

المجلس العالمي للبصمة الكربونية
GLOBAL CARBON COUNCIL



Project Submission Form

V3.2 - 2020

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COVER PAGE- Project Submission Form (PSF)	
BASIC INFORMATION	
Title of the Project Activity	26MW Pake Hydro Power Plant
PSF version number	Version 01
Date of completion of this form	01/07/2022
Project Owner(s) <small>(Shall be consistent with De-registered CDM Type B Projects)</small>	Song Da 9 Joint Stock Company
Country where the Project Activity is located	Vietnam
GPS coordinates of the project site(s)	Latitude: 22°41'53.55"N (22.6982°) Longitude: 104°20'10.88"E (104.3363°)
Eligible GCC Project Type as per the Project Standard <small>(Tick applicable project type)</small>	<input checked="" type="checkbox"/> Type A: <input type="checkbox"/> Type A1 <input checked="" type="checkbox"/> Type A2 <input type="checkbox"/> Type B – De-registered CDM Projects:¹ <input type="checkbox"/> Type B1 <input type="checkbox"/> Type B2

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

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<p>Minimum compliance requirements</p>	<input checked="" type="checkbox"/> Real and Measurable GHG Reductions <input checked="" type="checkbox"/> National Sustainable Development Criteria (if any) <input checked="" type="checkbox"/> Apply credible baseline and monitoring methodologies <input checked="" type="checkbox"/> Additionality <input checked="" type="checkbox"/> Local Stakeholder Consultation Process <input checked="" type="checkbox"/> Global Stakeholder Consultation Process <input checked="" type="checkbox"/> No GHG Double Counting <input checked="" type="checkbox"/> Contributes to United Nations Sustainable Development Goal 13(Climate Action)																																			
<p>Choose optional and additional requirements <small>(Tick applicable label categories)</small></p>	<input checked="" type="checkbox"/> Do-no-net-harm Safeguards to address Environmental Impacts <input checked="" type="checkbox"/> Do-no-net-harm Safeguards to address Social Impacts <input checked="" type="checkbox"/> Contributes to United Nations Sustainable Development Goals (in addition to Goal 13)																																			
<p>Applied methodologies <small>(Shall be approved by the GCC or the CDM)</small></p>	<p>ACM0002 Grid-connected electricity generation from renewable sources, ver 20.0</p>																																			
<p>GHG Sectoral scope(s) linked to the applied methodology(ies)</p>	<p>GHG Sectoral Scope GHG SS1- Energy (Renewable/Non Renewable sources)</p>																																			
<p>Applicable Rules and Requirements for Project Owners <small>(Tick applicable Rules and Requirements)</small></p>	<table border="1"> <thead> <tr> <th data-bbox="505 1205 1081 1247">Rules and Requirements</th> <th data-bbox="1081 1205 1273 1247">Reference</th> <th data-bbox="1273 1205 1453 1247">Version</th> </tr> </thead> <tbody> <tr> <td data-bbox="505 1247 1081 1304"><input checked="" type="checkbox"/> ISO 14064-2</td> <td data-bbox="1081 1247 1273 1304"></td> <td data-bbox="1273 1247 1453 1304"></td> </tr> <tr> <td data-bbox="505 1304 1081 1381"><input checked="" type="checkbox"/> Applicable host country legal requirements /rules</td> <td data-bbox="1081 1304 1273 1381"></td> <td data-bbox="1273 1304 1453 1381"></td> </tr> <tr> <td data-bbox="505 1381 695 1818"> <input checked="" type="checkbox"/> GCC Rules and Requirements² </td> <td data-bbox="695 1381 1081 1438"><input checked="" type="checkbox"/> Project Standard</td> <td data-bbox="1081 1381 1273 1438"></td> <td data-bbox="1273 1381 1453 1438">V3.1</td> </tr> <tr> <td></td> <td data-bbox="695 1438 1081 1516"><input type="checkbox"/> Approved GCC Methodology (XXXXX)</td> <td data-bbox="1081 1438 1273 1516"></td> <td data-bbox="1273 1438 1453 1516"></td> </tr> <tr> <td></td> <td data-bbox="695 1516 1081 1572"><input checked="" type="checkbox"/> Program Definitions</td> <td data-bbox="1081 1516 1273 1572"></td> <td data-bbox="1273 1516 1453 1572">V3.1</td> </tr> <tr> <td></td> <td data-bbox="695 1572 1081 1650"><input checked="" type="checkbox"/> Environment and Social Safeguards Standard</td> <td data-bbox="1081 1572 1273 1650"></td> <td data-bbox="1273 1572 1453 1650">V2.0</td> </tr> <tr> <td></td> <td data-bbox="695 1650 1081 1728"><input checked="" type="checkbox"/> Project Sustainability Standard</td> <td data-bbox="1081 1650 1273 1728"></td> <td data-bbox="1273 1650 1453 1728">V2.1</td> </tr> <tr> <td></td> <td data-bbox="695 1728 1081 1818"><input checked="" type="checkbox"/> Instructions in Project Submission Form (PSF)-template</td> <td data-bbox="1081 1728 1273 1818"></td> <td data-bbox="1273 1728 1453 1818">V3.2</td> </tr> </tbody> </table>			Rules and Requirements	Reference	Version	<input checked="" type="checkbox"/> ISO 14064-2			<input checked="" type="checkbox"/> Applicable host country legal requirements /rules			<input checked="" type="checkbox"/> GCC Rules and Requirements ²	<input checked="" type="checkbox"/> Project Standard		V3.1		<input type="checkbox"/> Approved GCC Methodology (XXXXX)				<input checked="" type="checkbox"/> Program Definitions		V3.1		<input checked="" type="checkbox"/> Environment and Social Safeguards Standard		V2.0		<input checked="" type="checkbox"/> Project Sustainability Standard		V2.1		<input checked="" type="checkbox"/> Instructions in Project Submission Form (PSF)-template		V3.2
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²GCC Program rules and requirements: <https://www.globalcarboncouncil.com/resource-centre.html>

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	<input type="checkbox"/> Add rows if required			
	<input checked="" type="checkbox"/> CDM Rules ³	<input checked="" type="checkbox"/> Approved CDM Methodology (XXXXX)	ACM 0002	V20.0
		<input checked="" type="checkbox"/> Tool for the demonstration and assessment of additionality	TOOL 01	V7.0
		<input type="checkbox"/> Combined tool to identify the baseline scenario and demonstrate additionality	TOOL 02	
		<input checked="" type="checkbox"/> Tool to calculate the emission factor for an electricity system	TOOL 07	V7.0
		<input type="checkbox"/> Demonstration of additionality of microscale project activities	TOOL 19	
		<input type="checkbox"/> Demonstration of additionality of small-scale project activities	TOOL 21	
		<input type="checkbox"/> Additionality of first-of-its-kind project activities	TOOL 23	
		<input checked="" type="checkbox"/> Common practice	TOOL 24	V3.1
		<input checked="" type="checkbox"/> Investment analysis	TOOL 27	V11.0
		<input type="checkbox"/> Positive lists of technologies	TOOL 32	
		<input type="checkbox"/> Guidelines for objective demonstration and assessment of barriers		
		<input type="checkbox"/> Add rows if required		
<p>Choose Third Party External Project Verification by approved GCC Verifiers⁴</p> <p>(Tick applicable verification categories)</p>	<input checked="" type="checkbox"/> GHG emission reductions (i.e., Approved Carbon Credits (ACCs)) <input checked="" type="checkbox"/> Environmental No-net-harm Label (E⁺) <input checked="" type="checkbox"/> Social No-net-harm Label (S⁺)			

³CDM Program rules: <https://cdm.unfccc.int/Reference/index.html>


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

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	<input checked="" type="checkbox"/> United Nations Sustainable Development Goals (SDG+) <input type="checkbox"/> Bronze SDG Label <input type="checkbox"/> Silver SDG Label <input type="checkbox"/> Gold SDG Label <input checked="" type="checkbox"/> Platinum SDG Label <input type="checkbox"/> Diamond SDG Label <input checked="" type="checkbox"/> CORSIA requirements (C+) <input checked="" type="checkbox"/> Host Country Attestation on Double counting
<p>Declaration to be made by the Project Owner(s)⁵ (Tick all applicable statements)</p>	<p>The Project Owner(s) declares that:</p> <p><input checked="" type="checkbox"/> The Project Activity complies with the eligibility of the applicable project type (A1, A2, B1 or B2) as stipulated by the Project Standard.</p> <p><input checked="" type="checkbox"/> The Project Activity shall start operations, and start generating emission reductions, on or after 1 January 2016.</p> <p><input checked="" type="checkbox"/> The Project Activity is eligible to be registered under the GCC program.</p> <p><input checked="" type="checkbox"/> No carbon credits generated by the proposed Project Activity will be claimed as carbon credits in any other GHG program anywhere in the world, either for compliance or voluntary purposes, for the entire 10-year GCC crediting period.</p> <p><input checked="" type="checkbox"/> The proposed Project Activity, if Type A, is NOT registered as a GHG Project Activity in any other GHG program or any other voluntary program anywhere in the world.</p> <p><input checked="" type="checkbox"/> The proposed Project Activity is NOT included as a component Project Activity (CPA) in a registered GHG Programme of Activities (PoA) under any GHG program (such as the CDM or any other voluntary program) anywhere in the world.</p> <p><input checked="" type="checkbox"/> The proposed Project Activity is NOT a CPA that has been excluded from a registered PoA under any GHG program (such as the CDM or any other voluntary program) anywhere in the world.</p> <p>Provide details (if any) below for the boxes ticked above.</p> <p><input checked="" type="checkbox"/> If a GCC project chooses to apply to use ACCs under CORSIA, the Project Owner(s) is required to declare that they are aware that they must obtain and provide to the GCC and its Registry (operated by IHS Markit) a written attestation from the host country's national focal point (e.g., Ministry of Environment or Civil Aviation Authority) or focal point's designee, as required by CORSIA Emissions Unit Eligibility Criteria, which:</p>

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

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	<p><input checked="" type="checkbox"/> Confirms the avoidance of double counting as required by CORSIA;</p> <p><input checked="" type="checkbox"/> Shall be made publicly available prior to the use of units from the host country under CORSIA; and</p> <p><input checked="" type="checkbox"/> Places all responsibility on the Project Owner(s) to replace any and all doubly claimed or counted ACCs by the host country, in the GCC registry operated by IHS Markit.</p> <p>Provide details below for the boxes ticked above</p>
	<p>The Project Owner(s) declares that:</p> <p><input checked="" type="checkbox"/> All of the information provided in this document, including any supporting documents submitted to the GCC or its registry operator IHS Markit at any time, is true and correct;</p> <p><input checked="" type="checkbox"/> They understand that a failure by them to provide accurate information or data, or concealing facts and information, can be considered as negligence, fraud or willful misconduct. Therefore, they are aware that they are fully responsible for any liability that arises as a result of such actions.</p> <p>Provide details below for the boxes ticked above</p>
<p>Appendixes 1-7</p>	<p>Details about the Project Activity are provided in Appendixes 1 through 7 to this document.</p>
<p>Name, designation, date and signature of the Project Owner(s)</p>	<p>On behalf of Song Da 9 Joint Stock Company</p>  <p>Signature: Name: Vamsi Krishna M Designation: Business Head Authorized Representative: Kosher Climate India Private Limited Date:01/07/2022</p>

1. PROJECT SUBMISSION FORM

Section A. Description of the Project Activity

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

The Purpose of this project activity is to generate the clean electricity from the hydropower and feed the generated electricity to the Vietnam national grid.

The Pake hydropower project is located in the terraced system of the upstream of the Chay river. The project area is located along Chay River in the section of San Chai commune, Simacai district, Lao Cai Province and Pa Vay Su commune, Xin Man district, Ha Giang province.

The hydropower project is composed of a run-of-river hydropower plant built on terrace of chay river upstream with capacity of 26 MW. The plants are connected via a 110kV transmission line to the national grid.

The project is commissioned, operational and the total project capacity has been connected to the national Grid of Vietnam through the erected distribution and transmission lines. Generated power from the project is being supplied to the Provincial Vietnam Electricity Corporation (EVN). Project owners have signed a long-term power purchase agreements with the EVN to supply the generated power at the contracted price.

Project activity is commissioned on 25/11/2020 and successfully operational from the date of commissioning.

The project will replace average anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 76443 tCO₂e per year, thereon displacing estimated average of 95,067 MWh/year amount of electricity from the generation-mix of power plants connected to the national grid, which is mainly dominated by thermal/fossil fuel-based power plant. The project activity reduces 7,64,434 tCO₂e emissions during the entire crediting period.

Scenario existing prior to the implementation of project activity:

Prior to the implementation of the project activity, electricity in Viet Nam was produced mainly from fossil fuel sources and solely distributed to customers through the unique national electricity grid managed by Electricity of Viet Nam (EVN).

Baseline Scenario

The scenario existing prior to the implementation of the project activity, is electricity delivered to the grid by the project activity that 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”. This is a green field project activity. There was no activity at the site of the project participant prior to the implementation of this project activity. Hence pre-project scenario and baseline scenario is the same.

Sustainable Development Indicators

In addition to contribution to the sustainable environment by reducing the GHG emissions and reducing the dependency on fossil fuels, this project activity also contributing to the sustainable development though supporting the local community and local economy.

Social well-being: The project activity provided / provides job opportunity to local people during erection, commissioning, and maintenance of the Hydro project. This will result in the improvement of living standards of the local community. The installation of the renewable energy project will also lead to the development of basic infrastructure like roads and communication with the nearby cities, which will also improve the living standards of the local population.

Environmental well-being: Hydropower is one of the cleanest renewable energy powers and does not involve any fossil fuel. There are no GHG emissions. The impact on land, water, air and soil is negligible. Thus, the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.

Economic well-being: The project activity generates permanent and temporary employment opportunity within the vicinity of the project. The electricity supply in the nearby area improves which directly and indirectly improves the economy and life style of the area.

Technological well-being: The project activity is step forward in harnessing the untapped Hydropower potential and further diffusion of the Hydropower technology in the region. The project activity leads to the promotion and demonstrates the success of Hydropower projects in the region which further motivate more investors to invest in Hydropower power projects. Hence, the project activity leads to technological well-being.

A.2. Location of the Project Activity

This project is located in SiMaCai district, Lao Cai province and Xin Man district, Ha Giang province in Vietnam.

The table provides details of location of each project:

Project Promoters	Installed Capacity (MW)	Physical Address	Geographical Coordinates
Song Da 9 Joint Stock Company	26	San Chai commune, SiMaCai district, Lao Cai province and Pa Vay Su commune, Xin Man district, Ha Giang province, Vietnam	Latitude: 22°41'53.55"N (22.7225) Longitude: 104°58'23" E (104.9730)

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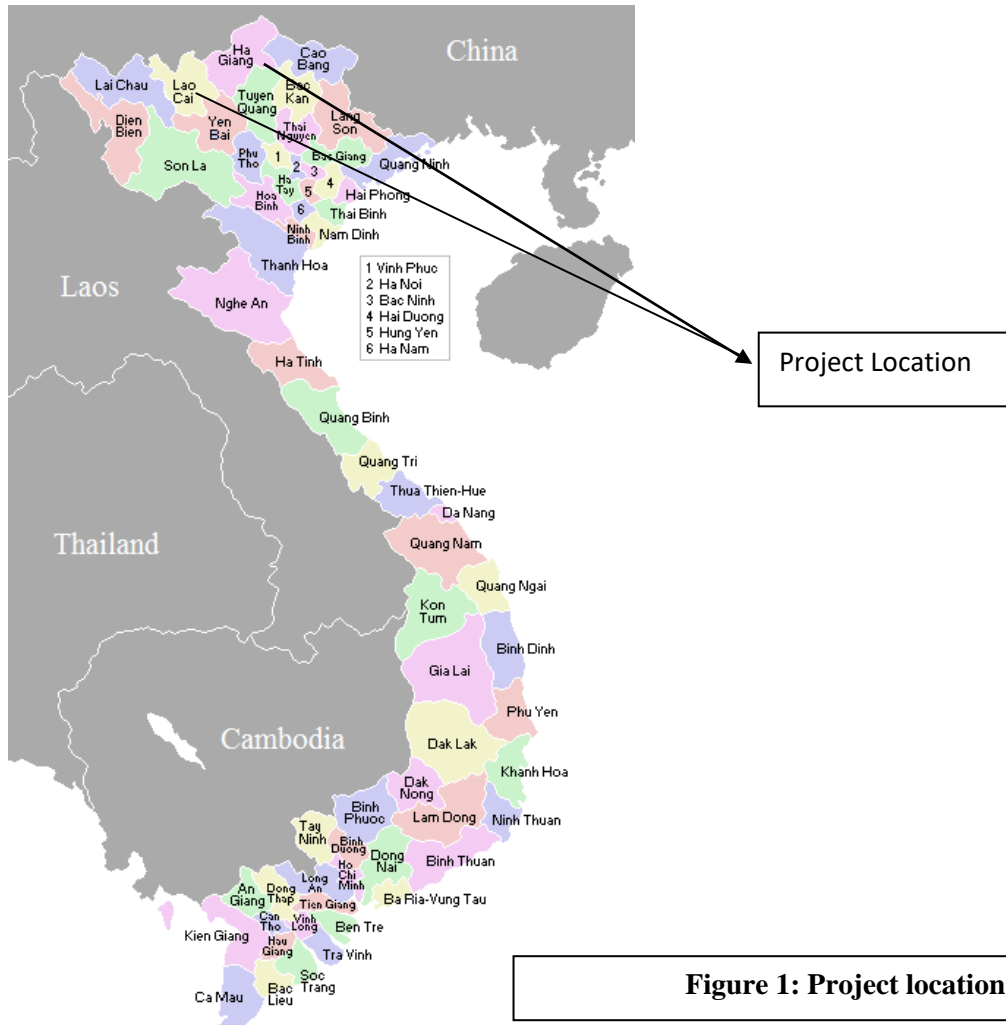


Figure 1: Project location map

A.3. Technologies/measures

The technology employed, converts Hydropower to electrical energy. Project activity used 3 Phase Synchronous Generator which converts the Hydropower into the electricity. The Hydropower plant has the Turbines, Generators, Transformers and other relay and protection system.

Technical specifications of the components used during the project commissioning are given below

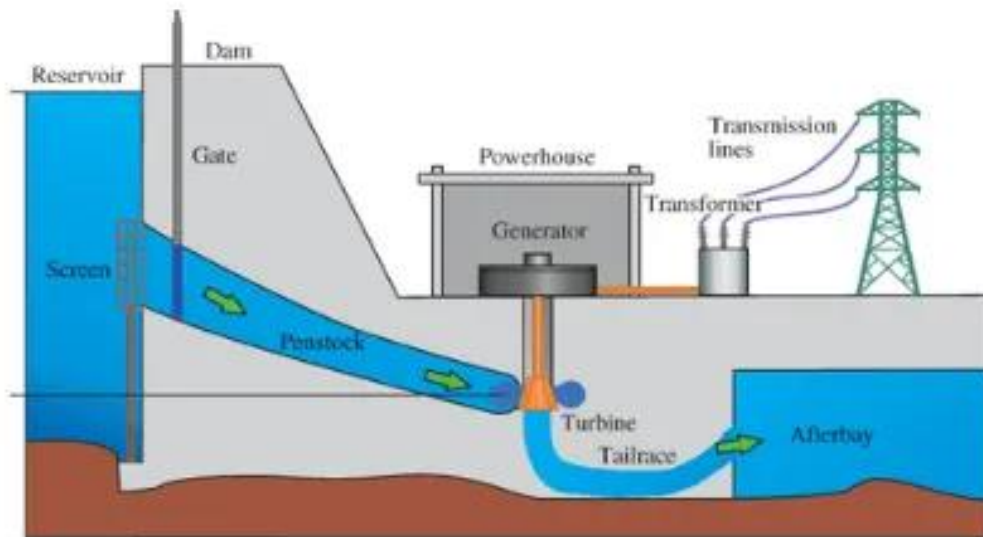
Parameter	Details
Project Name	26MW Pake Hydro Power Plant
Project Capacity	Capacity- 26 MWp
Technology	3 Phase Synchronous generators
Turbine	Manufacturer – KEM, HLA551-LJ-215
	Rating – 13 MW

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	No of Tubines - 2
Generator	Siemens, 31.5 MVA
Mounting Structure	Fixed tilt
Lifetime of the project	25 Years

Hydropower works by harnessing the energy that comes from the flow of water through a turbine connected to a generator, thus turning it into electricity.

As water flows down a river, it turns a turbine in a similar way to a dam. The turbine is connected to a generator and the electricity produced is stepped up using transformer and then distributed through transmission lines to 110 kV Song Chay Substation.



An intelligent automatic monitoring and alarm system (SCADA) has been already installed in the project control room which will monitor and record the real time data from the plant and alerts the staff in case of any malfunctioning in the equipment operation. However Separate Energy meters have been installed at the substation to record the import export of electricity from the plant. Monitoring and metering system is explained in detail in the below section B.7.4

This is a green field project activity generating the electricity from the Hydropower energy and supplying it to the national grid. In the baseline scenario the equivalent of electricity would have been generated from the fossil fuel-based grid connected power projects to which the project activity is connected. There is no technology transfer occurred in the proposed project activity.

A.4. Project Owner(s)

Location/ Country	Project Owner(s)	Where applicable ⁶ , indicate if the host country has provided approval (Yes/No)
Vietnam	Song Da 9 Joint Stock Company	No

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

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

Period		Name of the Entities	Purpose and Quantity of ACCs to be supplied
From	To		
25/11/2020	24/11/2030	CORSIA	For offsetting Greenhouse gasses 7,64,434 tCO ₂ for 10-year period

The proposed GCC project activity has not been registered under any other GHG or EUETS or any other emission trading schemes. The Carbon credits (ACCs) generated from this project activity will not be double counted under any other GHG mechanisms or emission trading schemes.

A.6. Additional requirements for CORSIA

The proposed project activity is hydro energy-based power project, by supplying the clean energy displacing the equivalent amount of electricity in the national grid which is being otherwise supplied by the fossil fuel-based power projects. The project activity is the installation of an environmentally safe and sound technology since there are no GHG emissions associated with the electricity generation. The project activity complies with all relevant environmental and social safeguard standards and does not cause any net harm to the environment and society.

CORSIA pilot phase vintage eligibility criteria require that first crediting period of Project must start on or after 1 January 2016. The GCC Program also started on 1 Jan 2016. The proposed project activity starts operations after 1st January 2016 and thus complies with the requirement.

⁶For example, *Project Coordination Form* is to be filled-in by Project Owners for projects located in Qatar. A written attestation from the host country's national focal point or the focal point's designee, as required by CORSIA (Refer section A.5 of the PSF guidelines).

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Additional CORSIA Criteria	Justification for the project
Comply with the Environment and Social Safeguards Standard to ensure that the Project Activity does not cause any net harm to the environment or society and provides an opportunity to demonstrate this achievement by obtaining the additional certification labels <i>E+</i> and <i>S+</i> . Please refer to <i>Section E</i> of this document.	Please refer section E of this PSF.
Comply with the Project Sustainability Standard to ensure that the Project Activity demonstrates the level of contribution towards achieving the United Nations Sustainability Development Goals (SDGs) and provides an opportunity to demonstrate this achievement by obtaining the additional <i>SDG+</i> label (Bronze, Silver, Gold, Platinum, or Diamond). Please refer to <i>Section F</i> of this document.	Please refer section F of this PSF.
Obtain and provide to the GCC and its Registry (operated by IHS Markit), a written attestation from the host country’s national focal point or the focal point’s designee, as required by <i>CORSIA Emissions Unit Eligibility Criteria</i> ⁷ (paragraph 7 (c) of the <i>Carbon Offset Credit Integrity Assessment Criteria</i>) and <i>Programme Application Form – Appendix A – Supplementary Information Form</i> ⁸ (refer to section 3.7.8. with respect to the Host Country Attestation on Double Counting), which shall be made publicly available prior to the use of units from the host country under CORSIA.	Such attestation shall be provided during ER verification when the host country provides such provision.

Section B. Application of selected methodology(ies)

B.1. Reference to methodology(ies)

The United Nations approved consolidated baseline methodology applicable to this project is ACM0002 “Grid-connected electricity generation from renewable sources”, Version - 20⁹
 Following tools have been referred during the estimation of emission reduction calculations as per the methodology ACM0002.

⁷ ICAO document ‘CORSIA Emissions Unit Eligibility Criteria’:

<https://www.icao.int/environmental-protection/CORSIA/Documents/ICAO%20document%2009.pdf>

⁸ <https://www.icao.int/environmental-protection/CORSIA/Pages/TAB.aspx>

⁹ <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWWDN8ED5PG>

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- Tool to calculate the emission factor for an electricity system, Version 7.0¹⁰.
- Tool for the demonstration and assessment of additionality, Version 7.0.0¹¹.
- Methodological tool “Common Practice” Version 03.1¹²
- Methodological tool “Investment Analysis” Version 10.0¹³

B.2. Applicability of methodology(ies)

The methodology ACM0002, Version 20.0 is applicable to the project activity under the following conditions:

Applicability Criteria	Applicability status
<p>This methodology is applicable to grid-connected renewable power generation project activities that:</p> <p>(a) install Greenfield power plant; (b) involve a capacity addition to (an) existing plant(s); (c) involve a retrofit of (an) existing plant(s)/unit(s); (d) involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) involve a replacement of (an) existing plant(s)/unit(s)</p>	<p>The proposed project activity is a green field, grid connected renewable power plant.</p> <p>Therefore, it confirms to the said criteria</p>
<p>The methodology is applicable under the following conditions:</p> <p>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</p>	<p>The project activity is the installation of hydropower power project. Thus, it meets the first applicability condition</p>
<p>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 or 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</p>	<p>The project activity does not involve capacity additions, retrofits, replacement, or rehabilitations.</p> <p>Hence, the methodology is applicable.</p>
<p>In case of hydro power plants, one of the following</p>	<p>The project activity is implemented in an</p>

¹⁰ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

¹¹ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

¹² <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-24-v1.pdf>

¹³ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-24-v1.pdf>

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<p>conditions shall apply:</p> <ul style="list-style-type: none"> (a) The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs; or (b) The project activity is implemented in an existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3) is greater than 4 W/m²; or (c) The project activity results in new single or multiple reservoirs and the power density calculate equation (3), is greater than 4 W/m². (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density of any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m², all of the following conditions shall apply. <ul style="list-style-type: none"> (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4) is greater than 4W/m²; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be: <ul style="list-style-type: none"> (a) Lower than or equal to 15 MW; and (b) Less than 10% of the total installed capacity of integrated hydro power project 	<p>existing single reservoir, with no change in the volume of reservoir</p>
<p>In the case of integrated hydro power projects, project proponent shall:</p> <ul style="list-style-type: none"> (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project 	<p>The project activity does not involve integrated hydro power project. Hence, the methodology is applicable.</p>

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<p>activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability indifferent 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.</p>	
<p>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;</p>	<p>The project activity does not include switching from fossil fuels to renewable energy, and the project is not a biomass fired power plant. Hence, the methodology is applicable.</p>
<p>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”.</p>	<p>The project activity does not include switching from fossil fuels to renewable energy, and the project is not a biomass fired power plant. Hence, the methodology is applicable.</p>
<p>In addition, the above applicability conditions, the applicability conditions of tool referred in the methodology ACM0002, version 20.0 has been referred here under:</p>	
<p>Tool07: Tool to calculate the emission factor for an electricity system Version 7.0</p>	
<p>This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g., demand-side energy efficiency projects).</p>	<p>The project activity is a greenfield hydropower power generation plant and hence, according to the applied methodology, 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”.</p>
<p>Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, the conditions specified in “Appendix 2: Procedures related to off-grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power</p>	<p>Since the project activity is grid connected Hydropower project, this condition is applicable and the emission factor has been calculated accordingly.</p>

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<p>plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.</p>	
<p>In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.</p>	<p>The project activity is located in Vietnam, a non-Annex I country. Therefore, this criterion is not applicable for the project activity</p>
<p>Under this tool, the value applied to the CO₂ emission factor of bio fuels is zero</p>	<p>The project activity is a grid connected Hydropower project and therefore, this criterion is not applicable for the project activity</p>
<p>Tool 01: Tool for the demonstration and assessment of additionality; Version 7.0.0,</p>	
<p>The use of the “Tool for the demonstration and assessment of additionality” is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool.</p>	<p>Since the applied technology is not a new methodology project proponent has applied this tool for the demonstration additionality in compliance with the tool. Refer to section B.5 of the PSF for the detailed applicability of this tool and additionality assessment. Hence this tool is applicable</p>
<p>Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.</p>	<p>In line with the methodology requirement Project developer has applied this tool for the demonstration of additionality assessment. Hence this tool is applicable</p>
<p>Tool 24: Common Practice version 3.1</p>	
<p>This methodological tool is applicable to project activities that apply the methodological tool “Tool for the demonstration and assessment of additionality”, the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”, or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality.</p>	<p>Project activity applies “Tool for the demonstration and assessment of additionality”. Hence this tool is applicable.</p>
<p>In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.</p>	<p>Applied methodology ACM0002 version 20.0 doesn't specify any approach for the demonstration of common practice analysis. As per the methodology the additionality including common practice analysis has been demonstrated as per</p>

	<p>the Tool 01: Tool for the demonstration and assessment of additionality” version 7.0.0 and Tool 24: Common Practice Analysis version 3.1. Hence Justified.</p>
<p>Tool27: Investment analysis version 11.</p>	
<p>This methodological tool is applicable to project activities that apply the methodological tool “Tool for the demonstration and assessment of additionality”, the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”, the guidelines “Non-binding best practice examples to demonstrate additionality for SSC project activities”, or baseline and monitoring methodologies that use the investment analysis for the demonstration of additionality and/or the identification of the baseline scenario.</p>	<p>Project activity applies “Tool for the demonstration and assessment of additionality”. Hence this tool is applicable.</p>
<p>In case the applied approved baseline and monitoring methodology contains requirements for the investment analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.</p>	<p>Applied methodology ACM0002 version 20.0 doesn’t specify any approach for the demonstration of Investment analysis. As per the methodology the additionality including investment analysis has been demonstrated as per the Tool 01: Tool for the demonstration and assessment of additionality” version 7.0.0 and Tool 27: Investment Analysis version 10.0 Hence Justified.</p>

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

The project boundary includes the Hydropower plant, sub-stations, grid and all power plants connected to the national grid. The proposed project activity will evacuate power to the Vietnam national grid. Therefore the entire Vietnam national grid and all connected power plants have been considered in the project boundary for the proposed project activity.

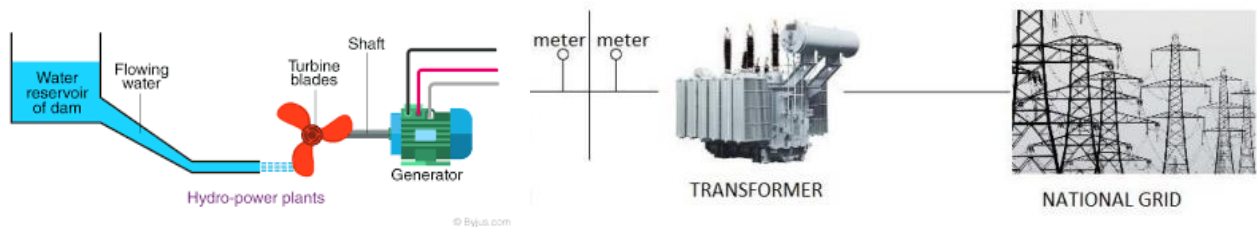


Fig: Project Boundary

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The project does not involve any other emissions sources not foreseen by the methodologies. The greenhouse gases and emission sources included in or excluded from the project boundary are shown in table below.

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

Source		GHG	Included?	Justification/Explanation
Baseline	Grid Connected Electricity Generation	CO ₂	Yes	Main Emission Source
		CH ₄	No	Minor Emission source
		N ₂ O	No	Minor Emission source
Project Activity	Greenfield Hydropower Project activity	CO ₂	No	No CO ₂ emissions are emitted from the project
		CH ₄	No	Project activity does not emit CH ₄
		N ₂ O	No	Project activity does not emit N ₂ O

B.4. Establishment and description of the baseline scenario

An Approved large-scale baseline CDM methodology ACM0002 “Grid-connected electricity generation from renewable sources”, Version 20.0 has been followed along with the “tool to calculate the emission factor for an electricity system, version 7.0” are used to establish the baseline scenario.

According to the methodology baseline scenario has been identified as “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 project activity involved setting up of Hydropower generation Plant to harness the hydropower to produce electricity and supply to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied to the electricity grid by the operation of grid-connected power plants (mainly by fossil fuel fired plants) and by the addition of new generation sources, as reflected in the combined margin (CM) calculations.

Hence, the baseline for the project activity is the equivalent amount of power from the national grid.

The combined margin ($EF_{grid,CM,y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) and build margin (BM). Calculations for this combined margin must be based on data from an official source (where available) and made publicly available

The combined margin of the Vietnam national grid used for the project activity is as follows

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Parameter	Value	Nomenclature	Source
EF _{grid,CM,y}	0.8641 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Department of Climate Change - Ministry of Natural Resources and Environment, "Research and develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)" ¹⁴
EF _{grid,OM,y}	0.9242 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3 year (2018,2019 and 2020) generation-weighted average, sourced from data „ national grid emission factors was published by Department of Climate Change - Ministry of Natural Resources and Environment, Official "Research and develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)
EF _{grid,BM,y}	0.6840 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	National grid emission factors was published by Department of Climate Change - Ministry of Natural Resources and Environment, "Research and develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)

The baseline case is in compliance with all applicable legal and regulatory requirements references.

B.5. Demonstration of additionality

The additionality of the proposed project activity is demonstrated by following the guidance provided in the GCC project Standard V 3.1.

As per the GCC Project Standard additionality can be demonstrated using the following two components

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

¹⁴ [http://dcc.gov.vn/van-ban-phap-luat/1081/Nghien-cuu,-xay-dung-he-so-phat-thai-\(EF\)-cua-luoi-dien-Viet-Nam-nam-2020-\(k%C3%A8m-CV-1316/BDKH-TTBVTOD\).html](http://dcc.gov.vn/van-ban-phap-luat/1081/Nghien-cuu,-xay-dung-he-so-phat-thai-(EF)-cua-luoi-dien-Viet-Nam-nam-2020-(k%C3%A8m-CV-1316/BDKH-TTBVTOD).html)

a) Legal requirement test

As per the paragraph no 46 of the project standard V3.1 the project is not implemented by the force of law. This is a voluntary activity undertaken by the project owner in compliance with all the legal requirement in the host country. Hence project complies with the legal requirement test.

b) Additionality Test

As per the GCC Project standard V3.1 this project needs to be demonstrating the additionality test based on the Project specific additionality test.

Additionality has been demonstrated as per the applied methodology ACM0002 (Version 20.0). Methodology requires the project participant to determine the additionality based on “Tool for the demonstration and assessment of additionality”, Version 7.0.0.

The step-wise approach to establish additionality of the project activity has been followed, details of which are provided in the following paragraphs:

As per the applied methodology requirement, Additionality of the project activity is demonstrated using the Methodological tool “Tool for the demonstration and assessment of additionality” Version 07.0.0. The tool defines the following steps:

Sub Step 0: Demonstration whether the proposed project activity is the first-of-its-kind.

The proposed project activity is not the first of its kind as implementation of Hydropower project in the State is not first of its kind.

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

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

As per the applied ACM 0002 version 20.0; Para 22, *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.*

However, for the assessment of additionality the following alternatives are identified:

Alternative 1: The proposed project activity undertaken without being registered as a GCC project activity.

Alternative 2: No project activity is undertaken

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

<u>Alternative</u>	<u>Compliance with laws & regulation</u>
Alternative 1: The proposed project activity undertaken without being registered as a GCC	Government of Vietnam does not restrict implementation of Hydropower project.

project activity	
Alternative 2: No project activity is undertaken.	No law or regulation mandate PP to invest in this project.

Hence, all the alternatives identified above comply with mandatory laws and regulations in Vietnam. The financial attractiveness of Alternative 1 is demonstrated through investment analysis explained below.

Step 2: Investment Analysis

As per para 29 of “Tool for the demonstration and assessment of additionality” it is determined that the proposed project activity is not an economically attractive or financially feasible option.

To conduct the investment analysis, Methodological tool 27: Investment analysis, version 11.0, EB 112 Annex 02 has been referred.

Sub-step 2a: Determine appropriate analysis method

As per “Tool for the demonstration and assessment of additionality” (version 07.0.0), for financial analysis of the project, the following three options are available:

- Option I: Simple Cost Analysis
- Option II: Investment Comparison Analysis
- Option III: Benchmark Analysis

The proposed project activity generates financial and economic benefits from sale of the generated electricity other than ACC revenues, so the simple cost analysis (Option I) is not applicable. Out of the two remaining options, Option II is also not applicable as there are no other credible and realistic baseline scenario alternatives other than electricity supply from the grid. Thus, the benchmark analysis (Option III) is chosen to prove additionality.

Since, identified baseline for the proposed project activity is continuation of current practice (i.e. equivalent amount of energy would have been generated by grid electricity system through its currently operating power plants and by new capacity addition) and which is outside the direct control of the project participant, hence benchmark analysis (option III), where the returns on investment in the project activity are compared to benchmark returns that are available to any investors in the country is selected as the most appropriate method.

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

The investment analysis using Benchmark analysis approach (Option III) has been chosen. In the following, Equity IRR is used to demonstrate the additionality of the project.

As per para 15 of Tool 27: Investment analysis, version 10.0 states that Required/expected returns on equity are appropriate benchmarks for equity IRR. The project is promoted by private limited company and hence the return on equity and the risks associated with the investments for their shareholder is of primary concern. Hence, in order to analyze the financial viability of the project

activity, the prime financial indicator that has been used is the post-tax equity IRR of the project activity.

Selection of Appropriate Benchmark

The benchmark has been considered in accordance with CDM Tool 27 “Investment Analysis” Version 11.0, “The values in the table in the Appendix may also be used, as a simple default option”.

Methodology deployed for arriving at a suitable value of Benchmark using Default Value has been described below:

- As the proposed project activity generates power utilizing Hydropower energy, Group 1 as per para 5a of Appendix of EB 105 Annex 6 has been identified as a suitable category.
- The investment analysis has been carried out in Nominal terms. Accordingly, Default value as given in table under the Appendix, Tool 27 has been adjusted by adding suitable forecasted inflation rate taken from IMF world Economic database as no inflation forecast or inflation target published by central Bank of Vietnam.
- Average forecasted inflation rate for the host country (Vietnam) published by the IMF (International Monetary Fund) World Economic Outlook for the next five years has been considered

The decision-making year of the project is on 13/11/2017. Hence applicable inflation rate has been chosen from the IMF databases accordingly for the estimation of resultant benchmark.

The benchmark has been computed in the following manner:

Default Value Benchmark:

The cost of equity is determined by selecting the values provided in the table of the Appendix, i.e., Default values for cost of equity (expected return on equity) in the ‘Methodological tool: Investment analysis.

The Required return on equity (benchmark) was computed in the following manner:

$$\text{Nominal Benchmark}^{15} = \{(1+\text{Real Benchmark}) * (1+\text{Inflation rate})\}-1$$

Where:

Default value for Real Benchmark = 11.72% (as per Appendix of EB 105, Annex 6)

Inflation Rate forecast for by (International Monetary Fund) World Economic Outlook database for Vietnam.

¹⁵ As per Pg. 320 of Corporate Finance, Second Edition of Aswath Damodaran

Benchmark estimation:

The Cost of Equity has been considered using the “Methodological tool: Investment analysis version 11.0” available at the time of decision making as well as the latest available value. As a conservative approach, the minimum value of benchmark has been considered as calculated using these 2 approaches.

Table under the tool “Investment analysis” version 10.0 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in Vietnam = 11.72%¹⁶

Thus, minimum cost of equity considered for calculation of Benchmark = 11.72%

Since the inflation rate is not available for 5-years in the IMF website from the start date of the project activity average inflation rate of 3-years has been considered for benchmark estimation which is latest available at the time of publication of PSF for GSC publication which is conservative. for Vietnam as IMF World Economic Outlook available at the time of investment decision and corresponding benchmark values is

Inflation rate for 5 years	Source
4.0%	World Economic Outlook database: April 2020 ¹⁷

Corresponding benchmark values applicable at the time of investment decision time:

Inflation Forecast	Benchmark
5 Years	
4.0%	16.19%

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

The period considered for Post Tax Equity IRR calculations is 25 years, which corresponds to the operational lifetime of the project activity.

Depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, is added back to net profits for the purpose of calculating the financial indicator.

Input values considered for the IRR calculation are provided below.

¹⁶ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v10.0.pdf>

¹⁷ <https://www.imf.org/en/Publications/WEO/weo-database/2017/October/weo-report?c=582,&s=PCPIPCH,&sy=2017&ey=2022&ssm=0&scsm=1&sc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1>

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Particulars	Value	Unit	Source/Remarks
Capacity of the project (AC)	26	MW	TDD
Plant Load Factor	41.74%	%	TDD
Annual Net generation	95.067	GWh	Calculated
Auxiliary Consumption	1.90	GWh	
Net Generation	93.17	GWh	
Normal Generation	46.583	GWh	
Rushhour Generation	23.291	GWh	
Lowhour generation	23.291	GWh	
Project cost	963600	VND Million	TDD
Debt	70%	%	Standard Banking procedure
Equity	30%	%	
Debt	674520.00	VND Million	Calculated
Equity	289080.00	VND Million	Calculated
Interest rate	8.00%	%	https://www.focus-economics.com/country-indicator/vietnam/interest-rate
Debt Repayment tenure	15	years	Standard Banking procedure
Moratorium	1	year	
Operation and Maintenance	10599.60	VND Million	Calculated
Escalation in O & M	5%	%	TDD
Insurance Cost	2409.00	VND Million	Calculated
VAT	10.00%	%	As per prevailing tax rates
Normal Tariff	720	VND/kWh	TDD
Rushhour Tariff	2600	VND/kWh	
Lowhour Tariff	710	VND/kWh	
Depreciation Civil Works	4.00%	%	TDD
Depreciation Equipment	10.00%	%	TDD
Corporate Tax (0-6 Years)	0.00%	%	TDD
Corporate Tax (7-15 Years)	7.50%	%	TDD
Corporate Tax (16-30 Years)	28.00%	%	TDD
Salvage Value	10%	%	TDD

Post Tax Equity IRR for the project activities against the benchmark values are shown in table below. Thus, it is evident that the project is not financially attractive as the equity IRR is less below the benchmark value.

Post tax Equity IRR	Benchmark Value
7.94%	16.19%

Sensitivity Analysis

The robustness of the conclusion drawn above, namely that the project is not financially attractive, has been tested by subjecting critical assumptions to reasonable variation. As required by Annex 02 of EB 112, only 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. PP has identified the total revenue from the project activity is dependent on the Tariff, Plant Load Factor, Project Cost and O&M Costs constitute more than 20% of the project costs. These factors have been subjected to a 10% variation on either side and the results of the sensitivity analysis indicate that even after applying such variation the EIRR does not cross the benchmark.

Variation %	-10%	Normal	10%	Variation required to reach benchmark	Value required to reach benchmark	Tariff rate based on Hour
Tariff (VND/KWh)	5.09%	7.94%	10.91%	26.70%	912.24	Normal Hour - 720
						Rush Hour - 2600
						Low Hour - 710
PLF (%)	5.09%	7.94%	10.91%	26.70%	52.88%	-
Project Cost (Mn VND)	11.39%	7.94%	5.20%	-20.60%	765098.40	
O&M Cost (Mn VND)	8.36%	7.94%	7.52%	NA	NA	

An analysis has been done to identify the percentage variation at which the financial indicators will equal/breach the benchmark and the probability of its occurrence. Based on sensitivity analysis it can be concluded that the proposed project activity is additional with reasonable variation in values and is not likely to reach the benchmark value. The occurrence of these events is unlikely for the following reasons:

- a) **Tariff:** The Tariff rate of electricity used for investment analysis i.e., tariff 720 VND/kWh (Normal Hour), 2600 VND/kWh (Rush Hour) & 710 VND/kWh (Low Hour) is sourced from the DPR estimate applicable at the time of investment decision. The project will breach the benchmark value at a tariff variation of 26.7%. However, the actual tariff based on the PPAs signed is same as the tariff considered in the IRR calculation i.e tariff 720 VND/kWh (Normal Hour), 2600 VND/kWh (Rush Hour) & 710 VND/kWh (Low Hour) fixed for PPA tenure without any escalation which is much below the tariff value required to breach the benchmark value. Hence, increase in tariff is unlikely.
- b) **PLF:** The PLF used for investment analysis i.e 41.74% is sourced from the DPR estimate applicable at the time of investment decision and the IRR breach the benchmark value at a PLF variation of more than 26.7% increase in the estimated PLF. The increase in PLF value to breach the benchmark is highly unlikely as the estimated PLF is based on the annual

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Hydropower energy radiation estimated for project lifetime. However as per the latest energy generation reports the PLF for the last year is much below the estimated PLF in the IRR calculation. Equity IRR at normative PLF values are less than the benchmark value and given the analysis above it's highly unlikely that PLF will increase above breaching value.

- c) **Project Cost:** The project cost considered for investment analysis i.e., 963600 VND Million. The cost is sourced from DPR which is based on the negotiations with Supplier. A variation of -20.6% is required for IRR to breach benchmark which is not possible as the project is already commissioned at the estimated cost in the IRR which can be verified from the EPC contracts. The actual cost incurred in commissioning of the project is same as the estimated cost. Hence reduction of 20.6% is unlikely to happen.
- d) **O&M Costs:** The sensitivity analysis reveals that O&M will breach the benchmark at negative values and is hypothetical case. Since the O&M cost is subject to escalation (as evidence by the O&M agreement) and also subject to inflationary pressure, any reduction in the O&M costs is highly unlikely.

Step 3: Barrier analysis

Barrier analysis has not been used.

Step 4: Common practice analysis

Stepwise approach for common practice analysis has been carried out as per Methodological tool "Common Practice", version 03.1.

- (a) *The projects are located in the applicable geographical area;*
- (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.*

Step (1): Calculate applicable capacity or output range as +/- 50% of the total design capacity or output of the proposed project activity:

The capacity of the project activity is 26 MW and hence the output range as per the guideline is selected to be 13 MW to 52 MW.

Step (2): Identification of the similar projects (CDM and non-CDM) is carried out as per sub-steps of Step (2) as follows:

- a) As the project is located in Vietnam, therefore, the applicable geographical area is Vietnam and projects in the host country Vietnam have been chosen for analysis.
- b) The projects applying same measure (i.e, only renewable energy through Hydropower) are selected as the proposed project activity is Hydropower project.
Therefore, all projects applying same measure (b) as the proposed project activity are candidates for similar projects.
- c) The energy source used by the project activity is Hydropower. Hence, only Hydropower projects have been considered for analysis.
- d) The project activity produces electricity; therefore, all power plants that produce electricity are candidates for similar projects.
- e) The capacity range of the projects is within the applicable capacity range for the chosen projects (13 MW to 52 MW)
- f) The start date of the project is 13/11/2017 (EPC contract signed date), As Kyoto Protocol was ratified by Vietnam on 25/09/2002¹⁸, and therefore projects which had started commercial operation between 25/09/2002 to 13/11/2017 have been identified.

Numbers of Similar projects identified, which fulfill above-mentioned conditions are

N_{Hydropower} = 0

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}.*

CDM/VCS/GS/GCC and EU-ETS project activities, which have got registered, submitted for registration or are under validation, have been excluded in this step. The list of the power plants identified is provided to the DOE. After excluding the registered, submitted for registration and under validation projects the total number of projects. List of projects have been submitted to DOE for verification.

No similar projects are identified in Step (2), 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}.*

From the projects identified above, those projects which employ “**different technologies**” have

¹⁸<https://unfccc.int/node/61236>

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been excluded and the number of such projects has been identified as N_{diff} .

Since $N_{all} = 0$ hence, $N_{diff} = 0$

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.

Calculate

$$F = 1 - N_{diff}/N_{all}$$
$$F = 1 - (0/0) = 1$$
$$N_{all} - N_{diff} = 0 - 0 = 0$$

Outcome of Step 5:

As,

- i. $F = 1$ which is greater than 0.2
- ii. $N_{all} - N_{diff} = 0$; is not more than 3

Since $N_{all} - N_{diff}$ is less than 3, the project activity is “not a common practice” within a sector in the applicable geographical area.

Conclusion:

As described above, the project fulfils all necessary requirements of additionality specified in the ‘Tool for the demonstration and assessment of additionality’ v7.0.0. Hence, the project is additional.

B.6. Estimation of emission reductions

B.6.1. Explanation of methodological choices

As per the paragraph 41 of the methodology ACM0002 Version 20.0 emission reductions are calculated as follows

Emission Reductions

$$ER_y = BE_y - PE_y$$

Where

- ER_y = Emission reductions in year y (t CO₂e/yr)
 BE_y = Baseline emissions in year y (t CO₂/yr)
 PE_y = Project emissions in year y (t CO₂/yr)

Baseline Emissions

As per the approved consolidated Methodology ACM0002 version 20.0 that Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid- connected power plants. The baseline emissions are to be calculated as follows:

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

Where,

- BE_y = Baseline emissions in year y (t CO₂/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 CO₂ 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)

AS per para 41 of ACM0002, version 20.0, when the project activity is installation of Greenfield power plant, then:

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

Where,

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

The EG_{facility, y} is estimated from the PLF provided as per the third party engineering company report as below:

EG _{facility, y} (MWh)
95,067

As per the methodology combined margin grid emission factor has been calculated as per the “**Tool to calculate the grid emission factor for an Electricity System**” version 07.

Most updated national data: The data on national grid emission factors was published by Department of Climate Change - Ministry of Natural Resources and Environment, Research and

develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)" (ref. [http://dcc.gov.vn/van-ban-phap-luat/1081/Nghien-cuu,-xay-dung-he-so-phat-thai-\(EF\)-cua-luoi-dien-Viet-Nam-nam-2020-\(k%C3%A8m-CV-1316/BDKH-TTBVTOD\).html](http://dcc.gov.vn/van-ban-phap-luat/1081/Nghien-cuu,-xay-dung-he-so-phat-thai-(EF)-cua-luoi-dien-Viet-Nam-nam-2020-(k%C3%A8m-CV-1316/BDKH-TTBVTOD).html)) has been used for the calculation of emission factor.

As per the "Tool to calculate the emission factor for an electricity system" Version 07.0, EB 100, Annex 4, the following steps have been followed.

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

Step 1: Identify the relevant electricity systems

For the purpose of determining the electricity emission factor, the project electricity system is defined as the electricity transmission system of Vietnam which is a single system connected by transmission lines throughout the country and owned by the Vietnam Electricity Corporation (EVN). Electricity imports from a connected electricity system are included and as per Tool to calculate emission factor of an electricity system, for the purpose of determining the operating margin emission factor, 0 tCO₂/MWh is applied.

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

Only grid connected power plants are included in the calculation, as per Option I of the "Tool to calculate the emission factor for an electricity system" version 07.0.0

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

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods, which are described under Step 4:

- (a) Simple OM; or
- (b) Simple adjusted OM; or
- (c) Dispatch data analysis OM; or
- (d) Average OM.

The simple OM method (Option a) is used for this study as the low-cost/must-run resources (LC/MR) constitute less than 50% of total electricity production. The share of low-cost/must run power plants in the last two years are in the range of 4.55% to 6.69 as shown in the below table.

Units: MWh

Ratio of power output from low-cost/must-run sources (% of Net Generation)						
Year	2016	2017	2018	2019	2020	Total (2016-2020)
Hydropower	50,254,951	71,056,945	69,485,682	54,411,106	59,387,446	304,596,131
Bagasse	64,000	78,000	456,400	280,996	331,319	1,210,715
Wind	-	-	-	721,189	946,157	1,667,346
Solar	-	-	-	4,833,674	9,684,525	14,518,199
Import	2,736,000	2,361,000	3,124,000	3,316,000	3,067,000	14,604,000
Total power output	159,817,731	169,942,517	188,063,484	207,214,694	207,692,796	932,731,222
Average 5-year low cost/must run percentage: 36.09%						

Data Source: Vietnamese grid emission factor in 2020, Ministry of Natural Resources and Environment, Department of Climate Change ¹⁹

As per tool to calculate emission factor for an electricity system (Version 07), The simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production. Since the low cost/must run resources constitute less than 50% of total grid generation as seen from the average of five most recent years, the Simple OM method can be used to calculate the Operating Margin Emission factor.

PP has chosen ex ante option, thus, no monitoring and recalculation of the emissions factor during the crediting period is required. PP has considered a data vintage of 3-year generation-weighted average, based on the most recent data available at the time of submission of the GCC-PSF to the Verifier for validation.

Step 4: Calculate the operating margin emission factor ($EF_{grid,OMSimple,y}$) according to the selected method

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units.

The simple OM may be calculated:

¹⁹ [http://dcc.gov.vn/van-ban-phap-luat/1059/Nghien-cuu,-xay-dung-he-so-phat-thai-\(EF\)-cua-luoi-dien-Viet-Nam-\(K%C3%A8m-CV-263/BDKH\).html](http://dcc.gov.vn/van-ban-phap-luat/1059/Nghien-cuu,-xay-dung-he-so-phat-thai-(EF)-cua-luoi-dien-Viet-Nam-(K%C3%A8m-CV-263/BDKH).html)

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Option A: Based on the net electricity generation and a CO2 emission factor of each power unit;

Or

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

Department of Climate Change - Ministry of Natural Resources and Environment, “Research and develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)”²⁰. This provides information about the Combined Margin Emission Factor of Vietnam national grid. The Combined Margin is calculated ex ante using the guidelines provided by the UNFCCC in the “Tool to calculate the emission factor for an electricity system, Version 07”. We have, therefore, used the Combined Margin data published in the Grid Emission Factor for GHG Reduction Project/Activity, for calculating the Baseline Emission Factor.

As per “Tool to calculate the emission factor for an electricity system”, Option B (“Calculation based on total fuel consumption and electricity generation of the system”) is used to calculate simple OM emission factor. Where Option B is used, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including lowcost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_y}$$

Where:

$EF_{grid,OMsimple,y}$ - Simple operating margin CO₂ emission factor in year y (tCO₂/MWh)

$EG_{m,y}$ - Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)

$FC_{i,y}$ - Amount of fuel type i consumed in the project electricity system in year y (mass or volume unit)

$NCV_{i,y}$ - Net calorific value (energy content) of fuel type i in year y (GJ/mass or volume unit)

$EF_{CO2,i,y}$ - CO₂ emission factor of fuel type i in year y (t CO₂/GJ)

EG_y - Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh)

i - All fuel types combusted in power sources in the project electricity system in year y

y - the relevant year as per the data vintage chosen in STEP 3

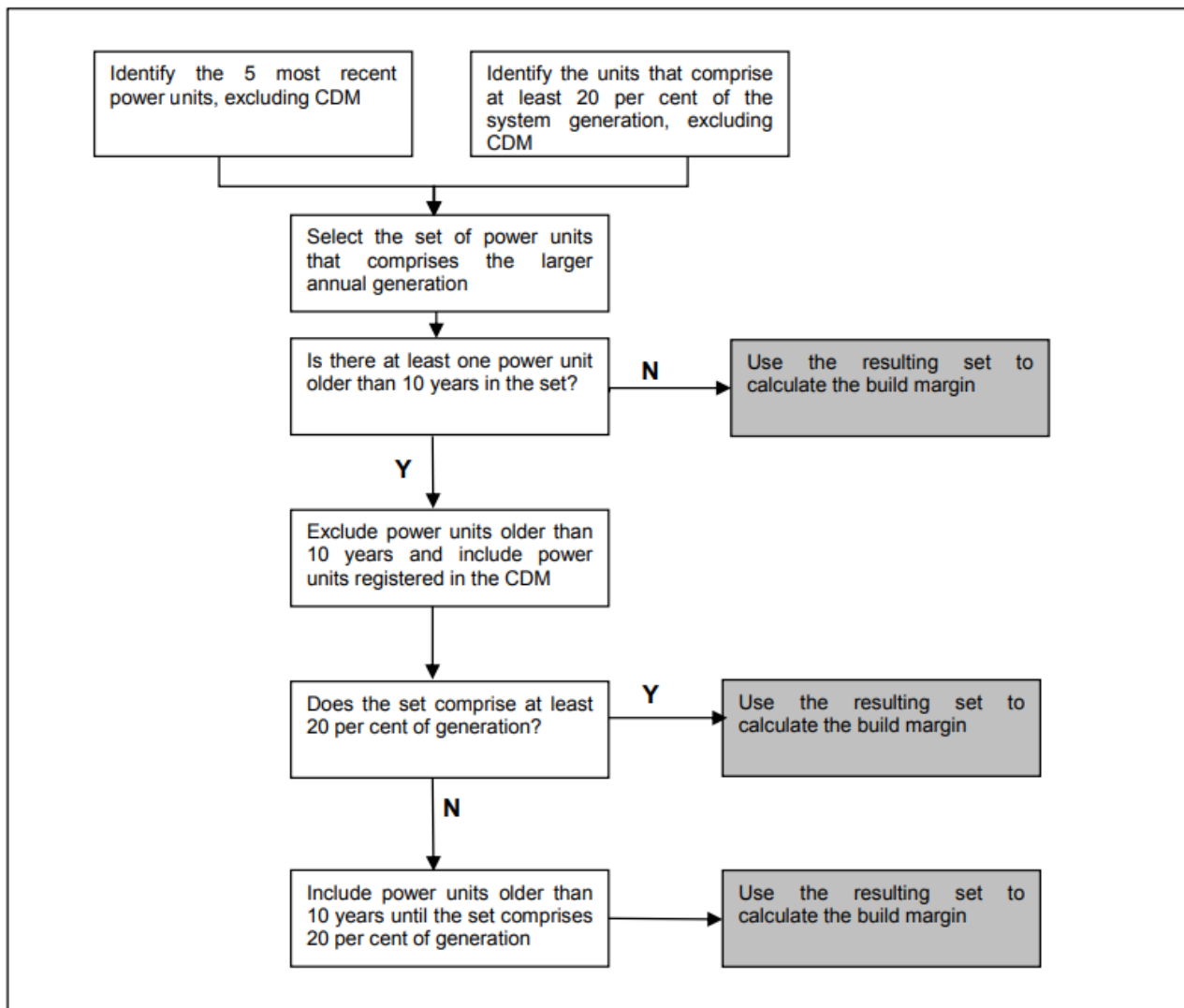
As per the Vietnamese grid emission factor in 2020 weighted average operating margin is as below:

²⁰ [http://dcc.gov.vn/van-ban-phap-luat/1081/Nghien-cuu,-xay-dung-he-so-phat-thai-\(EF\)-cua-luoi-dien-Viet-Nam-nam-2020-\(k%C3%A8m-CV-1316/BDKH-TTBVTOD\).html](http://dcc.gov.vn/van-ban-phap-luat/1081/Nghien-cuu,-xay-dung-he-so-phat-thai-(EF)-cua-luoi-dien-Viet-Nam-nam-2020-(k%C3%A8m-CV-1316/BDKH-TTBVTOD).html)

$EF_{OM,y} = 0.9242 \text{ tCO}_2/\text{MWh}$

STEP 5: Calculate the build margin emission factor ($EF_{BM,y}$)

The project participants have chosen Option I, i.e. fixing build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of PSF submission to the DOE for validation. The build margin emissions factor is the generation-weighted average emission factor (tCO₂/MWh) of a sample group of power units, during the most recent year y for which power generation data is available. The Sample group of power units m used to calculate the build margin should be determined via the procedure summarized in the diagram of the Tool



Following this procedure, the list of plants/units selected to calculate the marginal emission factor built in 2020. The total power output of the plants commissioned in 2020 is accounting for 20.48%

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of the total electricity output of Vietnam's electricity grid in 2020.

Using the equation given in the step 5 for the BM calculation, the Built margin is calculated for the year 2020 is as below:

$$EF_{BM,y} = 0.6840 \text{ tCO}_2/\text{MWh}$$

STEP 6: Calculate the combined margin (CM) emissions factor

The combined margin is the weighted average of the simple operating Margin and the build margin. In particular, for intermittent and non-dispatch able generation types such as wind and solar photovoltaic, the Tool to calculate the emission factor for an electricity system, Version 07.0.0, EB 100, Annex 4, allows to weigh the operating margin and Build margin at 75% and 25%, respectively for wind and solar projects and 50% and 50%, respectively for hydro and biomass projects.

The baseline emission factor is calculated using the combined margin approach as described in the following steps:

Calculation of Baseline Emission Factor EF_y

The baseline emission factor EF_y is calculated as the weighted average of the Operating Margin emission factor ($EF_{OM,y}$) and the Build Margin emission factor ($EF_{BM,y}$):

$$EF_y = W_{OM} * EF_{OM,y} + W_{BM} * EF_{BM,y}$$

Where,

W_{OM} 50% weight for Hydropower energy projects

W_{BM} 50% weight for Hydropower energy projects

$EF_{OM,y}$ calculated as described in Steps 3&4 above (tCO₂/MWh)

$EF_{BM,y}$ calculated as described in Steps 5 above (tCO₂/MWh)

$$\begin{aligned} \text{Baseline Emission factor (Vietnam national grid)} &= 0.50 * 0.9242 + 0.50 * 0.6840 \\ &= 0.8041 \text{ tCO}_2/\text{MWh} \end{aligned}$$

The baseline emission factor is ex-ante parameter and will remain constant throughout the crediting period.

$EF_{grid,,}$	=	Combined Margin Grid Emission Factor = 0.8041 tCO ₂ /MWh
---------------	---	---

Project Emissions:

As per the approved consolidated Methodology ACM0002 (Version 20.0) para 31: "For most

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renewable energy power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

PE_y = Project emissions in year y (t CO₂e/yr)

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (t CO₂/yr)

$PE_{GP,y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO₂e/yr)

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (tCO₂e/yr)

As the project activity is the installation of a new grid-connected Hydropower plant and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore $PE_{FF,y}$, $PE_{GP,y}$, $PE_{HP,y}$ are equal to zero and thus, $PE_y = 0$.

Leakage Emissions:

No other 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.

Hence Emission reductions will be calculated as per the below equation

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

B.6.2. Data and parameters fixed ex ante

Data / Parameter Table 1.

Data / Parameter:	$EF_{grid,OM,y}$
Methodology reference	ACM0002: Grid-connected electricity generation from renewable sources, Version 20.0
Data unit	tCO ₂ /MWh
Description	Operating Margin CO ₂ emission factor in year y of Vietnam national Grid.
Measured/calculated /default	Calculated
Data source	Department of Climate Change - Ministry of Natural Resources and Environment, "Research and develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)" ²¹

²¹ [http://dcc.gov.vn/van-ban-phap-luat/1081/Nghien-cuu,-xay-dung-he-so-phat-thai-\(EF\)-cua-luoi-dien-Viet-Nam-nam-2020-\(k%C3%A8m-CV-1316/BDKH-TTBVTOD\).html](http://dcc.gov.vn/van-ban-phap-luat/1081/Nghien-cuu,-xay-dung-he-so-phat-thai-(EF)-cua-luoi-dien-Viet-Nam-nam-2020-(k%C3%A8m-CV-1316/BDKH-TTBVTOD).html)

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Value(s) of monitored parameter	0.9242																		
Measurement/ Monitoring equipment (if applicable)	<table border="1"> <tr> <td colspan="2">Not Applicable</td> </tr> <tr> <td>Type of meter</td> <td>NA</td> </tr> <tr> <td>Location of meter</td> <td>NA</td> </tr> <tr> <td>Accuracy of meter</td> <td>NA</td> </tr> <tr> <td>Serial number of meter</td> <td>NA</td> </tr> <tr> <td>Calibration frequency</td> <td>NA</td> </tr> <tr> <td>Date of Calibration/ validity</td> <td>NA</td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td>NA</td> </tr> <tr> <td>Calibration Status</td> <td>NA</td> </tr> </table> <p>Calculated in line with “<i>Tool to calculate the emission factor for an electricity system</i>” using data from Department of Climate Change - Ministry of Natural Resources and Environment, “Research and develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)”</p> <p>The value used is calculated ex-ante as generation based weighted average of last three years of the operating margin provided in the DNA data.</p> <p>Weighted average $= \frac{\sum_{i=1 \text{ to } n} (\text{Net generation in operating margin in year } i * \text{Simple operating margin in year } i)}{\sum_{i=1 \text{ to } n} (\text{Net generation in operating margin of year } i)}$</p>	Not Applicable		Type of meter	NA	Location of meter	NA	Accuracy of meter	NA	Serial number of meter	NA	Calibration frequency	NA	Date of Calibration/ validity	NA	Reference No. of Calibration Certificate	NA	Calibration Status	NA
Not Applicable																			
Type of meter	NA																		
Location of meter	NA																		
Accuracy of meter	NA																		
Serial number of meter	NA																		
Calibration frequency	NA																		
Date of Calibration/ validity	NA																		
Reference No. of Calibration Certificate	NA																		
Calibration Status	NA																		
Measuring/reading/ recording frequency (if applicable)	Not Applicable as the value is fixed ex-ante for entire crediting period.																		
Calculation method (if applicable)	Calculated in line with “Tool to calculate the emission factor for an electricity system”, version 7																		
QA/QC procedures	NA																		
Purpose of data	Baseline Emission calculation																		
Additional comments	The operating margin emission factor is a 3-year generation-weighted average (2018-2020). The operating Margin is calculated ex ante and fixed during the crediting period																		

Data / Parameter:	EF _{grid, BM, y}
Methodology reference	ACM0002: y: Grid-connected electricity generation from renewable sources, Version 20.0
Data unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor in year y of Vietnam national Grid
Measured/calculated /default	Calculated

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Data source	Department of Climate Change - Ministry of Natural Resources and Environment, "Research and develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)"																		
Value(s) of monitored parameter	0.6840																		
Measurement/ Monitoring equipment (if applicable)	Calculated in line with " <i>Tool to calculate the emission factor for an electricity system</i> " using data from Department of Climate Change - Ministry of Natural Resources and Environment, "Research and develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)"																		
Measuring/reading/ recording frequency (if applicable)	<table border="1"> <tr> <td colspan="2">Not Applicable</td> </tr> <tr> <td>Type of meter</td> <td></td> </tr> <tr> <td>Location of meter</td> <td></td> </tr> <tr> <td>Accuracy of meter</td> <td></td> </tr> <tr> <td>Serial number of meter</td> <td></td> </tr> <tr> <td>Calibration frequency</td> <td></td> </tr> <tr> <td>Date of Calibration/ validity</td> <td></td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td></td> </tr> <tr> <td>Calibration Status</td> <td></td> </tr> </table> <p>Not Applicable as the value is fixed ex-ante for entire crediting period.</p>	Not Applicable		Type of meter		Location of meter		Accuracy of meter		Serial number of meter		Calibration frequency		Date of Calibration/ validity		Reference No. of Calibration Certificate		Calibration Status	
Not Applicable																			
Type of meter																			
Location of meter																			
Accuracy of meter																			
Serial number of meter																			
Calibration frequency																			
Date of Calibration/ validity																			
Reference No. of Calibration Certificate																			
Calibration Status																			
Calculation method (if applicable)	Calculated in line with "Tool to calculate the emission factor for an electricity system", version 7																		
QA/QC procedures	NA																		
Purpose of data	Baseline Emission calculation																		
Additional comments	The Build Margin is calculated ex ante and fixed during the crediting period.																		

Data / Parameter:	$EF_{grid,CM,y}$
Methodology reference	ACM0002: y: Grid-connected electricity generation from renewable sources, Version 20.0
Data unit	tCO ₂ /MWh
Description	Combined Margin CO2 emission factor in year y of Vietnam National Grid
Measured/calculated /default	Calculated
Data source	National grid emission factor was published by Department of Climate Change - Ministry of Natural Resources and Environment, "Research and develop emission factor (EF) of Vietnam's electricity grid in 2020 (attached with OL 1316/BDKH-TTBVTOD)"
Value(s) of monitored parameter	0.8041

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Measurement/ Monitoring equipment (if applicable)	
	Type of meter
	Location of meter
	Accuracy of meter
	Serial number of meter
	Calibration frequency
	Date of Calibration/ validity
	Reference No. of Calibration Certificate
	Calibration Status
	The date has been considered in accordance to the Tool to calculate emission factor of an electricity system. The tool guides to take 50% weightage of EF_{grid} , OM_{simple} , & 50% weightage of $EF_{grid, BM, y}$.
Measuring/reading/ recording frequency (if applicable)	Not Applicable as the value is fixed ex-ante for entire crediting period.
Calculation method (if applicable)	Calculated in line with “Tool to calculate the emission factor for an electricity system”, version 7
QA/QC procedures	NA
Purpose of data	Baseline Emission calculation
Additional comments	The combined margin would be calculated ex-ante and fixed for the entire crediting period.

B.6.3. Ex-ante calculation of emission reductions

The ex-ante emission reductions (ER_y) for the project activity are calculated as follows

$$ER_y = BE_y - PE_y - LE_y$$

Where,

ER_y = Emission Reduction in tCO₂/year

BE_y = Baseline emission in tCO₂/year

PE_y = Project emissions in tCO₂/year

LE_y = Leakage Emissions in tCO₂/year

Baseline Emissions (BE_y):

The baseline emissions are the product of electrical energy baseline $EG_{PJ, y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.

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

AS per para 41 of ACM0002, version 20.0, when the project activity is installation of Greenfield power plant, then:

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

Where,

$$\begin{aligned} EG_{facility,y} &= \text{Total quantity of net electricity delivered to the grid in year } y \text{ (MWh/yr)} \\ EF_{grid,CM,y} &= \text{Baseline grid emission factor (t CO}_2\text{/MWh)} \\ &= 0.8041 \text{ t CO}_2\text{/MWh} \end{aligned}$$

The $EG_{facility,y}$ is estimated from the PLF provided as per the third-party engineering company report as below:

As per section B.6.1 above, the combined margin grid emission factor ($EF_{grid,CM,y}$) is 0.8492 tCO₂/MWh

Hence the annual baseline emission is calculated as below:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y} = 95,067 \text{ MWh} \times 0.8041 \text{ tCO}_2\text{/MWh} = \mathbf{76443 \text{ tCO}_2}$$

Project Emissions (PE_y):

As explained in the above section B.6.2 Project emissions from the project activity is considered Zero.

$$PE_y = 0$$

Leakage Emissions (LE_y):

As explained in the above section B.6.2 Project emissions from the project activity is considered Zero.

$$LE_y = 0$$

Emission Reductions (ER_y):

$$ER_y = BE_y - PE_y - LE_y$$

Since the project and leakage emissions are estimated as zero

$$\mathbf{ER_y = BE_y = 76443}$$

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

Year	Baseline emissions (t CO ₂ e)	Project emissions (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions (t CO ₂ e)
25-November-2020 to 24-November-2021	76,443	0	0	76,443
25-November-2021 to 24-November-2022	76,443	0	0	76,443
25-November-2022 to 24-November-2023	76,443	0	0	76,443
25-November-2023 to 24-November-2024	76,443	0	0	76,443
25-November-2024 to 24-November-2025	76,443	0	0	76,443
25-November-2025 to 24-November-2026	76,443	0	0	76,443
25-November-2026 to 24-November-2027	76,443	0	0	76,443
25-November-2027 to 24-November-2028	76,443	0	0	76,443
25-November-2028 to 24-November-2029	76,443	0	0	76,443
25-November-2029 to 24-November-2030	76,443	0	0	76,443
Total	7,64,434	0	0	7,64,434
Total number of crediting years	10			
Annual average over the crediting period	76,443	0	0	76,443

B.7. Monitoring plan**B.7.1. Data and parameters to be monitored**

Data / Parameter:	EG _{facility,y}
Methodology reference	ACM0002
Data unit	MWh/Year
Description	Quantity of net electricity generation supplied by the project (Hydropower) plant/unit to the grid in year y
Measured/calculated/default	Measured & calculated
Data source	Monthly Energy Meter reading
Value(s) of monitored parameter	95,067

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Measurement/ Monitoring equipment	
	Type of meter
	Location of meter
	Accuracy of meter
	Serial number of meter
	Calibration frequency
	Date of Calibration/ validity
	Reference No. of Calibration Certificate
	Calibration Status
	<p>0.2s class bidirectional meters will be installed at the EVN substation to measure and record the net electricity supplied to the grid.</p> <p>Since the meters are installed at the EVN substation, which is under the control of EVN, but not in the control of Project owner and since the meters are subject to change Project owner will provide the Serial numbers of the Energy meters at the time of emission reduction verification. Project owner does not wish to make the PSF inconsistent in any of the emission reduction period.</p>
Measuring/reading/recording frequency	Measurement: Continuous Recording: Monthly
Calculation method (if applicable)	The Net electricity supplied to the grid by each Hydro project is estimated as below Net electricity = Export – Import
QA/QC procedures	The export reading shall be crosschecked with the Invoice raised by the developer to EVN The import reading shall be crosschecked with the invoice raised by EVN to developer. The meter(s) shall be calibrated and maintained by the EVN as per their own schedule, and this frequency of meter calibration is not within the control of the Project Proponent. Energy meters will be calibrated on annual basis. Backup/Check meters are also installed in case of non-functioning or breakdown of Main meters. Check meter readings will be considered in case of failure of Main meter.
Purpose of data	Baseline Emission Calculations.
Additional comments	-

SDG Parameters Monitoring:

Data / Parameter:	5.C Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels																		
Methodology reference	GCC Project Sustainability Standard_V2.1.																		
Data unit	Document																		
Description	Non-Discrimination in employment generation and equal pay for equal work for both men and women																		
Measured/calculated/default	Measured																		
Data source	Organization Policy																		
Value(s) of monitored parameter	01																		
Measurement/ Monitoring equipment	<table border="1"> <tr> <td colspan="2">Not Applicable</td> </tr> <tr> <td>Type of meter</td> <td></td> </tr> <tr> <td>Location of meter</td> <td></td> </tr> <tr> <td>Accuracy of meter</td> <td></td> </tr> <tr> <td>Serial number of meter</td> <td></td> </tr> <tr> <td>Calibration frequency</td> <td></td> </tr> <tr> <td>Date of Calibration/ validity</td> <td></td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td></td> </tr> <tr> <td>Calibration Status</td> <td></td> </tr> </table>	Not Applicable		Type of meter		Location of meter		Accuracy of meter		Serial number of meter		Calibration frequency		Date of Calibration/ validity		Reference No. of Calibration Certificate		Calibration Status	
Not Applicable																			
Type of meter																			
Location of meter																			
Accuracy of meter																			
Serial number of meter																			
Calibration frequency																			
Date of Calibration/ validity																			
Reference No. of Calibration Certificate																			
Calibration Status																			
Measuring/reading/ recording frequency	Yearly																		
Calculation method (if applicable)	Not Applicable. It can be verified with document check or interview with the employees																		
QA/QC procedures	The project activity ensures that “equal pay for work of equal value” for both men and women and there is no any discrimination against women.																		
Purpose of data	To justify SDG Goal 5 – Achieve gender equality and empower all women and girls																		
Additional comments	-																		

Data / Parameter:	7.2.1 Renewable energy share in the total final energy consumption
Methodology reference	GCC Project Sustainability Standard_V2.1.
Data unit	MWh/Annum
Description	Net electricity supplied to the national grid.
Measured/calculated	Measured

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/default																			
Data source	Monthly Energy generation Reports																		
Value(s) of monitored parameter	95,067																		
Measurement/ Monitoring equipment	<table border="1"> <tr> <td colspan="2">Not Applicable</td> </tr> <tr> <td>Type of meter</td> <td></td> </tr> <tr> <td>Location of meter</td> <td></td> </tr> <tr> <td>Accuracy of meter</td> <td></td> </tr> <tr> <td>Serial number of meter</td> <td></td> </tr> <tr> <td>Calibration frequency</td> <td></td> </tr> <tr> <td>Date of Calibration/ validity</td> <td></td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td></td> </tr> <tr> <td>Calibration Status</td> <td></td> </tr> </table> <p>0.2s class bidirectional meters will be installed at the EVN substation to measure and record the net electricity supplied to the grid.</p> <p>Since the meters are installed at the EVN substation, which is under the control of EVN, but not in the control of Project owner and since the meters are subject to change Project owner will provide the Serial numbers of the Energy meters at the time of emission reduction verification. Project owner does not wish to make the PSF inconsistent in any of the emission reduction period.</p>	Not Applicable		Type of meter		Location of meter		Accuracy of meter		Serial number of meter		Calibration frequency		Date of Calibration/ validity		Reference No. of Calibration Certificate		Calibration Status	
Not Applicable																			
Type of meter																			
Location of meter																			
Accuracy of meter																			
Serial number of meter																			
Calibration frequency																			
Date of Calibration/ validity																			
Reference No. of Calibration Certificate																			
Calibration Status																			
Measuring/reading/ recording frequency	Measurement: Continuous Recording: Monthly																		
Calculation method (if applicable)	The Net electricity supplied to the grid by each Hydro project is estimated as below Net electricity = Export – Import																		
QA/QC procedures	<p>The export reading shall be crosschecked with the Invoice raised by the developer to EVN</p> <p>The import reading shall be crosschecked with the invoice raised by EVN to developer.</p> <p>The meter(s) shall be calibrated and maintained by the EVN as per their own schedule, and this frequency of meter calibration is not within the control of the Project Proponent.</p> <p>Energy meters will be calibrated on annual basis.</p> <p>Backup/Check meters are also installed in case of non-functioning or breakdown of Main meters. Check meter readings will be considered in case of failure of Main meter.</p>																		

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Purpose of data	To justify SDG Goal 7 – Ensure access to affordable, reliable, sustainable and modern energy for all																		
Additional comments	-																		
Data / Parameter:	8.5.1 Average hourly earnings of employees, by sex, age, occupation, and persons with disabilities																		
Methodology reference	GCC Project Sustainability Standard_V2.1.																		
Data unit	Numbers																		
Description	Average hourly earnings of employees, by sex, age, occupation, and persons with disabilities																		
Measured/calculated/default	Measured																		
Data source	Employment Records & Organization Policies																		
Value(s) of monitored parameter	1. No of employment (with bifurcation on number by sex, age group and where applicable, persons with disabilities) 2. Average earnings 3. Policy for Nondiscrimination and equal pay for the work of equal value.																		
Measurement/ Monitoring equipment	<table border="1"> <tr> <td colspan="2">Not Applicable</td> </tr> <tr> <td>Type of meter</td> <td></td> </tr> <tr> <td>Location of meter</td> <td></td> </tr> <tr> <td>Accuracy of meter</td> <td></td> </tr> <tr> <td>Serial number of meter</td> <td></td> </tr> <tr> <td>Calibration frequency</td> <td></td> </tr> <tr> <td>Date of Calibration/ validity</td> <td></td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td></td> </tr> <tr> <td>Calibration Status</td> <td></td> </tr> </table>	Not Applicable		Type of meter		Location of meter		Accuracy of meter		Serial number of meter		Calibration frequency		Date of Calibration/ validity		Reference No. of Calibration Certificate		Calibration Status	
Not Applicable																			
Type of meter																			
Location of meter																			
Accuracy of meter																			
Serial number of meter																			
Calibration frequency																			
Date of Calibration/ validity																			
Reference No. of Calibration Certificate																			
Calibration Status																			
Measuring/reading/ recording frequency	Yearly																		
Calculation method (if applicable)	Employment Records																		
QA/QC procedures	Not Applicable																		
Purpose of data	To justify SDG Goal 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all																		
Additional comments	-																		
Data / Parameter:	13.2.2 Total greenhouse gas emissions per year																		
Methodology reference	GCC Project Sustainability Standard_V2.1.																		
Data unit	tCO2e/Year																		

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Description	Quantity of CO2 emissions reduced																		
Measured/calculated/default	Measured and calculated																		
Data source	Monthly energy generation reports																		
Value(s) of monitored parameter	76443																		
Measurement/ Monitoring equipment	<table border="1"> <tr> <td colspan="2">Not Applicable</td> </tr> <tr> <td>Type of meter</td> <td></td> </tr> <tr> <td>Location of meter</td> <td></td> </tr> <tr> <td>Accuracy of meter</td> <td></td> </tr> <tr> <td>Serial number of meter</td> <td></td> </tr> <tr> <td>Calibration frequency</td> <td></td> </tr> <tr> <td>Date of Calibration/ validity</td> <td></td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td></td> </tr> <tr> <td>Calibration Status</td> <td></td> </tr> </table>	Not Applicable		Type of meter		Location of meter		Accuracy of meter		Serial number of meter		Calibration frequency		Date of Calibration/ validity		Reference No. of Calibration Certificate		Calibration Status	
Not Applicable																			
Type of meter																			
Location of meter																			
Accuracy of meter																			
Serial number of meter																			
Calibration frequency																			
Date of Calibration/ validity																			
Reference No. of Calibration Certificate																			
Calibration Status																			
Measuring/reading/ recording frequency	Monthly																		
Calculation method (if applicable)	<p>Emission reductions are calculated as below. Project owner records the monthly net energy generated and supplied to the national grid from the available monthly energy generation reports.</p> <p>Project owner has already calculated and fixed the combined margin grid emission factor for the host country i.e 0.8641 tCO2/MWh of grid electricity supplied.</p> <p>Now, Project developer calculates the emission reductions inline with the applied methodology ACM0002 as below</p> <p>Emission reductions (tCO2) = Net generation (MWh) * Grid Emission Factor (EF).</p>																		
QA/QC procedures	Energy generation shall be cross checked with the monthly invoices.																		
Purpose of data	To justify SDG Goal 13 – Take urgent action to combat climate change and its impacts.																		
Additional comments	-																		

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Monitoring of Social Safeguard Parameters

Data / Parameter:	Long-term jobs (> 1 year) created	
Methodology reference	Environment and Social Safeguards Standard - V2.0	
Data unit	Number	
Description	Number of people employed during the operation	
Measured/calculated /default	Calculated	
Data source	Employment Records	
Value(s) of monitored parameter	-	
Measurement/ Monitoring equipment	Not Applicable	
	Type of meter	
	Location of meter	
	Accuracy of meter	
	Serial number of meter	
	Calibration frequency	
	Date of Calibration/ validity	
	Reference No. of Calibration Certificate	
	Calibration Status	
Measuring/reading/ recording frequency	Yearly	
Calculation method (if applicable)	Not applicable	
QA/QC procedures	Not applicable	
Purpose of data	To justify social safeguard assessment	
Additional comments	-	

Data / Parameter:	New Short-term jobs (< 1 year) created	
Methodology reference	Environment and Social Safeguards Standard - V2.0	
Data unit	Number	
Description	Number of people employed during the construction	
Measured/calculated /default	Default	
Data source	EPC contract & Project Owner	
Value(s) of monitored parameter	-	

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Measurement/ Monitoring equipment	Not Applicable	
	Type of meter	
	Location of meter	
	Accuracy of meter	
	Serial number of meter	
	Calibration frequency	
	Date of Calibration/ validity	
	Reference No. of Calibration Certificate	
	Calibration Status	
	Measuring/reading/ recording frequency	Fixed (Not Monitored)
Calculation method (if applicable)	Not applicable	
QA/QC procedures	Not applicable	
Purpose of data	To justify social safeguard assessment	
Additional comments	-	

Data / Parameter:	Job related training imparted
Methodology reference	Environment and Social Safeguards Standard - V2.0
Data unit	Number
Description	Number of trainings conducted, and Employees trained
Measured/calculated /default	Calculated
Data source	Training Records
Value(s) of monitored parameter	At least 01

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Measurement/ Monitoring equipment	Not Applicable	
	Type of meter	
	Location of meter	
	Accuracy of meter	
	Serial number of meter	
	Calibration frequency	
	Date of Calibration/ validity	
	Reference No. of Calibration Certificate	
	Calibration Status	
	Measuring/reading/ recording frequency	Yearly
Calculation method (if applicable)	Not applicable	
QA/QC procedures	Not applicable	
Purpose of data	To justify social safeguard assessment	
Additional comments	-	

B.7.2. Monitoring-program of risk management actions

Data / Parameter:	Solid Waste Pollution from Hazardous Wastes
Objective of the Program of Risk Management Actions	Program of Risk Management Actions for generation Hazardous Wastes (PRMA 01)
Purpose:	To mitigate an environmental impact identified as Harmful in the risk assessment and to develop a Program of Risk Management Actions plan to address the risk of Solid Waste Pollution from Hazardous Wastes.
Describe the environment /social impact risk that needs to be mitigated.	There is a possibility of Hazardous waste (for e.g., used transformer oil) generation during the operation of the project activity which may impact the environment if it is not properly treated and disposed as per the law.
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	Quantity of hazardous waste (transformer oil) will be discarded through the registered licensed vendor for safety disposal and recycling as applicable in compliance to the applicable host country laws and regulations.

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Program of Risk Management Actions to achieve the target(s):							
	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)
	1	Monitoring of hazardous waste generation (Transformer oil)	Project Owner	01	This parameter will be monitored for total crediting period since commercial operation of the project	Quantity of Hazardous waste generation (Transformer oil)	This parameter will be monitored for total crediting period since commercial operation of the project
	2						
	Date of Closing the Program:						
QA/QC procedures:	Record will be maintained and submitted during verification.						
Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	Monitored data and record will be submitted to verifier during the emission reduction verification.						

There were no harmful risks identified from the project and hence no mitigations measures are applicable.

B.7.3. Sampling plan

No Sampling plan is required.

B.7.4. Other elements of the monitoring plan

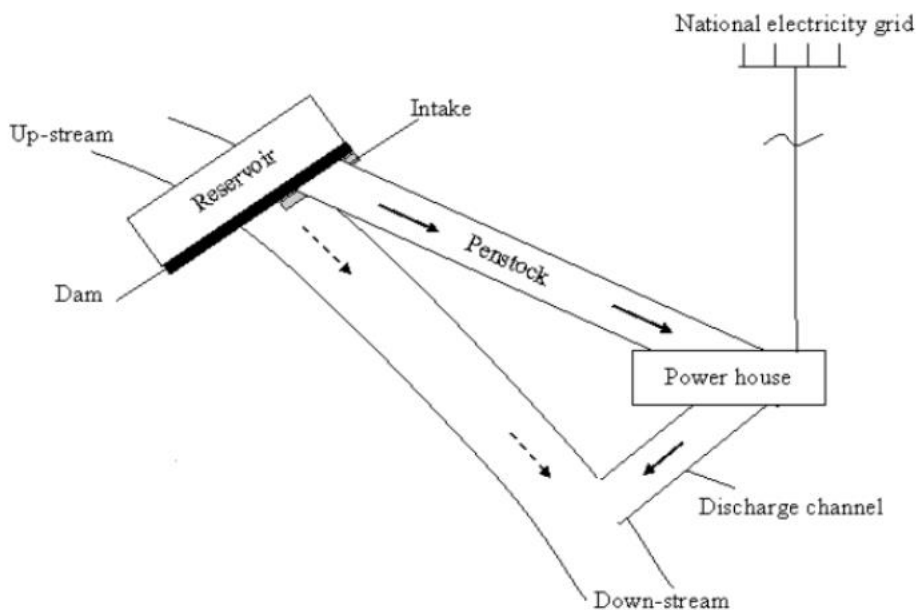
The monitoring plan is developed in accordance with the modalities and procedures for GCC project activities and is proposed for grid-connected Hydropower project being implemented in Vietnam. The monitoring plan, which will be implemented by the project participant describes about the monitoring organization, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

The project owner has entered into agreement with the O&M Contractor for the operation and maintenance of Hydro Power Plant. O&M contractor will provide a monthly report, which includes

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generation data, major breakdown events and machine availability. Project manager is responsible for recording of monthly meter readings of export and import. Monthly power export and import data will be sent regularly to site in charge of each project separately

The electricity generated from the project activity will be supplied to the national grid for the complete project lifetime under a long-term PPA with the consumers. The electricity generated from the project activity before entering the grid at the connection point will be measured by digital kilowatt hour (kWh) meters. The power meters at the connection point are bi-directional nature which records the net export and import. Both main and check meters of +/-0.2s accuracy class have been installed at the substation. These are the 3-phase bi-directional trivector meters.



Monitoring Process at project site

The metering and data collection system are installed and used to monitor the parameters including:

1. Power output of the project exported to the national grid during the year y ($EG_{\text{export},y}$)
2. The amount of electricity the plant imported from the national grid in the year y ($EG_{\text{import},y}$).
3. Net electricity of the plant is exported to the national grid during the year y ($EG_{\text{facility},y}$) using for calculating baseline emissions, calculated according to the following formula:

$$EG_{\text{facility},y} = EG_{y,\text{export}} - EG_{y,\text{import}}$$

The electricity generated from the project activity will be supplied to the national grid for the complete project lifetime under a long-term PPA with the consumers. The electricity generated from the project activity before entering the grid at the connection point will be measured by digital

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kilowatt hour (kWh) meters. The power meters at the connection point are bi-directional nature. The metering system includes the main system and back-up systems. The back-up systems will be used in case of failing of the main meter.

Data from the operating meters will be measured continuously. Additionally, monthly manual readings will be taken from the operating meters. Monthly, EVN staff and staff of the operation division of the power plant will cross-check manual readings from the power meter with the electronically recorded data and sign a joint balance sheet which indicates the amount of power fed into the grid within that month.

This joint balance sheet is also the basis of payment by the consumer to the project proponent. Hence, the monitoring plan is well integrated into the standard EVN procedures

The steps of monitoring the electricity supplied to the national grid and the electricity imported from grid by the proposed project are as follows:

1. The electricity supplied by the project to the grid and electricity imported from the grid are measured automatically by the bi-directional meter systems (main and backup power meters). The data is measured continuously
2. Persons in charge of data record and meter supervisor from the Project Developer together with staff from EVN shall read and collect data from power meters on the first day of every month, the result will be signed by both parties and kept respectively.
3. The data from the backup power meters will be cross checked with the data from main power meter. The data from back-up system will be used in case of failing of the main meter;
4. The Project developer provides the record of main, backup power meters, copy of invoices and other related documents to the verifier.

All monitored data will be stored for at least two years after the end of crediting period or the last issuance of ACCs for this project activity, whichever occurs later.

Monitoring roles and responsibilities:

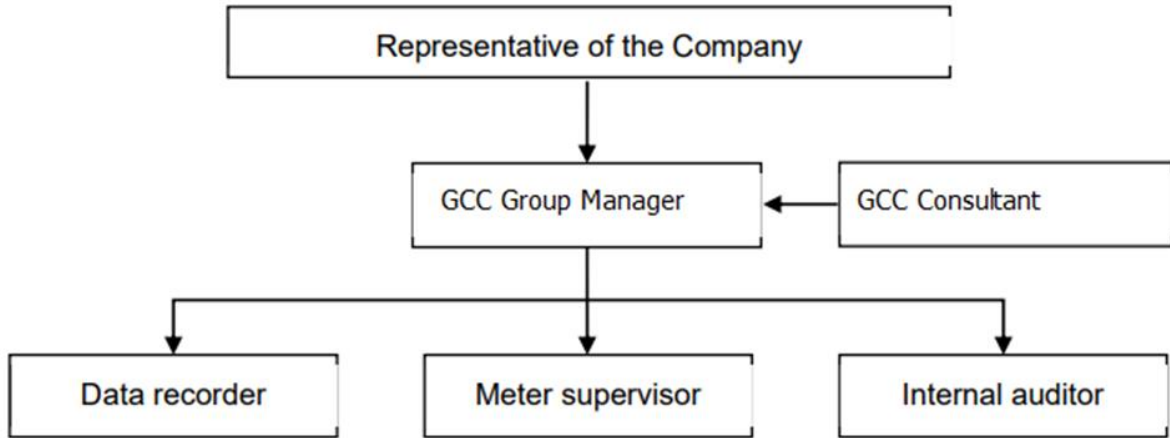


Figure: Structure of the monitoring group

The responsibilities of each person involved are elaborated as follows:

Person	Responsibility
Representative of the Company	Legal representative of the Project Company Review the monitoring report annually
GCC group manager	Managing the whole GCC business of the project, guiding and supervising data recorder after trained by GCC consultant.
GCC consultant	Providing trainings and technical support about GCC monitoring plan
Data recorder	Collecting and recording data every month.
Meter supervisor	Checking power meter periodically according to relevant regulation.
Internal auditor	Checking the monitoring procedures, double checking the collected data.

Personal Training:

The project employs qualified and experienced persons for plant operation. The training period shall be for three months, as this would be adequate and necessary to ensure proper imparting of the objective. The training course will be thoroughly and meticulously designed, highlighting the objectives, salient features, operational aspects and trouble shooting.

Emergency preparedness:

In case of any unforeseen event that is not covered under this monitoring plan, staff of the operation division will immediately inform the chief of the operation division. The chief of the operation division is then responsible to ensure that the cause for the unforeseen event is detected, the event is remedied and for the period in which the unforeseen event has occurred uncertainty in data gathered is limited as much as possible.

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- In normal condition, the data of main power meter will be used as the basis of payment by the EVN to the PO and to calculate the emission reductions by the project activity.
- In case the main power meter is in failure and the backup power meter is still in good operation, the result of the backup meter will be used to calculate the emission reduction by the project activity.
- In case of both main and backup power meters are in failure, the Project Owner and the EVN will jointly calculate a conservative estimate of power supplied to the grid. The assumptions used to estimate net electricity supply to the grid will be signed by both a representative of the project owner as well as a representative of the EVN
- In case any power meters are in failure, the Project Owner will inform EVN immediately and contract with the authorized party to verify/ calibrate and/or replace the failed power meter.

Internal auditing

No requirement of internal audit for the data monitored as the data is measured by the energy meter installed by EVN (government authority) and the reading is recorded every month by jointly by PD & representative from EVN. The main energy meter readings are verified against the reading of the backup meter to check any considerable variation. In case, considerable variation found, then either main meter reading or check meter reading whichever lower will be considered. The electricity readings recorded are used for electricity invoicing to Consumer. Hence, the data collected is of high accuracy and authorized by EVN

Data recording & archiving: The project proponent shall maintain data both in electronic form and hard copies. The monitored data shall be archived till 2 years after the completion of crediting period.

Section C. Start date, crediting period type and duration

C.1. Start date of the Project Activity

As per the paragraph 38 of the project standard V3.1, start of commercial operations has been considered as the start date. Hence project commissioning date (COD), on which project is connected to grid and started generating power and exporting to the grid there by started generating GHG emission reductions is considered as start date.

Start date of the project activity is 25/11/2020 which is the commissioning date of the project.

Since the start date is after 1st January 2016. Hence complies with the GCC project standard guidelines.

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C.2. Expected operational lifetime of the Project Activity

25 Years 00 Months.

C.3. Crediting period of the Project Activity

C3.1. Fixed crediting period

The crediting period is fixed crediting period for 10 Years.

C3.2. Start date of the crediting period

25/11/2020

C3.3. Duration of the crediting period

10 years from 25/11/2020 to 24/11/2030

Section D. Environmental impacts

D.1. Analysis of environmental impacts

The project activity does not involve any major construction activity. It primarily requires the installation of Hydropower generator, transformer station and transmission line. Hydropower project activity operations do not result in direct air pollution, noise pollution. Thus, there is no any significant impact due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity.

D.2. Environmental impact assessment

Pursuant to the Law on Environmental Protection of the Government of Vietnam, Government’s Decree NO: 18/2015/ND-CP, dated February 14, 2015, Project Owner must prepare and submit the detailed Environmental Impact Assessment Report to the Department of Natural Resources and Environment including the strategic environmental assessment, Environmental impact assessment and environmental protection Plan. This includes public consultation activities as a guideline for project owners before construction phase to make sure that projects will not contribute to negative environmental impact.

In compliance with the host country requirements Project Owner has prepared a detailed Environmental Impact assessment report covering the detailed assessment on Environmental, Social, and economic parameters in the project region during the construction and operation of the project activity.

EIA report was submitted and approved by the respective district “Department of Natural resources and Minerals, Provincial People Committee”. Respective details of EIA approval for each subproject have been provided below. The report clearly mentioned that Hydropower plant does not result in direct air pollution, noise and water pollution

Project name	EIA approval authority	Ref No and Date
26MW Pake Hydro Power Plant	MONRE Department – Lao Cai & Ha Giang Provincial People Committee	Decision No. 273/QD-BTNMT 02 February 2016

The EIA assessment and respective approval authority concludes that the implementation of the Hydro power project does not have any adverse negative impacts on the social, environmental and economical situations of the local habitat and livelihood in the project area. The Project implementation or operation doesn’t result in any air, water or noise pollution in the project area. It doesn’t lead to any local habitat resettlement or rehabilitation. Other side the implementation of project activity creates additional socio-economic benefits by means of creating additional benefits

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to the local community through creating sustainable infrastructure, economic growth and social development activities in the project area.

As per the EIA assessment carried out in the EIA report it is concluded the following Impact assessment

1. A study on the existing environment shows that the construction and operation period would not affect much change on the physical environment, such as the terrain, soil characteristics and geology.
2. Dust, air and noise pollution in minimal and not significant to harm the society near the project area. Project owner has taken adequate measures to mitigate the minimum effect caused during the construction of the project activity.
3. The waste generation is not significant in the wind power generation projects. However adequate measures and monitoring provisions have been identified and ensure to implement at the site to avoid the impact associated with the waste generated at the site.
4. The project doesn't impact the air quality during the operation of the lifetime of the project.
5. The result of the EIA concludes that that the development/construction and operation phases of the project will not cause any impact on land use, agriculture, waste management and public utilities in the project and adjacent areas.

Overall, the EIA report concludes that implementation of the Hydropower project does not have any adverse impacts on the geology, Air quality, Noise quality, Human values, social and economic issues in the project area.

Section E. Environmental and social safeguards

The main purpose of the environment and social safeguard assessment is to identify, evaluate and manage environmental and social impacts that may arise due to implementation and operation of the project. the Hydropower project is not likely to have significant adverse environmental and social impacts during the construction & operation period of the project activity.

E.1. Environmental safeguards

>>

Impact of Project Activity on		Information on Impacts, Do-No-Harm Risk Assessment and Establishing Safeguards										Project Owner's Conclusion	
		Description of Impact (both positive and negative)	Legal requirement / Limit	Do-No-Harm Risk Assessment			Risk Mitigation Action Plans		Do-No-Harm Residual Risk Assessment		Self-Declaration		
				Not Applicable (No actions required)	Harmless (No actions required)	Harmful (Actions required)	Operational Controls	Program of Risk Management Actions	Re-evaluate Risks	Monitoring	Explanation of Conclusion	The Project Activity will not cause any harm	
Environmental impacts on the identified categories²² indicated below.	Indicators for environmental impacts	Describe anticipated environmental impacts, both positive and negative from all sources (stationary and mobile), that may result from the Project Activity, within and outside the project boundary, over which the Project Owner(s) has control, and beyond what would reasonably be expected to occur in the absence of the Project Activity.	Describe the applicable national regulatory requirements /legal limits related to the identified risks of environmental impacts.	If no environmental impacts are anticipated, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as Not Applicable (No actions required)	If environmental impacts are anticipated, but are expected to be in compliance with applicable national regulatory requirements/ below the legal limits, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as Harmless (No actions required)	If environmental impacts are anticipated that will not be in compliance with the applicable national regulatory requirements or are likely to exceed legal limits, then the Project Activity is likely to cause harm (may be un-safe) and shall be indicated as Harmful (Actions required).	Describe the operational controls and best practices, focusing on how to implement and operate the Project Activity, to reduce the risk of impacts that have been identified as Harmful .	Describe the Program of Risk Management Actions (refer to Table 3), focusing on additional actions (e.g., installation of pollution control equipment) that will be adopted to reduce the risk of impacts that have been identified as Harmful .	Re-evaluate risks after Risk Mitigation Action Plans have been developed (refer to previous two columns) for impacts that have been identified as Harmful . Indicate whether the risks have been eliminated or reduced and, where appropriate, indicate them as Harmless (No actions required)	Describe the monitoring approach and the parameters to be monitored for each impact that has been identified as Harmful and described in the PSF (refer to Table 3).	Describe how the Project Owner has concluded that the Project Activity is likely to achieve the identified Risk Mitigation Action Plan targets for managing risks to levels that are unlikely to cause any harm.	Confirm that the Project Activity risks of negative environmental impacts are expected to be managed to levels that are unlikely to cause any harm (Mark +1 for Yes or and -1 for No)	
Environmental Safeguards													
Environment - Air	SO _x emissions	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	
	NO _x emissions	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	
	CO ₂ emissions	The Project activity reduces greenhouse	No mandatory law/regulation is applicable for Hydro projects in the country.	Since the impact is positive and cause no harm to the	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	Monthly electricity generation will be monitored	Not applicable as stated in earlier columns, it	+1

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

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	gases by producing and dispatching electricity generated by Hydro energy technology displace the number of emissions would have been occurred through the conventional fossil fuel power plants in the country. Hence implementation of Hydro project has the positive impact on the environment for this indicator.		environment further Risk assessment is Not Applicable (No actions required)							through the energy meters installed at the substation.	has positive benefit only.	
CO emissions	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Suspended particulate matter (SPM) emissions	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Fly ash emissions	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Non-Methane Volatile Organic Compounds (NMVOCs)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Odor emissions	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Noise Pollution	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Others												

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	<i>Add more rows if required</i>												
Environment - Land	<i>Solid waste Pollution from Plastics</i>	There were chances of Solid waste generation during the construction of the project from construction solid waste and domestic solid waste.	Decree No.59/2007/ND-CP dated 09 April 2006 of the Government on Solid Waste Management.	-	The waste generation during the construction activity were managed as per the local regulation. Hence it is Harmless, and no further actions required.	No Action Required	The Waste management plan has been prepared as a part of the ESIA study to address the environmental, health and safety impacts in the construction and operation phase of the project. The Waste management plan will be implemented in conjunction with the ESIA/ESMP.	No Action required	By implementing the developed ESM plan the residual risk associated with the project can be eliminated and the project become Harmless throughout its life cycle.		The project activity is unlikely to cause any harm related to this indicator.	0	
	<i>Solid waste Pollution from Hazardous wastes</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA	
	<i>Solid waste Pollution from Bio-medical wastes</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Solid waste Pollution from E-wastes</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Solid waste Pollution from Batteries</i>	Not applicable	No Regulation available in the country.	Not applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Solid waste Pollution</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA

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	<i>from end-of-life products/ equipment</i>											
	<i>Soil Pollution from Chemicals (including Pesticides, heavy metals, lead, mercury)</i>	The project is unlikely to cause pollution from chemicals and pesticides.	Not Applicable	Not applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Soil erosion</i>	There is a detailed report on the risk of soil erosion in the EIA report. According to the EIA report, there is a risk of erosion in some parts of the site area.	No regulation	Not applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	All necessary precautions will be taken against landslides and erosion as it is stated in EIA report	
	<i>Others</i>											
	<i>Add more rows if required</i>											
Environment - Water	<i>Reliability/ accessibility of water supply</i>	The water used for electricity is released back to the Lo River without any chemical change and at the same amount and quality. Therefore, agricultural and husbandry activities are not affected from the project activity since the project is run - type.	Minimum flow rates has been determined	Not applicable	Harmless	No Action Required	No Action Required	No Action Required	The plant has a reservoir. There is no Adverse impact for agricultural land in the project area. The amount of water supply will also be monitored.	The amount of water supply will be monitored.	Not applicable	+1
	<i>Water Consumption</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA

Project Submission Form

	<i>from ground and other sources</i>											
	<i>Generation of wastewater</i>	The project does not cause any wastewater discharge without treatment	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Wastewater discharge without/with insufficient treatment</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Pollution of Surface, Ground and/or Bodies of water</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Others</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Add more rows if required</i>											
Environment – Natural Resources	<i>Conserving mineral resources</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Protecting/enhancing plant life</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Protecting/enhancing species diversity</i>	Not Applicable	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Protecting/enhancing forests</i>	No forest land has been used for the project activity.	Not Applicable	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	No Action Required	NA
	<i>Protecting/enhancing other depletable natural resources</i>	Fish may be affected by the project activity	Minimum flow rates have been used.	No Action Required		Harmful	The fish species living in the study area, belong to the LC (Least Concern) category, it can be concluded	The mitigation measures has been taken	Harmless	The amount of water supply will be monitored.	There will not be any harm to the fish species with the help of the mitigation measures	+1

Project Submission Form

							that the project will not have a significant impact in terms of hydro - biological parameters in terms of sustainable ecosystem diversity.				taken.	
<i>Conserving energy</i>	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Nil
<i>Replacing fossil fuels with renewable sources of energy</i>	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Nil
<i>Replacing ODS with non-ODS refrigerants</i>	Not Applicable	Not Applicable	Not Applicable	No action required	No action required	Not Applicable	Not Applicable	No action required	Not Applicable	No impact Therefore this parameter will not be scored.	Not Applicable	
<i>Others</i>												
<i>Add more rows if required</i>												

Note: If the score is: (a) zero or greater, the overall impact is neutral or positive and there is no net harm; and (b) less than zero, the overall impact is negative and there is net harm to Environment. Score is obtained after adding the individual scores in each of the rows in the last column of the above table.

Net Score:	+3
Project Owner's Conclusion in PSF:	The Project Owner confirms that the Project Activity will not cause any net harm to the environment.

E.2. Social Safeguard

>>

Impact of Project Activity on		Information on Impacts, Do-No-Harm Risk Assessment and Establishing Safeguards								Project Owner's Conclusion		
		Description of Impact (both positive and negative)	Legal requirement /Limit	Do-No-Harm Risk Assessment			Risk Mitigation Action Plans		Do-No-Harm Residual Risk Assessment		Self-Declaration	
				Not Applicable (No actions required)	Harmless (No actions required)	Harmful (Actions required)	Operational Controls	Program of Risk Management Actions	Re-evaluate Risks	Monitoring	Explanation of Conclusion	The Project Activity will not cause any harm
<p>Social impacts on the identified categories²³ indicated below.</p>	<p>Indicators for social impacts</p>	<p>Describe the impacts on society and stakeholders, both positive and negative, that may result from constructing and operating of the Project Activity.</p>	<p>Describe the applicable national regulatory requirements / legal limits related to the identified risks of social impacts.</p>	<p>If no social impacts are anticipated, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as Not Applicable (No actions required)</p>	<p>If social impacts are anticipated, but are expected to be in compliance with applicable national regulatory requirements/ legal limits, then it the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as Harmless (No actions required)</p>	<p>If social impacts are anticipated that will not be in compliance with the applicable national regulatory requirements/ legal limits, then the Project Activity is likely to cause harm (may be unsafe) and shall be indicated as Harmful (Actions required).</p>	<p>Describe the operational controls and best practices, focusing on how to implement and operate the Project Activity, to reduce the risk of impacts that have been identified as Harmful.</p>	<p>Describe the Program of Risk Management Actions (refer to Table 3), focusing on additional actions (e.g., construction of crèche for workers) that will be adopted to reduce the risk of impacts that have been identified as Harmful.</p>	<p>Re-evaluate risks after Risk Mitigation Actions plans have been developed (refer to previous two columns) for impacts that have been identified as Harmful. Indicate whether the risks have been eliminated or reduced and, where appropriate, indicate them as Harmless (No actions required)</p>	<p>Describe the monitoring approach and the parameters to be monitored for each impact that has been identified as Harmful and to be described in the PSF (refer to Table 3).</p>	<p>Describe how the Project Owner has concluded that the Project Activity is likely to achieve the identified Risk Mitigation Action Plan targets for managing risks to levels that are unlikely to cause any harm.</p>	<p>Confirm that the Project Activity risks of negative social impacts are expected to be managed to levels that are unlikely to cause any harm (Mark +1 for Yes or and -1 for No)</p>

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

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Social Safeguards												
Social - Jobs	Long-term jobs (> 1 year) created/ lost	The project activity generates long term job opportunities during the operation the project activity. Project Owner has a policy on nondiscrimination for any openings.	Host country minimal wage requirements	This is a positive impact on the society Hence No actions required.	No action required.	No action required	No action required	No action required	No action required	To demonstrate the positive impact due to the project activity over the lifetime Project Owner monitors the impact through either of the following measures. 6. Employment Records 7. Host country minimal wage requirements and project compliance to that. Project Owner monitors the parameter and keep the records for the verification purpose.	The project is unlikely to cause any harm. Hence this parameter is scored as +1	+1
	New short-term jobs (< 1 year) created/ lost	The Project generated short term employment during the construction of the project.	Host country minimal wage requirements	This is a positive impact on the society Hence No actions required for further No-Harm Risk assessment.	No action required.	No action required	No action required	No action required	No action required	Since the project has already commissioned through the EPC contract it can be evidenced that Project has achieved the generation of short-term employment during the construction.	The project is unlikely to cause any harm. Hence this parameter is scored as +1	+1
	Sources of income generation increased / reduced	Not Applicable	No regulation	Not applicable	-	-	Not applicable	Not applicable	No action required	Not applicable	Not applicable	NA
Social - Health & Safety	Disease prevention	Not Applicable	No regulation	Not applicable	-	-	Not applicable	Not applicable	No action required	Not applicable	Not applicable	NA
	Reducing / increasing accidents	Not Applicable	NA	Not applicable	-	-	Not applicable	Not applicable	No action required	Not applicable	Not applicable	NA

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	<i>Reducing / increasing crime</i>	Not Applicable	NA	Not applicable	-	-	Not applicable	Not applicable	No action required	Not applicable	Not applicable	NA
	<i>Reducing / increasing food wastage</i>	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	NA
	<i>Reducing / increasing indoor air pollution</i>	Not Applicable	The Air (Prevention & Control of Pollution) Act 1981	Not applicable	No Action required	No Action required	Not applicable	Not applicable	No Action required	Not applicable	Not applicable	NA
	<i>Efficiency of health services</i>	Not Applicable	No local regulation available	Not applicable	No action required	No action required	Not applicable	Not applicable	No action required	Not applicable	Not applicable	NA
	<i>Sanitation and waste management</i>	Not Applicable	No local regulation available	Not applicable	No action required	No action required	Not applicable	Not applicable	No action required	Not applicable	Not applicable	NA
	<i>Other health and safety issues</i>	Not Applicable	Not applicable	No action required	No action required	Not applicable	Not applicable	Not applicable	No action required	Not applicable	Not applicable	NA
	<i>Add more rows if required</i>	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	NA
Social - Education	<i>Job related training imparted or not</i>	Employees gets benefited from training ..	-	This is a positive impact on the society Hence No actions required for further No-Harm Risk assessment	No action required	No action required	No action required	No action required	No action required	To demonstrate the positive impact due to the project activity over the lifetime Project Owner monitors the impact through either of the following measures. 8. List of Trainings conducted 9. Attendance Records Project Owner monitors the parameter and keep the records for the verification purpose.	The project is unlikely to cause any harm. Hence this parameter is scored as +1	+1
	<i>Educational services improved or not</i>	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not Applicable

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	<i>Project-related knowledge dissemination effective or not</i>	Project activity generates knowledge dissemination during the operation of the project.	Not applicable	This is a positive impact Hence no actions required	No action required	No action required	No action required	No action required	No action required	No action required	Since No risk has been associated with this parameter no risk mitigation action plan is required to implement.	0
	<i>Other educational issues</i>	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	
	<i>Add more rows if required</i>											
Social - Welfare	<i>Improving/deteriorating working conditions</i>	Not Applicable	EHS policy of project company	Not applicable	No action required	No action required	Not applicable	Not applicable	No action required	Not applicable	Not applicable	NA
	<i>Community and rural welfare</i>	Not Applicable	Not applicable	Not applicable	No action required	No action required	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	0
	<i>Poverty alleviation (more people above poverty level)</i>	Not Applicable	No local regulation	Not applicable	No action required	No action required	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	NA
	<i>Improving / deteriorating wealth distribution/ generation of income and assets</i>	Not Applicable	No local regulation	Not applicable	No action required	No action required	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	NA
	<i>Increased or / deteriorating municipal revenues</i>	Not Applicable	No local regulation	Not applicable	No action required	No action required	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	NA
	<i>Women's empowerment</i>	The project owner has the nondiscriminatory policy on recruitment and remuneration. (i.e right of equal pay). This ensures women's empowerment .	Organization Policy	This is a positive impact Hence no actions required	No action required	No action required	Project Owner has enforced the policy named "Remuneration and Welfare for Executives and Employees Policy" ensuring the employees in various positions	No action required	No action required	1. list of women employees if employed any 2. Organization policy on gender equality and equal remuneration.	The project activity creates positive impact on the society	+1

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							without discrimination and providing equal opportunities, both women, disabled, underprivileged.					
<i>Reduced / increased traffic congestion</i>	Not Applicable	No local regulation	Not applicable	No action required	No action required	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	NA
<i>Other social welfare issues</i>	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	NA
<i>Add more rows if required</i>												
<p>Note: If the score is: (a) zero or greater, the overall impact is neutral or positive and there is no net harm; and (b) less than zero, the overall impact is negative and there is net harm to society. Score is obtained after adding the individual scores in each of the rows in the last column of the above table.</p>												
Net Score:	+4											
Project Owner's Conclusion in PSF:	The Project Owner confirms that the Project Activity will not cause any net harm to society.											

Section F. United Nations Sustainable Development Goals (SDG)

UN-level SDGs	UN-level Target	Declared Country-level SDG	Defining Project-level SDGs					Project Owner(s)'s Conclusion		
			Project-level SDGs	Project-level Targets/ Actions	Project-level Indicators	Contribution of Project-level Actions to SDG Targets	Monitoring	Explanation of Conclusion	Are Goal/ Targets Likely to be Achieved?	

Project Submission Form

<p>Describe UN SDG targets and indicators</p> <p>See: https://unstats.un.org/sdgs/indicators/indicators-list/</p>	<p>Describe the UN-level target(s) and corresponding indicator no(s)</p>	<p>Has the host country declared the SDG to be a national priority? Indicate Yes or No</p>	<p>Define project-level SDGs by suitably modifying and customizing UN/ Country-level SDGs to the project scope.</p> <p>For guidance see: Integrating the SDGs into Corporate Reporting- A Practical Guide: https://www.unglobalcompact.org/docs/publications/Practical_Guide_SDG_Reporting.pdf</p> <p>Case-study from Coca-Cola and other organizations to develop organization-wide SDGs (page 114): https://pub.iges.or.jp/pub/re- alising-transformative-potential-sdgs</p>	<p>Define project-level targets/actions, by suitably modifying and customizing UN/Country-level targets to the project scope. Define the target date by which the Project Activity is expected to achieve the project-level SDG target(s). Refer to the previous column for guidance</p>	<p>Define project-level indicators by suitably modifying and customizing UN/Country-level indicators to the project scope or creating a new indicator(s). Refer to the previous column for guidance</p>	<p>Describe and justify how actions taken under the Project Activity are likely to result in a direct positive effect that contributes to achieving the defined project-level SDG targets and is additional to what would have occurred in the absence of the Project Activity</p>	<p>Describe the monitoring approach and the monitoring parameters to be applied for each project-level SDG target and Indicator</p>	<p>Describe how the Project Owner has concluded that the project is likely to achieve the identified Project level SDGs target(s).</p>	<p>Describe whether the project -level SDG target(s) is likely to be achieved by the target date (Yes or No)</p>
<p>Goal 1: End poverty in all its forms everywhere</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>
<p>Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>
<p>Goal 3. Ensure healthy lives and promote well-being for all at all ages</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>
<p>Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>
<p>Goal 5. Achieve gender equality and empower all women and girls</p>	<p>5.C Adopt and strengthen sound policies and enforceable legislation for the promotion</p>	<p>YES</p>	<p>Organization Policy for maintaining Non-discrimination and Gender equality during employment and remuneration policy for equal pay for equal work.</p>	<p>Project started commercial operation on 25/11/2020 and thus all policies related to the gender equality and remuneration are in place for implementation.</p>	<p>Project Owner through the implementation of organization policies for gender equality and equal remuneration targeted to eliminate any</p>	<p>In the absence of the project activity the additional employment opportunities created for both men and women would have not been occurred as</p>	<p>1. list of women employees if employed any 2. Organization policy on gender</p>	<p>Project has already commissioned to national grid and feeding the renewable power to the</p>	<p>YES Since the project activity is already operational Project activity</p>

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	n of gender equality and the empowerment of all women and girls at all levels				non-discrimination while employing the people and paying the equal remuneration for equal work.	there was no power plant is being operational in the project area. Project Owner has enforced the policy named “Remuneration and Gender Equality Policy” ensuring the employees in various positions without discrimination and providing equal opportunities, both women, disabled, underprivileged.)	equality and equal remuneration.	grid. Hence complied to the SDG. No 5.C	targeted SDG is likely to be achieved during the project entire crediting period.
Goal 6. Ensure availability and sustainable management of water and sanitation for all	NA	NA	NA	NA	NA	NA	NA	NA	NA
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.	YES	7.2.1 Renewable energy share in the total final energy consumption	Project started commercial operation on 25/11/2020 and thus resulted to increase in share of renewable energy in the grid mix of national grid.	Project target to generate and feed 95,067 MWh/year to the national grid and thus expected to increase the share of renewable energy by 23,76,675 MWh to the national grid for its lifetime	In the absence of the project activity 23,76,675 MWh of electricity would have been generated in the fossil fuel dominated grid mix of Vietnam and thus the project increase the share of	The value of net electricity supplied to the national grid shall be monitored and recorded. Refer section B.7.2 of this PSF.	Project has already commissioned to national grid and feeding the renewable power to the grid. Hence complied to the SDG. No 7.2	YES Since the project activity is already operational Project activity targeted SDG is likely to be achieved during

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						renewable energy in national grid.			the project entire crediting period.
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.	Yes	8.5.1 Average hourly earnings of employees, by sex, age, occupation, and persons with disabilities.	Project EPC contract was signed on 13/11/2017 and project was commissioned on 25/11/2020. Thus during the construction and operation of the project, increases full and productive employment and decent work. Project Owner is an equal employment provider without any discrimination such as sex, age and personal disability and also the policy ensures equal pay for work of equal value.	Project creates new employment and generates income for 25 no of people during the project lifetime.	In the absence of the project activity the targeted employment would not have been occurred and thus by through implementation and operation of the it increases full and productive employment and decent work	1. No of employment (with bifurcation on number by sex, age group and also where applicable, persons with disabilities) 2. Average earnings 3. Policy for Non discrimination and equal pay for the work of equal value.	Project has already constructed and commissioned. Hence complied to SDG No 8.5	YES Targeted SDG is likely to be achieved during the entire crediting period.
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased	No	Build and operate clean and resilient energy generation facility.	build and operate 26 MW Hydropower project in Vietnam	Project activity reduces an average of 76443 tCO ₂ per annum and 22,91,675 tCO ₂ e during the lifetime	Project owner ensures and undertake following actions to demonstrate the contribution to the SDGs. 1. Long term wheeling and banking agreements have been	Monitoring Parameter: Net quantity of electricity supplied to the National Grid (MWh/Annun)	Project activity involves installation of wind project which is clean and resilient infrastructure from the conventional fossil	YES

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<p>resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities</p> <p>9.4.1CO2 emission per unit of value added</p>						<p>signed with power distribution utility to supply the generated power from the wind power project to the final consumers through the national grid.</p> <p>2.Ensures best O&M practices at the site to optimise plant efficiency to generate maximum possible renewable energy and supply to the grid.</p> <p>These two actions ensure increase of renewable share in the national grid thereby increase in the total final energy consumption.</p>	<p>Monitoring procedures: Main and Check meters are installed at the substation by the electricity utility to measure the net exported electricity from the plant. The value of net electricity generation supplied to the grid as per Monthly Meter Reading Report forms which can be cross-checked from electricity bills in which the generate electricity is adjusted</p>	<p>fuel-based power plant technology. Supports advanced industrialization by providing zero greenhouse gas and non-polluting clean electricity. Support industrialization through local hiring, procurement, and training and skills development. Project has already commissioned and achieving the Goal targets.</p> <p>Hence the Project activity is likely to achieve the SDG targets.</p>	
--	--	--	--	--	--	---	--	--	--

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							Calculate the emission reductions by displacing the equivalent amount of grid electricity by multiplying with the combined margin grid emission factor.		
Goal 10. Reduce inequality within and among countries	NA	NA	NA	NA	NA	NA	NA	NA	NA
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable	NA	NA	NA	NA	NA	NA	NA	NA	NA
Goal 12. Ensure sustainable consumption and production patterns	NA	NA	NA	NA	NA	NA	NA	NA	NA
Goal 13. Take urgent action to combat climate change and its impacts	13.2 Integrate climate change measures into national policies, strategies and planning	No	13.2.2 Total greenhouse gas emissions per year	Project started commercial operation on 25/11/2020 and thus resulted to reduces 76443 tCO2 emissions per year in the host country	Project target to reduce 76443 tCO2 emissions per year in the host country and expected to reduce 19,11,075 tCO2 emission reductions to in the host country for its lifetime	In the absence of the project activity 76443 tCO2/year emission reductions would have been generated from the fossil fuel dominated power plants in the host	The quantity of CO2 emission reduction /year reduced due to the operation of the project activity. Refer section	Project has already commissioned and started reducing the emissions. Hence complied to the SDG No.13	YES Targeted SDG is likely to be achieved during the entire crediting period.

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						country.	B.7.2 of this PSF.		
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development	NA	NA	NA	NA	NA	NA	NA	NA	NA
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	NA	NA	NA	NA	NA	NA	NA	NA	NA
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	NA	NA	NA	NA	NA	NA	NA	NA	NA
Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development	NA	NA	NA	NA	NA	NA	NA	NA	NA
SUMMARY						Targeted		Likely to be Achieved	
Total Number of SDGs						5		5	
Certification label (Bronze, Silver, Gold, Platinum, or Diamond) for the ACCs as defined in the PSF						Platinum		Platinum	

Section G. Local stakeholder consultation

G.1. Modalities for local stakeholder consultation

Pursuant to the Law on Environmental Protection of the Government of Vietnam, Government's Decree NO: 18/2015/ND-CP, dated February 14, 2015, Project owner has to conduct a detailed Environmental impact assessment including the local stakeholder consultation meeting before the construction of the project activity to make sure that projects will not contribute to negative environmental impact.

Local stakeholder meeting was carried at two different places by inviting the stakeholders belonging to the local commune peoples committee of respective province. LSC has been carried out at following three provinces surrounding the project area at three different dates.

Sl.No	Date of Meeting	Place
01	20/01/2020	Committee of Lao Cai province, Pa Vay Su commune.

The physical Local stakeholder consultation was carried out by inviting the local stakeholders through Invitation to the peoples community by attaching the EIA report with date of meeting

The Project representatives presented the salient features of the project activity to the stakeholders including the impact of project activity on Social, economic and environmental safeguards with the implementation of the project. The stakeholders also acknowledged the socio-economic benefits of the project activity including improved infrastructure in the region, and employment opportunities for local residents. The opinions expressed by the local stakeholders and the respective responses were recorded.

Details of the meeting with list of participants are provided in the EIA report. EIA report has been submitted to the verifier.

G.2. Summary of comments received

A summary of the comments and queries from the stakeholders are presented below along with the responses from the representatives of the project participants:

Stakeholder comment	Explanation provided by PP representative
How do you manage the dust and air and noise pollution during the construction	Adequate measures as mentioned in the EIA will be followed to eliminate the risk of air, noise and dust pollution during the construction of the project activity.
Requested to adopt measures to minimize negative impacts of the project on the natural environment, socio-economic and community health	Adequate measures as mentioned in the EIA will be followed to eliminate the anticipated negative impacts during the construction & Operation phase of the project activity.
Does the Hydropower plant affect the rain in the local area?	No, the Hydropower plant installation does not have impact over the rainfall.

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Is there any impact on the local people due to the waste generation at the plant?	There is no significant solid waste generation or wastewater discharge due to the Hydropower plants. However, if any waste generates during the project operation will be well managed at the plant storage yard and dispatched to the regulated dumping areas with out affecting the local people on regular intervals. You can anytime complain your grievances if any due to the project operation at the site grievance register.
Does the availability of National Highway near project site have impacts?	To ensure the safety of workers and local people, public warning signs, speed reduction sign will be arranged.
Is there any vacancy in the Hydropower plant?	Yes, based on the skills and qualification first preference will be provided to the local people.

G.3. Consideration of comments received

There were no concerns raised by the local stakeholders. The potential benefits of the project activity for the local stakeholders were acknowledged

No negative comments have been received on project activity from any of the local stakeholders consulted. As all comments were very positive about the project, no further action is required.

There were no further comments raised by the stakeholders and they were totally in support for setting up of these kinds of projects in the region.

Section H. Approval and authorization

No host country approval is required hence N/A.

Appendix 1. Contact information of project owners

Organization Name	Song da 9 Joint Stock Company
Country	Vietnam
Address	Song Da 9 Building, Pham Hung street, My Dinh 2 ward, Nam Tu Liem District, Ha Noi.
Telephone	-
Fax	-
E-mail	duchanh.pake@gmail.com
Website	www.songda9.com
Contact person	Mr. Pham Duc Hanh

Appendix 2. Affirmation regarding public funding

Not Applicable

Appendix 3. Applicability of methodology(ies)

Please refer section B.2

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

Not applicable

Appendix 5. Further background information on monitoring plan

Not applicable

Appendix 6. Summary report of comments received from local stakeholders

Refer Section G.2

Appendix 7. Summary of de-registered CDM project (Type B)

Not Applicable

DOCUMENT HISTORY

Version	Date	Comment
V 3.2	31/12/2020	<ul style="list-style-type: none"> ▪ The name of GCC Program’s emission units has been changed from “Approved Carbon Reductions” or ACRs to “Approved Carbon Credits” or ACCs.
V 3.1	17/08/2020	<ul style="list-style-type: none"> ▪ Editorial revisions made <ul style="list-style-type: none"> ○ Revised Table in section B.7.2 on Monitoring-program of risk management actions ○ Revised Table in section E.1 on Environmental Safeguards ○ Revised Table in section E.1 on Social Safeguards ○ Revised Table in section F on United Nations Sustainable Development Goals (SDG)
V 3.0	05/07/2020	<ul style="list-style-type: none"> ▪ Revised version released on approval by Steering Committee as per GCC Program Process; ▪ Revised version contains following changes: <ul style="list-style-type: none"> ○ Change of name from Global Carbon Trust (GCT) to Global Carbon Council (GCC); ○ Considered and addressed comments raised by Steering Committee: <ul style="list-style-type: none"> ➤ during physical meeting (SCM 01, dated 29 Oct 2019, Doha Qatar); and ➤ electronic consultations EC01-Round 01 (15.09.2019 – 25.09.2019), EC01-Round 02 (27.03.2020 – 27.06.2020). ○ Feedback from Technical Advisory Board (TAB) of ICAO on GCC submission for approval under CORSIA²⁴;
V 2.0	25/06/2019	<ul style="list-style-type: none"> ▪ Revised version released for approval by the GCC Steering Committee. ▪ Revised version includes additional details and instructions on the information to be provided, consequent to the latest developments world-wide (e.g., CORSIA EUC).
V 1.0	01/11/2016	Initial version released under the GCC Program Version 1

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

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