctly determined the start date of the project activity as per paragraphs 80 of the Project Standard version 2.0. The crediting period has been chosen as a ‘Renewable’ for the period of 15 (Fifteen) years, which is as per paragraph 87 (a) of the PS version 2.0. The PDD has stated at section C.2 that the start date of the crediting period would be 01/06/2019. The project participant has therefore met the requirements of paragraphs 85 – 91 of the PS version 2.0. The expected operational lifetime of the project activity is specified at section C.2 of the PDD as ‘25 years’. Hence, the requirement of paragraph 86 of the PS version 2.0 is also met by the project participant.										

D.6. Social, Economic and Environmental impacts

Means of validation	PP has analyzed relevant Social, Economic and Environmental Impacts which are associated with the project implementation and the summary of the analysis is provided in the PDD section D.1. The information provided in this section was validated against the requirement of Gold Standard “Safeguarding Principles and Requirements”, Version 1.1 Dated 1st March 2018. It is concluded that PP has identified safeguarding principles in following categories SOCIAL & ECONOMIC SAFEGUARDING PRINCIPLES – Under this category PP has identified following Safeguarding principles for the assessment		
	Safeguarding Principle	Assessment	Validation Conclusion on Assessment Question, Justification and Mitigation measures identified by PP
	Human Rights	No	There is no Human right violations observed as BIM SOLAR FARM is following the country laws on human right violations and it is ensured that the continued compliance toward this requirement is observed. Host Country Vietnam has ratified INTERNATIONAL HUMAN RIGHTS (1948) and country laws are aligned to this requirement. There is no additional mitigation measure required. Based on the assessment of information provided in the PDD is found credible and reliable.
	Gender Equality and Women's Rights	No	There is no violation to the Gender equality and women's rights was observed during the project construction phase. PP has employed women during construction phase as well as operation phase, the wages, salary provided to women found to be in accordance with local labour codes- PP is ensuring compliance towards the Labour codes, general labour and employment acts - Labour Code (10/2012/QH13). Since PP is following Labour code strictly and ensures compliance on continual basis, there is no additional mitigation measures required to be implemented towards this safeguarding principle.
	Community Health Safety and Working conditions	Yes	Since there is a possibility of exposure to health and safety risk to the community and persons working on behalf of the project, PP has identified that there is an impact to this safeguarding principle although there is a specific law in host country i.e. Labour Code - Law No. 10/2012 / QH13. In order to avoid any risk PP has identified the mitigation measure i.e. continuous trainings on health and safety to create awareness amongst employees as well as people working on behalf of the Project during operation phase.
	Cultural Heritage Indigenous, peoples displacement and Resettlement	NO	The project installation and operation does not involve in the damaging of cultural heritage, or displacement and resettlement of the people. The project is installed on the State land which is not used for any settlement or there is no agricultural activities were happening. This was confirmed during site visit and interactions with the stakeholders. The

			ownership of land utilized for the project installation was verified using relevant documentation and found satisfactory and hence it is concluded that the assessment outcome provided by PP in the PDD found correct.
	Corruption	NO	The project activity is not involved in any corruption related activities and it is demonstrated by PP that during project construction phase there is no corruption is observed. Host country Vietnam has ratified UN convention against Corruption in 2007 and PP observes strict compliance to the requirement of controls on corruption. Since the anti-corruption law is already implemented in Vietnam in 2015 as Anti-Corruption Law (Law No. 36/2018/QH14), there is no additional mitigation measures are required and PP shall be observing strict compliance to this law in continual manner.
	Economic Impacts	NO	Based on the Site visit and background information collected related to project, it is confirmed that the project does not employ any child labour and provides safe and healthy working conditions during all phases of the project and provides appropriate wages. This also confirms that there is no adverse economic impact due to the implementation of this project activity. In fact the project activity provides an employment opportunity and regular income to the people residing near to the project site. This helps the people to achieve sustainable economic growth and improved lifestyle.
	ENVIRONMENTAL AND ECOLOGICAL SAFEGUARDING PRINCIPLES: Under this category PP has identified following Safeguarding principles for the assessment		
	Safeguarding Principle	Assessment	Validation Conclusion on Assessment Question, Justification and Mitigation measures identified by PP
	Climate and Energy	No	The project activity involves generation of renewable energy from the natural resource i.e. Solar energy and the generated electricity is exported to the national grid. Hence it is concluded that there is no impact to the safeguarding principle "Climate and Energy". The project in fact contribute positively to the safeguarding principle and hence there is no additional mitigation measures are required.
	Water	No	The Project involves the generation of Solar power using photovoltaic panels, and hence there is no usage of water is involved in the project activity and there will be no water pollution is possible due to the implementation of BIM Solar Farm Project. Hence there is no additional mitigation measures are required. Justifications provided by the PP in PDD is

			found correct and acceptable.
	Environment, Ecology and Land Use	No	The Project involves the generation of Solar power using photovoltaic panels, hence project does not impact on - Land and soil usage for any project related activity – the project is installed on the state owned land leased by the PP. The State land is just a grassland and due to the project activity there is no change of Land use pattern. - It is also confirmed during the site visit is it confirmed that the project does not increases vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, draught or other environmental calamity. - Project is found to be in compliance with the relevant country specific Environmental Legislation i.e. Environmental Protection Law (Number: 55/2014/QH13) - Environmental Impact Assessment (EIA) for the project is done by the PP and relevant outcome of the EIA is considered to assess the Safeguarding principle. - Based on the overall assessment it is concluded that there is no additional mitigation measures are required and this is found correct.
Findings	NIL		
Conclusion	The validation team concludes that the Safeguarding principles are assessed and the results are found correctly defined and it is in accordance with - Safeguarding Principles and requirements – Version 1.1, Dated 1st March 2018. - PS version 2.0 paragraphs 92 & 93 that the project participant has carried out an analysis of the environmental impacts and also an environmental impact assessment in accordance with the host country requirements i.e. Vietnam.		

D.7. Local stakeholder consultation

Means of validation	As per Principle 3 “Stakeholder Inclusivity” as stated in the Para 3.4.3 of GOLD STANDARD FOR THE GLOBAL GOALS PRINCIPLES & REQUIREMENTS, Version 1.1 – Published March 2018, it is must that Projects shall identify and engage relevant stakeholders and seek expert stakeholder input where necessary in the design, planning and implementation of the Project. The Stakeholder consultation shall be conducted as per Gold Standard for the Global Goals STAKEHOLDER CONSULTATION & ENGAGEMENT PROCEDURE, REQUIREMENTS & GUIDELINES , Version 1.1 Validation team assessed the submitted Local Stakeholder Consultation Report by the PP and observed that the process is found in line with above mentioned requirements. PP ensured that 1st round of Local Stakeholder consultation process was conducted on site, PP has invited relevant Stakeholders through Email and other relevant means i.e. Individual invitation letter, Newspaper, Commune Notice Boards, Personal invitations. The evidences of these means adopted are provided transparently in the Stakeholder Consultation Report /Ref-P4/. 2nd Round of Stake holder consultation includes feedback and due diligence of the comments received during 1st round. This was also found transparently presented in the report, found satisfactory and in line with the Stakeholder consultation and engagement procedure requirements and guidelines. The stakeholder consultation was conducted in three separate meetings as
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described below

Date Of Stakeholder Consultation	Type of Stakeholder Engaged during the meeting
13/03/2019	Local community people
13/03/2019	Women only
14/03/2019	Government authorities
14/05/2019	NGOs & GS

PP has prepared a simple Power point presentation in local language to brief stakeholder on the project as well as sustainability parameters affected due to the implementation of project. PP has also engaged experts in the consultation and these experts are from agencies i.e. Government and NGO's.

PP has shared the assessment of Safeguard principles during stakeholder consultation and performed exercise on blind sustainability assessment with stakeholders. The outcome of the Blind assessment is provided in the separate report i.e. "Blind Sustainability Assessment Report", where the assessment results performed by each stakeholder are provided and it was observed that there is no negative assessment is done by the stakeholder, most of the parameters are assessed as "Does not Impact".

PP has received few generic comments from the Stakeholders and those comments are found responded satisfactorily, there is no pending comment for the response. It is also observed from the comments received from Stakeholder that no technical, technology related comments received as the Project technology is simple and proven green technology and does not have significant environmental and societal impacts. It is also observed that the Solar power project is not a new project in host country and the project design and implementation is in line with the Standard Engineering practices.

PP has briefed all stakeholder during 1st and 2nd consultation that PP has established a mechanism for continuous input / grievance. Grievances / feed backs at any given point is welcomed through an Email and site based register.

Also During Validation Site Visit a small stake holder consultation round was arranged where same stake holders were invited who attended 1st Stake holder consultation. Validation team interacted with the Stake holders to understand their feedback on 1st stake holder consultation. Stakeholder provided positive opinion about the Project implementation as well as the 1st Stakeholder consultation PP conducted.

During Validation site visit DOE included interview of Stakeholder as one of the agenda for validation. In order to complete the objective of this validation agenda, PP arranged one Stake holder meeting on 13/03/2019, 14/03/2019 and 14/05/2019 and invited all those stakeholders who participated during 1st Round of Stake holder meeting.

During site visit Validation Team witnessed the proceedings and then interviewed sampled group of stakeholders to understand their feedback about the project and last stakeholder consultation round. (For Category A and B)

During this meeting all stakeholders residing in the province attended including all categories, except few NGO's and WWF representatives.

For Government official PP arranged separate session on 4/05/2019 (For Category B, C and D) in the Commune Hall where one to one discussion on project and stakeholder feedback was done.

Overall the 2nd Feedback round was satisfactory and no adverse feedback was noted. All Stakeholders are aware of the project implementation and benefits of the Project to the Environment. It was also understood that few local personnel have got employment during project construction as well as operational phase. PP is

	helping community by providing financial help to upgrade the school/ community buildings and also providing scholarship to the bright school going students. While performing desk top review of project documents prior to the site visit it was noted that PP has purchased the Land for the project installation from individual persons, hence a specific feedback from the stakeholders needs to be obtained on the land acquisition process followed by the PP. During site visit and individual stake holder interview, a specific set of questions were asked i.e. - How was the Land purchase done by PP? - Did you received full compensation as agreed by the commune land authority? - Are you satisfied with the price you got for your land? - Have you got the legal documents / receipt towards the land sale? - Any dispute in entire land purchase exercise? Based on the feedback received from the stake holders interviewed it is confirmed that the Land purchase process is correctly followed by the PP and this process was closely monitored by the local commune authority. Each individual who sold the land to PP has got all legal documents and receipts and these documents were shared by the individual during interview. The process found to be transparent and in accordance with relevant legal requirements for the land acquisition. There is no concern reported by the individuals who sold their land to PP. Only one disputed land piece is there within the project area, one individual refused to sale the land to PP and hence this land was not purchased and it was clearly barricaded and the disputed owner has been provided with the right to access his/ her land through project property. This was also brought to the notification to the commune land authority and the dispute is now settled amicably.
Findings	Nil
Conclusion	Based on the Local Stakeholder Consultation process conducted by the PP and the solicitation of stakeholder comments obtained during the Local stakeholder consultation process as presented in PDD section E.1, E.2 as well as Local Stakeholder consultation reports submitted by the PP, it is confirmed that the procedure adopted for the Local Stakeholder consultation is in accordance with following specific requirements. ✓ Gold Standard for the Global Goals Stakeholder Consultation & Engagement Procedure, Requirements & Guidelines, Version 1.1 ✓ GOLD STANDARD FOR THE GLOBAL GOALS PROGRAMMES OF ACTIVITIES REQUIREMENTS Version 1.1 – Published March 2018 ✓ Para 3.4.3 of GOLD STANDARD FOR THE GLOBAL GOALS PRINCIPLES & REQUIREMENTS, Version 1.1 – Published March 2018 ✓ Approved CDM Large Scale Methodology ACM 0002, Version 19.0

D.8. Sustainable development co-benefits

Means of validation	Not Applicable for the Gold Standard Projects
Findings	Not Applicable
Conclusion	Not Applicable

D.9. Approval

Means of validation	Not Applicable for the Gold Standard Projects
Findings	Not Applicable
Conclusion	Not Applicable

D.10. Authorization

Means of validation	Not Applicable for the Gold Standard Projects
Findings	Not Applicable
Conclusion	Not Applicable

D.11. Modalities of communications

Means of validation	Not Applicable for the Gold Standard Projects
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Findings	Not Applicable
Conclusion	Not Applicable

D.12. Global stakeholder consultation

Means of validation	Not Applicable for the Gold Standard Projects
Findings	Not Applicable
Conclusion	Not Applicable

SECTION E. Internal quality control

The validation report underwent an Internal Technical Review (ITR) before requesting registration of the project activity.

The ITR is an independent process performed to examine thoroughly that the process of validation has been carried out in conformance with the requirements of the validation scheme as well as internal Bureau Veritas procedures.

The Team Leader provides a copy of the validation report to the reviewer, including any necessary validation documentation. The reviewer reviews the submitted documentation for conformance with the validation scheme. This will be a comprehensive review of all documentation generated during the validation process.

When performing an Internal Technical Review, the reviewer ensures that:

- The validation activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.
- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the validation exercise, review of sample documents.

The reviewer may raise Clarification Requests to the validation team and will discuss these matters with the Team Leader.

After the agreement of the responses to the Clarification Requests from the validation team as well as the PP(s), the finalized validation report is accepted for further processing such as submitting to Gold Standard.

SECTION F. Validation opinion

Bureau Veritas (India) Private Limited (BVIL) has performed a validation of the “BIM Solar Farm” Project Activity in host country Vietnam. The validation was performed on the basis of Gold Standard, UNFCCC and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

Project participant used the latest tool for demonstration of the additionality. In line with this tool, the PDD provides analysis of investment, technological and other barriers to determine that the project activity itself is not the baseline scenario.

By the description of the project as provided in earlier sections of the validation report, the project is likely to result in reductions of GHG emissions partially. An analysis of the investment and technological barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions, viz; 461,636 tCO₂e per annum.

The review of the project design documentation (version 03) and the subsequent follow-up interviews have provided Bureau Veritas (India) Private Limited with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project activity correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria. BVIL thus requests registration of “BIM Solar Farm” as a Gold Standard project activity.

Appendix 1. Abbreviations

Abbreviations	Full texts
BIM SOLAR FARM	BIM Renewable Energy Joint Stock Company (BIMRE) – Vietnam
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CM	Combined Margin
CO2	Carbon Dioxide
DNA	Designated National Authority
EB	Executive Board
EF	Emission Factor
EVN	Electricity Vietnam
EPC	Engineering Procurement and Construction
EIA	Environmental Impact Assessment
GHG	Green House Gases
GS	Gold Standard
GS4GG	Gold Standard For Global Goals
GW	Gigawatt
GWh	Gigawatt-hour
IPCC	Inter-Governmental Panel on Climate Change
IRR	Internal Rate of Return
kW	Kilowatt
kWh	Kilowatt-hour
LIBOR	London Interbank Offered Rate
MONRE	Ministry Of Natural Resource and Environment
MP	Monitoring Plan
MW	Megawatt
MWh	Megawatt-hour
NGO	Non-Governmental Organization
ODA	Official Development Assistance
O & M	Operation and Maintenance
OM	Operating Margin
PCP	Project Cycle Procedure
PDD	Project Design Document
PLF	Plant Load Factor
PP	Project Participant
PS	Project Standard
SDG	Sustainable Development Goals
tCO2	Tonnes of Carbon Dioxide
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VVS	Validation and Verification Standard
VND	Vietnamese Dong
RCBC	Rizal Commercial Banking Corporation

Appendix 2. Competence of team members and technical reviewers

Mr. Ram Desai	Bureau Veritas Certification, Brunei	Team Leader, Climate Change Lead Verifier, <i>Environmental Engineer with over all 13 years of experience in various industries related to Water & Waste water engineering design, installation & Commissioning, Integrated Facility Management for Environmental Services operations in various industries i.e Automotive, Pharmaceutical , IT & Electronics (With Clean Room).</i> <i>Management System Implementation and Maintenance, Green Building concept implementation, Lean Management Implementation, Water & Waste Water engineering Design & project Management, Project Environmental Compliance etc for a construction company.</i> <i>He is the lead auditor for Environment management system, Quality management system and Occupational health and safety management system and his auditing experience spans for 3 year with BVCI & BVCS. He has undergone intensive training on Clean Development Mechanism and was trained as Lead Verifier for CDM in the year 2005 and working as a lead Verifier for validation and verification of CDM/VCS projects</i>
Mr. Hong Linh Nguyen	Bureau Veritas Vietnam	Technical Reviewer, Climate change Lead Verifier: <i>He has graduated in Environmental Studies and had a Master Degree of Quality Management. He has undergone intensive training on Clean Development Mechanism. His working experience includes more than 7 years of auditing works in the field of Quality Management System and Environmental Management System. He has been involved in the validation / verification / technical review work of more than 30 GHG projects</i>

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
<u>Documents related directly to the GHG components of the project activity</u>				
P1	PP	PDD Version 01 – 01/04/2019		BIM SOLAR FARM
P2	PP	PDD Version 02 – 10/08/2019		BIM SOLAR FARM
P3	PP	PDD Version 03 – 21/10/2019		BIM SOLAR FARM
P4	PP	Stake Holder Consultation Report Version 2 – 09/08/2019		BIM SOLAR FARM
P5	PP	Blind SD Assessment Report		BIM SOLAR FARM
P6	PP	Attendance Register for the Stake holder Consultation		BIM SOLAR FARM
P7	PP	Meeting Evaluation Record		BIM SOLAR FARM
P8	GS	Preliminary Review under Gold Standard for the Global Goals for BIM SOLAR FARM June 2019		BIM SOLAR FARM
P9	PP	IRR Spread Sheet for Investment Analysis		BIM SOLAR FARM
P10	PP	Emission Reduction Calculation Spreadsheet		BIM SOLAR FARM
P11	State Bank of Vietnam	Exchange Rate_VND and USD - The State Bank of Vietnam quoted the central rate of VND versus USD on		BIM SOLAR

		10/21/2019:		FARM
P12	EVN	HD mua ban dien EVN (PPA) & its Appendices - Power Purchase Agreement with EVN		BIM SOLAR FARM
P13	ERS	Mechanical Completion Certificate - Mechanical Completion Certificate for 330 MW Solar Photovoltaic Power Plant issued by ERS Energy Sdn Bhd.		BIM SOLAR FARM
P14	ERS	PVsyst report Year 0 – 10 - PVsyst Report for the Simulation of the Power generation using PVSYST V6.75 issued by ERS Energy Sdn Bhd (Malaysia)		BIM SOLAR FARM
P15	ERS	O_M Agreements - BIME (18E) O&M Agreement with Juwi Renewable Energies Pte. Ltd. Dtd. 8th August 2018 - BIMRE (18S) O&M Agreement with Juwi Renewable Energies Pte. Ltd. Dtd. 8th August 2018 - BIMRE(18N) O&M Agreement with Bougues Energies & Services Dtd. 31st January 2019		BIM SOLAR FARM
P16	PVI Insurance	Insurance Policies issued by PVI Insurance Corporation - BIME (18E) Insurance Policy No. 18-SOLARBIM-PVI2018 – 18E Dtd. 08/08/2018 - BIMRE (18n) Insurance Policy No. 18N201MW-SOLARBIM-PVI2018 / E06 – Dtd. 04/06/2018 - BIMRE(18S) Insurance Policy No. 18S50MW-SOLARBIM-PVI2018, Dtd. 28/08/2018		BIM SOLAR FARM
P17	RCBC	Loan Facility Agreements - - Facility Loan Agreement PP BIM Energy Joint Stock Company has signed with lender Rizal Commercial Banking Corporation for BIME (18E Plant) Dtd. 3rd July 2018 - Facility Loan Agreement PP BIM Renewable Energy Joint Stock Company has signed with lender Rizal Commercial Banking Corporation for BIMRE (18N & 18S Plant) Dtd. 10th August 2018		BIM SOLAR FARM
P18	MONRE	Grid EF_MONRE_29.03.2019 - Detailed Report on Emission Factor published by Ministry of Natural Resource and Environment for the Year 2017, Date of Publishing 29/03/2019		BIM SOLAR FARM
P19	BIM SOLAR FARM (PP)	Not registered with other scheme_Declaration - PP's Declaration that BIM Solar Farm is not registered with any other schemes other than Gold Standard, Dtd. 20/10/2019		BIM SOLAR FARM
P20	ERS	Project Technical Specifications - Project Technical Specifications for BIM SOLAR FARM Solar Power Plant, Document No. BIM SOLAR FARM30-E-TS-6001.D, issued by the EPC contractor ERS Energy Sdn Bhd		BIM SOLAR FARM
P21	Seraphim Solar System Co. Ltd.	PV Module Seraphim 345Wp SRP-345-6MA-HV_EV - Technical Specification of Seraphim PV Modules – Provided by the EPC Contractor ERS Energy Sdn Bhd.		BIM SOLAR FARM
P22	SUNGROW	Inverter SUNGROW SG3125HV_EV - Technical Specification for Sungrow Inverter		BIM SOLAR FARM
P23	EVN	EVN Annual Report 2017 - Vietnam Electricity – Annual Report 2017 for demonstrating Baseline Scenario in power generation in host country Vietnam, Published by EVN		BIM SOLAR FARM
P24	National Assembly Vietnam	EIA Regulation - Regulations on environmental protection planning, strategic Environmental assessment, environmental impact assessment and environmental protection plan		BIM SOLAR FARM
P25	ERS	Monthly Report June -2019 - Monthly Report on		BIM

		operation of Solar Power plant after commissioning of the Plant for Plant Performance and Energy Export to grid – generated by ERS Energy Sdn Bhd		SOLAR FARM
P26	ERS	Monthly Report July -2019 - Monthly Report on operation of Solar Power plant after commissioning of the Plant for Plant Performance and Energy Export to grid - generated by ERS Energy Sdn Bhd		BIM SOLAR FARM
P27	ERS	Monthly Report Aug -2019 - Monthly Report on operation of Solar Power plant after commissioning of the Plant for Plant Performance and Energy Export to grid - generated by ERS Energy Sdn Bhd		BIM SOLAR FARM
P28	EVN	List of First 10 power plants - Progress of 10 Solar Power projects in host country Vietnam, a press release by EVN – this is used for demonstrating the Common Practice analysis.		BIM SOLAR FARM
P29	EVN	Vietnam's First Mega Solar Power Plant - Press Release on 10/10/2018 for the 1 st Mega Solar power plant commissioning with installed capacity of 48 MW.		BIM SOLAR FARM
P30	Ministry of Planning and Investment	Investment Decision 31.08.2019 - Certificate of Investment Registration , Dtd. 31/08/2018, as per local law on Investment No. 67/2014 / QH13 Dtd. 26/11/2014 issued by the Ministry of Planning and Investment.		BIM SOLAR FARM
P31	ILO	Ratifications of ILO- Ratifications of ILO conventions: Ratifications for Viet Nam obtained from website https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:103004		BIM SOLAR FARM
P32	UN	SDG8Goal 8 :.. Sustainable Development Knowledge Platform obtained from https://sustainabledevelopment.un.org/sdg8 - Documents provides detailed information on SDG 8.		BIM SOLAR FARM
P33	EVNEPTC	Calibration Records for the Meters - Calibration Report for the Electricity Meters installed at BIM SOLAR FARM Solar Power Plant – The Calibration is done by Electricity Trading Company (EVNEPTC) Dtd, 07/05/2019.		BIM SOLAR FARM
P34	Elster	Specification of Meter - Manufacturing specifications of Bi Direction, direct connected or CT Meters – A1700 Make Elster - installed at BIM SOLAR FARM Solar Power Plant -		BIM SOLAR FARM
P35	ERS Energy Sdn Bhd & PP	EPC Contract Document _Project Starting Date - EPC Contract Agreement signed between PP and ERS Energy Sdn Bhd, Dtd. 20/07/2018 – to demonstrate the start date of the Project		BIM SOLAR FARM
P36	EVNEPTC	Operational Licenses issued by EVN – - Operational License for BIME (18E Plant) Dtd. 22/04/2019 - Operational License for BIMRE (18N Plant) Dtd 11/05/2019 - Operational License for BIMRE (18S Plant) Dtd 07/05/2019		BIM SOLAR FARM
P37	UN	Declaration of Human Rights		BIM SOLAR FARM
P38	ILO	Labour Code		BIM SOLAR FARM
P39	International cooperation department	Labour Code of Vietnam		BIM SOLAR FARM
P40	National Assembly Vietnam	Labor code		BIM SOLAR FARM
P41	UN Treaty	Human Rights		BIM

	Body - OHCHR			SOLAR FARM
P42	National Assembly Office Vietnam	Law on Cultural Heritage		BIM SOLAR FARM
P43	UN Convention Against Corruption	Ratifications against corruption		BIM SOLAR FARM
P44	National Assembly Vietnam	Law on environmental protection		BIM SOLAR FARM
P45	PP	Security Contract for BIMRE (18N & 18S) signed with Nam Do-Ninh Thuan BV. Services Co. Ltd. Signed in 2019.		BIM SOLAR FARM
<u>Background documents related to the design and/or methodologies employed in the design or other reference documents</u>				
B1	GS	Gold Standard for the Global Goals - Key Project Information & Project Design Document (PDD) – Version 1.1 - August 2017		GS Website
B2	GS	Gold Standard for the Global Goals - Stakeholder Consultation Report - Version 1 – July 2017		GS Website
B3	GS	Gold Standard Principles & Requirements – Version 1.2, Dtd. 23/10/2019		GS Website
B4	GS	Gold Standard Safeguarding Principles and Requirements - Version 1.2, Dtd. 23/10/2019		GS Website
B5	GS	Gold Standard Principles & Requirements – Version 1.2, Dtd. 23/10/2019		GS Website
B6	GS	Gold Standard Renewable Energy Activity Requirements – Version 1.2, Dtd. 23/10/2019		GS Website
B7	GS	Gold Standard Validation & Verification Body Requirements – Version 1.0, Dtd. 1/03/2018		GS Website
B8	UNFCCC EB 100 Annex 6	ACM 0002, version 19.0 “Grid-connected electricity generation from renewable sources”		UNFCCC CDM website
B9	UNFCCC EB 100 Annex 4	Tool to calculate the emission factor for an electricity system, version 7.0		UNFCCC CDM website
B10	UNFCCC EB 101 Annex 2	CDM Validation and Verification Standard for Project Activities version 2.0		UNFCCC CDM website
B11	UNFCCC EB 101 Annex 1	CDM Project Standard for Project Activities version 2.0		UNFCCC CDM website
B12	UNFCCC EB 101 Annex 16	CDM Project Cycle Procedures for Project Activities version 2.0		UNFCCC CDM website
B13	UNFCCC EB 70 Annex 8	Tool for the demonstration and assessment of additionality, version 7.0		UNFCCC CDM website
B14	UNFCCC EB 101 Annex 11	Tool for Investment Analysis version 8.0		UNFCCC CDM website

B15	UNFCCC EB 96 Annex 5	Tool for baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation version 3.0		UNFCCC CDM website
B16	UNFCCC EB 84 Annex 7	Tool for Common Practice Analysis version 3.1		UNFCCC CDM website
B17	UNFCCC EB 48 Annex 11	Guidelines for the reporting and validation of PLF's version 1		UNFCCC CDM website
B18	UNFCCC EB 50 Annex 13	Guidelines for Objective Demonstration and Assessment of Barriers version 01,		UNFCCC CDM website
B19				

Appendix 4. 5Clarification requests, corrective action requests and forward action requests

Table 1. CLs from this validation

CL ID	01	Section no.	A.5	Date: 16/09/2019
Description of CL				
In PDD Section Technologies and /or Measures it is mentioned that different PV modules are used which has different Efficiency Values (%), Please clarify how these values are utilized to arrive at the Total Energy Generated by the Plant (EG _{PJ,y}). (CL)				
Project participant response				Date: 10/10/2019
The total power generation estimated by the PVSyst software where all the parameters are accounted while estimating the power generation. Hence, a clear definition has been included under section B.6.4 in the revised PDD as follows: <i>The power generations have been estimated by the power simulation software (PVSyst Version 6.67 & 6.75). The software used various criteria such as equipment specifications, local weather patterns, geographical area, shading factor, efficiency of the system, thermal losses, etc to determine the power generation.</i>				
Documentation provided by project participant				
DOE assessment				Date: 15/01/2020
PP has revised PDD Section A.5 to demonstrate the calculation of Plant Load factor. To demonstrate how PP has arrived at the PLF, PP utilized a 3 rd party research paper published on ScienceDirect on the performance evaluation of Solar Power Plant in India. In Solar plant PLF is equivalent to CUF i.e. Capacity Utilization Factor. Which is defined as real output of the plant compared to theoretical maximum output of the plant. CUF=Energy measured (kWh)/(365 * 24* installed capacity of the plant). Based on the above verification and relevant corrections done by PP in the PDD it is concluded that the CL is closed.				

CL ID	02	Section no.	A.5	Date: 16/09/2019
Description of CL				
Under PDD Section Technologies and /or Measures PP has defined Plant Load Factor against each individual Plant i.e.18E, 18N and 18S, however it is not clear how PP arrive at the PLF Value, Please Clarify. (CL)				
Project participant response				Date: 10/10/2019
The computation of PLF has been shown with relevant supporting link under section A.5 of the revised PDD.				
Documentation provided by project participant				
DOE assessment				Date: 15/01/2020

Based on the site visit outcome and country specific information available publically it is concluded that the simplified additionality is not applicable for the project and hence the clarification provided by PP and necessary corrections in the Revised PDD are found correct and acceptable.

As a correction PP has decided to work out the investment Analysis to demonstrate the Additionality. This approach is found correct and in accordance with the "Tool for demonstration and assessment of Additionality, Version 07.00"

Based on the justification PP has revised PDD section B.5 to incorporate demonstration of additionality using Investment Analysis. This approach is found correct and hence accepted and the CL is closed

CL ID	03	Section no.	B.6.1	Date: 16/09/2019
Description of CL				
Under PDD section "Relevant target for Each of the three SDG's" PP has identified three SDG's i.e. SDG7, SDG 8 and SDG 13, however justifications provided against is SDG is not clear and it does not provide clarity how these three SDG's are applicable and Project contributes to meet the SDG requirements. (CL)				
Project participant response				Date: 10/10/2019
The justification provided under section B.6.1 has been rewritten based on the targets chosen for each SDG in th revised PDD.				
Documentation provided by project participant				
DOE assessment				Date: 15/01/2020
Validation Team Checked the revised justifications in the Revised PDD under Section B.6.1 and it is found that PP has appropriately discussed how the selected SDG indicators are relevant to Project and how project will be contributing to achieve the established target against each indicator.				
Based on the revised justification it is concluded that the SDG Indicator selection is correct and justification is now clear. Hence the Clarification is closed..				

CL ID	04	Section no.	B.5	Date: 17/09/2019
Description of CL				
In PDD Section B.5 Demonstration of Additionality, PP has demonstrated the Additionality of project utilizing "Simplified procedure to demonstrate additionality" as specified in the Approved methodology ACM002. As per para 29 of "Simplified procedure to demonstrate additionality" PP has justified that the percentage share of total installed capacity of the specific technology i.e. Solar Power (870MW) in the total installed grid connected power generation capacity in Vietnam is equal to 2%. This claim is based on the "Vietnam Electricity Annual Report 2017" which represents the scenario at the end of 2016. However on the basis of latest information on the EVN Website it is observed that Total Installed grid connected capacity of Solar Technology is more than 4000MW and it corresponds to 2.7% of total power generation capacity. Please explain how the additionality claim in the PDD Version 2.0 is correct? (CL)				
Project participant response				Date: 15/01/2020
After the validation site visit, PP has decided to apply financial additionality instead of simplified additionality due to lack of supporting documents.				
The entire section B.5 has been revised in accordance with:				
- Tool for demonstration and assessment of Additionality" Version 07.0.0 - Investment Analysis, Version 09.0				
Documentation provided by project participant				
DOE assessment				Date: 25/10/2019
Validation Team Checked the revised justifications in the Revised PDD under Section B.6.1 and it is found that PP has appropriately discussed how the selected SDG indicators are relevant to Project and how project will be contributing to achieve the established target against each indicator.				
Based on the revised justification it is concluded that the SDG Indicator selection is correct and justification is now clear. Hence the Clarification is closed..				

CL ID	05	Section no.	B.7.1	Date: 17/09/2019
Description of CL				

In the monitoring plan PP has explained how Electricity grid emission factor (tCO₂/MWh), EFCM_{grid,y} is arrived and it is noted that PP has utilized Weighting averages are considered as WOM – 75% and WBM – 25%, however in the supporting evidence i.e. “The analyst of Emission Factor of Vietnam Grid” Report issued by Climate Change Department, Ministry of Natural Resource and Environment (MONRE) it is mentioned that weighing averages are considered as WOM – 50% and WBM – 50%.

Please explain the rationale behind considering weighting averages as WOM – 75% and WBM – 25% (CL)

Project participant response	Date: 15/01/2020
The combined margin emissions factor is calculated as per Tool 7, paragraph 86 a), where the different weightage applied for OM & BM emission factors for the solar power generation project activities as follows:	
The following default values should be used for w _{OM} and w _{BM} :	
(a) Wind and solar power generation project activities: w _{OM} = 0.75 and w _{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods;	
(b) All other projects: w _{OM} = 0.5 and w _{BM} = 0.5 for the first crediting period, and w _{OM} = 0.25 and w _{BM} = 0.75 for the second and third crediting period,8 unless otherwise specified in the approved methodology which refers to this tool.	

Documentation provided by project participant	
DOE assessment	
Date: 25/10/2019	
Validation Team Checked the revised justifications in the Revised PDD under Section B.6.1 and it is found that PP has appropriately discussed how the selected SDG indicators are relevant to Project and how project will be contributing to achieve the established target against each indicator.	
Based on the revised justification it is concluded that the SDG Indicator selection is correct and justification is now clear. Hence the Clarification is closed..	

CL ID	06	Section no.	B.7.3	Date: 17/09/2019
Description of CL				
Please explain apart from calibration is there any other uncertainty in the monitoring of the data / parameter is expected and how PP identifies the level of uncertainty and accuracy. It there any threshold is established for uncertainty or accuracy level? (CL)				
Project participant response				Date: 10/10/2019
Since all monitoring parameters are based on relevant official records, there is no uncertainty expected from the project.				
Documentation provided by project participant				
DOE assessment				Date: 15/01/2020
Validation Team Checked the revised justifications in the Revised PDD under Section B.6.1 and it is found that PP has appropriately discussed how the selected SDG indicators are relevant to Project and how project will be contributing to achieve the established target against each indicator.				
Based on the revised justification it is concluded that the SDG Indicator selection is correct and justification is now clear. Hence the Clarification is closed..				

Table 2. CARs from this validation

CAR ID	01	Section no.	A.5	Date: 16/09/2019
Description of CAR				
Under PDD Section Technologies and /or Measures PP has mentioned that Average lifetime of the Project is determined using methodological Tool (AM-TOOL-10, Version 1) i.e. “Tool to determine the remaining lifetime of equipment”, However this tool is required to determine the remaining lifetime of the equipment and hence it is not applicable for this Project activity as this is the Greenfield project. (CAR)				
Project participant response				Date: 15/01/2020

The following portion has been removed from the revised PDD:
*The technical lifetime of the project activity is determined by using "Tool to determine the remaining lifetime of equipment" (Version 1). The tool states that:
 Project participants may use one of the following options to determine the remaining lifetime of the equipment:*
 (a) *Use manufacturers information on the technical lifetime of equipment and compare to the date of first commissioning;*
 (b) *Obtain an expert evaluation;*
 (c) *Use default values.*
As per option (a),

Documentation provided by project participant

DOE assessment **Date:** 25/10/2019

PP has used information provided by the Manufacturer of Solar Panels to determine the Technical Lifetime of the Project equipment and hence it is found satisfactory. Based on the justification provided and the corrections made in the PDD Section A.5, the CAR is closed.

PP has applied the technical Life of Solar panels as 25 years, which is demonstrated through Technical specifications of Solar panels installed on project site i.e. Seraphim make SRP-345-6MA-HV model. –Found satisfactory.

CAR ID	02	Section no.	A.7	Date: 16/09/2019
Description of CAR				
In PDD section A.7 it is required to provide the information on Funding sources of Project, however PP just provided information that Project does not utilize Public funding or ODA funding's, which is partially meeting the requirement as Funding source is not mentioned. (CAR)				
Project participant response				Date: 15/01/2020
Following information has been included in the revised PDD: <i>The project has received the following funding sources:</i>				
Funding Sources		Total		
Investment by Project owner (Equity)		30%		
Bank Loan (Debt)		70%		
The actual amount of equity and bank loan were shown to validator during the onsite validation and substantiated with relevant documents.				
Documentation provided by project participant				
DOE assessment				Date: 25/10/2019
PP has used information provided by the Manufacturer of Solar Panels to determine the Technical Lifetime of the Project equipment and hence it is found satisfactory. Based on the justification provided and the corrections made in the PDD Section A.5, the CAR is closed.				
PP has applied the technical Life of Solar panels as 25 years, which is demonstrated through Technical specifications of Solar panels installed on project site i.e. Seraphim make SRP-345-6MA-HV model. –Found satisfactory.				

CAR ID	03	Section no.	B.4 & B.5	Date: 16/09/2019
Description of CAR				
In PDD Section Establishment and description of baseline scenario, PP has mentioned that "The total installed electricity generation capacity in Vietnam has reached 42,315 MWp as of Dec 2016" referring to the "Vietnam Electricity Annual Report 2017", while cross checking the information it was noted that the actual total electricity generation by December 2016 was 42,135 MWp. Same Error is observed in section Demonstration of Additionality (CAR)				
Project participant response				Date: 15/01/2020
It's a typo error and it has been revised all over in the revised PDD as follows: 42,315 is changed to 42,135				
Documentation provided by project participant				
DOE assessment				Date: 25/10/2019

CAR ID	04	Section no.	B.6.5	Date: 16/09/2019
Description of CAR				
While Estimating Ex-ante values against each SDG outcome PP has provided two separate tables for SDG 7 and SDG 13 where Baseline Estimates are provided as MWh Value and tCO2 Emission Reductions achieved and respectively. And project estimate shows Zero, How it is possible? The Objectives of these SDG's are not understood clearly and representation of values found to be wrongly mentioned. (CAR)				
Project participant response				Date: 15/01/2020
The tables are revised based on the benefits achieved by the project activity in the revised PDD				
Documentation provided by project participant				
DOE assessment				Date: 25/10/2019

CAR ID	05	Section no.	B.7.1	Date: 17/09/2019
Description of CAR				
Under PDD section B.7.1 PP has provided information on the Data and Parameters to be monitored, under Parameter "Relevant SDG indicator" PP has identified 8.5.2 and 8.8.2 as indicators for monitoring, however the selection of the SDG Indicator found to be wrong and the monitoring description is also found to be wrong. Further PP has also Identified indicator 13.3.2 for monitoring, however the Description of Monitoring found to be wrong. (CAR)				
Project participant response				Date: 15/01/2020
The indicators are changed from 8.5.2 to 8.5.1 as well as from 8.8.2 to 8.8.1 under section B.7.1 of the revised PDD. Based on the relevant indicators chosen, the monitoring method and procedure has been revised. Also, the description of Indicator 13.3.2 has been amended in the revised PDD.				
Documentation provided by project participant				
DOE assessment				Date: 25/10/2019

CAR ID	06	Section no.	B.7.3	Date: 17/09/2019
Description of CAR				
The Metering Information provided in PDD section B.7.3 is not clearly Identifying the Tariff Meters. There are several meters are found installed at all three plants and hence it is critical to identify those relevant meters for the transparency and accuracy in the monitoring of Energy generation and export Data. (CAR)				
Project participant response				Date: 15/01/2020
A metering layout for all three plants has been enclosed under Appendix 3 in the revised PDD.				
Documentation provided by project participant				
DOE assessment				Date: 25/10/2019

CAR ID	07	Section no.	C.2.1	Date: 17/09/2019
Description of CAR				
In PDD section "Start Date of Crediting Period", PP has identifying start date based on the date of 1 st injection of electricity to the grid, however there is no clear supporting evidence for this event available with PP, however while reviewing supporting evidence i.e. Operational licenses it was noted that Commercial Licenses are issued much later than the Date of 1 st Injection of Electricity to the grid. (CAR)				
Project participant response				Date: 15/01/2020

Based on evidence available, Section C.2.1 has been revised as follows: <i>Starting date of the first crediting period: 01/06/2019</i> <i>Since the date of operational license for each plant is varying as follows, the above start date of crediting period has been chosen for a conservative manner:</i> 18E: 22/04/2019 18N: 11/05/2019 18S: 07/05/2019	
Documentation provided by project participant	
DOE assessment	Date: 25/10/2019

Table 3. FARs from this validation

FAR ID	01	Section no.		Date: 18/09/2019
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN); • Make editorial improvements.
03.1	11 January 2018	Editorial revision to remove an erroneously included instruction paragraph in section D.2 (Identification of project type).
03.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
02.0	22 July 2016	EB 90, Annex 3 Revision to include provisions related to automatically additional project activities.
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Registration Keywords: project activities, validation report		