Gold Standard®

Gold Standard for the Global Goals
Key Project Information & Project Design Document (PDD)

Version 1.1 – August 2017

Gold Standard

KEY PROJECT INFORMATION

Title of Project:	BIM Solar Farm
Brief description of Project:	BIM Solar Farm is a green-field grid-connected solar power project comprises of three solar plants in various locations with a total installed capacity of 330MW. Refer Section A.1 for individual plant information. All the three plants are located at Thuan Nam District, Ninh Thuan Province, Vietnam. The BIM Solar Farm is jointly owned by BIM Renewable Energy Joint Stock Company (BIMRE) and BIM Energy Joint stock Company (BIME). Both BIMRE and BIME are the brands belonging to BIM Group (Vietnam). The entire electricity generated by the solar farm will be fed into the Vietnam national grid (hereafter referred as "the 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/MW. Estimated electricity generation by three plants is 543,613 MWh per annum. The electricity generation will result 461,636 tCO_2/year and total emission reduction will be 2.3 million tCO_2 for the first crediting period.
Expected Implementation Date: Expected duration of Project:	Implementation has been completed for thee plants and the commercial operation started as follows: 18N – 11/05/2019 18S – 07/05/2019 18E – 23/04/2019 25 years
Project Developer:	BIM Renewable Energy Joint Stock Company (BIMRE) – Vietnam BIM Energy Joint stock Company (BIME) – Vietnam
Project Representative:	BIMRE & BIME (Vietnam) – Mr Nguyen Phuong Trung
Project Participants and any communities involved:	BIMRE & BIME (Vietnam)
Version of PDD: Date of Version:	Version 01 – 13/05/2019 Version 02 – 09/08/2019 Version 03 – 10/12/2019 Version 04 – 25/03/2020 Version 05 – 29/05/2020
Host Country / Location:	Vietnam (Thuan Nam District, Ninh Thuan Province)
Certification Pathway (Project Certification/Impact Statements & Products	Impact Statements & Products (GS-VER Carbon Credits)
Activity Requirements applied: (mark GS4GG if none relevant)	GS4GG
Methodologies applied:	ACM0002: Grid-connected electricity generation from renewable sources (Version 19.0)
Product Requirements applied:	Gold Standard – Verified Emission Reductions (GS-VERs)
Regular/Retroactive:	Retroactive
SDG Impacts:	1. SDG 7 – Affordable and Clean Energy 2. SDG 8 – Decent Work and Economic Growth 3. SDG 13 – Climate Action
Estimated amount of SDG Impact Certified	1. SDG 7 – 543,613 MWh/year of power generation. 2. SDG 8 – 82 employment opportunities for local people 3. SDG 13 – 461,636 tCO_2/year of emission reduction.

SECTION A. Description of project

A.1. Purpose and general description of project

BIM Solar Farm (hereafter referred as the "Proposed Project" or "Project Activity") is a green filed grid connected solar power plants with a total installed capacity of 330 MWp, which comprises of three power plants as follows:

Plant Name	Location	Installed Capacity (MWp)	Estimated Power Generation (MWh/yr)[1]
18N	Phuoc Ninh Commune	250	414,450
18S	Highway 1A, Lac Tien Hamlet, Phuoc Minh Commune	50	80,156
18E	Highway 1A, Quan The Hamlet, Phuoc Minh Commune	30	49,007
	Total	**330**	**543,613**

All the above plants are located at Thuan Nam District, Ninh Thuan Province, Vietnam. The legal owner of 18N & 18S is BIM Renewable Energy Joint Stock Company (BIMRE) and the 18E is BIM Energy Joint stock Company (BIME). Both BIMRE and BIME are the brands belonging to BIM Group (Vietnam). The entire electricity generated by the solar farm will be fed into the Vietnam national grid (hereafter referred as "the grid") without any Greenhouse Gas (GHG) emissions. The operational lifetime of the project 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[2]. Estimated electricity generation by three plants is 543,613 MWh per annum. The electricity generation will result in a total emission reduction of 461,636 tCO_2/year. The total emission reduction will be 2.35 million tCO_2 for the first crediting period 5 years starting from the date of commercial operation. Furthermore, project activity will contribute further dissemination of solar energy and extension of national power generation in Vietnam.

The project activity contributes to the following goals:

- Reduce anthropogenic emissions of GHGs compared to the business-as-usual
- Employment opportunities for residents during construction and operation phase of the project
- Reduce other pollutants resulting from power generation industry in Vietnam and import dependency
- Attract foreign project owners and stimulate the growth of renewable energy sector in Vietnam

The project owners believe that the efficient utilization of natural resources with responsible environmental consideration is a driving force for sustainable development in Vietnam. Other than the objective of climate change mitigation through significant reduction of GHG emissions, the project activity creates positive environmental and economic benefits (sustainable development) through the following aspects in Vietnam:

Environmentally: The project does not contribute to the carbon emissions, harmful pollutants and suspended airborne particulate matter associated with coal and fossil fuel fired power plants. Also, it does not involve any equipment with moving component and hence it is free of noise pollution and does not contaminate the soil and water.

Socially : The project has provided/will provide job opportunities to local people and improve the local standard of living by frequent visits by engineers, professionals and industrialists to the sites. The project supports the "revised Power Development Plan VII (PDP VII)" in increasing the electricity generation by using renewable energy sources.

Economically : The project will reduce the dependency of Vietnam on coal, fossil fuel and electricity importation as well as negative impact on the foreign exchange. It will contribute to strengthen the renewable energy sector, especially solar energy sector in Vietnam. The project will be the first to demonstrate the capacity of large-scale solar projects to meet power needs in Vietnam.

A.2. Eligibility of the project under Gold Standard

The project meets the eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements document as described below:

GS Eligibility Criteria	Eligible? (Yes/ No/ Not Applicable)	Remarks/Justification
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	Yes	The project type is large-scale solar which is an eligible project type as it is in accordance with 1.1.1 a) and 1.1.1 b) of the Eligible Project Types & Scope under Renewable Energy Activity Requirements. The project applies methodology ACM0002., which is an approved methodology under Gold Standard.
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	Yes	The project is automatically eligible as per "GS Activity Requirements".
Project types applying for Gold Standard approval are referred to the Gold Standard Vision and Mission. The Project Developer shall demonstrate how the Project would contribute to these and how the Gold Standard for the Global Goals Requirements would be met in their application for approval	Not Applicable	Photovoltaic Solar project is an approved project type as per "GS Activity Requirements" and does not require approval from Gold Standard.
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	Not Applicable	Photovoltaic Solar project is an approved project type as per "GS Activity Requirements" and does not require approval from Gold Standard.
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	Yes	This project activity is not associated with geo-engineering or energy generated from fossil fuel or nuclear, fossil fuel switch. Also, the project activity does not support, enhance or prolong such energy generation.
General Eligibility Criteria under Renewable Energy Activity Requirements Project Type: As discussed above, the project type is eligible. Project Location: As per the guideline, the project can be qualified if it is located any part of the world. BIM solar farm is located in Vietnam and thereby the project is eligible. Project scale: The project activity is 330MWp solar project and thus qualified as large-scale project. The project proponent has declared[3] that the "BIM Solar Farm" is not registered with any other schemes.		

[1] The power generations are estimated by the PVSyst software and the reports are available during validation

2 "The Analysis of Emission Factor of Vietnam Grid" report issued by Climate Change Department, Ministry of Natural Resource and Environment (MONRE).

[3] A declaration letter will be submitted to GS-VVB during validation for justification.

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

The legal owner of 18N & 18S is BIM Renewable Energy Joint Stock Company (BIMRE) and the 18E is BIM Energy Joint stock Company (BIME). Both BIMRE and BIME are the brands belonging to BIM Group (Vietnam).

The ownership can be justified by few documents such as land lease agreement, EPC contract, Power Purchase Agreement (PPA), and Insurance policy.

A.4. Location of project

A.4.1. Host Country

Vietnam

A.4.2. Region/State/Province etc.

Thuan Nam District, Ninh Thuan Province

A.4.3. City/Town/Community etc.

18E - Highway 1A, Quan The Hamlet, Phuoc Minh Commune

18N - Phuoc Ninh Commune

18S - Highway 1A, Lac Tien Hamlet, Phuoc Minh Commune

A.4.4. Physical/Geographical location

Picture 1 – Map of Vietnam & Locations of 3 power plants in Ninh Thuan Province

Corner GPS Coordinates	Arial locations and layouts
18E E1 – 11.44853, 108.89506 E2 – 11.44347, 108.90312 E3 – 11.43871, 108.90066 E4 – 11.43945, 108.89845 E5 – 11.44422, 108.89818 E6 – 11.44192, 108.89445	
18N N1 – 11.43961, 108.87468 N2 – 11.44349, 108.86501 N3 – 11.44432, 108.86175 N4 – 11.4526, 108.8618 N5 – 11.45295, 108.86721 N6 – 11.45785, 108.87063 N7 – 11.46102, 108.87072 N8 – 11.45997, 108.87973	
18S S1 – 11.40232, 108.87579 S2 – 11.40244, 108.8775 S3 – 11.40046, 108.87753 S4– 11.40105, 108.87928 S5– 11.40046, 108.87753 S6 – 11.40105, 108.87928 S7 – 11.40008, 108.87936 S8 – 11.39916, 108.87739 S9 – 11.39797, 108.87775 S10 – 11.39864, 108.87886 S11 – 11.39814, 108.88152 S12 – 11.39673, 108.88139 S13 – 11.39667, 108.88311 S14 – 11.40119, 108.88264 S15 – 11.40059, 108.8853 S16 – 11.39942, 108.88504 S17 – 11.39915, 108.88617 S18 – 11.3929, 108.88511	

A.5. Technologies and/or measures

The technology being employed is a conversion of solar energy into electrical energy. The project activity is the installation of an environment friendly green technology since there are no GHG emissions associated with the electricity generation. Since this is a greenfield project there was no electricity generation at the project site prior to its implementation.

Photovoltaic (PV) is a power generation method that 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[4]. The technical specifications[5] of equipment as follows:

Technical Specifications of PV Modules				
Model	TSM-325PE14A	TSM-330PE14A	JAP72S01-325/SC	JAP72S01-330/SC
Type	Multicrystalline	Multicrystalline	Polycrystalline	Polycrystalline
Max Power (Pmax)	325	330	325	330
Open Circuit Voltage (Voc)	45.6	45.8	46.38	46.40
Max Power Voltage (Vmp)	37.2	37.4	37.39	37.65
Short Circuit Current (Isc)	9.19	9.28	9.17	9.28
Max Power Current (Imp)	8.73	8.83	8.69	8.77
Efficiency (%)	16.7	17	16.7	17.0
Power Tolerance	0 ~ +5W		0 ~ +5W	
Max System Voltage	1500V DC(IEC/UL)		1000V/1500V DC(IEC)	
Max Series Fuse	15A		20A	

Technical Specifications of Inverters	
Model	SG3125HV
Max. PV Input Voltage	1500V
Max PV Input Current	4178A
AC Output Power	3593kVA @ 25^{0}C / 3473kVA @ 45^{0}C / 3125kVA @ 50^{0}C
Max AC Output Current	3458A
Max Efficiency / Euro. Efficiency	99.0% / 98.7%
Auxiliary Power Supply	415V, 15kVA
Operating Ambient Temperature range	-35^0 to 60^{0}C
Cooling Method	Temperature controlled forced air cooling

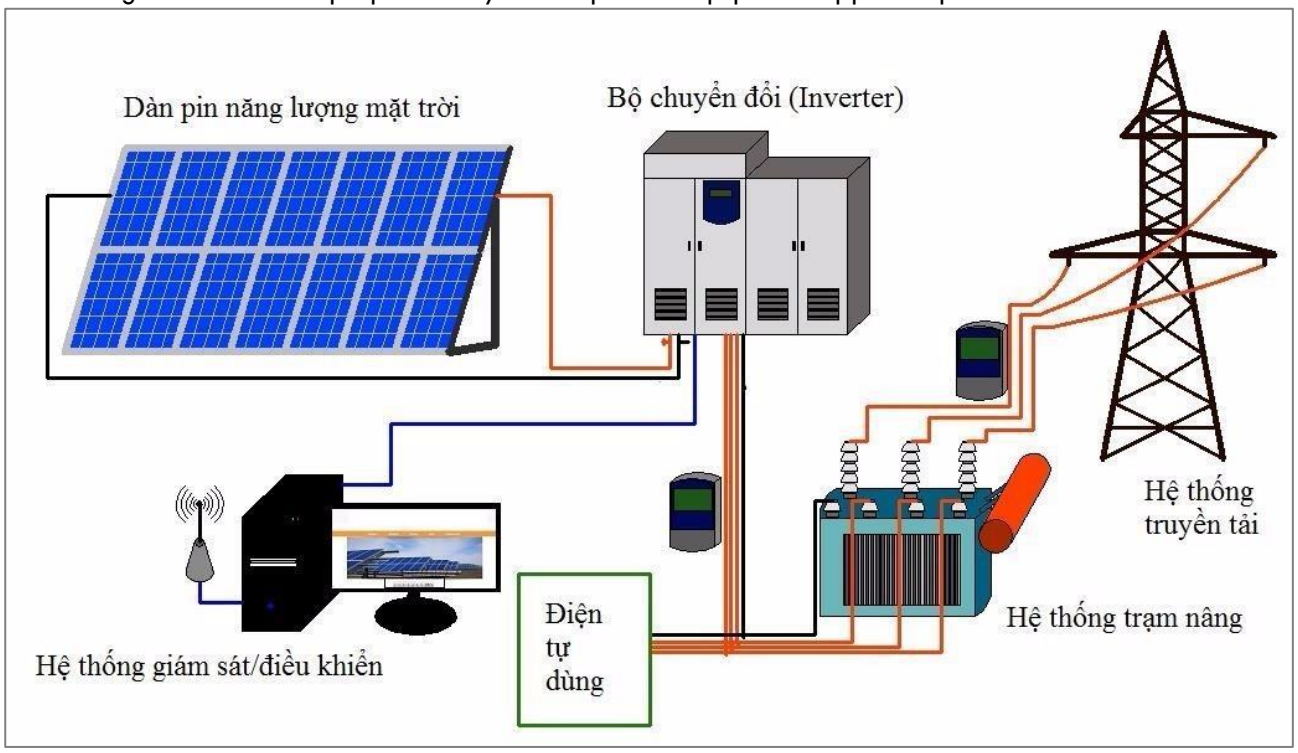
General Information			
Plant Name	18E	18N	18S
Total Capacity	30MW	250 MW	50MW
Number of Inverter Stations	8	58	12
Number of Inverters	16	116	24
Total Number of Modules	90,990	754,320	153,900
Power generation capacity (per year)	49,007 MWh	414,450 MWh	80,156 MWh

[4] https://www.sciencedirect.com/topics/materials-science/photovoltaics

[5] Suppliers' specifications / data sheet

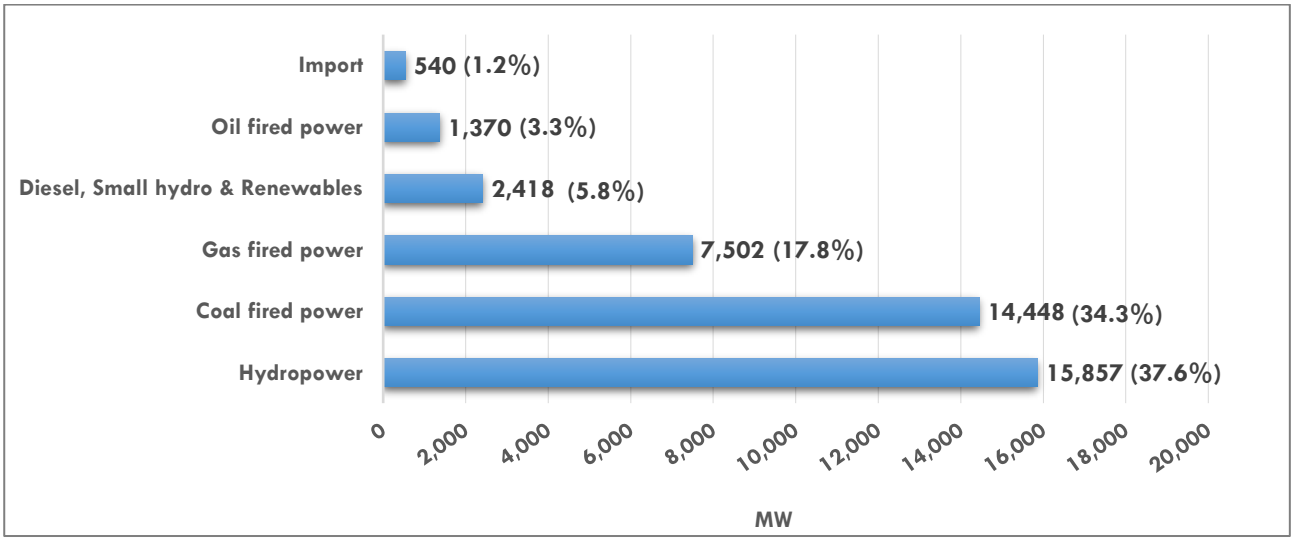
Plant Load Factor (PLF) or Capacity Utilization Factor (CUF)[6]	49,007 ÷ (30 × 8760) = 18.65%	414,450 ÷ (250 × 8760) = 18.92%	153,900 ÷ (30 × 8760) = 18.30%

The average lifetime of the project is 25 years as per the equipment supplier's specifications.



Picture 2 - Schematic diagram of a typical solar grid plant

In the absence of the project activity, the equivalent amount of electricity supplied to grid would have been generated by grid connected power plants, hence the baseline scenario of the project activity is the grid-based electricity system. The project activity does not pose any adverse effect on the environment and contribute positively in reducing GHG emissions by displacing energy generation from fossil fuel powered plants. The fuel mix in Vietnam national grid as follows:



Picture 3: Vietnam Electricity Grid – Power Generation Sources[7]

[6] https://www.sciencedirect.com/science/article/pii/S2352484715000311

[7] Vietnam Electricity – Annual Report 2017 (https://en.evn.com.vn/c3/gioi-thieu-l/Annual-Report-6-13.aspx)

Other than the hydro power, the fossil fuels contribute more than 55% of Vietnam total capacity of 42,135 MW. Also, Vietnam is still importing 1.2% of electricity from neighbouring countries.

The project activity is expected to generate 543,613 MWh of electricity per annum and thereby achieve emission reductions by avoiding GHG emissions from the business-as-usual scenario electricity generation within the Vietnam national grid. The emission reduction and the crediting period will start with the first day of the documented electricity supply to the national grid. Applying the approved methodology to the project, the annual average emission reduction will be 461,636 tCO_2 and the total emission reduction over the 5-year crediting period is expected to reach 2.35 million tCO_2.

The proposed project contributes to the sustainable development in accordance with Principle-1 of GS4GG as follows:
SDG#7: The solar power plants are clean energy projects and produce 543,613 MWh energy per annum.
SDG#8: The project has a positive effect on economic benefits. 82 local people is employed to date, and more people will be recruited during the operation phase.
SDG#13: The project activity reduces CO_2 emissions as estimated 461,636 tCO_2 per annum.

A.6. Scale of the project

Large Scale
The total installed capacity of "BIM Solar Farm" is 330 MW[8] which is greater than 15 MW (Section 1.2.4 of "GS4GG Renewable Energy Activity Requirements") and thereby the proposed project activity is considered as large scale.

A.7. Funding sources of project

The project has received the following funding sources:

Funding Sources	Share
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. The project activity does not have any public funding or Official Development Assistance (ODA) funding.

A.8. Assessment that project complies with 'gender sensitive' requirements

As per GS4GG's "Gender Equality Requirements & Guidelines"[9]:

Questions & Response/Explanations
Q1. Does the project reflect the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy? Explain how.
As per Gold Standard Gender Policy[10], clause 4.2 states that "Foundational gender-sensitive requirement - This strengthens Gold Standard's 'do no harm' approach and addresses safeguards to prevent or mitigate adverse impacts on women or men and girls and boys. Such action is mandatory for all projects seeking Gold Standard certification and includes compliance with the gender 'do no harm' safeguards, gender gap analysis and gender sensitive stakeholder consultations." The proposed project is a renewable energy grid connected power project and therefore it's not gender sensitive. The project does not adversely impact women or men.

[8] Annex B of Power Purchase Agreement (PPA) signed for individual power plant.

[9] https://globalgoals.goldstandard.org/100-gs4gg-gender-equality-requirements-guidelines/

[10] https://globalgoals.goldstandard.org/101-1-g-gold-standard-gender-policy/

Q2. Does the project align with existing country policies, strategies and best practices? Explain how.

BIM Solar Farm project does not involve in any form of based on gender, race, religion, sexual orientation or any other basis as per the country policies, strategies and best practices. Vietnam was ratified[11] relevant ILO core conventions on equality, namely Equal Remuneration Convention (Convention No 100) and Discrimination (Employment and Occupation) Convention (Convention No 111) in 1997 to prevent any form of discrimination.

Q3. Does the project address the questions raised in the Gold Standard Safeguarding Principles & Requirements document? Explain how.

The Project shall complete the following gender assessment questions[12] below:

- ***Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?***
  No, the Project does not reduce women´s access to or control of resources, entitlements and benefits. The project will benefit to local community regardless of gender.
- ***Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?***
  No, the Project does not create any adverse effect on the local community.
- ***Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, childcare duties, low literacy or educational levels, or societal discrimination)?***
  No, the Project does not consider the gender roles while engaging them and thereby provide equal rights to men and women. Local community meetings are scheduled considering participation by both Men and Women.
- ***Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?***
  The project does not discriminate the local community on basis of gender or caste or religion and therefore equally serve to all.
- ***Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?***
  No, the Project design neither increase women´s workload nor prevent them from engaging in other activities.
- ***Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?***
  There is no room for discrimination against women in this Project.
- ***Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?***
  The Project will not limit women´s ability regarding natural resources. The project is solely utilizing solar power and therefore does not impact natural resources of the region.
- ***Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?***
  No, the Project will not expose women and girls to further risks or hazards.

Q4. Does the project apply the Gold Standard Stakeholder Consultation & Engagement Procedure, Requirements & Guidelines? Explain how

Since the EPC signed date is considered as staring date of the project activity, the project is seeking for retroactive GS certification. However, the Stakeholder Consultation & Engagement Procedure Requirements has been done as follows:

Environmental Impact Assessment (EIA) meetings have been conducted in Aug 2018 with the participation of local villages, government officials and general stakeholders at Thuan Nam district of Ninh thuan province.

[11] https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO:11200:P11200_COUNTRY_ID:103004

[12] https://globalgoals.goldstandard.org/100-gs4gg-safeguarding-principles-requirements/

BIM group has organized community consultation which is a requirement of EIA Regulation[13]. As per the regulation the consultation process carried out as follows:

1. The consultancy unit shall coordinate with the project owner in elaborating the EIA report and the accompanying mitigation measures.
2. Contact the local authorities where the project is going to plan a community consultation.
3. Prior notification to the units consulted on: Time, place, composition, contents of consultation ...
4. Send the preliminary EIA report together with the written request for comments to representatives of the People's Committee of Phuoc Minh commune on the process of construction and environmental protection measures attached.
5. Organizing consultations according to contents and composition already notified
6. Receive comments from People's Committees of communes.
7. Explain the contents of questions, need clarification of the local where the project implementation.

The project owner coordinated with the Phuoc Minh & Phuoc Ninh Commune People's Committee to organize community-based consultations directly affected by the project.

Participants include representatives of the parties include:

- Commune People's Committee;
- Fatherland Front Committee;
- Departments of mass organizations;
- Households affected by the project;
- Project owner: BIM Renewable Energy JSC;
- Consultancy unit making EIA report.

Contents of the meeting:

- The chairman of the meeting informed the reason for the meeting and introduced the participants
- The project owner briefly presents the report on the environmental impact assessment of the project, including the contents of the project, the positive and negative impacts of the project on the environment and public health as well as the mitigation measures.
- Members attending the meeting provided comments on the process of project implementation, project activities and accompanying environmental protection measures.

Basically, all participants agree with the content of the project. However, in the implementation process, the commitments and mitigation measures mentioned in the EIA report must be complied with. Participants were contributed their ideas and signed the minutes. The project owner has received the official letter of Phuoc Minh & Phuoc Ninh Commune People's Committee about the consultation in the process of EIA. Commune People's Committee basically agrees with the objectives, content, plan and implementation process of the project.

In addition, local stakeholder consultation meetings have been held at site office in accordance with Gold Standard Stakeholder Consultation & Engagement Procedure Requirements. The meetings were organized four times with different set of stakeholders as follows:

Meeting #	Date (Time)	Type of Stakeholders	Category Code
1	13.03.2019 (0930)	Local community people	A
2	13.03.2019 (1430)	Women only	A
3	14.03.2019 (0930)	Local authorities & Government officials	B &C
4	14.05.2019 (0930)	NGOs and GS	D, E & F

A total of 27 participants (16 women & 11 men) were attended the meeting. All the meetings were held at Meeting room 01, floor 1, BIM Salt JSC, Highway 1A, Quan The Hamlet, Phuoc Minh Commune, Thuan Nam District, Ninh Thuan Province, Vietnam. To increase the attendees for the meeting, a loudspeaker announcement was made in all three villages by the village management board.

[13] https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Nghi-dinh-18-2015-ND-CP-bao-ve-danh-gia-moi-truong-chien-luoc-danh-gia-tac-dong-moi-truong-266409.aspx

The meeting has started with introduction of the project proponents who are BIM Group and AC Energy. Subsequently, we have requested to the stakeholders to introduce themselves individually as well as sign the attendance register. The entire presentation was carried out in local language (Vietnamese) by the BIM Group's representative Mr Nguyen Phuong Trung (Project Coordinator).

He has explained the purpose of the meeting, the gold standard process and certification, current electricity profile of Vietnam and following by the brief explanation about the three solar plants. Mr Trung has opened the floor to obtain the questions and feedbacks from stakeholders about the projects.

After clarified all the questions (Section C3 of SCR report), the GS continuous input mechanism was explained and discussed that whenever they have a complaint or a request, they can be able to fill in the grievance book which can be located at the site office. Mr Trung has also explained that would be regularly checked by the project manager. All local stakeholders agreed on this mechanism and the book was placed at site office.

Following the grievance mechanism, Mr Trung has explained about the sustainable development goals and the impacts created by the project on them. Following that, Blind Sustainability Development Assessment were conducted as well as discussed on the sustainability monitoring plan with stakeholders.

Finally, the meeting feedback forms were circulated and closed the meeting in brief. End of the meeting, the contact details of the project owner and the Gold Standard Office were shared with the participants. Local stakeholders were encouraged to give feedback about the project. Since the project's application for GS registration is retroactive, a Stakeholder Feedback round would also be carried out.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

The selected approved methodology as follows:

Scope No : 1
Sectoral Scope : Energy industries (renewable - / non-renewable sources)
Title : ACM0002: Grid-connected electricity generation from renewable sources[14]
Version : 19
Validity : 31 August 2018 onwards

Tools referenced in this methodology:

- Tool for the demonstration and assessment of additionality (Version 7.0)
- Combined tool to identify the baseline scenario and demonstrate additionality (Version 7.0)
- Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (Version 3.0)
- Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 3.0)
- Tool to calculate the emission factor for an electricity system (Version 7.0)
- Tool to determine the remaining lifetime of equipment (Version 1.0)
- Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period (version 3.0.1)

B.2. Applicability of methodology

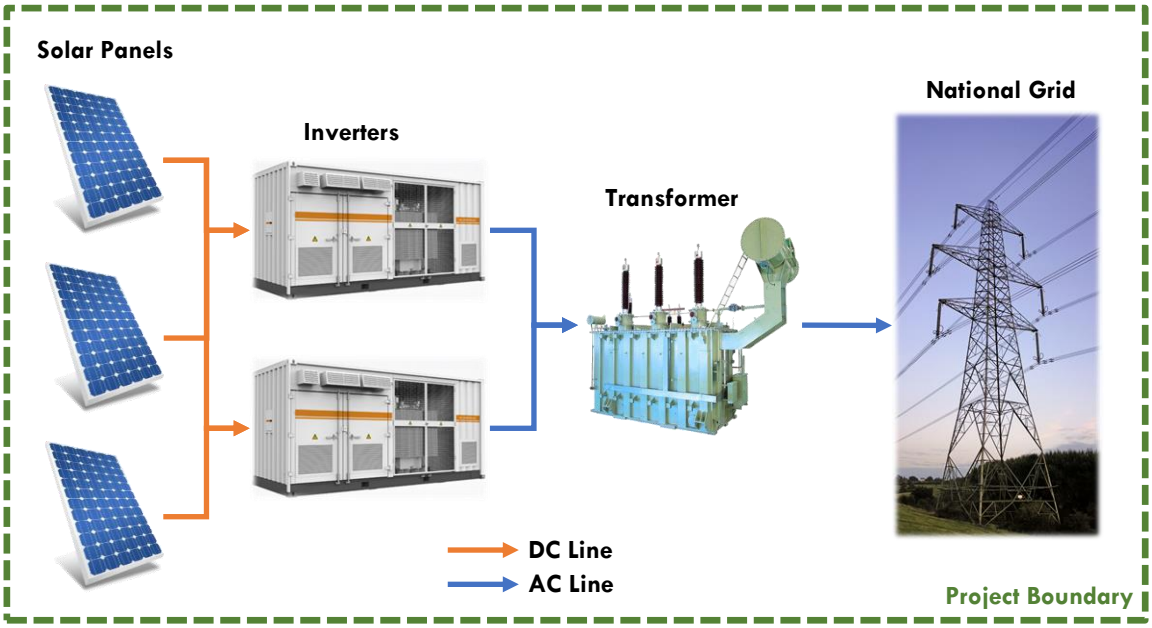
Applicability Criteria	Applicable? (Yes/ No/ N.A)	Project Justification
3. This methodology is applicable to grid-connected renewable energy power generation project activities that:	Yes	The proposed project is a grid-connected

[14] https://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD

Applicability Criteria	Applicable? (Yes/ No/ N.A)	Project Justification
(a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).		greenfield renewable energy (Solar) power generation plant.
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;	Yes	The entire proposed project activity is solar power plant.
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.	N.A	The proposed project is a greenfield project and thereby no capacity additions, retrofits, rehabilitations or replacements the existing plant/unit.
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/m^2; 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/m^2; 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/m^2, all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m^2; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/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.	N.A	It's not applicable as the proposed project is a solar power project
In the case of integrated hydro power projects, project proponent shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that	N.A	It's not applicable as the proposed project is a solar power project

Applicability Criteria	Applicable? (Yes/ No/ N.A)	Project Justification
collectively constitute to the generation capacity of the integrated hydro power project; or (b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.		
The methodology is not applicable to: (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; (b) Biomass fired power plants/units.	Yes	The proposed project is neither fuel switch nor biomass plant as it is a solar power plant.
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".	N.A	The proposed project is a greenfield project and thereby no capacity additions, retrofits, rehabilitations or replacements the existing plant/unit.

B.3. Project boundary



Picture 4: Project Boundary

For the purpose of GHG mitigation/sequestration following table shall be completed (delete if not required)

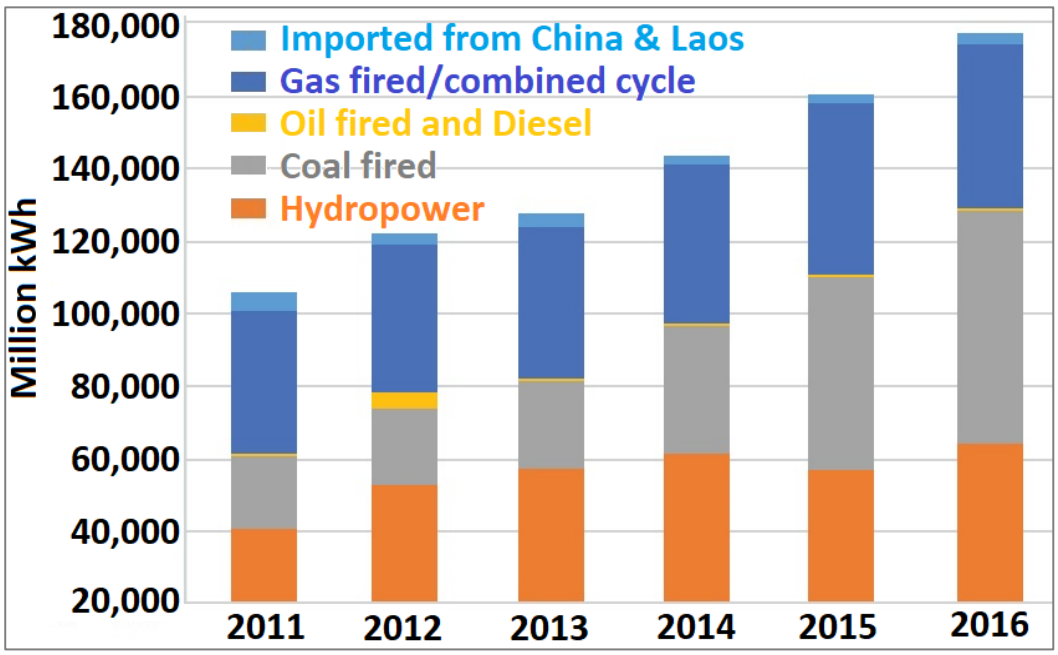
Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Electricity generation by fossil fuel-based power plants connected to the grid	CO_2	Yes	Main emission source. The dominant emissions from fossil fuel-based power plants which are currently connected to the grid will be considered in baseline calculations.
		CH_4	No	Minor emission sources
		N_2O	No	Minor emission sources
Project scenario	Proposed project activity	CO_2	No	Minor emission sources
		CH_4	No	Minor emission sources
		N_2O	No	Minor emission sources

B.4. Establishment and description of baseline scenario

The selected methodology (ACM0002) states that "If the project activity is the installation of a Greenfield power plant, 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 "TOOL07: Tool to calculate the emission factor for an electricity system".

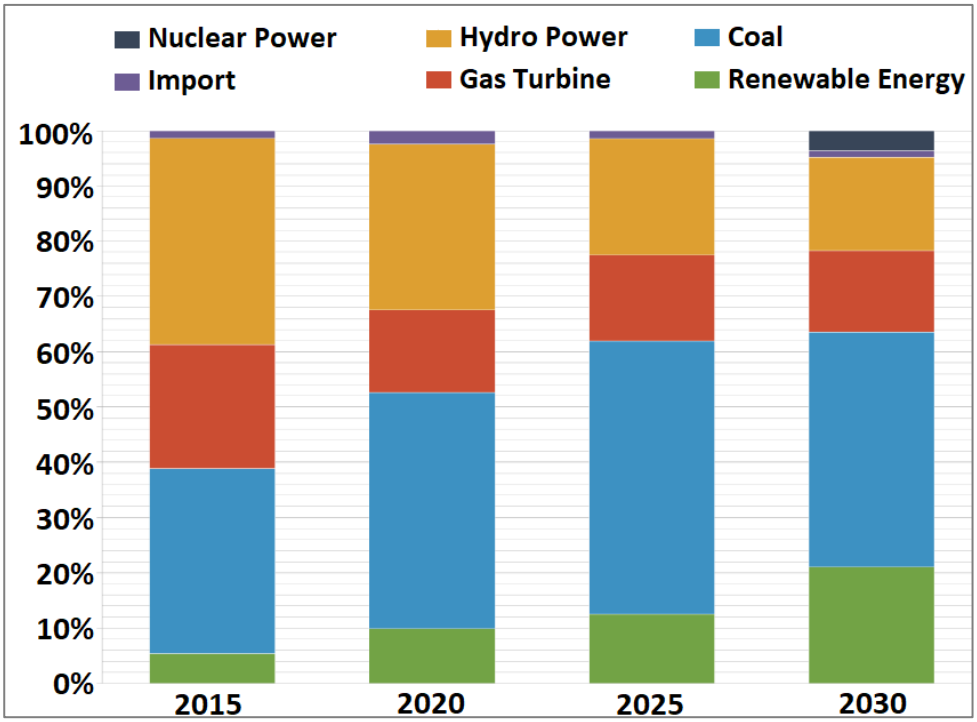
The Project activity is generation of electricity from renewable energy sources. The electricity generated from the solar PV plant has zero emissions and the electricity generated will be fed into the national grid through the interconnection facility at the site.

The Vietnam national grid is partially contributed by GHG intensive fossil fuel-based power stations. The state-owned company Vietnam Electricity Corporation (EVN) dominates power production, transmission, and sales in Vietnam. Vietnam has a large range of domestic primary energy sources such as crude oil, coal, natural gas and hydro power which have played an important role in ensuring energy security for economic development in the past two decades. The total installed electricity generation capacity in Vietnam has reached 42,135 MWp as of Dec 2016.The share of resources in the Vietnam electricity generation has shown in Picture 3. The contribution to annual electricity generation by 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%, import 1.2%.



Picture 5a: Historical Share of Energy Resources in Vietnam Power Generation Capacity

[Source: Vietnam Electricity (EVN) – Annual report 2017]



Picture 5b: Projected Share of Energy Resources in Vietnam Power Generation Capacity [Source: revised Power Development Plan VII]

As per the historical data shown in Picture 5a above, coal-based power generation capacity has been rapidly increased in each year since 2011 while comparing with hydro power generation capacity. Likewise, in accordance with the projection (2015 to 2030) shown in Picture 5b, it is clear that the coal-based power generation will remain the main sources for electricity generation in Vietnam.

B.5. Demonstration of additionality

Prior Consideration:

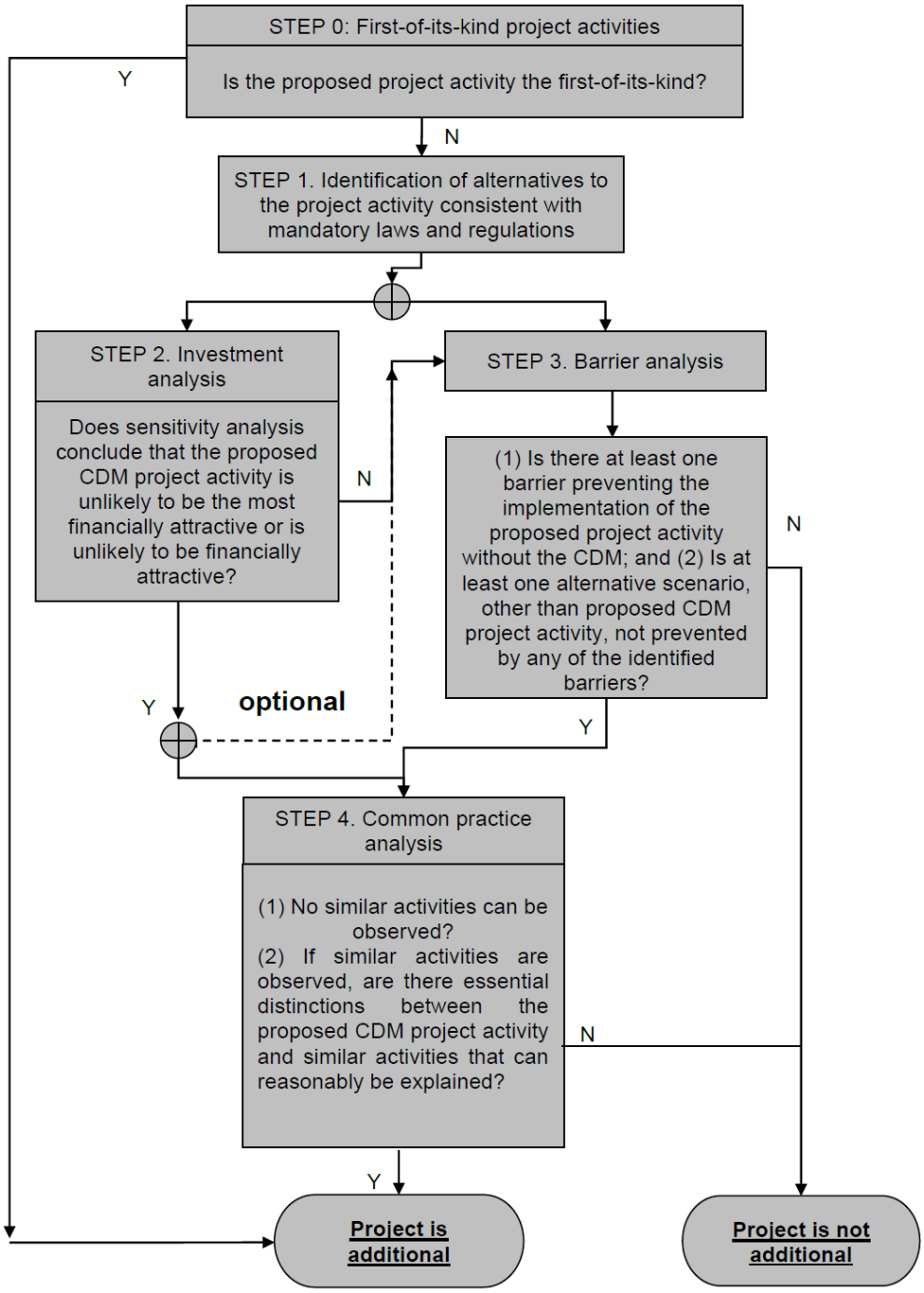
A brief introduction about "The Carbon Market" (refer Appendix 4) was presented during the board meeting conducted on 11th April 2018. This indicates that the project owner was aware about the gold standard and the associated additional revenue stream. Consideration of carbon revenue is also recorded as a part of the board meeting in which the decision to proceed ahead with the setting up of the project was taken.

Chronology of actions taken for securing carbon revenue:

In parallel with implementation of the proposed project, the project owner also initiated the process to secure the carbon revenue. Details of the major events/decisions that have been taken to secure the carbon revenue are as follows:

Events/Decisions	**Date**		
	18E	**18N**	**18S**
Prior consideration	11-04-2018		
Environmental Impact Assessment (EIA)	19-04-2018	17-08-2018	17-08-2018
Power Purchase Agreement (PPA)	20-06-2018	18-12-2018	18-12-2018
Engineering, Procurement & Construction (EPC) contract	08-08-2018	20-07-2018	08-08-2018
Operation & Maintenance (O&M) contract	08-08-2018	31-01-2019	08-08-2018
Appointment of consultant for Gold Standard Certification	12-02-2019		
Stakeholder Consultation Meetings	13-03-2019, 14-03-2019 & 14-05-2019		
Commercial Operation Date (COD)	22-04-2019	11-05-2019	07-05-2019
Appointment of GS-VVB	06-09-2019		
Expected to be certified under Gold Standard	2nd Quarter of 2020		

The demonstration of additionality for the proposed Project activity is being carried out in accordance with the additionality tool published by the UNFCCC i.e. "Tool for demonstration and assessment of Additionality" Version 07.0.0. The tool provides a step-wise approach to demonstrate additionality which is displayed below:



Step 0. First-of-its-kind Project Activities

Is project activity is the first-of-its-kind?

No. the proposed project is a solar power project located in Vietnam which is solar technology to generate power. Thus, this project activity is not a first-of-its-kind.

Step1. Identification of alternatives to the proposed project activity consistent with current laws and regulations

In accordance with the chosen methodology ACM0002 version 19.0, paragraph 22 states:

"*if the project activity is the installation of a Greenfield power plant, 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 plant and by the addition of new generation sources.*"

Since the baseline scenario is defined by the chosen methodology, no further analysis is required to carry out to identify the plausible alternatives. However, the identification of plausible alternatives has been considered in order to demonstrate the compliance towards the Tool 01:

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

In the absence of the proposed project activity, plausible and credible project activities to the proposed project activity are as below:

Alternative 1: The proposed project activity not undertaken as a VER project activity

Alternative 2: Construction of some other renewable or thermal plant with the same annual power output

Alternative 3: Continuation of the current situation (no project activity or other alternatives undertaken)

Alternative 1:

The alternative, "The proposed project activity not undertaken as a GS-VER project activity" is not realistic, since the equity IRR of the proposed project activity is below the benchmark IRR. (Please see Investment Analysis Section)

Alternative 2:

The Vietnam National Electricity Group (EVN) gives priority to local resources with low environmental impact to generate electricity and therefore other renewable resources may be considered as alternatives to the proposed project. Vietnam grid is mainly consisting of hydroelectric based renewable energy. The revised Power Development Plan (PDP) VII[15] prioritize the development of renewable energy sources for electricity production; increase the proportion of electricity generated from renewable energy sources up to around 7% in 2020 and above 10% in 2030. However, it does not promote hydro power such as large-scale, medium-scale and pumped storage hydro power. Therefore, hydropower is not a plausible alternative. Besides hydro power, solar and wind energy is also expected to help Vietnam catch up with the rapid growth in electricity demand in both short and long term. The Ministry of Industry and Trade[16] issued a circular which is regulating the development of wind power projects and Standardized Power Purchase Agreement for wind power projects. With the advantage of a long coastline and favourable terrain, the construction of wind power stations is a solution that can help improve Vietnam's electricity output in the coming years. Vietnam's goal is to develop 2,000 megawatts of wind power by 2025 and 6,000 megawatts by 2030. Therefore, construction of a wind power plant with the same annual electricity output is a realistic alternative.

In terms of thermal alternative, coal contributes major level in the national level power generation. In accordance with revised PDP VII, the total capacity of coal-fired power plants will be around 26,000 MW (42.7% of total capacity) by 2020[17]. Since 2011, a series of large coal thermal power plants (600 - 1,200 MW) across the country have been continuously put into operation. Along with the development of both the number of plants and the capacity scale, coal thermal power technology is also becoming more and more modern, allowing the operation of the units with high efficiency, safety and economy. Many coal thermal power plants have invested in coal-fired technology especially in modern environmental treatment technology with high efficiency such as: ESP system for electrostatic precipitator, SOx, NOx removal, etc., meeting the requirements of Vietnamese environmental standards. Hence, development of a coal fired power plant with same output is realistic alternative.

Alternative 3:

Ensuring national energy security in the coming period is the biggest challenge. Currently, the Ministry of Industry and Trade and EVN[18] are focusing on researching and implementing synchronously many solutions such as:

---

[15] http://gizenergy.org.vn/media/app/media/legal%20documents/GIZ_PDP%207%20rev_Mar%202016_Highlights_IS.pdf

[16] https://translate.google.com/translate?hl=en&sl=vi&u=http://evnhanoi.vn/tin-tuc-evnhanoi/tiet-kiem-dien/5233-tiem-nang-phat-trien-dien-gio&prev=search

[17] https://translate.google.com/translate?hl=en&sl=vi&u=https://www.evn.com.vn/d6/news/Tong-quan-ve-phat-trien-nhiet-dien-than-o-Viet-Nam-6-12-24125.aspx&prev=search

[18] https://translate.google.com/translate?hl=en&sl=vi&u=https://www.evn.com.vn/d6/news/Dam-bao-dien-giai-doan-2020-2030-Bo-Cong-Thuong-canh-bao-thieu-hut-nguon-cung-6-12-23979.aspx&prev=search

Speeding up the construction of power and grid works; increase buying electricity from China and Laos; fuel imports (coal, gas); rational operation of the system; strongly develop renewable energy (RE) projects, especially rooftop solar PV, especially in the southern region, contributing to reducing supply pressure. Hence, continue the current situation without project activity or alternative undertaken is not a plausible alternative.

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

The circular[19] of "Provisions on order and procedures for granting and withdrawing permits for electricity activities" is providing a detailed requirement to generate, transmission, distribution and wholesale/retail of electricity. Hence, obtaining license before operate power plants is mandatory and therefore all the alternatives discussed above are in line with applicable legal and regulatory requirements.

Step 2: Investment Analysis

The following steps are used to determine the proposed project activity is not financially attractive or feasible.

Sub-step 2a: Determine appropriate analysis method

As per "Tool for the demonstration and assessment of additionality" (version 07.0.0), paragraph 32 states:

"*If the CDM project activity and the alternatives identified in Step 1 generate no financial or economic benefits other than CDM related income, then apply the simple cost analysis (Option I). Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III).*"

Since the project owner couldn't obtain the financial data regarding the investment of at least one alternative available, Options I & II are not applicable for the proposed project activity. Hence, the most appropriate financial analysis would be Option III (benchmark analysis) where the returns on equity investment from the project activity is compared with nominal benchmark.

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

The benchmark analysis approach has been chosen to assess the additionality of the proposed project activity.

Identified Financial/Economic Indicator:

The expected return on equity (Equity IRR) was selected as the financial indicator to assess the financial additionality of the proposed project activity as per Methodological tool for Investment analysis (version 09.0).

Selection of Appropriate Benchmark:

The methodological tool for Investment Analysis, Version 09.0, paragraph 16 states:

"*In situations where an investment analysis is carried out in nominal terms and the available IRR benchmarks are in real terms, project participants shall convert the real term values of benchmarks to nominal values by adding the inflation rate. The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the project activity shall be used.*"

As stated above the nominal[20] benchmark is computed as follows:

Nominal Benchmark = {(1+Real Benchmark) × (1+Inflation Rate)} – 1

Whereas:

Real Benchmark	:	The default benchmark for Group 1 for Vietnam under Appendix of EB97, Annex 8 is 14%
Inflation rate	:	Average inflation rates of 2019, 2020, 2021, 2022 and 2023 obtained from International Monetary Fund (IMF) [21] and used 3.8%

[19] https://thuvienphapluat.vn/van-ban/thuong-mai/Thong-tu-36-2018-TT-BCT-quy-dinh-ve-trinh-tu-thu-tuc-cap-thu-hoi-giay-phep-hoat-dong-dien-luc-397244.aspx

[20] Slide 216 of Corporate Finance, Second Edition of Aswath Damodaran & https://en.wikipedia.org/wiki/Nominal_interest_rate

[21] https://www.imf.org/external/datamapper/PCPIPCH@WEO/WEOWORLD/VNM

Nominal Benchmark = {(1+14%) × (1+3.8%)} – 1

= {118.33%} – 1

Nominal Benchmark = 18.33%

Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III)

As per the Methodological Tool: Investment Analysis, Version 09.0, the general issued in calculation and presentation are discussed as follows:

General issues as per investment analysis tool	Justification
6. The period of assessment should not be limited to the proposed crediting period of the CDM project activity. Both project internal rate of return (IRR) and equity IRR calculations should reflect the period of expected operation of the underlying project activity (technical lifetime) and if a shorter period than the technical lifetime is chosen, the investment analysis shall be conducted for at least 10 years and include the fair value of the project activity assets at the end of the assessment period. The IRR calculation may include the cost of major maintenance and/or rehabilitation if these are expected to be incurred during the period of assessment.	The project activity has chosen 25 years (project lifetime) for the IRR calculation. Fair value is considered as zero in accordance with the following explanation: As per Annex 2 of "GUIDING REGULATION ON MANAGEMENT, USE AND DEPRECIATION OF FIXED ASSETS" issued by Ministry of Finance, Straight-line depreciation method defines: $\text{Annual average rate of depreciation for the fixed assets} = \frac{\text{Primary price of fixed assets}}{\text{Time of depreciation}}$ Where, the default value for maximum time of depreciation for power generation assets is 20 years which is mentioned under Annex 1 in the same guideline. Since BIM Solar Farm has been chosen 25 years for computation, no fair value is considered.
7. The fair value of any project activity assets at the end of the assessment period shall be included as a cash inflow in the final year. The fair value should be calculated in accordance with local accounting regulations where available, or international best practice. It is expected that such fair value calculations will include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets.	Since the IRR calculation has been used the entire project life time of 25 years, no fair value has been considered.
8. The discount rate used in the investment comparison analysis shall be determined following the requirements as set out in this tool for the calculation of IRR benchmarks in section 6 below.	No discount is considered in the IRR computation.
9. The weighted average costs of capital (WACC) and the cost of equity provided in the Appendix or calculated using Capital Asset Pricing Model (CAPM) are post-tax IRR benchmarks, and investment analysis shall be conducted with post-tax cash flows. Depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, shall be added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV). The cash flow effects of taxation should be included in the IRR/NPV calculation.	The investment analysis has been conducted with the post-tax cash flows. There are no depreciation and other non-cash items are not considered in the calculation.
10. Input values used in all investment analysis shall be valid and applicable at the time of the	The input values used in all investment analysis has been valid and applicable at the time of the

investment decision taken by the project participant. The DOE is therefore expected to validate the timing of the investment decision and the consistency and appropriateness of the input values with this timing. The DOE should also validate that the listed input values have been consistently applied in all calculations.	investment decision taken by the project participant. The date of EPC signed on 20th Jul 2018 is considered as the investment decision date Therefore, the default benchmark for IRR has been used from Methodological Tool: Investment Analysis, Version 08.0.
11. In the case of project activities for which implementation ceases after the commencement and where implementation is recommenced due to consideration of the CDM the investment analysis should reflect the economic decision-making context at point of the decision to recommence the project. Therefore, capital costs incurred prior to the revised project activity start date can be reflected as the recoverable value of the assets, which are limited to the potential reuse/resale of tangible assets	This is not applicable as the project activity has been successfully implemented as well as subsequently under operation as planned since the financial decision made.
12. Project participants shall supply spreadsheet versions of all investment analysis. All formulas used in this analysis shall be readable and all relevant cells shall be viewable and unprotected. The spreadsheet will be made available to the Board, UNFCCC secretariat and others contracted to assess the request for registration on behalf of the Board including assigned members of the Registration and Issuance Team. In cases where the project participant does not wish to make such a spreadsheet available to the public an exact read-only or PDF copy shall be provided for general publication. In case the project participant wishes to black-out certain elements of the publicly available version, a clear justification for this shall be provided to the secretariat by the DOE when requesting registration.	The spreadsheet is available during the validation of the proposed project activity.

The values used in investment analysis were valid and applicable at the time of the investment decision taken by the management. The key values used to calculate the return on equity as follows:

Exchange Rate: 1USD = 22,635 VND (Source: State Bank of Vietnam[22])

Details of the Project	Value		Reference
	BIME (18E)	BIMRE (18N&S)	
Project location	Vietnam		Power Purchase Agreement (PPA)
Total capacity (MW)	30	300	Appendix B of PPA
Date of commissioning	22-Apr-19	5-May-19 (18N) 7-May-19 (18S)	Operational License
Plant Life time	25		Appendix B of PPA

22 https://www.sbv.gov.vn/TyGia/faces/Aiber.jspx?_afrLoop=33777021381882577&_afrWindowMode=0&_adf.ctrl-state=49df93rbs_106

Electricity Generation			
Annual generation (mil kWh)	49	495	Estimated by PVSyst software
Annual degradation per year (%)	0.5%		https://www.nrel.gov/state-local-tribal/blog/posts/stat-faqs-part2-lifetime-of-pv-panels.html
Electricity Tariff (USD/kWh)	0.0935	0.0935	PPA
O&M Cost			
O&M Cost (mil USD)	0.14	1.52	O&M Contract
Security Guard – 142,560,000 VND/month (mil USD)	-	0.08	Security Contract (signed in VND and convert with exchange rate)
Project Costing			
Total Project cost (mil USD)	29.57	302.14	Calculated value
Equity Share (%)	30%	30%	Calculated value
Debt Share (%)	70%	70%	Project Loan Facility Agreement (Page 2)
Equity Amount (mil USD)	8.87	90.64	Calculated value
Debt (Bank Loan)			
Debt Amount (mil USD)	20.70	211.50	Project Loan Facility Agreement (Page 2)
Base Interest Rate (Rate-10) (%)	3.1%	3.1%	Project Loan Facility Agreement (Page 6 in BME and Page 15 in BIMRE)
LIBO Rate (as per date of loan agreement) (%)	2.77%	2.82%	https://www.macrotrends.net/2515/1-year-libor-rate-historical-chart
Fixed Interest Rate (Base Rate + 2.9%) (%)	6.00%	6.00%	Calculated as per Page 6 in BME and Page 15 in BIMRE of Project Loan Facility Agreement
Floating Interest Rate (LIBO + 2.9%) (%)	5.67%	5.72%	Calculated as per Page 6 in BME and Page 15 in BIMRE of Project Loan Facility Agreement
Income Tax			
CIT (%)	20%		https://moj.gov.vn

Outcome of Investment Analysis:
By considering all the above values, the equity IRR for BIM Solar Farm as follows:

Nominal Benchmark (Investment Analysis Tool)	Equity IRR without carbon revenue
18.33%	BIME – 14.15% BIMRE – 14.93%

The equity IRR is estimated based on the project activity's lifetime of 25 years, cash outflows and cash inflows into the project activity. From the above table, the estimated equity IRR is below than the nominal Benchmark and thereby justifying that the investments are not financially attractive. Therefore, the project activity is an additional and not a Business-As-Usual (BAU).

Sub-step 2d: Sensitivity Analysis

As per the Methodological Tool: Investment Analysis, Version 09.0, paragraph 27 states:

"Variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation (all parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude), and the results of this variation should be presented in the PDD and be reproducible in the associated spreadsheets."

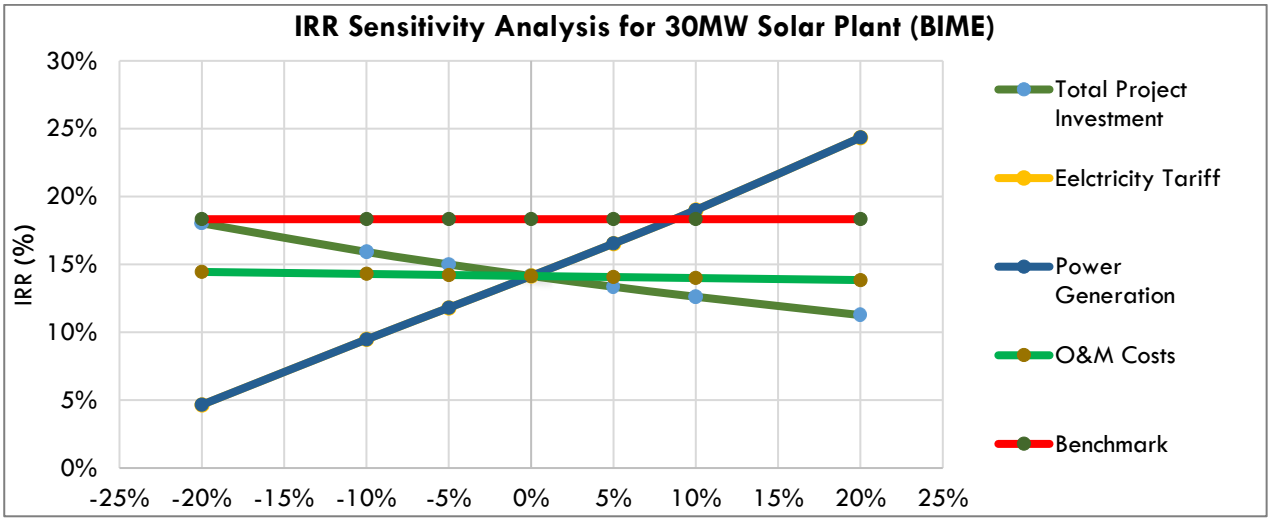
The project investment is already fixed, and the electricity tariff has been already committed with national grid for 20 years. Therefore, both values are not subjected to variation. Hence, only power generation and O&M expenses are subjected to reasonable variation. However, following factors have been considered in to sensitivity analysis:

- Total project investment
- Electricity tariff
- Power generation
- Operation & Maintenance (O&M) costs

The results of sensitivity analysis are as follows:

BIME (18E) – 30MW

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%



Variations	Calculated IRR	Benchmark IRR	Required variation to exceed benchmark
Total Project Investment	14.15%	18.33%	-22%
Electricity Tariff			9%
Power Generation			9%
O&M Costs			Not reasonable (<-100%)

Total Project Investment

The equity investment by project owner was 8.87 million USD which is 30% of the total project investment cost. To assess the additionality of this project, if equity decreased by 22%, then equity IRR would exceed the benchmark. Further, sensitivity analysis of +20% to -20% have been conducted and in both the cases equity IRRs are less than the benchmark. Considering the actual equity investment, the estimated equity IRR is 14.15% which is almost 23% less than the nominal benchmark. As per the contracts/agreements in place, relevant purchase orders are already made, thus the equity investment is impossible to vary in the future.

Electricity Tariff

To evaluate the additionality of the project, electricity tariff is sourced from the Power Purchase Agreement (PPA) signed between the BIM Energy JSC and EVN (Vietnam Electricity). Since the tariff rate (0.0935 USD per unit) is fixed for a period of 20 years, revenue generation is also fixed for almost entire lifetime of the project. The sensitivity analysis of +20% to -20% have been conducted and the calculated IRR is exceeding the benchmark when the electricity tariff increased up to 9% which is impossible as the PPA has already been signed for almost entire life time of the project.

Power Generation

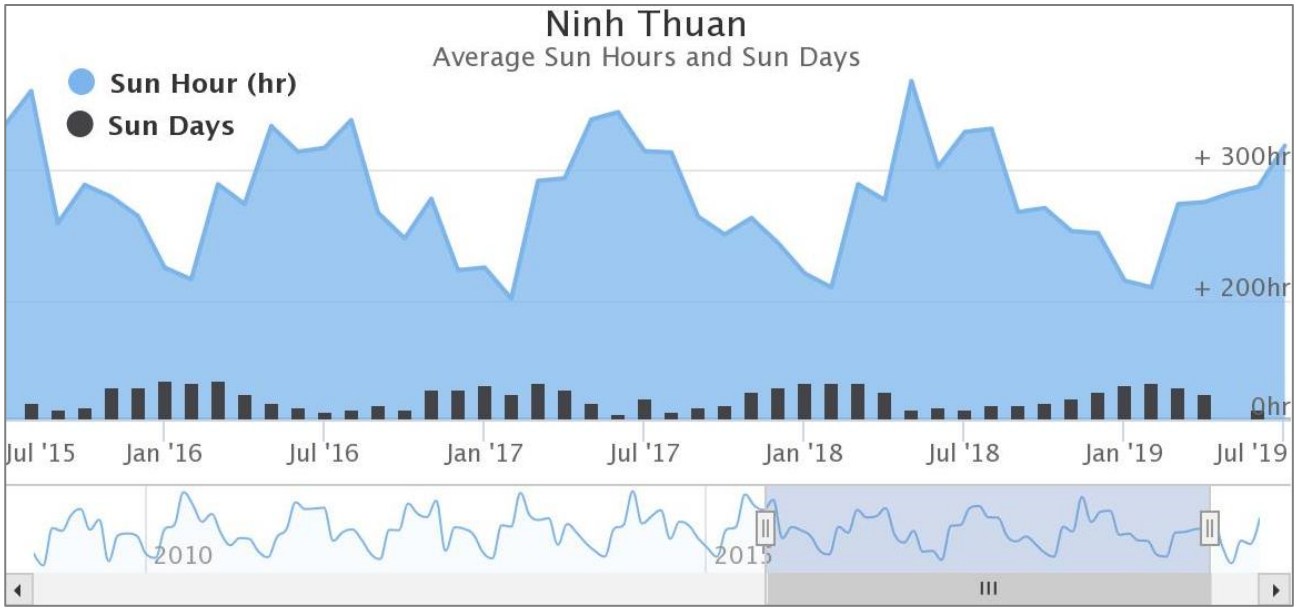
The power generation affects the equity IRR of the proposed project activity. Increase in power generation would lead to increase in electricity supply to grid as well as revenue. Further, sensitivity analysis of +20% to

-20% have been conducted and the calculated IRR is exceeding the benchmark, if the power generation increase 9%.

The actual power generation in latest three months as follows:

Months	Generation (kWh)[23]	Monthly Average (kWh)	Yearly Consumption (MWh)	Estimated Generation (MWh)	Variation
Jun-19	3,428,523	3,072,190	36,866	49,007	24% lower than estimated
Jul-19	2,654,450				
Aug-19	3,133,596				

Past three years of average sun hours[24] for Ninh Thuan province as follows:



As per the past three years weather data, it concludes that the maximum sun hour period is from June to August during the year and thereby the power generation too. However, the monthly average of actual power generation is 24% lower than the estimated power generation. Hence, the actual power generation will not exceed the estimated power generation in the following years.

Operation & Maintenance Costs

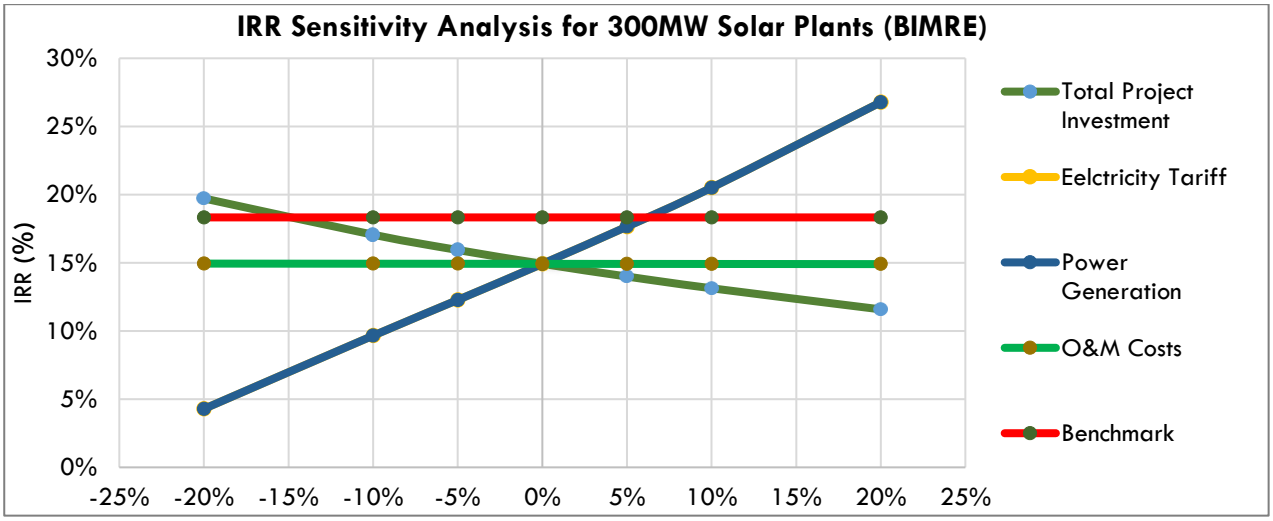
As per the current O&M Costs, the sensitivity analysis of +20% to -20% have been conducted and in both the cases equity IRR is less than the benchmark. Also, the analysis shows that the equity IRR would exceed the benchmark, if the O&M costs decrease more than 100% which is not reasonable. Hence, the O&M costs associated with the project has no impact on the financial returns of the equity.

BIMRE (18N & 18S) – 250MW & 50MW

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%

[23] Monthly invoices to EVN

[24] https://www.worldweatheronline.com/ninh-thuan-weather-averages/vn.aspx



Variations	Calculated IRR	Benchmark IRR	Required variation to exceed benchmark
Total Project Investment	14.93%	18.33%	-16%
Electricity Tariff			7%
Power Generation			7%
O&M Costs			Not reasonable (<-100%)

Total Project Investment

The equity investment by project owner was 90.64 million USD which is 30% of the total project investment cost. To assess the additionality of this project, if equity decreased by 16%, then equity IRR would exceed the benchmark. Further, sensitivity analysis of +20% to -20% have been conducted and the IRR exceeding the benchmark while the equity investment is reduced 20%. Considering the actual equity investment, the estimated equity IRR is 14.93% which is almost 19% less than the nominal benchmark. As per the contracts/agreements in place, relevant purchase orders are already made, thus the equity investment is impossible to vary in the future.

Electricity Tariff

To evaluate the additionality of the project, electricity tariff is sourced from the Power Purchase Agreement (PPA) signed between the BIM Energy JSC and EVN (Vietnam Electricity). Since the tariff rate (0.0935 USD per unit) is fixed for a period of 20 years, revenue generation is also fixed for almost entire lifetime of the project. The sensitivity analysis of +20% to -20% have been conducted and the calculated IRR is exceeding the benchmark when the electricity tariff increased up to 7% which is impossible as the PPA has already been signed for almost entire life time of the project.

Power Generation

The power generation affects the equity IRR of the proposed project activity. Increase in power generation would lead to increase in electricity supply to grid as well as revenue. Further, sensitivity analysis of +20% to -20% have been conducted and the calculated IRR is exceeding the benchmark, if the power generation increase 7%.

The actual power generation in latest three months as follows:

Months	Generation (kWh) [25]	Monthly Average (kWh)	Yearly Consumption (MWh)	Estimated Generation (MWh)	Variation
Jun-19	33,051,881	39,441,805	473,302	494,606	4% lower than estimated
Jul-19	43,451,946				
Aug-19	41,821,587				

[25] Monthly invoices to EVN

As defined under BIME sensitivity analysis, the peak period of sun hours as well as power generation is from June to August in all years. However, it seems that the actual power generation is 4% lower than the estimated power generation. Hence, the actual power generation will not exceed the estimated power generation in the following years.

Operation & Maintenance Costs

As per the current O&M Costs, the sensitivity analysis of +20% to -20% have been conducted and in both the cases equity IRR is less than the benchmark. Also, the analysis shows that the equity IRR would exceed the benchmark, if the O&M costs decrease more than 100% which is not reasonable. Hence, the O&M costs associated with the project has no impact on the financial returns of the equity.

It can be observed from above justifications that in various scenarios wherein there are changes in project investment, electricity tariff, power generation and O&M cost, the Equity IRR does not cross the benchmark. Thus, it can be concluded that revenue from sale of VERs is important to alleviate this gap and hence the project is unlikely to be financially attractive.

Step 3: Barrier Analysis

Barrier analysis is not considered.

Step 4: Common practice analysis

Common practice analysis has been carried out as per Methodological tool: Common Practice, version 03.1 EB 84, Annex 7. As per the methodological tool, the following definitions are explained in order to evaluate the project as per the stepwise approach for common practice:

Paragraph 9. Applicable geographical area:

Vietnam (host country) has been considered as the applicable geographical area for this project.

Paragraph 10. Measure:

The project activity reduces GHG emission by generating renewable electricity and thereby falls under the following measure:

(b) Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies (example: energy efficiency improvements, power generation based on renewable energy);

Paragraph 11. Output:

The output of the project activity is electricity.

Paragraph 12. Different technologies:

The project activity uses solar energy as power generation source and therefore falls under:

(a) Energy source/fuel (example: energy generation by different energy sources such as wind and hydro and different types of fuels such as biomass and natural gas);

Stepwise approach for common practice

Definitions as per methodological tool	Justification
Step 1: calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.	+50% of project's installed capacity: 495 MW Installed capacity of the project activity: 330 MW -50% of project's installed capacity: 165 MW
Step 2: identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions: (a) The projects are located in the applicable geographical area;	Identification of similar projects (CDM & Non-CDM) is carried out as follows: (a) The applicable geographical area is Vietnam (host country) and thereby all projects located in Vietnam are considered

(b) The projects apply the same measure as the proposed project activity; (c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity; (d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant; (e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1; (f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.	(b) The proposed project activity uses renewable energy to generate power. Therefore, all renewable energy projects located in Vietnam are considered. (c) The energy source used by the project activity is Solar. Hence, only solar energy projects have been considered. (d) The project activity produces electricity; therefore, all solar power plants are considered. (e) The capacity range of the projects is within the applicable capacity range from 165 to 495 MW (f) The project start date was 20th July 2018. Numbers of Similar projects (CDM and non-CDM) identified, which fulfil above-mentioned conditioned are: In accordance with press releases[26], there was no solar plants installed at the time investment decision made on 20th July 2018. Hence, there was no projects are identified under Step 2.
Step 3: within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all}.	No projects identified under Step 2 and therefore, $N_{all} = 0$
Step 4: within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number N_{diff}.	No projects identified under Step 3 and therefore, $N_{diff} = 0$
Step 5: calculate factor $F=1-N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/ technology) using a measure/ technology similar to the measure/ technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.	$F=1-N_{diff}/N_{all}$ $F = 1- 0/0 = 1 – infinity$ Hence, F is indefinite value
As per paragraph 18, The proposed project activity is a "common practice" within a sector in the applicable geographical area if the factor F is greater than 0.2 and $N_{all}-N_{diff}$ is greater than 3.	Since F is indefinite value, unable to justify the $F<0.2$ as well as $N_{all}-N_{diff}$ is zero which is not greater than 3. Hence, the project activity is not a "common practice" in the applicable geographical area.

The above explanation/justification clearly shows that the propose project activity is unlikely to be financially attractive as well as not a common practice in host country; hence the project activity is additional.

26 https://translate.google.com/translate?hl=en&sl=vi&u=http://kingteksolar.com.vn/tin-tuc/cap-nhat-tien-do-hon-10-du-an-nha-may-dien-nang-luong-mat-troi-tai-viet-nam.html&prev=search

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

SDG	Targets	Justifications
SDG 7: Affordable and Clean Energy	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	In Vietnam, the electricity generation is mostly composed by hydro and coal fired power plants. However, to meet the growing energy demand in the future, the nation largely depends on coal as a major resource for power generation as per the "revised Power Development Plan VII (PDP VII)". Also, the revised PDP VII states that Vietnam to prioritize the development of renewable energy sources for electricity production; increase the proportion of electricity generated from renewable energy sources (excluding large-scale, medium-scale and pumped storage hydro power) up to around 7% in 2020 and above 10% in 2030. In addition, the renewable power generation contributes less than 6% (excluding major hydro power plants) in the total power generation. The project activity is expected to generate 543,613 MWh of clean energy per annum which will increase the renewable energy share significantly in national level and thereby in global energy mix. Therefore 7.2 target has been chosen for SDG 7.
SDG 8: Decent Work and Economic Growth	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.	Mostly the local people have employment opportunities in salt farming, and they may not get pay for entire year due to seasonal weather pattern change. However, the proposed project is created permanent job opportunities (82 full time employees) for local community and therefore target 8.5 has bene chosen for SDG8. The goal/target will be monitored by the number of full-time employees with the employment records during the verification process.
SDG13: Climate Action	13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.	The project's contribution is done through training and awareness raising of local people and setting good example by investing to the climate friendly technology. The project would lead to reduction of approx. 461,636 tCO_2 per annum and

		therefore 13.3 target has been chosen for SDG 13. The awareness program will be conducted either once or twice a year to educate and create awareness among the local community regarding the climate change and their impact on the environment as well as how to mitigate them.

B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

The methodological choices/approaches for estimating the SDG outcome as follows:

SDG	Method of Measurement	QA/QC
SDG 7: Affordable and Clean Energy *Ensure access to affordable, reliable, sustainable and modern energy for all.*	Electricity produced and supplied to the grid is monitored through energy meters. A SCADA (Supervisory control and data acquisition) in place to control and monitor the plant operation. Net electricity will be calculated by state electricity board and PP on monthly basis and provided in the monthly report or equivalent. The other parameters used to reach net electricity supplied to grid are mentioned in monitoring plan.	This parameter is monitored monthly basis and value of parameter will be cross checked with invoices to national grid. The electricity meters will be calibrated as per supplier recommendations.
SDG 8: Decent Work and Economic Growth *Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all*	Employment generation is monitored through social/health insurances or income tax records, job contracts and staff register. Details of staff employment history and wages are kept confidential as per data protection act of Vietnam.	This parameter is not required any QA/QC procedure. The DOE can confirm this parameter with review employee's records and interview with project owner or employees on site.
SDG 13: Climate Action *Take urgent action to combat climate change and its impacts*	The emission reduction parameter is calculated through net electricity supplied to grid and grid emission factor. The grid emission factor is ex-ante parameter obtained from "The Analysis of Emission Factor of Vietnam Grid" report issued by Climate Change Department, Ministry of Natural Resource and Environment (MONRE) and explained in section B.6.3. This is in line with "Tool to calculate the emission factor for an electricity system, version 7". The emission reductions are calculated as per the methodology requirement sated under "SDG 13: Climate Action" in section B.6.4.	As per the chosen methodology, equations (11) & (17) was used to calculate the baseline emission & emission reduction and it is further explained in section B.6.4 as well as used in emission reduction spreadsheet. This parameter is calculated and thereby no QA/QC procedure is required.

B.6.3. Data and parameters fixed ex-ante for monitoring contribution to each of the three SDGs

Since the parameters contribute to SDG 7 and SDG 8 will be monitored directly by using electricity meters (for net electricity generation) and employment records (for number of employees), SDG 13 will be monitored

through the calculation of emission reduction achieved by using net electricity supplied to grid and grid emission factor. The grid emission factor will be fixed ex-ante basis as follows:

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter	$EF_{grid,OM,y}$
Unit	tCO_2/MWh
Description	Operating Margin CO_2 emission factor for the electricity system in year y
Source of data	National electricity system regulation centre
Value(s) applied	0.8336
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07" by using 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.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This data will be archived for 2 years beyond the crediting period.

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter	$EF_{grid,BM,y}$
Unit	tCO_2/MWh
Description	Build Margin CO_2 emission factor for the electricity system in year y
Source of data	National electricity system regulation centre
Value(s) applied	0.8961
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07" by using 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.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This data will be archived for 2 years beyond the crediting period.

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter	$EF_{grid,CM,y}$
Unit	tCO_2/MWh
Description	Combined Margin CO_2 emission factor for the electricity system in year y
Source of data	National electricity system regulation centre
Value(s) applied	0.8492
Choice of data or Measurement methods and procedures	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: $EF_{grid,CM,y} = (EF_{grid,OM,y} \times W_{OM}) + (EF_{grid,BM,y} \times W_{BM})$ Where: $EF_{grid,BM,y}$= Build margin CO_2 emission factor in year y (tCO_2/MWh) $EF_{grid,OM,y}$= Operating margin CO_2 emission factor in year y (tCO_2/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM}= Weighting of build margin emissions factor (%) = 25%
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This data will be archived for 2 years beyond the crediting period.

B.6.4. Ex-ante estimation of outcomes linked to each of the three SDGs

SDG 7: Affordable and Clean Energy

The baseline outcome benefit is zero.

The project activity generates 543,613 MWh which will be monitored by electricity meters. No ex-ante estimation required for SDG 7.

SDG 8: Decent Work and Economic Growth

The baseline outcome benefit is zero.

The project provides employment 82 local people at present. This will help to achieve SDG 8 with indicators 8.5.2 "Unemployment rate, by sex, age and persons with disabilities" and following target: 8.5 "By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value". Number of jobs created and wages for both men and women to demonstrate that the project provides decent work for all women and men and equal pay for equal work.

In addition, project activity improves the quality of employment by giving training to employee. All employees are trained on health and safety issues during each monitoring period. This will help to achieve "the project labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment." Training records or certificates will be provided during each monitoring period

SDG 13: Climate Action

Baseline Emission:

AS per ACM0002 (Version 19.0), the baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$

Where:

BE_y = Baseline emissions in year *y* (t CO_2/yr)

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

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of "TOOL07: Tool to calculate the emission factor for an electricity system" (t CO_2/MWh)

The estimated electricity generation[27] by the proposed project is as follows:

18N (MWh)	18S (MWh)	18E (MWh)	Total ($EG_{PJ,y}$)
414,450	80,156	49,007	543,613

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.

The combined margin ($EF_{grid,CM,y}$) emission factor for the Vietnam's electricity system is 0.8492 tCO_2/MWh. It has been estimated by Climate Change Department of Ministry of Natural Resource and Environment (MONRE) in line with "Tool to calculate the emission factor for an electricity system" in an ex-ante basis.

Hence the baseline is:

$EG_{PJ,y}$	×	$EF_{grid,CM,y}$	=	BE_y
543,613 MWh/yr	×	0.8492 tCO_2/MWh	=	461,636 tCO_2/yr

[27] Estimated by using power simulations variant – Done by Bouygues Energies & Services (France)

Project Emission:

The proposed project activity involves the generation of electricity by development of solar power project. The generation of electricity does not result in greenhouse gas emissions and therefore the project emission (PE_y) is zero. However, in order to meet the requirement of SDG 7&13, the electricity consumed by the project activity from the grid will be continuously monitored and therefore included as a monitoring parameter under section B.7.1

Leakage Emission:

The energy generating equipment is not transferred from or to another activity. Therefore, leakage does not have to be taken into account and thereby leakage emission (LE_y) zero.

Emission Reduction:

BE_y	–	PE_y	–	LE_y	=	ER_y
461,636 tCO_2/yr	–	0 tCO_2/yr	–	0 tCO_2/yr	=	461,636 tCO_2/yr

B.6.5. Summary of ex-ante estimates of each SDG outcome

SDG 7: Affordable and Clean Energy

Year	Baseline estimate (MWh)	Project estimate (MWh)	Net benefit (MWh)
2019 (1st Jun – 31st Dec)	0	317,108	317,108
2020	0	543,613	543,613
2021	0	543,613	543,613
2022	0	543,613	543,613
2023	0	543,613	543,613
2024 (1st Jan – 31st May)	0	226,505	226,505
Total	0	5,436,130	5,436,130
Total number of crediting years	5		
Annual average over the crediting period	0	543,613	543,613

SDG 8: Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possible in the baseline scenario. The project activity further information is hiring 82 local employees. This will help to achieve SDG 8 with indicators 8.5.2 "Unemployment rate, by sex, age and persons with disabilities" and following target: 8.5 "By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value". 82 local employees (including women) are important effect as a large scale and there will be more local people recruited in the operation phase.

Furthermore, number of people (82 local employees) are trained on health and safety issues during per each monitoring period. This will help to achieve "the project labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment." Training records or certificates will be provided during each monitoring period.

SDG 13: Climate Action

Year	Baseline estimate (tCO_2)	Project estimate (tCO_2)	Net benefit (tCO_2)
2019 (1st Jun – 31st Dec)	0	269,288	269,288

2020	0	461,636	461,636
2021	0	461,636	461,636
2022	0	461,636	461,636
2023	0	461,636	461,636
2024 (1st Jan – 31st May)	0	192,348	192,348
Total	0	2,308,180	2,308,180
Total number of crediting years	5		
Annual average over the crediting period	0	461,636	461,636

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Relevant SDG Indicator	7.2.1 – Renewable energy share in the total final energy consumption
Data / Parameter	$EG_{PJ,grid,y}$
Unit	MWh/yr
Description	Quantity of electricity generated and supplied by the project power plant to the grid in year y
Source of data	Standard metering of the net electricity supplied to the grid as indicated in the Power Purchase Agreement (PPA)
Value(s) applied	543,613 (this value may change in future due to fluctuation in power generation)
Measurement methods and procedures	Electricity generated would be monitored by the electricity meters on a continuous basis and readings will be taken every month for billing purpose. The meters have the capability to store 18 months of data as well as transfer them to historical server which is located in the HV substation control room. It can be downloaded on a monthly basis for billing purpose. The computer has a web-based software where the data can be seen by the Vietnam Electricity (ENV) remotely. Archive of the data would be available for entire lifetime of the project.
Monitoring frequency	Continuous measurement with daily recording (The meters can capture half hourly generation data and the data would be logged through the SCADA system in a daily basis. However, readings will be downloaded on a monthly basis for record keeping and billing to the EVN.)
QA/QC procedures	Electricity meters will be calibrated once in three years as per EVN requirement. The electricity generation can also be cross-checked using the invoices billed to EVNEPTC for payment
Purpose of data	Calculation of baseline emissions to demonstrate contribution to SDG7'-7.2 By 2030, increase substantially the share of renewable energy in the global energy mix"
Additional comment	None

Relevant SDG Indicator	7.2.1 – Renewable energy share in the total final energy consumption
Data / Parameter	$EC_{PJ,i,y}$
Unit	MWh/yr
Description	Quantity of electricity consumed by the project electricity consumption source j in year y
Source of data	Direct measurement by electricity meters
Value(s) applied	To be monitored

Measurement methods and procedures	Electricity consumption by the project plant would be monitored by the electricity meters on a continuous basis and readings will be taken every month for billing purpose. The main meter is acting like a two-way (bi-directional) meter and therefore capture electricity consumption as well as transfer them to server which is located in the HV substation control room. It can be downloaded on a monthly basis for billing purpose. Archive of the data would be available for entire lifetime of the project.
Monitoring frequency	The meters can capture half hourly data and the data would be logged through the SCADA system in a daily basis. However, readings will be taken on a monthly basis for record keeping and billing to the EVN.
QA/QC procedures	Continuous measurement with daily recording (The meters can capture half hourly generation data and the data would be logged through the SCADA system in a daily basis. However, readings will be downloaded on a monthly basis for record keeping and billing to the EVN.)
Purpose of data	Calculation of project emissions to demonstrate contribution to SDG7'-7.2 By 2030, increase substantially the share of renewable energy in the global energy mix"
Additional comment	None

Relevant SDG Indicator	8.5.1 – Average hourly earnings of female and male employees, by occupation, age and persons with disabilities
Data / Parameter	Employees' monthly wages
Unit	Vietnam Dong per employee
Description	Monthly wages to all employees by the project activity
Source of data	Job contracts (or) Pay slip (or) Payroll records
Value(s) applied	Employees' wages record available during validation.
Measurement methods and procedures	Randomly choose employees with similar designation from payroll records and compare their wages and experience
Monitoring frequency	Once for each monitoring period
QA/QC procedures	Payroll records, job contracts and staff register will be provided annually. After first verification, only changes in employees will be reported.
Purpose of data	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'
Additional comment	None

Relevant SDG Indicator	8.8.1 – Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status
Data / Parameter	No of Fatal & Non-fatal injuries
Unit	Number
Description	Total number of employees injured during the operation and maintenance period of project activity
Source of data	Health & Safety issues records
Value(s) applied	No values are applied at this moment and it will be monitoring parameter throughout the crediting period.
Measurement methods and procedures	The total number of Health and Safety training based on Training Records or Certificates
Monitoring frequency	Once for each monitoring period
QA/QC procedures	Accident or incident records will be provided
Purpose of data	Monitoring the health and safety records of employees to demonstrate contribution to SDG8 – 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

Additional comment	Since Vietnam has already ratified[28] relevant ILO core conventions on equality, namely Equal Remuneration Convention (Convention No 100) in 1997, Indicator 8.8.2[29] is not considered as monitoring parameter.

Relevant SDG Indicator	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
Data / Parameter	No of awareness programmes
Unit	Number
Description	Provide awareness trainings regarding the climate change and mitigation measures
Source of data	Training records include attendance register or photos of training
Value(s) applied	No values are applied at this moment and it will be monitoring parameter throughout the crediting period.
Measurement methods and procedures	The training records include attendance registers and photos will be available to measure the level of awareness program conducted for local communities and others
Monitoring frequency	Once for each monitoring period
QA/QC procedures	None
Purpose of data	Monitoring the awareness programs conducted will help to demonstrate the contribution to SDG13 – 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Additional comment	None

B.7.2. Sampling plan

Not Applicable

B.7.3. Other elements of monitoring plan

Monitoring data is collected in accordance with the agreement done between the project owner and Vietnam Electricity Corporation (EVN) which provides the infrastructure for the connection to the national grid. Data will be stored electronically, during the crediting period and at least two years after the last issuance of credits for the solar power project activity in the concerning crediting period. The Project Participant will be responsible for storage of data received from the measuring devices.

Monitoring procedures

Please refer Appendix 3 for metering layout for three plants.

All the installed electricity meters have an internal memory that can be stored 18 months of monitored data. The electricity meters will obtain hourly data and send to the historical server located at HV substation control room on a daily basis. The data can be downloaded from the computer at control room through web-based dashboard installed by EVN. The data will be monitored by the assigned operator at control room during 5am to 6pm and the EVN who can see the data remotely form their location. There will be no data after sunset and the inverter turn in to standby mode. The operator will collate and compile all operational data on a monthly basis and send to plant operation manager. The operation manager will verify the data and send to top management for endorsement before proceeding to billing to power purchaser.

Period of archiving

The data will be archived electronically every hour in meters and the meters will send the data to historical server on a daily basis. Monthly data can be downloaded for billing purposes.

[28] https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO:11200:P11200_COUNTRY_ID:103004

[29] https://sustainabledevelopment.un.org/sdg8

Calibration of equipment

The calibration of electricity meters will be done as per supplier recommendation by an independent accredited third party. However, the tariff meters are validated by EVN as per their requirement in three years interval. The relevant calibration certificates will be made available at the time of verification. The following meters are installed at sites:

Plant Name	Brand	Model	Accuracy class	Number of Meters
18N & 18S	Elster	A1700	Tariff Meter: 0.2 Others: 0.5	15 (18N) & 9 (18S)
18E	Landis+Gyr	E650 Series 3		7

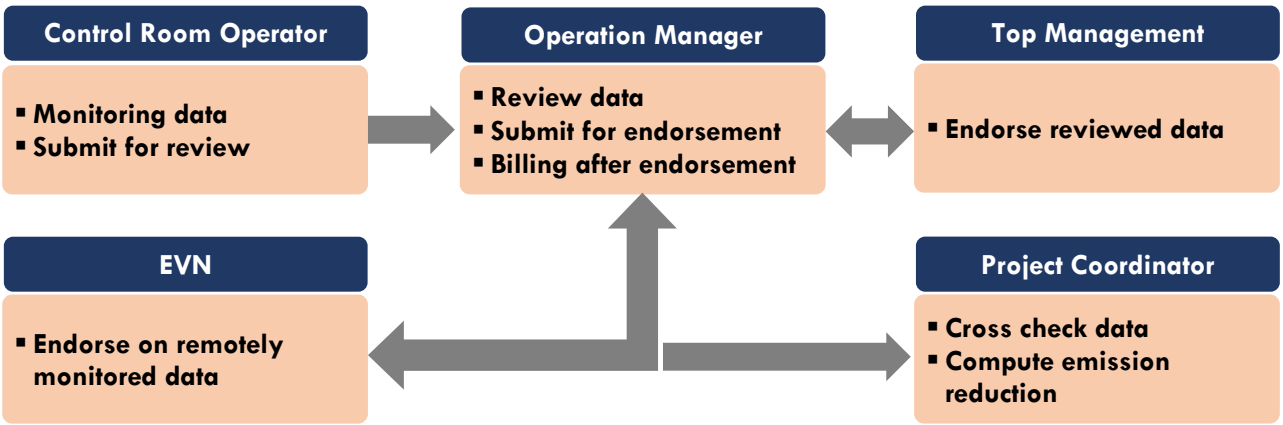
Internal Audit

An internal audit will be carried out by project coordinator every year at the power plant to ensure that the parameters are being monitored in accordance with this Project Design Document (PDD). The findings (if any) of the audit will be included in the annual report.

Training requirements

The suppliers of the equipment will train the staff in-charge during erection, to operate and maintain the equipment efficiently. Apart from this, the equipment supplier will provide complete manuals and documentation providing details for the maintenance schedule and the required activities associated with it.

The following roles and responsibilities will be used to monitor the project activity as per procedures:



The monitored data will be reported on a yearly basis for the calculation and estimation of emission reductions. This data will be checked against the billing to EVN. If the project is not performing as expected or if there are any negative impacts on the volume of emission reductions obtained, identify the where the project is deviating in its generation of emission reductions and the immediate measures which need to be undertaken to maintain the expected generation of emission reductions from the operation of this project. Should there be any significant changes in plant operation, these will be notified and amendments to the PDD will be requested during the following verification by DOE.

For each verification period, project owner will prepare a monitoring report that will be submitted to a DOE for verification. Project owner ensures that the procedures and monitoring plan are being followed. All data will be kept for a minimum of 2 years following issuance of certified emission reductions or the end of the crediting period, whichever is later, and the storage of this data will be the responsibility of the project owners.

SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

20/07/2018[30]

[30] Date of "Engineering, Procurement & Construction – EPC" Agreement signed

As per 3.4.3.2 of GS4GG, the date of "Engineering, Procurement & Construction (EPC)" agreement signed is considered as project starting date. The EPC was signed for 18E & 18S on 08/08/2018 and for 18N on 20/07/2018. Hence, the earliest date has been chosen for project starting date.

C.1.2. Expected operational lifetime of project

25 years and 00 months

C.2. Crediting period of project

Renewable crediting period

C.2.1. Start date of crediting period

Starting date of the first crediting period: 01/06/2019

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:
18E: 22/04/2019
18N: 11/05/2019
18S: 07/05/2019

C.2.2. Total length of crediting period

First crediting period – 5 years and 00 months
The crediting period will be renewed twice, hence the entire crediting period is 15 years

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/ potentially/ no)	Justification	Mitigation measure (if required)
SOCIAL & ECONOMIC SAFEGUARDING PRINCIPLES				
1. Human Rights	a. The Project Proponent and the Project shall respect Internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights. b. The Project shall not discriminate with	No	a. The Project Proponent and the Project does not conflict with the economic livelihood or other factors of the local communities. Thus, the Project does not cause any human rights abuse and respects internationally proclaimed human rights issue. b. As a member of United Nations and part of UN Agreement on Human	Not required

	regards to participation and inclusion.		Rights[31], it is ensured by law in Vietnam that no action can be taken against human rights.	
2. Gender Equality & Women's Rights	1. The Project shall complete the following gender assessment questions in order to inform Requirements, below: a. Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits? b. Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)? c. Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's	No	1. The project fully complied with Vietnam labor code[32] where the gender equality is clearly defined. The justifications for the gender assessment questions are as follow: a. No, the Project does not reduce women´s access to or control of resources, entitlements and benefits. The project will benefit to local community regardless of gender. b. No, the Project does not create any adverse effect on the local community. c. No, the Project does not consider the gender roles while engaging them and thereby provide equal rights to men and women. Local community meetings	Not required

31 https://thuvienphapluat.vn/van-ban/Quyen-dan-su/Tuyen-ngon-quoc-te-nhan-quyen-1948/65774/noi-dung.aspx

32 https://www.ilo.org/dyn/natlex/natlex4.detail?p_lang=en&p_isn=91650

	activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?		are scheduled considering participation by both Men and Women.	
	d. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?		d. The project does not discriminate the local community on basis of gender or caste or religion and therefore equally serve to all.	
	e. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?		e. No, the Project design neither increase women´s workload nor prevent them from engaging in other activities.	
	f. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?		f. There is no room for discrimination against women in this Project.	
	g. Would the Project potentially limit		g. The Project will not limit women´s	

	women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services? h. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards? 2. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women. a. Sexual harassment and/or any forms of violence against women - address the multiple risks of gender-based violence, including sexual exploitation or human trafficking. b. Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls.		ability regarding natural resources. The project is solely utilizing solar power and therefore does not impact natural resources of the region. h. No, the Project will not expose women and girls to further risks or hazards. 2. The project does not create any direct or indirect impacts on gender equality and/or the situation of women: a. The project proponent has a grievance cell which would investigate complaints. b. Project participation by women or girls is merely voluntary basis and there is no compulsion on them. The project proponent has a grievance cell which would investigate complaints.	

	c. Restriction of women's rights or access to resources (natural or economic). d. Recognise women's ownership rights regardless of marital status - adopt project measures where possible to support to women's access to inherit and own land, homes, and other assets or natural resources. 3. Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work, specifically: a. Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities. b. Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity		c. The Project will not restrict women´s rights or access regarding natural resources. d. Marital status is completely irrelevant to the Project. The project proponent does not discriminate on gender, caste, religion etc 3. The project has applied the principles of non-discrimination and equal treatment, pay & work as follows: a. Yes, the Project has equal opportunity for women and men to contribute both in volunteer and working positions. b. The project proponent has a specified HR policy that considers participation by both men and women.	

	leave, or marital status. c. Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits. 4. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks.		c. There is no limit on the access to Project participation and benefits from either of these conditions. 4. BIM Solar Farm project does not involve in any form of discrimination in any kind. Vietnam also ratified[33] relevant ILO core conventions on equality, namely Equal Remuneration Convention (Convention No 100) and Discrimination (Employment and Occupation) Convention (Convention No 111) in 1997.	
3. Community Health, Safety & Working Conditions	a. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community.	Yes	a. The project proponent is committed to the employee's workplace health & safety during all phases of the project. All employees will attend health & safety trainings. This issue is protected by Labor code[34] and UN Agreement on Human Rights[35].	Workplace Health & Safety trainings will be conducted regularly during the project operation.
4. Cultural Heritage, Indigenous Peoples, Displacement and Resettlement	a. Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g.,	No	a. As per the EIA report, the construction and operation of the BIM Solar Farm will not be creating any damage, alteration and/or removal to the critical cultural heritage. Law	Not required

33 https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO:11200:P11200_COUNTRY_ID:103004

34 https://thuvienphapluat.vn/van-ban/Lao-dong-Tien-luong/Bo-Luat-lao-dong-2012-142187.aspx

35 https://www.ohchr.org/EN/Countries/AsiaRegion/Pages/VNIndex.aspx

	knowledge, innovations, or practices)?		on Cultural heritage is protected against alteration, damage or removal by the "law on cultural heritage"[36].	
	b. Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?		b. The project does not involve any settlement areas. Thus, this project does not cause the physical or economic relocation of peoples. The project activity does not involve any alteration of existing roads as well as it does not add additional traffic. Since the site located isolated area, the traffic volume is negligible. Hence, there is no additional burden to the existing traffic. In addition, the project proponent built new roads for those sites which do not have road access.	
	c. Does the Project require any change to land tenure arrangements and/or other rights? d. For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?		c. The project's area is desert land and all of them belongs to BIM Group as per EIA report. d. The BIM Solar Farm Project is not involving land-use tenure. Thus, the Project does not require any changes to land tenure arrangements or other rights. In addition, there are no uncertainties regarding land tenure, access rights, usage rights or land ownership. The Land for	

36 https://thuvienphapluat.vn/van-ban/Van-hoa-Xa-hoi/Van-ban-hop-nhat-10-VBHN-VPQH-2013-hop-nhat-Luat-di-san-van-hoa-204826.aspx

	e. Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?		the project has been approved by the several local Authorities as per EIA report. e. No cultural heritage/ indigenous people are replaced by the project.	
5. Corruption	a. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	a. BIM Solar Farm project does not involve and is not complicit in any kind of corruption. Vietnam has ratified[37] UN convention against Corruption in 2007.	Not required
6. Economic Impacts	a. The project does not employ and is not complicit in any form of child labor. b. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.	No	a. BIM Group and their subcontractors complying with all relevant national laws regarding child labor. BIM Group will not employ children in any shape or form for their works. Vietnam has ratified ILO "C138 – Minimum Age Conventions" and "C182 – Worst Forms of Child Labour Convention"[38] b. The project owner is committed to the safe and healthy working conditions all phases of the project. All employees will attend trainings health & safety. This issue is protected by Labor	Not required

37 https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XVIII-14&chapter=18&clang=_en#EndDec

38 https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO:11200:P11200_COUNTRY_ID:103004

	c. The project does not involve and is not complicit in any form of forced or compulsory labor.		code[39] and UN Agreement on Human Rights[40]. c. BIM Group and appointed contractors will not involve in any form of forced or compulsory labour. Vietnam has ratified ILO "C029 – Forced Labour Convention" [41]	
ENVIRONMENTAL & ECOLOGICAL SAFEGUARDING PRINCIPLES				
1. Climate and Energy	a. Will the Project increase greenhouse gas emissions over the Baseline Scenario? b. Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	a. The project reduces Greenhouse Gas (GHG) emissions and fossil fuel usage compared to the baseline scenario. b. On the contrary the project generates renewable energy and supplies (except plant's auxiliary consumption) to the grid. The auxiliary consumption is measured by deduction of power supplied to the grid from the total power generated by the plant. However, it's to be noted that the auxiliary power consumed by the plant is generated as renewable energy and thereby no emission involved. However, the auxiliary consumption will be continuously monitored.	Not required
2. Water	a. Will the Project affect the natural or pre-existing pattern of	No	a. The project being a solar power project thus there is no impact of	Not required

39 https://www.ohchr.org/EN/Countries/AsiaRegion/Pages/VNIndex.aspx

40 https://www.ohchr.org/EN/Countries/AsiaRegion/Pages/VNIndex.aspx

41 https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO:11200:P11200_COUNTRY_ID:103004

	watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity? b. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? If 'Yes' or 'Potentially' proceed to question 2. c. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?		water resources. As per the EIA report, the plant area does not have large rivers and streams, only small gaps flow. In the dry season, there is almost no water, only water in the rainy season. b. No. As per EIA report, the risk of erosion is unlikely by the project. c. No. As per EIA report, the risk of erosion is unlikely by the project.	
3. Environment, Ecology and Land Use	a. Does the Project involve the use of land and soil for production of crops or other products? b. Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions? c. Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or	No	a. The project has been established at the desert land which was not used for production of crops and other products for a long time. b. The project is susceptible to decreased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme conditions. c. As per the EIA report, the solar plant does not affect the herbal life.	Not required

	harvesting, commercial development)?			
	d. Could the Project potentially result in the release of pollutants to the environment?		d. The project takes a precautionary approach regarding environmental challenges and is not complicit in practices contrary to the precautionary principle. The environment is protected by several Laws and Regulations in Vietnam. The purpose of the "Law on Environmental Protection"[42] is to protect the environment with principles of sustainable development and environment. The project owner also follows necessary procedures for environmental safety at the project.	
	e. Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?		e. All hazardous and non-hazardous wastes will be disposed as per the local regulations. The methods are categorized for all materials in the EIA report.	
	f. Will the Project involve the application of pesticides and/or fertilisers?		f. Not applicable for solar power plants.	
	g. Will the Project involve the harvesting of forests?		g. No. the project area was deserted before project implementation	
	h. Does the Project modify the quantity or		h. No. The project does not modify the quantity	

42 https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Luat-bao-ve-moi-truong-2014-238636.aspx

	nutritional quality of food available such as through crop regime alteration or export or economic incentives?		or nutritional quality of food available	
	i. Will the Project involve animal husbandry?		i. No. Not applicable for solar project.	
	j. Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites[11] identified?		j. EIA report states that the projected area of the Project is saline soils, not located in sensitive ecological zones, biodiversity conservation areas, and there are no rare and valuable plant and animal species.	
	k. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?		k. No. There were no endangered species found in the project boundary as per EIA report.	
	l. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?		l. No. The project does not impact other areas where endangered species may be present.	

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

The stakeholder consultation meetings were organized four times with different set of stakeholders as follows:

Meeting #	Date (Time)	Type of Stakeholders	Category Code
1	13.03.2019 (0930)	Local community people	A
2	13.03.2019 (1430)	Women only	A
3	14.03.2019 (0930)	Local authorities & Government officials	B &C
4	14.05.2019 (0930)	NGOs and GS	D, E & F

A total of 27 participants (16 women & 11 men) were attended the meeting. All the meetings were held at Meeting room 01, floor 1, BIM Salt JSC, Highway 1A, Quan The Hamlet, Phuoc Minh Commune, Thuan Nam District, Ninh Thuan Province, Vietnam. To increase the attendees for the meeting, a loudspeaker announcement was made in all three villages by the village management board.

The meeting has started with introduction of the project proponents who are BIM Group and AC Energy. Subsequently, we have requested to the stakeholders to introduce themselves individually as well as sign the attendance register. The entire presentation was carried out in local language (Vietnamese) by the BIM Group's representative Mr Nguyen Phuong Trung (Project Coordinator).

He has explained the purpose of the meeting, the gold standard process and certification, current electricity profile of Vietnam and following by the brief explanation about the three solar plants. Mr Trung has opened the floor to obtain the questions and feedbacks from stakeholders about the projects.

After clarified all the questions (refer E.2 Summary of comments received), the GS continuous input mechanism was explained and discussed that whenever they have a complaint or a request, they can be able to fill in the grievance book which can be located at the site office. Mr Trung has also explained that would be regularly checked by the project manager. All local stakeholders agreed on this mechanism and the book was placed at site office.

Following the grievance mechanism, Mr Trung has explained about the sustainable development goals and the impacts created by the project on them. Following that, Blind Sustainability Development Assessment were conducted as well as discussed on the sustainability monitoring plan with stakeholders.

Finally, the meeting feedback forms were circulated and closed the meeting in brief. End of the meeting, the contact details of the project owner and the Gold Standard Office were shared with the participants. Local stakeholders were encouraged to give feedback about the project.

E.2. Summary of comments received

The questions and comments of local participants and the answers to those questions and comments are briefly given below:

Stakeholder comment	Explanation (Why? How?)
Meeting 01	
Does the project affect livestocks and local farming?	Livestocks and agriculture production were analysed during the Environment Impact Assessment (EIA) and found out that the project does not affect them.
Does the project cause any water pollution or erosion?	The EIA has been identified two waste water sources which are run-off rain water and domestic waste water from workers on site. The analysis concluded that these sources will not create any impact on the groundwater and other water bodies nearby the site. Also, the risk of erosion is unlikely.
What will be the change in electricity after the project start operation?	The electricity services will be improved in the local community. Also, the electricity tariff may reduce as per the verbal discussion with local authority.
Any air pollution during operation?	No air pollution will be caused by the solar plant operation as there are no fossil fuel combustion involved.
Do you have any safety policy for employees working at BIM Group?	Based on the EIA report, BIM group has already committed to comply with regulations on labor safety and hygiene on the site. Regular safety induction also being conducted for the workers on site.
Meeting 02	
Does the power generated from the project have any harm to human's health?	BIM Solar farm has obtained and following Electricity Safety Standard from EVN. The plants area will be fenced and deployed security team to avoid any trespassing by human or livestocks. In addition, during operation the temperature around the PV panels will decrease as the panels absorbs the heat. Lightning arresters are installed around the panel areas.
Meeting 03	
In rainy season, the amount of rain water absorbed by the ground	As per EIA report, rainwater drainage system has been constructed around the construction site and it will lead the rainwater to rivers and

will not be the same as much as it used to be. Does it affect the cultivation area and cultivation by residents?	lake. BIM has assigned some staffs to periodically inspect the drainage systems and dredge manholes to ensure that the drainage systems are not obstructed.
What impacts will the project have on the livelihood of local people?	The projects are located in the Phuoc Ninh and Phuoc Minh communes. BIM will focus on the local developments through prioritizing local manpower resources, providing stable jobs and income to improve their lives and be able to access the health service and basic quantity of food.
When there is no solar power, how much carbon is reduced naturally by the natural ecosystem every year?	If no solar power, every year emission occurred by other power generation will not be reduced by the natural ecosystem. The other power plants will continue their operation to meet the power demands.

Stakeholder Feedback Round (SFR)

The Gold Standard stakeholders' consultation process has two main events: a "live" stakeholders consultation meeting and the stakeholders feedback round. The consultation meeting includes a discussion of the design and consequent impacts of the project while the feedback round provides ground for stakeholders to provide feedback on how their comments have been considered.

The documents including the Stakeholder Consultation Report (SCR) and the Project Design Document (PDD) will be delivered to the stakeholders who have been selected as stakeholders to the project activity. The main communication method will have been through e-mails and delivery of several hard copies of the mentioned documents for those who don't have an email address (specifically the local community) to the village management board for distribution. Since all the documents in English, the project owner will explain (in local language) about the project documentation in detail upon requested by the local community.

The beginning of two months Stakeholder Feedback Round will be announced through the village management board to the local community. This public announcement, emails and documents will contain information such as location of available these documents, the procedure to commit comments, timing and the contact's details. In addition, all these documents have been made available under the GS registry webpage (https://registry.goldstandard.org/projects) as required by GS.

Outcome of SFR:

The soft copies of Stakeholder Consultation Report (SCR) and the draft PDD have been circulated through emails (refer below) to various stakeholders who were invited through emails for consultation meetings. The feedback round period was 2 months from 13th Jun to 12th Aug 2019. Those who don't have email access such as local residents were informed through village management board about the feedback round. Hard copies of SCR and draft PDD were available at the board office for distribution. There were no feedback/comments received during the feedback round.

[BIM Group] Báo cáo tham vấn các bên liên quan và Văn bả...

File Message Developer Help Tell me what you want to do

Thu 6/13/2019 9:22 AM

Trần Thị Thủy Tiên <tien.ttt@bimgroup.com>

[BIM Group] Báo cáo tham vấn các bên liên quan và Văn bản thiết kế dự án cho Nhà máy điện mặt trời BIM

To sotnmt@ninhthuan.gov.vn; sonn@ninhthuan.gov.vn; ninhthuanpc@evnspc.vn; tinhdoan@ninhthuan.gov.vn

Cc Nguyễn Phương Trung; Thirumalavan Panchaksharam/SGP; 'AC ENERGY ARAGO, Daniel O' (arago.do@acenergy.com.ph)

PDD_BIM Solar Farm_13.05.2019.pdf 997 KB

SCR_BIM Solar Farm_21.05.2019.pdf 5 MB

Kính gửi ông/bà,

Tập đoàn BIM xin gửi lời cảm ơn ông/bà đã quan tâm và đến tham dự cuộc họp Tham vấn các bên liên quan theo Tiêu chuẩn Vàng do BIM Group tổ chức vào ngày 13/3/2019 đến ngày 14/3/2019.

Chúng tôi mong muốn nhận được ý kiến đánh giá cũng như đóng góp của ông/bà về Báo cáo Tham vấn các bên liên quan (SCR) và dự thảo Văn bản thiết kế dự án (PDD) như đính kèm. Các báo cáo này được dựa trên ý kiến/đánh giá chúng tôi nhận được trong suốt các cuộc họp Tham vấn.

Xin vui lòng gửi đánh giá/đóng góp của ông/bà cho chúng tôi **trước ngày 12/8/2019** đến:
Mr. Nguyễn Phương Trung (trung.np@bimgroup.com) hoặc Ms. Trần Thị Thủy Tiên (tien.ttt@bimgroup.com)

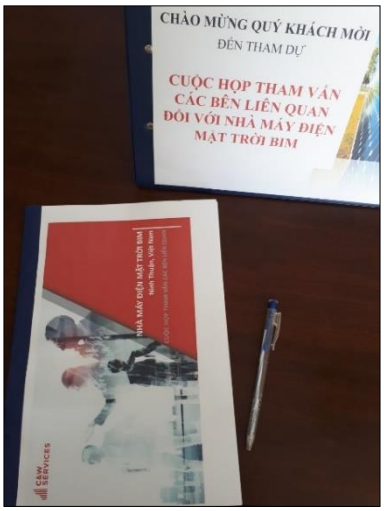
Xin chân thành cảm ơn.
Trần Thị Thủy Tiên

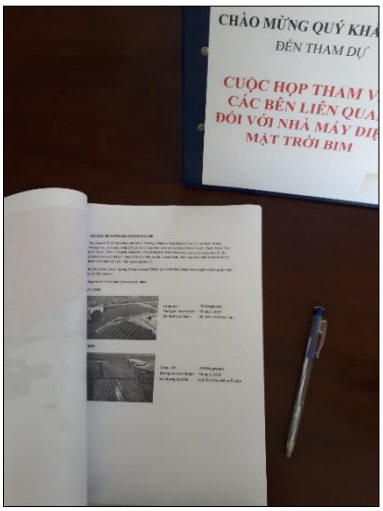
Tran Thi Thuy Tien (Ms)
Translator | New Energy Department | **BIM Group**
Mobile: +84 909.312.737 | Email: tien.ttt@bimgroup.com
Website: https://bimgroup.com

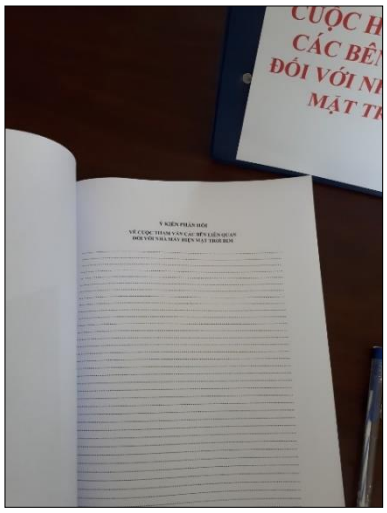
E.3. Report on consideration of comments received

Detailed information of the Stakeholders Consultation Process can be found in Local Stakeholder Consultation Report (Version 02, dated on 09.08.2019).

Continuous input/grievance mechanism expression method and details have been explained to the participants and discussed during the stakeholder consultation meeting. Furthermore, if the local stakeholders want to give any comment or feedback anytime, it is documented using the continuous Input/Grievance Expression Process Book below:







	Method Chosen (include all known details e.g. location of book, phone, number, identity of mediator)	**Justification**
Continuous Input / Grievance Expression Process Book	The process book will be located at the site office (floor 1, BIM Salt JSC, Highway 1A, Quan The Hamlet, Phuoc Minh Commune, Thuan Nam District, Ninh Thuan Province, Vietnam) as per stakeholders' suggestion.	Project Participant will be checking the comments in the book on a regular basis, and record responses. They will be respectful to the views of stakeholders and suggest alternative solutions or compromises wherever possible. It is chosen as main mechanism.
Telephone access	Project Proponent: BIM Group Mr. Nguyen Phuong Trung +84 936656694	This information will be explained at the consultation meeting and provided in the Continuous Input/Grievance Expression Process Book and invitation.
Internet/email access	Project Proponent: Mr. Nguyen Phuong Trung trung.np@bimgroup.com	This information will be explained at the consultation meeting and provided in the Continuous Input/Grievance Expression Process

	Gold Standard: info@goldstandard.org	Book and invitation.
Nominated Independent Mediator (optional)	N/A	N/A
Other	None	None

Appendix 1. Contact information of project participants

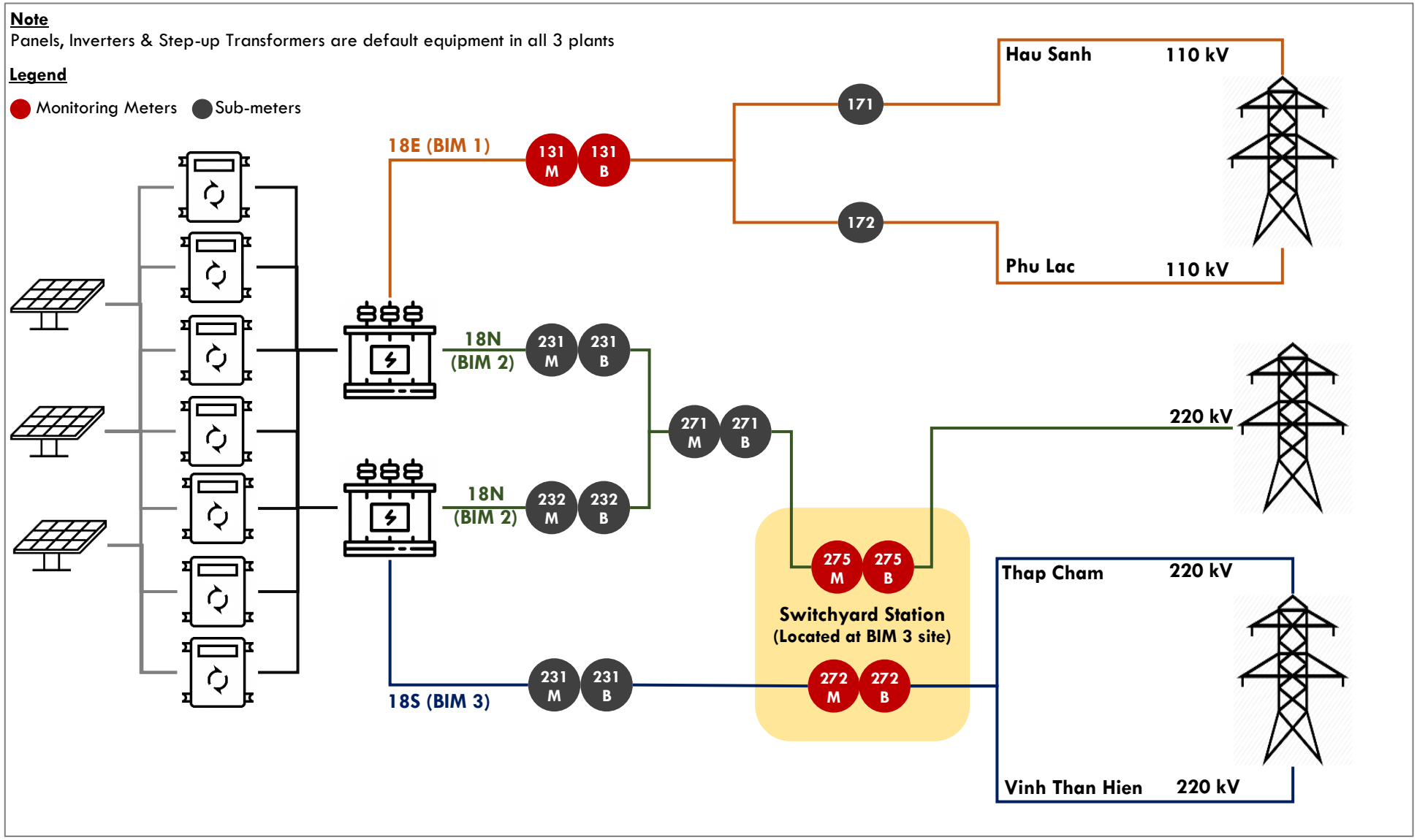
Organization name	BIM Renewable Energy Joint Stock Company
Registration number with relevant authority	4500617479
Street/P.O. Box	Lac Tien Village, Phuoc Minh Commune,
Building	BIM – Ninh Thuan Branch Office
City	Thuan Nam District
State/Region	Ninh Thuan Province
Postcode	-
Country	Viet Nam
Telephone	02593960273
Fax	-
E-mail	-
Website	https://bimgroup.com/en
Contact person	Mr. Nguyen Phuong Trung
Title	Project Coordinator
Salutation	
Last name	Trung
Middle name	Phuong
First name	Nguyen
Department	Renewable Energy
Mobile	+84 936 656 694
Direct fax	
Direct tel.	
Personal e-mail	trung.np@bimgroup.com

Appendix 2. Summary of post registration design changes

Revision History

Version	Date	Remarks
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1	10 July 2017	Initial adoption

Appendix 3. Metering Layout for Three Plants



Appendix 4. Prior Consideration

Email Correspondences:

AC ENERGY ARAGO, Daniel O

From: AC ENERGY DE JESUS, Roman Miguel G.
Sent: Tuesday, 27 March 2018 10:16 AM
To: AC ENERGY ARAGO, Daniel O; tranght@bimgroup.com; Doan Quoc Huy (dqhuy@bimvietnam.com); 'Nguyễn Hải Vinh'
Cc: AC ENERGY BAUI, Louis P.; AC ENERGY DEVCO SERRANO, Edsel John R.; AC ENERGY DEVCO LACIO, Katherine Rose F.; AC CLAUSSE, Patrice R.
Subject: RE: Carbon Market Proposal for BIM Solar
Attachments: The Carbon Market BIM.PPTX

Copying Huy, Vinh, and Patrice into this.

Basically, this refers to the sale of verified carbon credits which could create another revenue stream for the project, which we estimate at about ~USD150/year. As the accreditation for this needs to be done during construction period, we would look to secure the permission of the steering committee to proceed with this, with the AC Energy team taking the lead.

Regards,
Miguel

From: AC ENERGY ARAGO, Daniel O
Sent: Monday, March 26, 2018 6:13 PM
To: tranght@bimgroup.com
Cc: AC ENERGY DE JESUS, Roman Miguel G. <dejesus.rmg@acenergy.com.ph>; AC ENERGY BAUI, Louis P. <Baui.LP@acenergy.com.ph>; AC ENERGY DEVCO SERRANO, Edsel John R. <serrano.ejr@acenergy-devco.com>; AC ENERGY DEVCO LACIO, Katherine Rose F. <lacio.krf@acenergy-devco.com>
Subject: Carbon Market Proposal for BIM Solar

Hi Trang,

I'm Dan Arago, I'm handling the Carbon Trading of AC Energy's Carbon Credits. We have here a deck explaining BIM Solar Project's opportunity of additional revenue stream by taking part in the Carbon Market. Carbon Market is created from the trading of carbon emission allowances to encourage or help countries and companies to limit their carbon dioxide emissions, also known as *Emissions* or *Carbon Trading*. Solar Plant, being a renewable energy, can be a source of *Carbon Credits or Carbon Offsets*. Every energy produced by a solar plant produces an equivalent tradable Carbon which is called *Carbon Credits*. To be able to acquire a Carbon Credit, a project has to undergo a rigorous process and be certified by carbon offset standards such as The Gold Standard.

We would like to schedule a meeting with you over the phone to discuss this in detail. Will you be available on April 11, 2018 9:30am to 11:30am Vietnam time or 1:30pm to 3:30pm Vietnam time.

Thank you very much and regards,
Dan

Daniel O. Arago | Senior Manager
AC Energy | 4F 6750 Building, Ayala Avenue, Makati City 1226 Philippines
Tel: +632 730 6300 loc 6376 | Mobile: +63 917 820 3796 | Email: arago.do@acenergy.com.ph | Website: www.acenergy.com.ph

Introduction Deck Presented during Board Meeting on 11 April 2018:

The Carbon Market

BIM

11/04/2018

AC Energy

An Ayala Company

Outline

- Carbon Market
- The Gold Standard
- Registering to Gold Standard will generate additional revenue for BIM
- Schedule of Costs for one crediting period
- Projected Revenues and Profits

Carbon Market

- Started with Kyoto Protocol to address Climate Change as administered by the UNFCCC ("United Nations Framework Convention on Climate Change")
- Involves the granting of certificates to renewable energy companies corresponding to their generated energy whereby for every MWh of energy generated an equivalent **Carbon Credit** or **VER** ("Voluntary Emissions Reduction") is produced (ie. 10 MWh x 0.5 T-CO_2/MWh = 5 T-CO_2)
- Other international certification bodies and Carbon Credit Markets were established using the standards set by UNFCCC. This includes the **Gold Standard** and its trading platform **Markit**

The Gold Standard

Gold Standard® certified SDG impacts

- The **Gold Standard** is a globally recognized and trusted regulatory framework for the deployment of public and private capital into climate, environment and development projects.
- Unlike traditional NGOs, The Gold Standard takes a **market based 'payment for outcomes' approach**, ensuring that projects achieve genuine outcomes that deliver with as much impact as possible.
- Every project certified by The Gold Standard must **monitor, report and verify carbon savings and sustainable development benefits for local communities**.
- This 'carbon for development' philosophy has been recognized by governments, business and civil society as the **most effective approach and best practice model**, and is **endorsed globally by more than 80 NGO supporters**.
- Please refer to **https://www.goldstandard.org/** for more info

Registering to Gold Standard will generate additional revenue for BIM

- Crediting period is every **7 years**, each project is allowed up to **3 crediting periods** (7 years x 3 crediting period = 21 years)
- The company can generate **1,760,150 Tons** of Carbon Credits in each crediting period. The annual Carbon Credit that can be generated by each BIM Solar Facility is summarized as follows:

Plant	Size in MWp	Projected Annual Generation in MWh	VERs Generated in Tons of CO_2
Solar 1	30	45,951	22,976
Solar 2	50	76,158	38,079
Solar 3	250	380,789	190,395
Total		**502,898**	**251,450**

*Projected total VER units every 7 years is 1,760,150 Tons
**Annual generation values are based on the latest PV System simulations, and may change depending on the final solar farm design.
***Projected VER's are based on projected generation. Actual VER's will be based on the actual meter readings during operation

- Estimated revenues at **USD 1/ Ton** on the projected total VERs for seven years is about **USD 1,760k**.

Schedule of Costs for one crediting period

- **Registration** of the project to Gold Standard should be done during the construction until before the end of Year 1 of operation, renewal or **validation** is done every end of crediting period and **verification** could be done within the crediting period to claim carbon credits. The schedule of costs for one crediting period are summarized below all in USD.

Year	1	2	3	4	5	6	7
Cost of Registration/ validation	87,318						
Cost of Verification and Issuance of VERs			244,088				367,440

Projected Revenues and Profits

- Here's the projected revenues and profits of Carbon Credits for the **first Crediting Period** for **BIM Solar Farms** (all in USD), assuming annual output of **502,898 MWh which is approximately equivalent to 251,450 Tons-CO_2** of Carbon Credits or equivalent to **1,760,150 Tons-CO_2** of Carbon Credits **every 7 years**

Vintage	Total Costs (USD)	Equivalent Cost (USD/Tons)	Selling Rate (USD/Tons)	Projected Revenue (USD)	Profit (USD)	Effective Annual Profit (USD)
First 3 years (Year 1 to 3)	331,405	0.44	1	754,350	422,945	**140,981**
Next 4 years (Year 4 to 7)	367,440	0.37	1	1,005,800	638,360	**159,590**
Total Costs for the First Crediting Period	**698,845**			**1,760,150**	**1,061,305**	

Thank you!

AC Energy
An Ayala Company

32F Tower One and Exchange Plaza, Ayala Triangle, Ayala Avenue, Makati City 1226 Philippines | Tel +(632) 908.3032 | Fax +(632) 751.6511 | www.ayala-energyinfra.com