a) Project design document form

(Version 10.1)

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

BASIC INFORMATION	
Title of the project activity	70MW Solar Power Plant Project in Ba Ria - Vung Tau, Vietnam
Scale of the project activity	☒ Large-scale ☐ Small-scale
Version number of the PDD	V1.0
Completion date of the PDD	30/04/2019
Project participants	SH Solar Farm Vina Co., Ltd
Host Party	Socialist Republic of Viet Nam
Applied methodologies and standardized baselines	ACM0002 (Grid-Connected Electricity Generation from Renewable Sources – Version 19.0)
Sectoral scopes linked to the applied methodologies	Sectoral Scope : 01 Energy industries(renewable-/non-renewable sources)
Estimated amount of annual average GHG emission reductions	81,675 tCO_2

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

>> SH Solar Farm Vina Co.,Ltd is founded by South Korean company SH Power with a 100% stake and is working to install the 70MW Solar Power Plant in Chau Duc Industrial Park, Nghia Thanh, Ba Ria - Vung Tau. SH Power private company of the Republic of Korea will participate in the project activity as an investor and a Project Participant. SH Power is a company that was established by investing in South Korean companies such as Soosan Industries Co., Ltd and Halla E&C Co.,Ltd.

The project would be developed using poly-crystalline photovoltaic cells without any backup generators and would generate 100% clean energy to be fed into the national grid. The 70MW project is installation of a new power plant at the site and is not a capacity addition or retrofit or replacement of any other existing plant.

So the current baseline scenario is the energy that is being fed into the national grid through other power plants, the details of which would be provided in the document later, and the project scenario is a clean Greenfield power plant that would generate energy and supply it to the national grid through Vietnam Electricity(EVN).

The project would be generating around 102,530 MWh of electricity on average for a year as per the data from the contractor and would thus be reducing 81,675 tonnes of CO2 from the atmosphere annually, thus generating 81,675 CERs for the relevant crediting period.

The project would not only be reducing the GHGs through its installation but would also significantly contribute to sustainable development by improving the overall economy of the region as the project is going to be located in an economically downtrodden area.

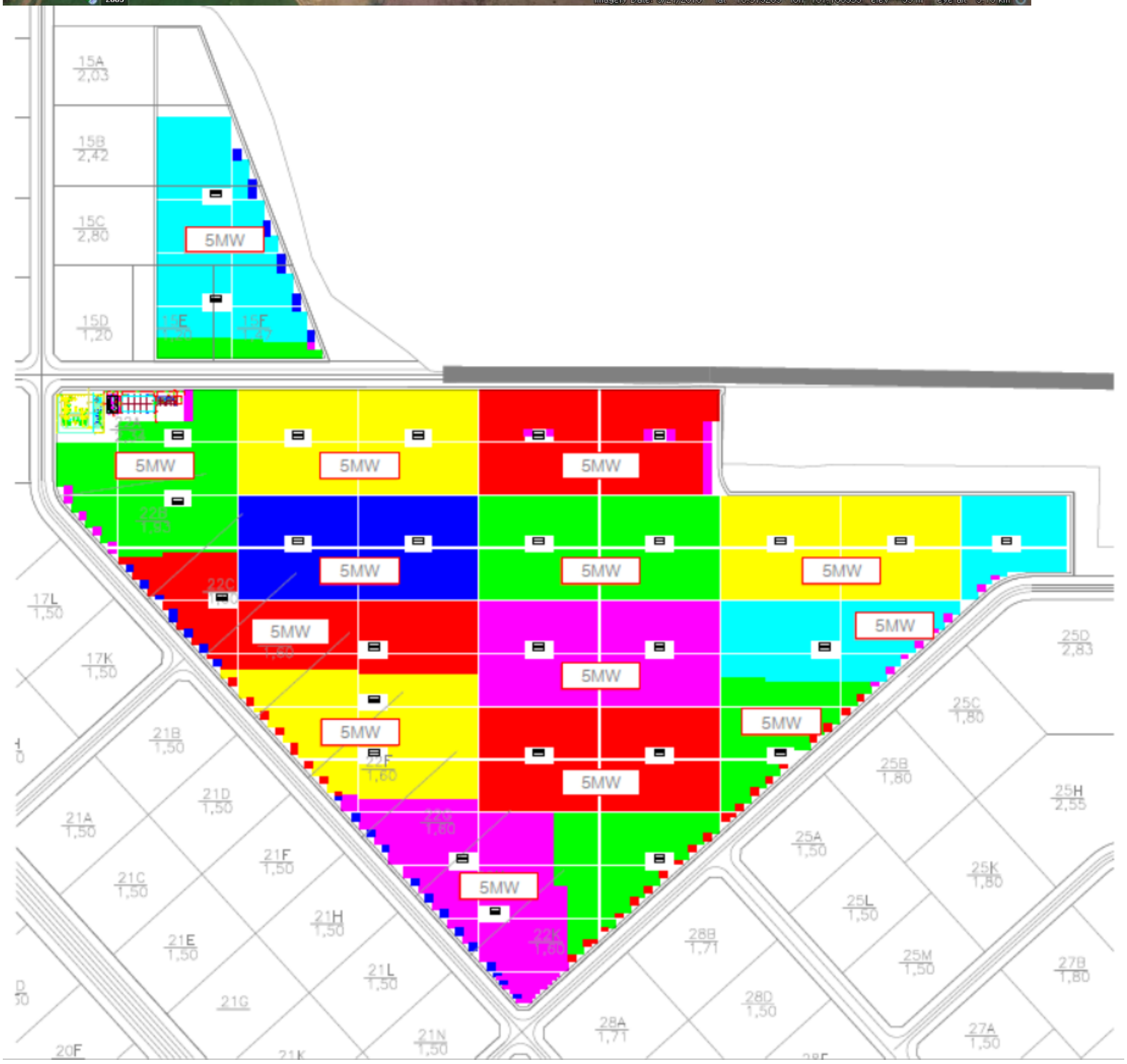
Apart from the economic improvement in the area, the project would reduce unemployment in the area by hiring the local labour for project related works and develop skillset of the people of that region.

A.2. Location of project activity

>> The Location information of project activity is as follows.

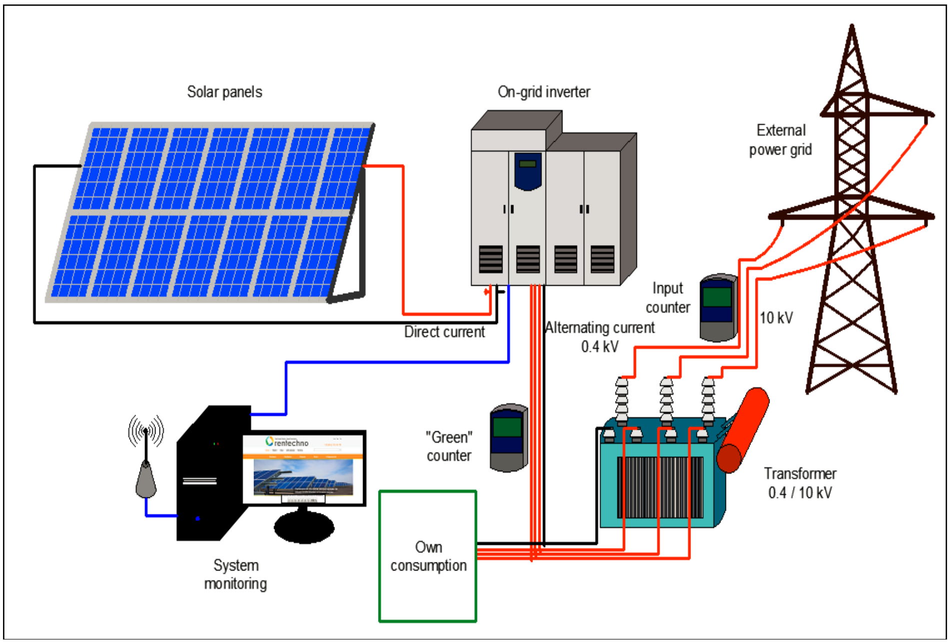
- Host Party : Socialist Republic of Viet Nam
- Location : Road No. D15, Chau Duc Industrial Park, Nghia Thanh Commune, Chau Duc District, Ba Ria - Vung Tau Province
- The coordinates of four points of the plant location are as under:
  1. Latitude 10.57859° North; Longitude 107.19182° East
  2. Latitude 10.57966° North; Longitude 107.18015° East
  3. Latitude 10.57321° North; Longitude 107.18553° East
  4. Latitude 10.58432° North; Longitude 107.18182° East


Nghĩa Thành
Google Earth


15A
2,03
15B
2,42
15C
2,80
15D
1,20
5MW

A.3. Technologies/measures

>> Solar PV system use directly sunlight for electricity production tanks to solar module systems. Solar modules are made of many different types of materials, manufactured by many processes and used widely for solar power projects in the world. Solar PV systems may only create electricity on day and power output will also vary according to different conditions of weather. However, Solar PV systems will produce max electricity on days it is hot, where the need to use electricity is increasing highly.



Solar PV modules will invert sunlight into DC tank to photovoltaic effects. This energy will be inverted into AC with the same frequency of the grid's tank to frequency inverters. Solar panel consists of multiple solar modules to be connected, which can range from tens of watts (W) to tens of megawatts (MW). For solar panels manufactured for commercial purposes, the photovoltaic conversion efficiency of solar panels is about 17.3%. This technology mainly uses tow radiation components that are direct and diffused and suitable even in area with low direct radiation.

The potential of solar energy at the location of SH Solar Power Plant Project has the annual average radiation of 4.87 kWh/m2/day. Among them, the value of February and March is over 5.0 kWhlm2/day.

SH Solar Power Plant Project has the capacity of 100 MWp (Phase1 : 70 MWp), the first year's power output is about 102.525 million kWh per year.· The Performance Ratio of the power plant reaches over 81.4%.

Power plant uses photo voltaic technology, symbolized as PV to directly convert sunlight into electrical energy. Power plant does not use the electrical storage.

Main Equipment in Power Plant :

- PV panels: Used to convert energy from solar radiation to electrical energy, the total capacity of the PV system is 70 MWp; Rated power of photovoltaic panels at standard conditions is 340 Wp; conversion efficiency of PV panel is over 17.1 %; Typical dimension is 1,994x 1.00 meter. The PV panels are fixed on the support frame, the angle of tilt for installation of PV panels is about 10 degrees southward, distance between the ranges is 0.9 meters. Parameter of PV panels is correct in the next phase.

- Inverter equipment: Used to convert DC power to AC power; 3 phases, central type, capacity of 625 kW/machine; Maximum input voltage is 1000 VDC, output voltage is about 400 V AC. The inverter parameters shall be correct in the next phase.

- 22 kV medium voltage transformer is integrated with inverter block, efficiency is over 98%. Transformer has the capacity of about 1.25 MVA, three-phase type, three-winding, YNd1d1 group of winding, 0.4/22 kV primary/secondary voltage, AN cooling type. The parameters of medium voltage transformer shall be accurate in the next phase.

- The power plant consists of 28 stations, each station has 4 inverters with capacity of 625 kW/machine and 2 medium voltage transformers with capacity of 1.250 kVA.

Other Equipment and components:

- The power cable connected to the main transformer station uses 22 KV three-phase copper cables, XLPE insulated cable, sections of 35 mm^2,70 mm^2, 90 mm^2 and 120 mm^2,depend on the location.

- The electrical cable line is located in the roughing along the internal traffic road of the Power Plant.

- Earth connection in Power Plant: PV panel support system, inverter and transformer station are grounded, the grounding resistance is ensured to be less than 0.5 ohm.

Monitoring System:

- SCADA control and monitoring system: The SH Solar power project is designed according to the type with watchman, equipped with the computer-controlled system that meets the technical requirements in accordance with regulations. The system is equipped with the following functions: data collection, data processing, control, monitoring and analysis of plant and transformer station operations; connecting and exchanging data with SCADA systems in dispatch center according to current standards (IEC 61850, IEC 60870-5104); Automatically collecting and analyzing the break-down data of relay.

The details of the equipment to be used for the project is as follows:

Solar Panel	Manufacturer	Hanwha Q CELLS
	Model	Q.PLUS L-G4.2 345
	Type	Poly crystal
	Rated Max. Power at STC	345W + 5W
	Module Efficiency	17.3%
	Class of Module	A
	Dimensions	1994X1000X35 mm
	Degradation Gradient	0.6%/year
	Warranty	83% of nominal power up to 25years.
Inverter	Manufacturer	HYOSUNG
	Model	HS-P625GLO
	Input	
	Rated DC Input Power	685kW
	Max. DC Input Voltage	1000V
	DC Voltage Range	550-1000V
	MPP Voltage Range	550-850V
	Max. DC Current	1245A
	Output	

	Rated AC Output Power	625kW
	Max. AC Output Power	625kW
	Rated AC Voltage Range	340V (-12 ~ +10)%
	Rated Grid Voltage	340V
	Rated Output Current	1061A
	Max Efficiency	>98%
	Dimensions	2222x2188x1013mm
	Ambient Temperature Range	(-20 ~ 50)℃
	Warranty	3 Years
Transformer	Manufacturer	HYOSUNG
	Model	N/A
	Rating Power	1300/(650+650) kVA
	Rated Voltage	HV 22,000V, LV 340V
	Cooling Method	ONAN
PV Cables	Manufacturer	TAIHAN
	Model	0.6/1kV Cu/XLPE/FR-PVC 1Cx6 mm2
	Diameter	3.12mm
	Total Length	105 km
63MVA Transformer	Manufacturer	ABB
	Model	N/A
	Rated Power	48/63 MVA
	Rated Voltage	HV 115kV, MV 23kV, LV 11kV

Existing scenario for the implementation of the project activity is continuation of the previous practice which means that power will be supplied by the regional power grids.

The PV technology has been imported from Hanwha Q-cell in South Korea. The technologies and know-how of the project have been transferred to the host country such that the labour working at the plant is local and has worked with the contractor throughout the installation and operations and maintenance phase thus resulting in the technological development of our human resource.

Although the Operations and Maintenance have been outsourced to the contractor, the local labour and employees working at the site have been able to get trained in handling the technology.

A.4. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Socialist Republic of Viet Nam (host Party)	Private entity - SH Solar Farm Vina Co.,Ltd	No
Republic of Korea	Private entity - SH Power Co.,Ltd	
Republic of Korea	Private entity - Soosan Industries Co.,Ltd	
Republic of Korea	Private entity - Halla E&C Co.,Ltd	

A.5. Public funding of project activity

>> The project is not receiving any public funding from Annex-I countries and no diversion of Official Development Assistance (ODA) involved in the project activity.

A.6. History of project activity

>>

Date	Milestone	Document
17/04/2018	Feasibility Study Report submission to Vietnam Government	Feasibility Study Report
06/05/2018	Local stakeholder consultation	Environmental Impact Assessment Report
01/06/2018	Environmental Impact Assessment Report submission to Vietnam Government	Environmental Impact Assessment Report
25/07/2018	Approval of Feasibility Study verification result	Announcement of basic design verification results of this project(VietNam Government)
27/07/2018	Approval of Environmental Impact Assessment Report	Approval document of Environmental Impact Assessment Report(VietNam Government)
27/09/2018 (starting date)	Signed contract for construction	Contract for Construction
27/02/2019	Prior Consideration Form submitted to the host country and UNFCCC	Submission of Prior Consideration Form
28/02/2019	Confirmation from VietNam DNA	Email regarding publication of project information for prior consideration of the CDM.
01/03/2019	Confirmation from UNFCCC	Email regarding publication of project information for prior consideration of the CDM.

A.7. Debundling

>> Large-scale project activities, not applicable

SECTION B. Application of selected methodologies and standardized baselines

B.1. Reference to methodologies and standardized baselines

>> The methodology used for this project is ACM0002: "Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources" (Version 19.0)

This methodology also refers to the followings tools (available on the UNFCCC CDM website):

(a) "TOOL01: Tool for the demonstration and assessment of additionality";
(b) "TOOL02: Combined tool to identify the baseline scenario and demonstrate additionality";
(c) "TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion";
(d) "TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation";
(e) "TOOL07: Tool to calculate the emission factor for an electricity system";
(f) "TOOL10: Tool to determine the remaining lifetime of equipment";
(g) "TOOL11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".

The tools that accompany the methodology and are referred-to in the methodology, for the purpose of computations and calculations, are as follows.

"Methodological Tool: Tool to calculate the emission factor for an electricity system" (Version 07.0)

Link for approved methodologies: https://cdm.unfccc.int/methodologies/PAmethodologies/approved

B.2. Applicability of methodologies and standardized baselines

>>

ACM0002 Applicability	Renewable Resources	Solar Photovoltaic
	Large Scale	70 MWp
	Grid Connected	Connected to National Grid; Install a Greenfield power plant

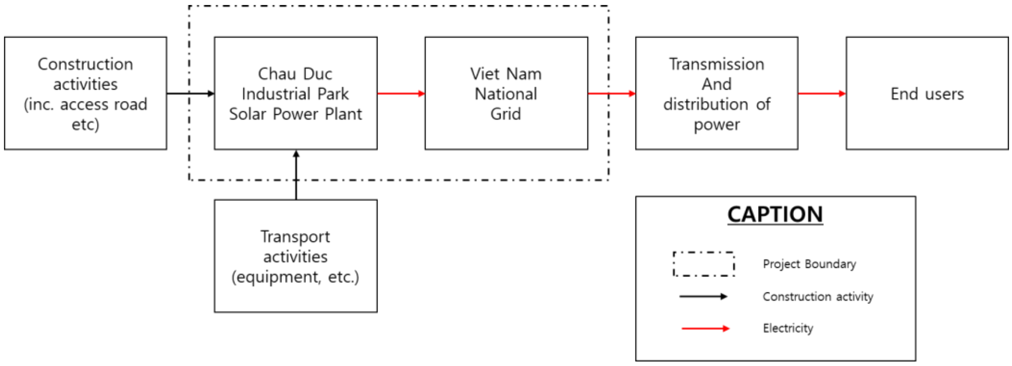
The 70MWp solar PV project is a newly installed Greenfield power project, which is neither a retrofit nor a capacity addition and does not involve switching from fossil fuels to renewable energy sources.

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

>>

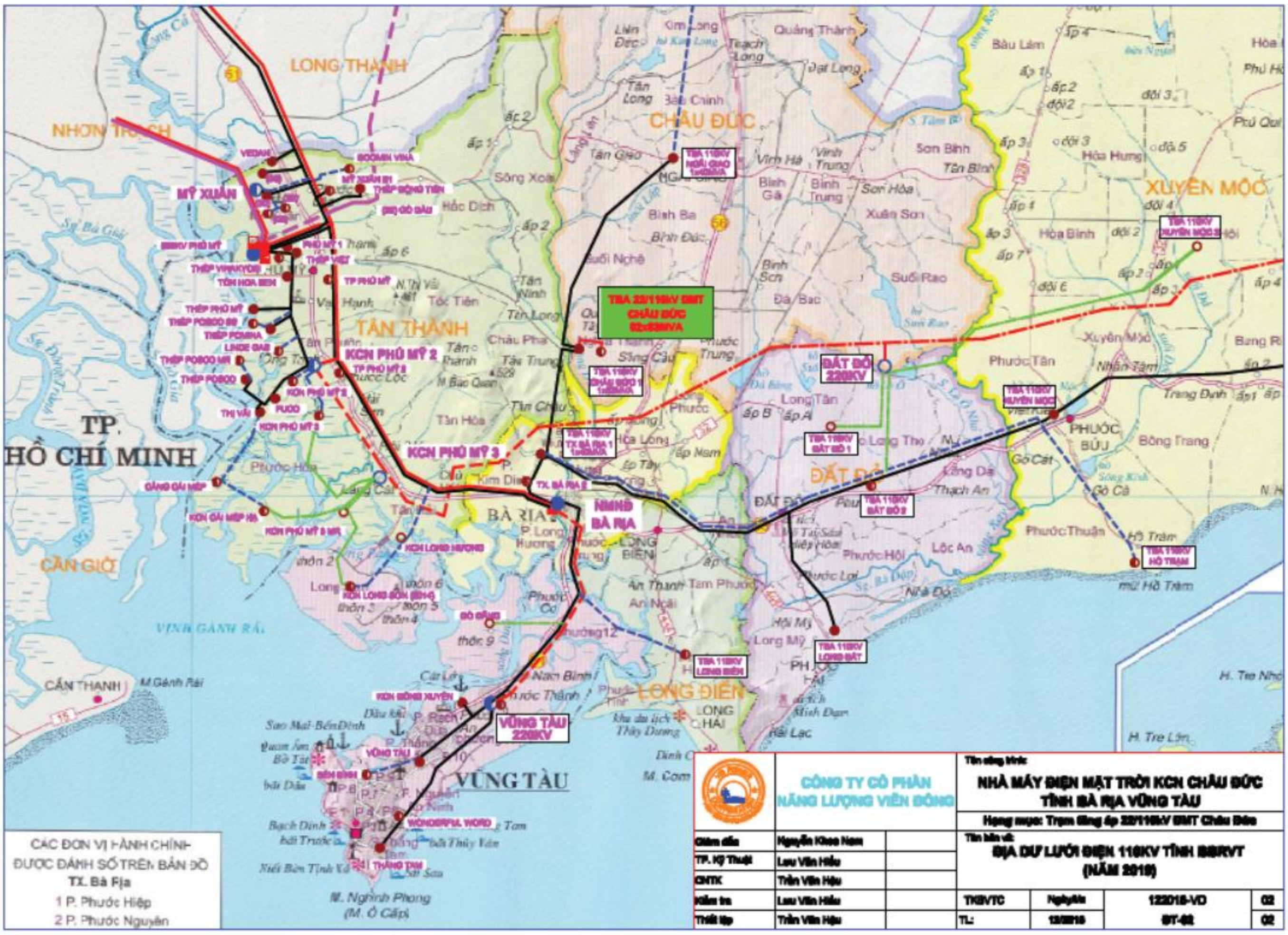
ACM0002 describes the project boundary as: "The spatial extent of the project boundary includes the project power plant/unit and all power plants/units connected physically to the electricity system that the CDM project power plant is connected to."

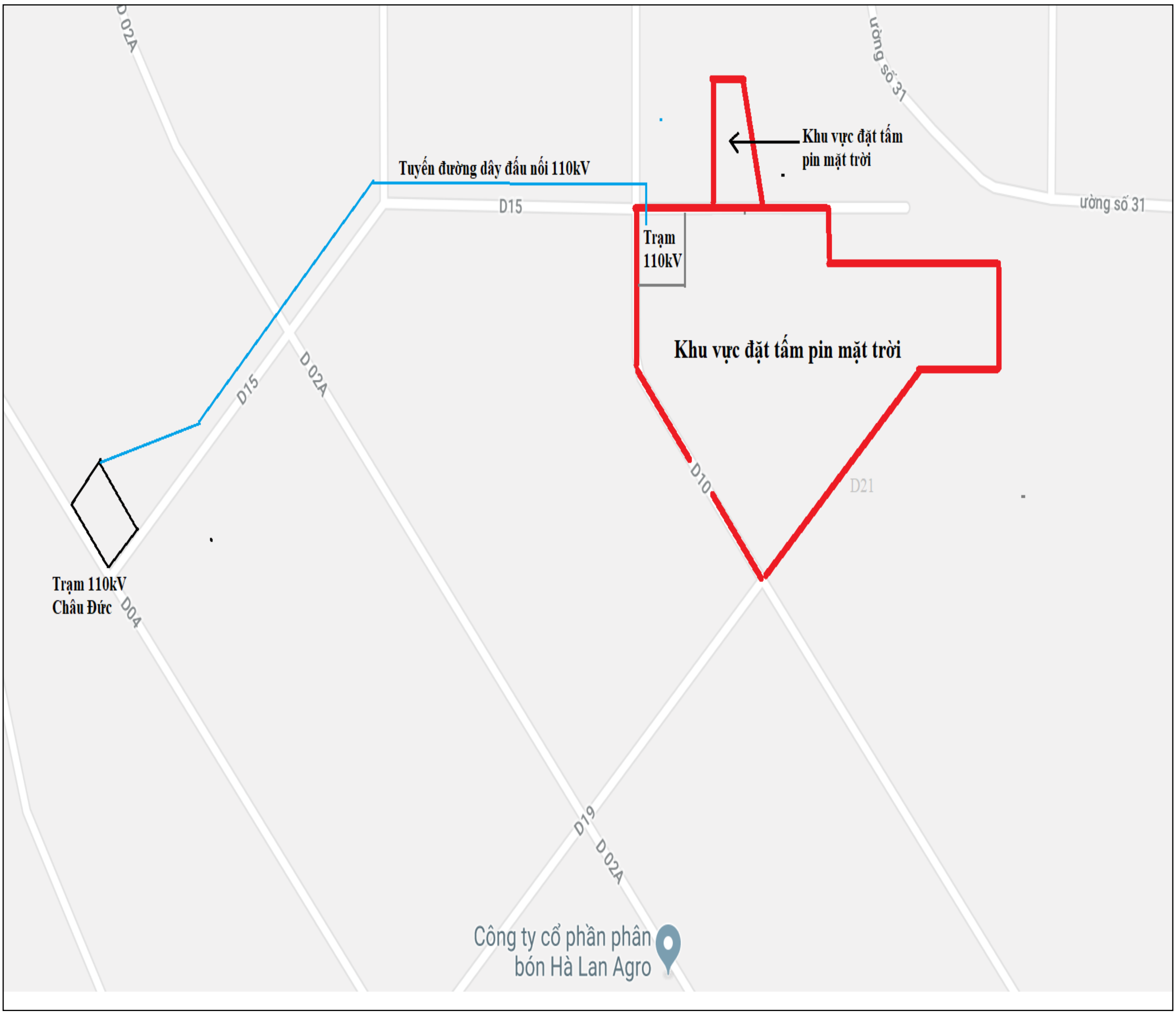
This is represented below in Figure B1.



The plant does not have any emission sources and GHGs within the project boundary that may need any monitoring. The plant boundary in the above diagram is shown via a dotted line whereas, the project is connected to the national grid through transmission lines, which are part of the national grid. The project boundary, thus, is depicted by solid line.

	Source	GHG	Included?	Justification/Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Main Emission Source
		CH_4	No	Minor Emission Source
		N_2O	No	Minor Emission Source
Project activity	Electricity generation from grid connected solar photovoltaic modules	CO_2	Yes	Zero-emissions from the project
		CH_4	No	Zero-emissions from the project
		N_2O	No	Zero-emissions from the project





B.4. Establishment and description of baseline scenario

>> The approved consolidated baseline methodology ACM0002 "Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources" recommends an analytical approach, whereby, the following options should be considered:

(a) Existing, actual or historical emissions as applicable; or
(b) Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment.

The approved consolidated methodology further prescribes that if the project activity is the installation of a new grid-connected Greenfield plant/unit, the baseline scenario is the following:
Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system."
The Project activity is generation of electricity from renewable energy sources.
The electricity generated from the solar PV plant has zero emissions; there is no material leakage and the electricity generated will be fed into the fossil intensive national grid through the interconnection facility at the site.
The state-owned company Electricity of Viet Nam (EVN) dominates power production, transmission, and sales in Viet Nam.

One of the key assumptions made in determining the baseline is to treat the whole grid system as one entity.
The grid system is not divided into provincial sub-groups (as in China for example), the only distinctions made by the EVN as to categorising power stations are by type (coal, gas, hydropower etc.) and ownership (state, independent power producer, "build-operate-transfer").

A conservative approach was taken by using the approved ACM0002 methodology, which considers that the Project activity would replace the weighted average of the ratio of emissions in the system represented by:

(a) The Operating Margin (OM) – the ratio of emissions from generation of all power generating projects in the defined system over the latest three year period excluding least cost/must run projects; and
(b) The Build Margin (BM) – the ratio of emissions attributable to the higher of (i) generation (MWh) from five most recent power projects built or (ii) generation (MWh) of the most recently built power plants equating to 20% of the most current annual system generation.

Accordingly, it is proposed to present in this PDD the measurement of emissions observed when comparing the "business as usual" case (without the project activity) with emissions under the project (the "project scenario" case).
The baseline emission factor (EFy) represents a conservative estimate of emissions per MWh of grid generation and the emissions "saved" per MWh of the project generation.
Vietnam□s average electricity grid emission factor of 0.7696 tCO2eq/MWh, as stipulated by the Government of Vietnam(Ministry of Natural Resources and Environment Vietnam) in March 2017 and the carbon dioxide intensity of the fuel source (other than electricity) used in the relevant industrial installations.

B.5. Demonstration of additionality

>> According to 5.3.1 of ACM0002_v19.0, solar photovoltaic technologies are in the positive list for grid connected electricity generation technologies. Moreover, it states that:
A specific technology in the positive list is defined as automatically additional if at the time of PDD submission, any of the following conditions is met:

a) The percentage share of total installed capacity of the specific technology in the total installed grid connected power generation capacity in the host country is equal to or less than two per cent; or

b) The total installed capacity of the technology in the host country is less than or equal to 50MW.

According to the annual EVN 2017 report, the smallest share of power sources connected to Vietnam power grid is imported electricity, accounting for 1 percent of the total.
Therefore, the portion of solar power generation power not specified in the report is less than 2%.
In other words, the total installed capacity of a grid-connected plant in the host country is less than 2%, so the total installed capacity of a particular technology meets (a) of the two conditions, which automatically proves additionality.

Since the project stands automatically additionality because of fulfilling the above a condition, "the Tool for the Demonstration & Assessment of Additionality" needs not be used here.

B.6. Estimation of emission reductions

B.6.1. Explanation of methodological choices

>> According to the latest version of the methodology, ACM0002 – Large-Scale Consolidated Methodology: Grid-connected Electricity Generation from Renewable Sources, Version 19.0, since

the project activity is installation of Greenfield Renewable Energy Power Plant, the baseline scenario is as follows:

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants.

The equation for the calculation of baseline emissions is as follows:

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

Where:

BE_y	= Baseline emissions in year y (tCO_2/year)
$EG_{PJ,y}$	= 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 the “Tool to calculate the emission factor for an electricity system” (t CO2/MWh)

The “Tool to calculate the emission factor for an electricity system” is applied to estimate the Operating Margin (OM), Build Margin (BM) and Combined Margin (CM) when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid. So this is applicable for this proposed project activity.

The electricity generation from SH Solar Farm(greenfield power plant) provides the electricity quantity necessary for the baseline emission calculation.

Also, the project activity uses as source for the Vietnam's Grid Emission Factor calculation (Combined Margin) the Operating Margin and Build Margin coefficients provided by the DNA of the host country (publicly available).

The CO2 Emission Factor resulting from electricity generation verified in the Vietnam's Grid Emission Factor is calculated based on energy generation records from plants operated centrally by the Ministry of Industry and Trade Vietnam.

The method used to make this calculation is the dispatch analysis. This information is necessary for renewable energy projects connected to the electricity grid and implemented in Vietnam under the CDM.

Calculation of $EG_{PJ,y}$

The process for the calculation of EGPJ,y varies across different types of project activities. If the project activity is the installation of a Greenfield power plant, then:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

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

Calculation of $EF_{grid,CM,y}$

For the calculation of $EF_{grid,CM,y}$, the latest tool, “Tool to calculate the emission factor for an electricity system, Version 07.0”, has been used.

The methodological tool identifies six steps that need to be completed for the successful calculation of the $EF_{grid,CM,y}$.

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

Step 1: Identify the relevant electricity systems

According to the "Tool to calculate the emission factor for an electricity system, Version 07.0", a grid/project electricity system is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (e.g. the renewable power plant location or the consumers where electricity is being saved) and that can be dispatched without significant transmission constraints.

As per section B.4., the identified business as usual scenario is the continued generation of power by the Vietnamese national grid system, and baseline emissions are those produced as a result of this. Therefore, the Vietnam national grid is identified as the relevant electric power system.

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

According to the tool, project participants may choose between including only grid power plants or both grid and off-grid power plants to calculate the operating margin and build margin emission factor.

The calculation of the operating margin and build margin emission factor is based on the Vietnam Government study released in 2017.

For this project, option 1 is selected, that is, only grid-connected power plants would be considered for the purpose of calculation of OM and BM emission factor.

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

According to the tool, the calculation of the operating margin emission factor ($EF_{grid,OM,y}$) can be based on one of the following four methods:

a) Simple OM
b) Simple Adjusted OM
c) Dispatch Data Analysis OM
d) Average OM

For the proposed project activity, option (a), Simple OM, is being selected because low-cost, must- run resources constitute less than 50% of the project electricity system.

Option (d) cannot be used because the low-cost, must-run resources are less than 50% and a detailed data is not available to choose option (b) or (c).

The details of low-cost must-run generation of electricity is as follows:

The Ex ante option has been chosen for this project.

The emission factor using the Simple Operating method has been calculated using a three year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period.

Thus the ex-ante option has been used for this project. The years used are 2013-2015 inclusive.

As per the "Tool to calculate the emission factor for an electricity system, Version 07.0", low-cost/must-run resources are power plants with low marginal generation costs or dispatched independently of the daily or seasonal load of the grid.

They include hydro, geothermal, wind, low- cost biomass, nuclear, and solar generation.

As per the data, the low-cost/must-run resources for the national grid of Vietnam only constitute hydel and hydro power generation and constitute less than 50% of the total grid generation for the average of the five most recent years as per the availability of data.

The data does not indicate that coal is used as a low-cost/must-run resource.
As per the tool, the emissions factor, $EF_{grid,OM,y}$, for the simple OM method can be calculated using one of the two data vintages, which are as follows:

a) Ex ante option:

If the ex ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required.
For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation.

b) Ex post option:

If the ex post option is chosen, the emissions factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.
If the data required to calculate the emissions factor for year y is usually only available later than six months after the end of year y, alternatively the emission factor of the previous year y-1 may be used.
If the data is usually only available 18 months after the end of year y, the emission factor of the year proceeding the previous year y-2 may be used.
The same data vintage (y, y-1 or y-2) should be used throughout all crediting periods.
For the purpose of this project activity, option (a), the ex ante option has been chosen.
The data used for calculations of required parameters is the average of 2013-2015, the most recent data available at the time of submission of CDM-PDD to the DOE.

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

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (t CO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.
It may be calculated by one of the following two options.

(a) **Option A**: Based on the net electricity generation and a CO_2 emission factor of each power unit; or

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

As per the study Option A under Step 4 "Calculation based on average efficiency and electricity generation of each plant" of the Emission Factor Tool is employed.

Here the Simple OM emission factor is calculated based on the electricity generation of each power unit and an emission factor for each power unit, as follows:

$$EF_{grid,OM\ simple,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where:
$EF_{grid,OMsimple,y}$ = Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$ = CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m = All power units serving the grid in year y except low-cost/must-run power units
y = The relevant year as per the data vintage chosen in Step 3

Determination of $EF_{EL,m,y}$

Option A1 is chosen to determine the emission factor of each power unit

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \times NCV_{i,y} \times EF_{CO_2,i,y}}{EG_{m,y}}$$

Where:

$EF_{EL,m,y}$ = Simple operating margin CO_2 emission factor of power unit m in year y (tCO_2/MWh)
$FC_{i,m,y}$ = Amount of fossil fuel type i consumed by power unit m in year y (Mass or volume unit)

$NCV_{i,y}$ = Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)
$EF_{CO2,i,y}$ = CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)
$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
M = All power units serving the grid in year y except low-cost / must-run power units
I = All fossil fuel types combusted in power unit m in year y
Y = The three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option) or the applicable year during monitoring (ex post option), following the guidance on data vintage in step 3

Determination of $EG_{m,y}$

For grid power plants, $EG_{m,y}$ is determined as per the monitoring tables issued by the Vietnamese Ministry of Natural Resources and Environment.
Viet Nam currently imports electricity from China to make up for the shortfall in supply from its own generation system.
Whilst the emission factor of China's grid is higher than that of Viet Nam's, as a conservative approach, this PDD has considered these imports as zero emissions whilst taking into account their contribution to the overall power generation of Viet Nam

Step 5. Calculate the build margin (BM) emission factor

For the first crediting period, the build margin emission factor will be calculated *ex-ante* based on the most recent information available on units already built for sample group *m* at the time of CDM- PDD submission to the DOE for validation (Option 1).

Imports from China are not considered in the build margin calculation because as per the Emission Factor Tool, recent or likely future additions to transmission capacity are not planned so as to enable significant increases in imported electricity from China.

Calculation of the build margin factor:

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

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

<u>Step 6: Calculate the combined margin emissions factor</u>

As per the "Tool to calculate the emission factor for an electricity system", the calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) can be based on one of the following methods:

(a) Weighted average CM; or

(b) Simplified CM

The weighted average CM method is being used as it is the preferred method according to the tool.

Weighted average CM

The combined margin emission factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$$

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 (per cent)
w_{BM}	= Weighting of build margin emissions factor (per cent)

The default values of w_{OM} and w_{BM} are 0.75 and 0.25, respectively for wind and solar power generation activities owing to their intermittent and non-dispatchable nature for the first crediting period and for subsequent crediting periods as per the "Tool to calculate the emission factor for an electricity system".

Leakage

No leakage emissions are considered.

The emissions potentially arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport etc.) are neglected.

Emission Reductions

As per the methodology, "ACM0002 Version 19.0", emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year y (tCO_2/MWh)
BE_y = Baseline emissions in year y (tCO_2/MWh)
PE_y = Project emissions in year y (tCO_2/MWh)

For this project activity project emissions have been taken to be 0 according to ACM0002 (Grid- Connected Electricity Generation from Renewable Sources – Version 17.0) 5.4 clause no. 36. This project is a green energy project with no CO_2 emissions.

PE_y = 0

B.6.2. Data and parameters fixed ex ante

(Copy this table for each piece of data or parameter.)

Data / Parameter	$EF_{CO2,grid,y} = EF_{grid,CM,y}$
Data unit	tCO_2/MWh
Description	Combined margin CO_2 emission factor for grid connected power generation as calculated in DNA issued "IGES List of Grid Emission Factors ver10.4
Source of data	IGES List of Grid Emission Factors ver10.4 Institute for Global Environmental Strategies
Value(s) applied	0.7966 tCO_2/MWh
Choice of data or Measurement methods and procedures	As per the Emission Factor Tool
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	$EF_{CO2,grid,y} = EF_{grid,OM,y}$
Data unit	tCO_2/MWh
Description	Combined margin CO_2 emission factor for grid connected power generation as calculated in DNA issued "IGES List of Grid Emission Factors ver10.4
Source of data	IGES List of Grid Emission Factors ver10.4 Institute for Global Environmental Strategies
Value(s) applied	0.7777 tCO_2/MWh
Choice of data or Measurement methods and procedures	As per the Emission Factor Tool
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	$EF_{CO2,grid,y} = EF_{grid,BM,y}$
Data unit	tCO_2/MWh
Description	Combined margin CO_2 emission factor for grid connected power generation as calculated in DNA issued "IGES List of Grid Emission Factors ver10.4
Source of dat	IGES List of Grid Emission Factors ver10.4 Institute for Global Environmental Strategies
Value(s) applied	0.8531 tCO_2/MWh
Choice of data or Measurement methods and procedures	As per the Emission Factor Tool
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	$EG_{pj,y}$
Data unit	MWh
Description	Estimated annual power generation as stated in the "PPA Agreement" in the feasibility study

Source of data	feasibility study
Value(s) applied	102,530 MWh
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	

B.6.3. Ex ante calculation of emission reductions

>> **Project Emissions**

The project emissions have been taken to be 0 as mentioned in section B.6.1.

$$PE_y = 0$$

Baseline Emissions

As mentioned in section B.6.1, the baseline emissions for a system can be calculated as follows:

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

Where:

BE_y = Baseline emissions in year y (tCO_2/year)

$EG_{PJ,y}$ = 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)[5]

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO2/MWh)

The grid emission factor for the year 2015 has been calculated above to be:

$$\mathbf{EF_{grid,CM,y}} = 0.7966\ tCO_2/MWh$$

The quantity of net electricity supplied to the grid is estimated from the feasibility study to be:

$$EG_{PJ,y} = 102{,}530\ MWh$$

From the above values, the baseline emissions for the proposed project activity for the year 2015 thus come out to be:

$$BE_{2019} = 0.7966\ tCO_2/MWh * 102{,}530\ MWh$$
$$= 81{,}675\ tCO_2$$

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

The crediting period selected for the calculations is renewable crediting period of 7 years.

The starting period of crediting would be from the start of Commercial Operations Date or the date of registration of proposed project activity as CDM project, whichever is later.

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
Year 1	81,675.40	0	0	81,675.40
Year 2	81,675.40	0	0	81,675.40
Year 3	81,675.40	0	0	81,675.40
Year 4	81,675.40	0	0	81,675.40
Year 5	81,675.40	0	0	81,675.40
Year 6	81,675.40	0	0	81,675.40
Year 7	81,675.40	0	0	81,675.40
Total	**571,727.80**	**0**	**0**	**571,727.80**
Total number of crediting years	7			
Annual average over the crediting period	81,675.40	0	0	81,675.40

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

(Copy this table for each piece of data or parameter.)

Data/Parameter	$EG_{facility, y}$
Data unit	MWh/year
Description	Energy generated by the project activity and supplied to the national grid during the year (y)
Source of data	Standard metering of the net electricity supplied to the grid as indicated in the Energy Purchase Agreement (EPA)
Value(s) applied	102,530 MWh
Measurement methods and procedures	Electricity generated would be measured and monitored by the electricity meters on a continuous basis and readings will be taken everymonth for billing to the power purchaser. The data would also be monitored using SCADA system, having a data storage that would keep track of the historical data. Archive of the data would be available for last10 years.
Monitoring frequency	The data would be logged through the SCADA system every fifteen minutes, however, readings will be taken on a monthly basis for record keeping and billing to the power purchaser..
QA/QC procedures	Electricity meters have been calibrated as per national standards of Electric Power Trading Company(EVNEPTC), the power purchaser. The values can also be cross-checked using the invoices billed to EVNEPTC for payment.
Purpose of data	Calculation of Certified Emission Reduction (CER) units
Additional comment	

B.7.2. Sampling plan

>> The data would not be collected through sampling. It would be available on ground and recorded as per the actual generation of electricity.

B.7.3. Other elements of monitoring plan

>> The monitoring plan of this project will be carried out in accordance with the documents of the Vietnamese government. The name of the monitoring plan document is "Technical Design Agreement for Power Measure System and Measurement Data Collection System for Solar Power Plant in CHAU DUC IP By And BETWEEN ELECTRIC POWER TRADING COMPANY AND SH SOLAR FARM VINA CO., LTD."; No. 3086/EPTC-KT&CNTT-KDBD

1. Measurement location

- Main measurement location: at the extended 110kV outgoing compartment of 110kV Chau Duc substation connected to SPP in Chau Duc IP;
- Backup measurement location 1: at the extended 110kV outgoing compartment of 110kV Chau Duc substation connected to SPP in Chau Duc IP, adjacent to the main measurement location;
- Backup measurement location 2: at the 110kV outgoing compartment of 110kV substation of SPP in Chau Duc IP connected to Chau Duc 110kV substation and at total 110kV feeder of transformers T1, T2 of 110kV substation of SPP in Chau Duc IP;
- Measurement location serving output separation: at the 22kV outgoing compartments of 110kV
- substation of SPP in Chau Duc IP connected to solar cell clusters.

The power measurement system will be installed accordingly at the above measurement locations.

2. Power delivery and receipt method

a. Power delivery and receipt direction

- For the main measurement system and backup measurement system 1: the delivery direction is similar to the capacity direction from 110kV outgoing compartment connecting SPP in Chau Duc IP to 110kV bus bar of Chau Duc 110kV substation; the opposite direction is the receipt direction;
- For the backup measurement system 2 at the 110kV outgoing compartment of 110kV substation of SPP in Chau Duc IP: the delivery direction is similar to the capacity direction from the 110kV bus bar system of 110kV substation of SPP in Chau Duc IP to the outgoing compartment connecting to Chau Duc 110kV substation; the opposite direction is the receipt direction;
- For the backup measurement system 2 at the 110kV feeder of transformers T1, T2 of 110kV substation of SPP in Chau Duc IP: the delivery direction is similar to the capacity direction from transformers T1, T2 to 110kV bus bar of 110kV substation of SPP in Chau Duc !P; the opposite direction is the receipt direction;
- For measurement system serving output separation: the delivery direction is similar to the capacity direction from 22kV outgoing compartments to the 22kV bus bar of 110kV substation of SPP in Chau Duc IP;

b. Conversion of power output to the connection location

- The measurement location of SPP in Chau Duc IP is coincident with the connection location of SPP in Chau Duc IP at the extended 110kV outgoing compartment of Chau Duc 110kV substation connecting SPP in Chau Duc IP, so the power output of SPP in Chau Duc IP on the grid at the connection location shall be the power output in the direction crossing the measurement location multiplied by the conversion coefficient k as 1.0;
- In case of any other power plants connected to the station or the line of SPP in Chau Duc IP, Party A and Party B shall review measurement locations and reach an agreement on conversion coefficient k.

3. Current transformer

- For the main measurement system: The current circuit of meter uses the secondary coil of 0.2 accuracy grade, 10VA capacity of the Current transformer installed at the 110kV outgoing compartment of Chau Duc 110kV substation connected to SPP in Chau Duc IP, reserved for the main meter; the current transformation ratio is 400-600-800/1A; the transformation ratio used for measurement is 600/1A;

- For the backup measurement system 1: The current circuit of meter uses the secondary coil of 0.5 accuracy grade, 10VA capacity of the current transformer installed at the 110kV outgoing compartment of Chau Duc 110KV substation connected to SPP in Chau Duc IP, reserved for the backup meter 1; the current transformation ratio is 400-600-800/1A; the transformation ratio used for measurement is 600/1A;
- For the backup measurement system 2 at the 110kV outgoing of 110kV substation of SPP in Chau Duc IP: The current circuit of meter uses the secondary coil of 0.5 accuracy grade, 10VA capacity of the current transformer installed at the 110kY outgoing compartment of 110KV substation of SPP in Chau Duc IP connected to Chau Duc 110kV substation, reserved for the backup meter 2; the current transformation ratio is 400-600-800/1A; the transformation ratio used for measurement is 600/1A;
- For the backup measurement system 2 at the 110kV feeders of transformers T1, T2 of 110KV substation of SPP in Chau Duc IP: The current circuit of meter uses the secondary coil of 0.5 accuracy grade, 10VA capacity of the current transformer installed at the 110kV feeders of transformers T1, T2 of 110KV substation of SPP in Chau Duc IP, shared for the backup meter 2 and measurement devices; the current transformation ratio is 200-400/1A; the transformation ratio used for measurement is 400/1A;
- For measurement system serving output separation: The current circuit of meter uses the secondary coil of 0.5 accuracy grade, 10VA capacity of the current transformer installed at the 22kV outgoing compartments of 110KV substation of SPP in Chau Duc IP, shared for the output separation meter 2 and measurement devices; the current transformation ratio is 400-800/1A; the transformation ratio used for measurement is 400/1A;

4, Voltage transformer

- For the main measurement system: The voltage circuit of meter uses the secondary coil of 0.2 accuracy grade, 10VA capacity of the voltage transformer installed at the 110kV outgoing Compartment of Chau Duc 110kV substation connected to SPP in Chau Duc IP, reserved for the main meter; the voltage transformation ratio used for measurement is $\frac{110}{\sqrt{3}}/\frac{0.11}{\sqrt{3}}\ \text{kV}$;
- For the backup measurement system 1: The voltage circuit of meter uses the secondary coil of 0.5 accuracy grade, 10VA capacity of the voltage transformer installed at the 110kV outgoing compartment of Chau Duc 110kV substation connected to SPP in Chau Duc IP, shared for the backup meter 1 and measurement devices; the voltage transformation ratio used for measurement is $\frac{110}{\sqrt{3}}/\frac{0.11}{\sqrt{3}}\ \text{kV}$;
- For the backup measurement system 2 at the 110KV outgoing of 110kV substation of SPP in Chau Duc IP: The voltage circuit of meter uses the secondary coil of 0.5 accuracy grade, 10VA capacity of the voltage transformer installed at the 110KV outgoing compartment of 110KV substation of SPP in Chau Duc IP connected to Chau Duc 110kV substation, reserved for the backup meter 2; the voltage transformation ratio used for measurement is $\frac{110}{\sqrt{3}}/\frac{0.11}{\sqrt{3}}\ \text{kV}$;
- For the backup measurement system 2 at the 110kV feeders of transformers T1, T2 of 110KV substation of SPP in Chau Duc IP: The voltage circuit of meter uses the secondary coil of 0.5 accuracy grade, 10VA capacity of the voltage transformer installed at the 110kV bus bar of 110kV substation of SPP in Chau Duc IP(using 02 separate secondary coils), shared for the backup meter 2 and measurement devices; the voltage transformation ratio used for measurement is $\frac{110}{\sqrt{3}}/\frac{0.11}{\sqrt{3}}\ \text{kV}$;
- For measurement system serving output separation: The voltage circuit of meter uses the secondary coil of 0.5 accuracy grade, 50VA capacity of the voltage transformer installed at the 22kV bus bars C41, C42 of 110kV substation of SPP in Chau Duc IP, shared for output separation meters and measurement devices; the voltage transformation ratio used for measurement is $\frac{110}{\sqrt{3}}/\frac{0.11}{\sqrt{3}}\ \text{kV}$;

5. Meters

- For the main measurement system: Use 3-phase 4-wire electronic meters, Elster-A1700, rated voltage of 3x63.5/110V, rated current 3x1(1.2)A, accuracy grade 0.2s for active power and 2.0 for reactive power;

- For the backup measurement systems 1 and 2 and measurement system serving output separation: Use 3-phase 4-wire electronic meters, Elster-A1700, rated voltage of 3x58/100-240/415V, rated current 3x1(1.2)A, accuracy grade 0.5s for active power and 2.0 for reactive power.
- Features and auxiliary devices meet the conditions of pairing the remote data collection and transmission system located at the measurement data management unit.

6. Measurement data collection system

As agreed in the technical design agreement documents for the power measurement system of SPP in Chau Duc IP, enclosed to the document No. 207/HALLA-TTDD dated 20/7/2018 of SH Solar Farm Vina Co., Ltd. with the following main contents:

- Connecting meter group: Connect meters into a group in the form of multi-drop using the communication port RS485. Connect 02 meter groups using optical fiber cables via electro-optical and optical-electro converters;
- Main connection line to the Measurement data management unit: WAN of Vietnam competitive generation market (VCGM WAN);
- Backup connection line to the Measurement data management unit: VPN connection via Internet line;
- Measurement data collection software at the Measurement data management unit: Use Itron Enterprise Edition software installed at the Measurement data management unit;
- Measurement data collection software at SPP in Chau Duc IP: To meet requirements at the Decision No.56/QD-DTDL dated May 20, 2011 of the National Load Dispatch Department;
- Security: To meet requirements at the Decision No. 56/QD-DTDL dated May 20, 2011 of the National Load Dispatch Department;
- Conversion, transmission devices: To meet requirements at the Decision No. 56/QD-DTDL dated May 20, 2011 of the National Load Dispatch Department.

7. Seal

As agreed in the technical design agreement documents for the power measurement system of SPP in Chau Duc IP, enclosed to the document No. 207/HALLA-TTDD dated July 20, 2018 of SH Solar Farm Vina Co., Ltd.

SECTION C. Start date, crediting period type and duration

C.1. Start date of project activity

>> Start date of project activity is September 27, 2018 and it is defined as the date when the Letter of Acceptance was signed (given in Contract For Construction).
This is the date after which the contractor was mobilized at site to start design and construction the solar power plant.

C.2. Expected operational lifetime of project activity

>> The expected operational lifetime is derived from the manufacturing information i.e. 25 years.
The tool used to calculate the remaining lifetime of the project equipment is "Tool to Calculate the Remaining Lifetime of the Project, Version 1, EB 50 Report, Annex 15, Page 1."
Using option (a) of the tool, 'Use manufacturer's information for the technical lifetime of equipment and compare to the date of first commissioning'.
As per the tool, This option can only be applied if:

1. Manufacturer's information for the technical lifetime of the equipment is available;
2. The project participants can demonstrate that the equipment has been operated and maintained according to the recommendations of the equipment supplier to ensure that the technical lifetime specified by the manufacturer is not reduced; and
3. There are no periodic replacement schedules or scheduled replacement practices specific to the industrial facility, that require early replacement of equipment before the expiry of the technical lifetime;

4. The equipment has no design fault or defect and did not have any industrial accident due to which the equipment cannot operate at rated performance levels.

Manufacturer's information on the following equipment is available in Energy Purchase Agreement, Schedule 29:

Equipment	Manufacturer	Equipment Lifetime	Certificate Available
PV Panels	Hanwha Q-cell	25 years	Yes
Inverters	Hyosung	25 years	Yes

Solar PV panels and inverters are the major equipment of the 70MWp plant and the manufacturers of both the equipment list the lifetime of the equipment to be of 25 years.

Moreover, the equipment is being operated as per the recommendations of the equipment supplier. The contract for the operations & maintenance of the plant belongs to Hyosung, the manufacturer of the inverters, whereas, an O&M manual10 is given, which specifies the maintenance criteria in accordance with manufacturer's recommendations for both the equipment.

There are no periodic replacements of the major equipment scheduled during the lifetime of the project.
The financial bid of the O&M contractor11 also states that the lifetime of all the major equipment of the plant are over 25 years so no periodic replacement is scheduled in this regard.

The equipment does not have any design defect and did not have any industrial accident that reduces the performance or efficiency of the plant.

Given the above information and justification, the lifetime of the plant can be safely assumed to be 25 years.

C.3. Crediting period of project activity

C.3.1. Type of crediting period

>> Renewable crediting period, First period of crediting

C.3.2. Start date of crediting period

>> The start date of crediting period is 01/06/2019 or the CDM registration date whichever is later.

C.3.3. Duration of crediting period

>> 7 years 0 month

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>

Evaluation and forecast of impacts during construction preparation phase

The project was built on an area of 60 hectares in the completed Chau Duc industrial park. There are no land acquisition and compensation activities. Therefore, the impacts during the preparation of the project are not available

Evaluation and forecast of impacts in the construction phase

Impact impacts related to waste

1. Impact on air environment

During the construction process, in the area around the air quality project is affected by the means of transportation, construction, ground leveling, earthworks, transporting materials causing. The main pollutants are dust, smoke containing CO, SOx, NOx, Hydrocarbon.

The concentration of dust, CO, SO2and NO2 in the exhaust smoke of construction vehicles (the levelling process and the construction process of construction items) is lower than the limit of the allowed standard. (QCVN 19: 2009 / BTNMT - Column B). In addition, construction equipment must not be used at the same time and not in the same location, so emissions from construction vehicles are easily dispersed.

However, the project participant will also apply construction vehicle control solutions to minimize the impact of emissions on ambient air quality.

2. Impact on water environment

Source of waste water during construction of the project is mainly domestic wastewater of construction workers. The number of workers participating in construction is 55 people.

Comparison of concentrations of pollutants in domestic wastewater with the National Technical Regulation on domestic wastewater (QCVN 14: 2008 / BTNMT, column B) shows that most parameters have a content exceeding the Standard Allow, if not treated, can cause surface water quality degradation. Therefore, the project plans to arrange mobile toilets to ensure that domestic wastewater is collected and not discharged into the environment. Therefore, this impact is assessed as small and controllable and minimized.

In general, the impact of pollution due to stormwater runoff during the construction phase is not large, rainwater is mainly high turbidity due to the rolling of rock and part of construction materials scattered during construction.

3. Impact due to solid waste generation

Solid waste generated during construction phase includes construction waste and domestic waste of construction workers.

Construction solid waste: including construction and waste materials such as iron, scrap steel, brick, stone, cement, etc. This amount of waste is estimated at 30-50kg / day. This waste is not discharged into the environment but will be reused for levelling (brick, stone, debris, etc) or reusing, selling scrap (iron, steel, etc). Therefore, the impact of construction waste is negligible.

Domestic solid waste: With a maximum of 55 workers / day, an average of 0.45 kg / person / day is discharged per person. The total amount of waste generated is about 25 kg / day. The main components of domestic waste include:

- Organic compounds such as fruits and vegetables, excess food
- Packages, packages for food and drinks
- Inorganic compounds such as plastic, plastic, glass
- Metal like cans

At the construction site, domestic solid waste is collected and gathered in the waste

collection area. The project will contract with the collection team at the Industrial Park to transport and handle it.

4. Impact due to hazardous waste generation

Hazardous solid wastes include: Greasy rags, oil, paint and solvent containers, etc., are not much (about 5-6 kg / month depending on the situation at the construction site) during the process.

All hazardous waste generated will be collected, sorted and stored in covered containers, labelled and placed in a safe location at the site.

Because the volume is not much, hazardous waste will be stored. Once every 6 months and at the end of construction, the project owner and the construction contractor will contract with a specialized unit (having a license to transport and handle hazardous waste) for transportation and handling. managing all hazardous waste at construction sites. The process of collecting, storing, transporting and processing are subject to hazardous waste management regulations so this impact is small and controllable.

Impact impacts not related to waste

1. Impact due to noise and vibration

The typical vibration emission level of machinery used in construction is shown in the table below. This is also the source of vibration generated from the activities of equipment and machinery in the construction of project items of the Project

According to QCVN 27: 2010 / BTNMT on vibration acceleration, the allowed level of vibration in construction activities in residential areas mixed with commercial, service and production areas must not exceed 75dB.

Compared to the Standard, the vibration of construction mechanics is about 30m from the source within the permissible limits of QCVN 27: 2010 / BTNMT

2. Impact to public transport

The process of transporting and gathering materials and equipment for construction mainly by road traffic, in the course of transportation may affect road traffic as follows:

Increase the density of means of transport on the roads leading to the project area. Construction materials are purchased locally and transported and assembled by motor vehicles;

The risk of causing damage, subsidence when transporting equipment and machinery. The most noticeable is the transformer for the station because this is a super-weight device. The transport process complies with Circular 46/2015 / TT-BGTVT on September 7, 2015, regulating the load, the limited size of roads; circulation of overloaded vehicles, limited vehicles, tracked vehicles on roads; transporting super-length and super-weight goods; limit the loading of goods on road vehicles when participating in traffic on roads.

With the project construction scale not too large, the level of operation of transport means is not high, transporting heavy equipment will use specialized vehicles and comply with current regulations to ensure safety. for people and existing infrastructure systems. Therefore, this impact is moderate, controllable and minimized.

3. Impact on cultural and historical relics

Location of the project is located in the Industrial Park. Therefore, the project will not

cause any impact on the landscape or protected areas.

The results of the field survey showed that the project did not go near or cross any military area or cultural and historical site.

However, during construction, if historical relics or archaeological relics are found, investors and contractors report immediately to the Department of Culture, Sports and Tourism for consideration.

4. Impact due to concentration of workers

Spread the disease from construction workers to local people and vice versa in unsanitary conditions and regularly come in daily contact. This impact is assessed as small because there is a medical station in the locality; moreover, construction workers will be equipped with knowledge about prevention of infectious diseases.

For construction teams, direct contractors have strict regulations and management methods. All employees must abide by these rules and do not affect social order.

5. Impacts on other socio-economic activities

Due to the peculiar nature of the work, in addition to the main work of the construction project, it is required to have professional staff trained by technical construction from electric construction companies, the rest Other jobs such as excavation, transportation of soil, stone, materials, construction, etc. can mobilize local labor sources. This work can provide temporary jobs for local leisure workers.

The number of construction workers locally increases the demand for social services and amenities. The demand of construction workers on food, daily necessities and services leads to the development of a number of local services.

6. Impact due to power cut at Chau Duc 110kV substation to connect

The 110kV connection line will be built from 110kV station of the project to the existing 110kV Chau Duc station to join the national grid. In order to carry out the connection, it is expected to conduct power cuts at Chau Duc 110kV substation for 1 day to connect. In the process of power cut to ensure the supply of electricity for local and production activities, the Southern power system dispatching center will coordinate electricity from Ngai Giao 110kV station to ensure power supply.

With a short cut-off time and active supply of additional power, the impact from power cuts does not affect the region's production and living conditions.

No.	**Source**	**Waste / impact**	**The object is affected**	**The scale is affected**	**Impact position**
A	**Source of impact related to waste**				
1	***Dust, exhaust gas***				
1.1	Soil excavation	Generate dust	- Worker - Local people	Maximum 4,05 mg/m^3	At construction areas
1.2	Unloading construction materials	Generate dust	- Worker	Maximum 0,28 mg/m^3	Material handling area

No.	Source	Waste / impact	The object is affected	The scale is affected	Impact position
2	***Wastewater***				
2.1	Activities of construction workers	Domestic wastewater	-Surface water -Groundwater	6,19 m^3/day	Roadworks
3	***Solid waste***				
3.1	Activities of ground leveling and construction and construction of items	Organic soil from the process of digging surface soil	-Earth environment -Air environment -Natural landscape		Roadworks
3.2	Activities of construction workers	Domestic solid waste	-Earth environment -Air environment -Natural landscape	Average 22 kg / day	Roadworks
3.3	Xây dựng các hạng mục	Construction solid waste: including cement, iron, steel, ...	-Earth environment -Air environment -Natural landscape	Average 30-50 kg / day	Location of construction
4	***Hazardous waste***				
	Build items	Greasy cloths, oil tanks, paints, solvents, ...	- Earth environment	Up to 10-12 kg / month depending on site use	Roadworks
B	**Impact sources are not related to waste**				
1	Transporting materials and equipment	- Increasing pressure on transportation system - Increase the density of means of transport - The risk of causing damage, subsidence, ... (when transporting equipment and	Hoi Bai-Chau Pha Street, National Road 56	Small	Hoi Bai-Chau Pha Street, National Road 56

No.	Source	Waste / impact	The object is affected	The scale is affected	Impact position
		machinery with large loads and carrying raw materials, overloaded materials, ...)			
2	Construction of items	- Noise <70dBA	- Worker	medium	Construction area
		- Soil erosion	- Change of land use purpose - Surface water source	Small	Construction area
3	Drag and stretch the wire of the aerial connection	- Causing traffic disruption - Work accidents	- Traffic system - Worker	medium	Along the connection line
4	Focus workers	- Immigration - Spreadthe disease - Conflict	- Water Environme nt - Culture and socio-economic of the locality - Community health	medium	Mainly in construction area
5	Risks and incidents	- Work accidents; - Explosion	- Worker	Small	Construction area

Evaluation and forecast of impacts in the operation phase

Impact impacts related to waste

1. Impact on air environment

The project is an electrical engineering infrastructure project. The process of transporting solar power plants, transformer stations and connection lines is mainly the management, maintenance, maintenance and repair activities when incidents occur. Therefore, air, water, soil and waste pollution is almost negligible, without changing the nature or value of soil, water and air environments. The waste generated is mainly due

to the domestic waste of the operators of the station and the transformer oil arising when there is a problem.

2. Impact on water environment

The total number of employees in the operation period is 17 people, arranged to work in shifts, up to 3 people / shift and 3 working days. The rest of the staff will be rested alternately to ensure health because they must work in a high voltage environment. Water is used for living, sanitation, hand washing.

Daily domestic wastewater contains many suspended substances, high levels of organic matter, residues, nutrients (nitrogen, phosphorus) and microorganisms.

Comparing the concentration of pollutants in domestic wastewater with QCVN on domestic wastewater (QCVN 14: 2008 / BTNMT, column B) shows that the pollution parameters have exceeding the permitted standards.

However, the wastewater flow is low and treated by septic system before flowing into the sewage drainage system of the IZ and is directed to the centralized wastewater treatment system of the industrial zone before being discharged. environment. Therefore, the impact of domestic wastewater is considered not large, does not cause significant pollution to the environment.

At the substation and the operator, all yard grounds are concreted, as well as no contaminated areas. Therefore, rainwater flows over the base of the station, which is insoluble and does not follow the waste, so it is considered as clean water.

This stormwater runoff is directed directly into manholes (with garbage protection installed) located along the internal road and flowing under the rain drainage system of the industrial park.

During operation, there will be no routine cleaning. The battery will be cleaned with natural rain. However, in the case of risks when natural disasters (storms, etc) will make the battery will be affected by soil, sand reducing the performance of the battery. To ensure PV panels operate at the right capacity, the operator performs cleaning of PV panels with water to wash away all dirt.

PV panels are washed with a specialized cleaning machine with automatic washing hands or manual cleaning.

The solar power plant project selects the PV plate cleaning plan with a dedicated cleaning machine with an automatic arm to save time and labor costs.

Water used to clean the panels is clean water, stored by water tanks built by the project owner (water after washing the battery mainly contains dust, soil, sand without hazardous or polluting components. Organic). The amount of water after washing the battery will automatically seep into the soil surface below the panels. In addition, this work only needs to be done when there is a disaster risk, not periodically. According to meteorological data, the project area is less affected by storms and floods. Therefore, this impact is considered negligible.

3. Impact of solid waste

During the operation phase, the solid waste produced is most notably solar panels. Refer to solar power plant in Korea, the rate of failure is only about 0.005% / year, the total number of damaged panels in 1 year is estimated 11sheet.

For all batteries damaged during the warranty period, the owner will transfer to the repair supplier.

Domestic solid waste generated from the activities of employees at the station is about 4

kg / day (0.45 kg / person / day x 3 persons / shift x 3 shifts / day). Main components include:

- Organic compounds such as fruits and vegetables, excess food

- Packages, packages for food and drinks

- Inorganic compounds such as plastic, plastic, glass

- Metal like cans

Domestic solid waste will be collected and treated as follows:

- In the departments of the operator, the security house arranges the garbage baskets;

- Everyday, the trash staff collects waste in all rooms, stores it in a 240-liter garbage bin and concentrates in the area near the station gate;

- The project participant carry out the hire collection team of the Industrial Park to collect and transport to treat.

4. Impact due to hazardous waste generation

During operation, insulating oil is used in transformers. The MBA of the project is expected to be newly invested and will be provided by leading suppliers around the world with the electric industry developing. The equipment is provided to ensure electrical safety standards as well as environmental safety, so the insulation oil is determined not to contain PCBs. Used oil for transformers is mineral oil, distillate products from petroleum (hydrocarbon) are mainly composed of series of cords (CnH2n) and methane (CnH2n+2) Shell Diala AX type according to ANSI / ASTM D3487 standards.

Normally, insulating oil is fixed in the MBA used for circulation to cool or keep the function as an insulator, so normal insulation oil does not generate the environment.

The management and operation of substations can generate hazardous wastes such as waste toner cartridges, waste bulbs, waste batteries, oil-cleaning rags, etc.

When in operation, the project owner will register the hazardous waste source master book with the Department of Natural Resources and Environment under the guidance in Circular No. 36/2015 / TT-BTNMT on hazardous waste management.

All hazardous wastes generated at the station are collected, classified and stored with labeled containers and containers, with lids and arranged in hazardous waste storage areas.

The project owner will contract with a specialized unit to transport and treat all hazardous waste powder generated at the station in accordance with the regulations on hazardous waste management. Transportation and handling is done every 6 months and when needed.

Impact impacts not related to waste

1. Impact due to noise and vibration

During the operation phase, noise may be generated by the transformer (the only device with noise when operating). However:

- During the investment project and technical design phase, transformers are proposed to be built with noise level meeting international operating standard IEC-51 which is <70dBA in distance of less than 3m;

- When making bidding documents, the requirements of the noise level of the transformer when operating (<70dBA in less than 3m distance) are clearly stated in the

bidding documents. And during the bidding process, this noise level requirement will also be considered as other mandatory technical conditions;

Therefore, the selected contractor's (manufacturer) MBA will meet international operating standards <70dBA within a distance of 3m.

The maximum noise level caused by the transformer operation at the location adjacent to the station barrier above 50m from the transformer position may be estimated lower than the standard prescribed for normal areas (from 6 to 21 hours) according to QCVN 26: 2010 / BTNMT (70 dBA).

The measurement results show that noise at locations in the station is lower than QCVN 24: 2006 / BYT of the Ministry of Health.

Thus, the noise generated by the station can be negligible to the staff working at the station.

When in operation, the connection line can generate noise due to optical discharge when there is small rain, humid air and porcelain string dust but the noise level is very low, negligible.

2. Effect of electromagnetic fields

The electric field at the measurement positions in the station ranges from 284.5-1.317 V / m, lower than the value specified in Decree 14/2014 / ND-CP dated February 26, 2014 (5,000V / m) ;

In addition, the operating staff mainly concentrated in the operating room, which has a low electromagnetic field, is divided into shifts for no more than 8 hours, equipped with labor protection equipment and health examination. year by year. Therefore, the impact of electromagnetic fields at the station is assessed as average.

Under the 110kV connection line, the electric field strength 1m from the ground below the line is always <2.5kV / m, lower than the permitted level (5kV / m) so the ability to affect power Human health under the line is low.

Therefore, the project ensures electromagnetic safety according to current regulations and the ability to affect human health.

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3. Impact due to luminescent maintenance of line safety corridors

For the 110kV overhead connection line, the protection corridor is limited by two vertical planes parallel to the line, with a distance to the outer wire when the wire is in a static state of 4 m.

Plants inside and outside the safety corridors are capable of falling into lines, breaking power lines, causing power lines to be damaged or exploded causing disruption of electricity transmission and danger to people People live in the surrounding area. Therefore, plants in the corridor are safely cleared periodically, and plants grown in the corridors safely without distance will be pruned.

The road corridor clearing is done manually, when clearing the corridor, it must comply with Decree No. 14/2014 / ND-CP dated February 26, 2014 of the Government detailing the implementation of the Law electric power safety.

Crops after clearing (if any) will be collected, concentrated along the connection line. The maintenance team will hire a local waste collection team to transport it for processing.

4. Environmental impact of storage of solar panels

Damaged battery panels will be stored in the warehouse before being transferred to

units with hazardous waste treatment functions to handle the panels. The project owner will build a warehouse to store the panels. The warehouse is 40x20m in size, 5.3m roof top height, 8x8x16cm brick wall construction, reinforced concrete floor foundation 1x2 B20 stone, main door uses rolling door, aluminum window glass frame, ventilation door Aluminum foil book frame.

The warehouse uses steel and composite structures, single-reinforced concrete foundations, tole roofs combined with insulation.

These waste panels will be stored in a walled warehouse and covered. They do not generate an external environment, so there will be no environmental impact.

5. Benefits of implementing the project

These benefits include:

− Avoided generation costs: due to the project, the economy will reduce investment (avoid) for a certain amount of thermal power, and reduce the amount of fuel costs to generate electricity generated by the power project heaven provided.

- Health care costs avoided: by reducing the amount of air pollution and environmental pollution mitted when burning the amount of avoided fuel above; avoidable costs due to reducing the rate of global climate change (resulting from reduced emissions of harmful emissions to the ozone layer). According to Official Letter No. 315 / KTTVBDKH-GSPT dated March 17, 2017 of Department of Meteorology, Hydrology and Climate Change - Ministry of Natural Resources and Environment published, Vietnam grid emission factor in 2015 is 0.8154 tons of CO2 / MWh. Based on that, it can be seen that with the output estimated at 102,525 MWh / year of the solar power plant project in Chau Duc Industrial Park, it can reduce about 83,598 tons of CO2 per year.

Because of the recognition of these benefits, governments of developed solar power countries have incentive and incentive policies to support investors to develop solar power.

No.	Source	Waste/impact	The object is affected	The scale is affected	Impact position
A	**Source of impact related to waste**				
1	***Wastewater***				
1.1	Activities of operating workers	Domestic wastewater	-Surface water -Groundwater	1 m^3/day	Project Area
2	***Solid waste***				
2.1	Activities of operating workers	Domestic solid waste	-Earth environment -Air environment -Natural landscape	3,6 kg/day	Project area
2.2	Production waste	Damaged machines, equipment and tools: infrequent	- -	20-30 kg/yeat	Project area

No.	Source	Waste/impact	The object is affected	The scale is affected	Impact position
		and dependent on machine operation			
3	***Hazardous waste***				
3.1	Operation of electric stations and solar panels	Ink cartridges, waste bulbs, oil rags, batteries, ...	- Earth environment	15-25 kg/year	Project area
3.2	Operation of transformers	Insulating oil	- Earth environment	Up to 30 m^3	Transformer station area
B	**Impact sources are not related to waste**				
1	Operation of the station	- Effect of electric field strength; - Noise.	Employees	Great	Project area
2	Operation of the connecting line	- Effect of electric field strength	People live around the road	Small	Along the connecting corridor
3	Maintain and maintain safety corridors	- Cut down the tree; - Electric shock accident when a weather problem and workers are not well trained.	Biological and biodiversity resources	Small	At maintenance sites
4	Risks and incidents	- Explosion. - Stop the connection. - Transformer, oil spill transformer. -	- Maintenance workers	Small, mainly occurs when the weather is bad and there are problems when operating	Project area and along the connecting route

D.2. Environmental impact assessment

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Approval of Environmental Impact Assessment Report for the Solar power plant project in Chau Duc Industrial Park

The project was approved by the Government of Vietnam under the Environmental Impact Assessment Report. The approved contents are as follows.

Pursuant to the Law on Organization of Local Administration dated June 19, 2015;
Pursuant to the Law on Environmental Protection dated June 23, 2014;
Pursuant to the Government's Decree No. 18/2015/ND-CP dated February 14, 2015, prescribing environmental protection master plan, strategic environmental assessment, environmental impact assessment and environmental protection plan;

Pursuant to the Minister of Natural Resources and Environment's Circular No.27120 15/TT - BTNMT dated May 29, 2015 on strategic environmental assessment, environmental impact assessment and environmental protection plans;

At the proposal of the Council for Evaluation of Environmental Impact Assessment Report for the Solar power plant project in Chau Duc Industrial Park, Chau Duc District, Ba Ria - Vung Tau Province on June 1, 2018;

Considering the content of Environmental Impact Assessment Report for the Solar power plant project in Chau Duc Industrial Park, Chau Duc District, Ba Ria - Vung Tau Province that has been amended and supplemented with document No. 117/CV-KT dated June 25, 2018 by SH Solar Farm Vina Co., Ltd;
At the proposal of the Director of the Department of Natural Resources and Environment in Report No. 3490/TTr-STNMT dated July 5, 2018,

DECIDE:
Article 1, To approve Environmental Impact Assessment Report for the Solar power plant project in Chau Duc Industrial Park, Nghia Thanh Commune, Chau Duc District, Ba Ria - Vung Tall Province (hereinafter referred to as the "Project") prepared by SH Solar Farm Vina Co., Ltd. (The project owner) with the following main contents:

1. Scope, scale and capacity of the project: To invest in a solar power plant on an area of about 60 ha and a 110 KV connection line with a length of 856 m in Chau Duc Industrial Park, Nghia Thanh Commune, Chau Duc District, Ba Ria - Vung Tau Province.
2. Environmental protection requirements for the project The Project owner must comply with the following requirements:
a) In the course of construction and operation, to strictly control and treat wastes arising, strictly abide by relevant national standards and technical regulations on environment related, ensuring that noise and vibration meet national technical standards on environment.
b) To collect and treat exhaust gases, especially dust generated up to national technical standards on environment according to regulations. Waste water collection and treatment shall be in accordance with the agreement to receive waste water input of Chau Duc Industrial Park. To comply with the Decision No. 43/2011/QD-UBND dated August 23, 2011 of the People's Committee of Ba Ria - Vung Tau province promulgating regulations on zoning of waste gas emission and discharge of wastewater according to national technical regulations on environment in the province.
c) To manage, collect, store, transport and dispose of hazardous wastes, hazardous wastes and ordinary solid waste arising in the course of construction and operation, ensuring the requirements on sanitary protection and environmental conditions as prescribed
d) To implement the environmental monitoring and management program strictly according to the contents of the approved Environmental Impact Assessment Report. To implement periodic environmental monitoring program for waste at the frequency of every 03months. To periodically report at least every 6 months to the Department of Natural Resources and Environment for inspection and supervision

e) To work out plans and necessary plans and fully implement measures to prevent and respond to environmental incidents, especially incidents in the course of construction and activities related to fire and explosion safety, safety of project items and surrounding ones.

Reliability of the methods used in the Environmental Impact Assessment

Method of EIA

- Method of making list and matrix method:

  Lists and matrices are used to establish the relationship between project activities and environmental impacts.

- Method of comparison

  Based on survey results, field measurements, results of laboratory analysis and calculation results based on comparative theory with Vietnamese standards to determine environmental quality in the project construction area. , Refer to the documentation of similar projects on the scale made.

  These methods have been studied and published on many specialized documents, it is highly accurate, provides quite sufficient information needed to perform environmental impact assessment and forecasting, create basis quite solid to build an environmental monitoring program in the construction and operation stages.

- Prediction method and expert

  Some impacts need to be forecasted based on similar projects, practical tests and calculation tools in consultation with experts. From the forecast results, impacts will be classified and proposed appropriate mitigation measures.

  This method is based on theory and experience to predict and predict possible impacts. Based on that, consider the impact of the project on environmental quality.

  This method is subjective, the results depend on the awareness and qualifications of the researchers.

- Rapid assessment method

  This method was issued by the World Health Organization (WHO) in 1993. The basis of the rapid assessment method is based on the nature of materials, technology, rules of processes in nature and experience to Identify and characterize pollution parameters.

  This method results in limited results in the case of limited parameters and data on industries and activities. In this report, there are many data on waste load (waste gas, waste, ...) in the construction phase (earthworks, transportation, ...) that are estimated based on the scope of influence, Climate conditions, assumptions. In fact, the actual climate conditions are very volatile, so it can be seen that the quantitative data on pollutant load is difficult to achieve 100% accuracy.

Other methods

- Field survey method, field sampling and laboratory analysis

  Field survey for environmental sampling and laboratory analysis to determine the parameters of air quality, water, noise levels in the project area and around.

- Methods of statistics and data processing

  Conduct field surveys in communes and districts where the project goes through, Collect data through working sessions, questions, face-to-face interviews, ...

  After collecting, the data are statistic with many methods such as descriptive statistics, inference statistics, estimation and testing, analysis and processing in order to analyze

survey data of environmental factors. (water, air, ,,,) serve for the analysis of environmental status and environmental impact assessment.

The method has been verified and standardized, the result is likely to carry random errors.

- Method of modeling

Using the electric field transition program (EMTP) to calculate the electric field strength 1m from the ground below the 110kV line. From there, assess the electromagnetic impact of the project.

This method gives visual results, large systematic errors, depending on the tests and standardization performance.

Evaluate the reliability of the methods used:

The assessments in EIA reports are quite accurate based on the solid foundations, popular specialized documents of domestic and foreign professional units.

The selected evaluation methods and impact mitigation measures, based on the actual operation of the same lines, are therefore feasible and highly effective.

Evaluate the reliability of the methods used:

The assessments in EIA reports are quite accurate based on the solid foundations, popular specialized documents of domestic and foreign professional units.

The selected evaluation methods and impact mitigation measures, based on the actual operation of similar lines, are therefore feasible and highly effective.

Table 3.18: Reliability of EIA methods

No	EIA method	Trust level
1	Method of making list and matrix method	High
2	Comparative method	High
3	Forecasting methods and experts	medium
4	Quick assessment method	medium
5	Field survey methods, field sampling and laboratory analysis	High
6	Statistical methods and data processing	High
7	Modeling method	medium

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

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E.2. Summary of comments received

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E.3. Consideration of comments received

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SECTION F. Approval and authorization

>> No letters of approval from the Host country or from the Annex 1 country are available yet.

Appendix 1. Contact information of project participants

Organization name	SH Solar Farm Vina Co.,Ltd
Country	Vietnam
Address	D15 street Chau Duc Industrial Zone, Nghia Thanh Commune, Chau Duc Town, Ba Ria-Vung Tau Province, Vietnam
Telephone	+84-90-9977-957
Fax	
E-mail	peh86@soosan.co.kr
Website	
Contact person	Eun-hwan, Park

Organization name	SH Power Co.,Ltd
Country	Republic of Korea
Address	Huyndai Venture Ville 3F 307, 10, Bamgogae-ro 1gil, Gangnam-gu, Seoul, Republic of Korea
Telephone	+82-2-2017-8123
Fax	+82-2-2017-8181
E-mail	Kbk0311@soosan.co.kr
Website	
Contact person	Byeong-Kyu, Kim

Appendix 2. Affirmation regarding public funding

The project does not receive any public funding from Annex I countries.

Appendix 3. Applicability of methodologies and standardized baselines

The applicability of the methodology has been discussed in section B.2.

Appendix 4. Further background information on ex ante calculation of emission reductions

All the information required for the calculation has been given in section B.6., and an excel sheet would be provided, showing all the figures used for the calculations of emission reductions. No further information is required in this regard.

Appendix 5. Further background information on monitoring plan

The monitoring plan has been discussed in section B.7. No further information is available in this regard.

Appendix 6. Summary report of comments received from local stakeholders

Appendix 7. Summary of post-registration changes

The proposed project activity is not registered yet and hence no post registrations changes have been recorded.

Document information

Version	Date	Description
10.1	28 June 2017	Revision to make editorial improvement.
10.0	7 June 2017	Revision to: • Improve consistency with the “CDM project standard for project activities” and with the PoA-DD and CPA-DD forms; • Make editorial improvement.
09.0	24 May 2017	Revision to: • Ensure consistency with the “CDM project standard for project activities” (CDM-EB93-A04-STAN) (version 01.0); • Incorporate the “Project design document form for small-scale CDM project activities” (CDM-SSC-PDD-FORM); • Make editorial improvement.
08.0	22 July 2016	EB 90, Annex 1 Revision to include provisions related to automatically additional project activities.
07.0	15 April 2016	Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0).
06.0	9 March 2015	Revision to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.
05.0	25 June 2014	Revision to: • Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the "Guidelines for completing the project design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1; • Change the reference number from F-CDM-PDD to CDM-PDD-FORM; • Make editorial improvement.
04.1	11 April 2012	Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b.
04.0	13 March 2012	Revision required to ensure consistency with the “Guidelines for completing the project design document form for CDM project activities” (EB 66, Annex 8).
03.0	26 July 2006	EB 25, Annex 15
02.0	14 June 2004	EB 14, Annex 06b

Version	*Date*	*Description*
01.0	03 August 2002	EB 05, Paragraph 12 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: project activities, project design document