Song Ong Hydropower Project

Document Prepared By TÜV NORD CERT GmbH

Project Title	Song Ong Hydropower Project
Version	02

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Summary:

Provide the following:

- Song Ong Hydropower Project is a hydropower plant with an installed capacity of 8.1MW consisting of 3 sets of 2.7MW generator. The project is expected to generate 39,994MWh net electricity per year and to be exported to the Viet Nam Grid.
- The 1st verification is conducted along the validation to have an independent third party assessment. The purpose is to confirm that the project activity is implemented in accordance with the project description and monitoring report.
- The method for the verification consists of document review, interview of relevant entities and on-site assessment by following the criteria required by the VCS standard version 3.2.
- Findings regarding restrictions of uncertainties related to the verification were raised and closed successfully.
- From the result of this 1st periodic verification, the verifier team confirms that the project had achieved emission reductions as mentioned in the reporting period from 24 March 2009 to 28 February 2011 (both dates included).

Abbreviations

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCS	VCS - Project Description
VCU	Voluntary Carbon Unit
VVM	Validation and Verification Manual

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1 INTRODUCTION

Swiss Carbon Value Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project:

"Song Ong Hydropower Project"

with regard to the relevant requirements of the Voluntary Carbon Standard 2011[/VCS/]. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered VCS project for the monitoring period 2009-03-24 to 2011-02-28 (both dates included).

The applied monitoring methodology is AMS-I.D version 16, "Grid connected renewable electricity generation".

1.1 Objective

The purpose of the validation is to conduct the VCS supplementary validation report along with the pre-CDM verification to have an independent third party assessment of the project design, in particular, the project's baseline, the additionality, the monitoring plan (MP) and the project's compliance with

- The requirements of VCS version 3.1 program guidelines
- approved methodology AMS-I.D version 16
- other relevant rules, including the host country, Viet Nam
- legislation and sustainability criteria

Then, the verification has been carried out along which purpose of independent checking of objective evidence, is as follows:

- to verify that the project is implemented as described in the project design document;
- to assess the implementation of the monitoring plan (MP) content in the VCS-PD;
- to assess the project's compliance with other relevant rules, including the host country Thailand legislation;
- to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

These are validated and verification objective to confirm that the project design as documented is sound reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of Voluntary Carbon Units (VCUs). The verification is followed for check the implementation is compliance to the regulation and ensure of the amount of CER that correct.

1.2 Scope and Criteria

The scope of the validation and verification covers the clauses of 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS PD and Monitoring Report as required by the Policy Announcement from VCS Association. The validation and verification scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan based on AMS-I.D: "Grid connected renewable electricity generation" - Version 16, from 2010-05-28 onwards, which are included in the VCS PD, Monitoring report and other relevant supporting documents.

The items covered in the validation and verification are described below:

- VCS version 3.1 and Project Country Criteria
- Project Description
- Project Baseline
- Monitoring Plan
- Calculation of GHG Emissions
- Project Additionality
- Background investigation and follow up interviews
- Environmental Impacts
- Draft validation reporting with CARs, CLs & FARs, if any
- Final validation reporting and Project Design Document Version 2.5 on http://cdm.unfccc.int/Projects/DB/RWTUV1289918487.21/view

The information included in the PD, Monitoring report and the supporting documents were reviewed against the requirements and criteria mentioned above. The TÜV NORD CERT GmbH JI/CDM CP has employed a risk-based approach in the validation and verification, focusing on the identification of significant risks for project implementation and the generation of VERs. The validation and verification is based on the information made available to TÜV NORD JI/CDM CP on the contract conditions and supporting documents made available to the DOE. This shall also include the information collected through performing interviews during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The assessment is not meant to provide any consulting to the project participant. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design. TÜV NORD JI/CDM CP has employed a risk-based approach in the validation and verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 Level of assurance

The verification has been planned and organized to achieve a

☒ reasonable level of assurance

☐ limited level of assurance.

1.4 Summary Description of the Project

The project activity is a hydropower project which consisted of the installation of water turbines and generators to generate electricity from hydro source. Other supporting facilities installed for the power generation includes water lifting dam (with daily regulation), water intake, water channel, penstock (pressurizing equipment), power house, and transmission line.

The project activity has an installed capacity of 8.1MW (3X2.7MW) with an expected gross annual generation of 40,500MWh. In the course of implementing the project activity, a new reservoir is created with a surface area of 17,000m^2. The power density of the project activity was calculated to be 476.5W/m^2. Hence it is expected that no project emissions will occur from the reservoir.

The hydropower plant will be connected to the Viet Nam National Grid. The technology employed will provide lower emission generation as compared to the current mixed generation of Viet Nam National Grid. The technology/process employed will be environmentally safe and sound.

The emission reduction of the project activity is counted since the project started to export electricity to the National Grid on 2009-03-24 which is the commercial operation date approved by the Power Company 2 (subsidiary of EVN)[/COD1/]. The project's construction was completed and had connected to the Grid in mid-March 2009 with 3 sets of generation unit (turbine and generator). The generation equipment are then tested and commissioned during the period between 2009-03-17 till 2009-03-22. The testing of the equipment was certified by third party authorized party by the Power Company 2.

The project activity has been registered with the United Nations Framework Convention on Climate Change (UNFCCC) as a CDM project activity (Reference No. 4117) on 2011-02-04. However the CDM crediting period starts on 2011-03-01.

The main objective of the project activity is to utilize renewable source to generated electricity and export to the Viet Nam National Grid. The project activity is beneficial of GHG emissions from the dependence of fossil fuel to generate power. Furthermore the project is a plan to improve the electricity supply in Viet Nam.

The emission sources and greenhouse gases (GHGs) involved in the project activity are:

1. CO_2 emission of the fuel-mixed electricity Grid.
2. CO_2 emission from the fossil-fuel usage in the project boundary for electricity generation.
3. CH_4 emission from newly created reservoir.

During the on-site visit on 2011-10-10, 2011-10-11 and 2011-10-14, the hydropower plant location was visited and project location has been confirmed in table 1-1.

Table 1-1: Project Location

Item	Project scope
Host country:	Viet Nam
Region:	Quang Son commune
Project address:	Ninh Son District, Ninh Thuan Province
Latitude	Power House – 11°44'56" N Water Intake – $11^0$45'13" N
Longitude	Power House – 108°49'20" E Water intake – $108^0$48'19" E

Annual estimated emissions reduction is 21,416 VERs. The project contributes to the sustainable development as the activity will:

- Reduce the dependent for grid supply impact upon climate change,
- Improve electricity supply in the demanding Viet Nam Grid.
- Improve the knowledge of renewable energy in Viet Nam
- Improve the attraction of private investor to the province with more stable electricity supply
- Improve local infrastructure (e.g. road),
- Provide employment for locals.

The project is owned and operated by Song On Hydropower Joint Stck Company. Under the VCS project, the monitoring period is 2009-03-24 to 2011-02-28 (both dates include). Essential data of the project is presented in the following Table 1-2, 1-3 and 1-4.

Table 1-2: Project Characteristics

Item	Data			
Project title	Song Ong Hydropower Project			
Project owner	SONG ONG HYDRPOWER JOINT STOCK COMPANY			
Any specific project categories	☐ Mega projects (> 10^6 t CO_{2eq} / a) ☒ Projects (5,000 to 10^6 t CO_{2eq} / a) ☐ Micro projects (< 5000 t CO_{2eq} / a) ☐ AFOLU project ☐ Grouped project ☐ No specific project category			
VCS MR dated	Draft:	2011-09-21	Final:	2012-03-29
Applied Methodology	AMS-I.D: Version 16: Grid Connected renewable electricity connection			
Project starting date	2009-03-24			
Crediting period	☐ Renewable Crediting Period (10 y) ☒ Fixed Crediting Period (10 y)			
Start of crediting period	2009-03-24			

Table 1-3: Technical data of the project

Parameter	Unit	Value
Turbines		
Unit		3
Installed capacity	MW	3X2.7
Type		Francis Vertical Axis
Runner diameter	m	1.4
Rated net head	m	27
Rated efficiency	%	86.91
Design flow	m^3/s	11.57
Generator		
Unit		3
Type		SF2700-20/3250
Capacity	MW	2.7
Rated voltage	kV	6.3

Parameter	Unit	Value
Rated Efficiency	%	95.2
Transformer		
Manufacture		ABB Ltd
Unit		3
Type		3 phase 2 windings
Rated capacity	MW	3.5
Primary voltage	kV	6.3
Secondary voltage	kV	24

Table 1-4: Parameters confirmed during verification

Parameter	Instrument Type	Manufacturer	Instrument Model	Accuracy
$EG_{y,export}$ = $EG_{facility,y}$	Electricity meter	Elster	A1700	0.2s (main meter) 0.5 (back-up meter)
$EG_{y,import}$	Electricity meter	Elster	A1700	0.2s (main meter) 0.5 (back-up meter)
$EG_{BL,y}$	Calculated			
A_{PJ}	Third party assessment			
Cap_{PJ}	Equipment name plate checking			
$FC_{i,j,y}$	Measurement ruler	-	-	-

In addition to these parameters the make, accuracy and class of main and check meters installed in the transformer yard, outage register, maintenance checklists, calibration records, electricity generation and defect registers were checked and verified.

1.5 Appointment of team members and technical reviewer

Table 1-5: Involved Personnel

	Name	Company	Function [1)]	Qualification Status [2)]	Scheme competence [3)]	Technical competence [4)]	Host country Competence	Team Leading Competence	On-site Visit
☒ Mr. ☐ Ms.	Cheong, Chun Yuen (Robert)	TN Malaysia	TL [A)]	SA	☒	1.2	☐	☒	☒

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence [3]	Technical competence [4]	Host country Competence	Team Leading Competence	On-site Visit
☒ Mr. ☐ Ms.	Cheong, Chee Yin (Nicholas)	TN Malaysia	TM[A]	A	☒		☐	☐	☒
☒ Mr. ☐ Ms.	Pham, Van Trung	TN Vietnam	TM[A]	A	☒	S	☒	☐	☒
☒ Mr. ☐ Ms.	Jochen Schubert	TN Cert	TR/FA[B]	SA	☒	1.2	☐	☒	-

1) TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

3) GHG auditor status (at least Assessor)

4) As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, …)

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

The supplementary validation of the project consisted of the following steps:

2.1 Validation Process

The supplementary validation of the project consisted of the following steps:

- Contract review;
- Appointment of team members and technical reviewers;
- Desk review of the Project Document[/PD/] submitted by the client and additional supporting documents.
- Validation planning;
- On-Site assessment;
- Background investigation and follow-up interviews with personnel of the
- project proponent and its contractors;
- Draft validation reporting;
- Resolution of corrective actions; (if any)
- Final verification reporting;
- Technical review;
- Final approval of the validation

Table 2.1: Validation sequence

Topic	Time
Assignment of validation	2011-09-12
On-site visit	2011-10-10, 2011-10-11 & 2011-10-14
Draft reporting finalised	2012-01-19
Final reporting finalised	2012-03-19
Technical review on final reporting finalised	2012-03-28
Final corrections	2012-03-29

The main validation steps are described below:

2.1.1 Review of Document

The Supplementary VCS PD[/PD/] and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

This report shows the documents considered during the validation process and listed as follows:

- Table 6-1: Documents provided by the project proponent
- Table 6-2: Background investigations and assessment documents
- Table 6-3: Websites consulted

2.1.2 Resolution of any material discrepancy

Material discrepancies identified in the course of the validation are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this validation is included in the next section 3 of this report.

2.1.3 Interview

Before and during the on-site visit, the validator of TÜV NORD performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

The project proponent(s), other project entity(ies), the consultants, were interviewed to confirm selected information and to resolve issues identified in the documents review. The main topics of the interviews are summarized in Table 2-1.

Table 2.1-1: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Song Ong Hydropower Joint Stock Company	• General aspects of the project • Technical equipment and operation • Changes since implementation • Monitoring and measurement equipment • Remaining issues from validation • Calibration procedures

Interviewed Persons / Entities	Interview topics
Energy and Environment Consultancy Joint Stock Company	• Quality management system • Involved personnel and responsibilities • Training and practice of the operational personnel • Implementation of the monitoring plan • Monitoring data management • Data uncertainty and residual risks • GHG calculation • Procedural aspects of the verification • Maintenance • Environmental aspects • Editorial issues of the Monitoring Report

2.1.4 Site Inspection

The team has carried out site inspection and the interview to cross check the compliance of the project activity along with the project description document. Also, the related documents of the project activity had been assessed to confirm the actual situation during site visit.

2.2 Validation Findings

The team has carried out site inspection and the interview to cross check the compliance of the project activity along with the project description document. Also, the related documents of the project activity had been assessed to confirm the actual situation during site visit.

The team assessed to the Validation Report prepared last DOE which available on the UNFCCC website http://cdm.unfccc.int/Projects/DB/RWTUV1289918487.21/view. The discrepancies raised by the DOE as listed in the report are 14 CARs, 11 CLs and 2 FARs. All CARs and CLs were closed out since from previous DOE. The others two FARs as left from the DOE were review by team. Two FARs left regards to the training of personnel and QA/QC procedure to operate the power plant. The team has reviewed that evidences substantiated by PP also cross check actual situation during site visit. Therefore, two FARs are closed.

In this section the assessments and findings from the desk review of the VCS PD, site visit, interviews and supporting documents as well as the final assessments are summarised. Table 2-1 includes an overview of all raised CARs, CLs and FARs.

Table 2.2-1: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
i.	VCS PD Template Section - 1.2	-	-	-
ii.	VCS PD Template Section - 1.3	-	1	-
iii.	VCS PD Template Section - 1.5	1	1	-

iv.	VCS PD Template Section - 1.6	1	-	-
v.	VCS PD Template Section - 1.7	1	-	-
vi.	VCS PD Template Section - 1.9	1	-	-
vii.	VCS PD Template Section - 1.10	1	-	-
viii.	VCS PD Template Section - 1.12.1	1	-	-
ix.	VCS PD Template Section - 1.12.2	-	-	-
x.	VCS PD Template Section - 1.12.3	-	-	-
xi.	VCS PD Template Section - 1.12.4	1	-	-
xii.	VCS PD Template Section - 1.13	1	-	-
	SUM	**8**	**2**	**-**

VCS PD Template Section - 1.2

Description

The project activity is a CDM Type I project under Scope 1 – Energy Industries (renewable-/non-renewable sources). The project activity was registered with the approved methodology AMS-I.D – Grid connected renewable electricity generation version 16.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

Final Assessment

It can be confirmed during the onsite assessment that the project activity is a hydropower project. The project uses the water source from the Ong river to generate electricity and exports to the Viet Nam National Grid. As according to the registered CDM PDD, the project is a Type I project classified under Scope 1 (Energy Industries (renewable-/non-renewable sources). The project is applying the methodology AMS-I.D – Grid connected renewable electricity generation version 16. The version of the methodology applied is consistent with the registered CDM PDD.

VCS PD Template Section - 1.3

Description

The project proponent of the project activity are as below:

Song Ong Hydropower Joint Stock Company - the project owner of Song Ong Hydropower Project

Project Address: Quang Son Commune, Ninh Son District, Ninh Thuan Province Vietnam
Telephone: +84 683 851 556
Represented by: Mr Nguyen Hai Quynh
Email: thuydienso@yahoo.com.vn

Swiss Carbon Value Ltd. – *The VER buyer*[1]
Address: Technopark Str. 1 8005 Zurich, Switzerland
Telephone: +41 43 501 3550
Represented by: Mr Renat Heuberger
Email: registration@southpolecarbon.com

Other participants:

Energy and Environment Consultancy Joint Stock Company – *The project consultant*
Address: Room 1210, Building 18T2, Trung Hoa, Nhan Chinh, Le Van Luong Street
Telephone: +84 4 2214 8810
Fax: +84 4 6281 2733
Represented by: Ms Dang Thi Hong Hanh
Email: eec@eec.vn

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**1.3-1**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Clarification is requested if there is any other project proponents are involved in the project activity which will have direct interaction with the registry as accordance to clause 3.2.1 of the VCS Registration and Issuance Process version 3.0		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	"Swiss Carbon Value Ltd." is a project proponent and not considered as other entities. Therefore, the information indicated in section 1.3 has been corrected in the updated PD version 2.0		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Section 1.3 of the PD, version 2.0 and dated 2011-11-03 was updated with the following organization as one of the project participant involved in the registry: Swiss Carbon Value Ltd. who is the VER buyer for Nam Ngan Hydropower Project. This was cross-checked with the ERPA /ERPA/ dated 2010-05-20 signed by and between Swiss Carbon Value Ltd. and the project proponent. All the necessary details about the project participant have been provided in Section 1.3 of the PD. The information could be assessed as sufficient and complete. CL is CLOSED		

[1] The CDM CER buyer is Dong Naturgas A/S

Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

The project proponents have been identified according to the VCS Program Guide version 3. The assessment team had reviewed the Emission Reduction Purchasing Agreement (ERPA) dated 2010-05-20 which had entered into contractual agreement on 2010-07-07 to confirm the project proponent. The contractual agreement was signed between Nam Mu Hydropower Joint Stock Company and South Pole Carbon Value Ltd. South Pole Carbon Value Ltd. is the representative of the VCS project database.

VCS PD Template Section - 1.5

Description

The project start date is 2009-03-24, the date when the project activity started commercial operation which is accepted by the power purchasing company, Power Company 2 – a subsidiary of Viet Nam Electricity (EVN).

Related Findings

☐ No CARs, CLs or FARs have been identified in this context
☒ The following finding(s) have been addressed:

Finding:	**1.5-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The date format is not according to the requirement of VCS.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The date format has been corrected in the revised PD version 2.0		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	All the dates used in the PD have been rewritten in the PD version 2.0 dated 2012-01-04 in line with the date format of the VCS requirement. The date format has been made consistent with the VCS requirement. CAR is CLOSED		

Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

The project start date has been identified as according to the VCS Standard 3.2. The project start date is the date on which the project began generating the GHG emission reductions or removals. The project had started to generate GHG emission reductions on 2009-03-24 when the hydropower plant had started the commercial operation. The letter of confirming the commercial operation has been issued by the Power Company No.2 (a subsidiary of Viet Nam Electricity (EVN) to purchase power in Viet Nam[2]) on 2009-04-14/COD1/. The hydropower plant had undergone 72 hours commissioning for each generation units/PI4/PI5/PI6/. The table below shows the commissioning dates:

Generation Unit	Start date of 72 hours commissioning	Date of the Minutes of commissioning
Unit 1	2009-03-22	2009-03-25
Unit 2	2009-03-17	2009-03-20
Unit 3	2009-03-19	2009-02-22

The commissioning had been conducted jointly

with the equipment supplier.

Prior the commercial operation, monitoring equipment (electricity meters) has been tested and accepted by Power Company 2. The project activity includes the installation of 2 electricity meters (one main and one back-up) which have been tested on 2009-03-05. The testing report was issued on 2009-03-24/TI5/TI7/ by the Power Company 2.

In order to confirm the electricity generation approval, the assessment team had reviewed the generation license/SC2/.

Since the commercial operation date has been approved and agreed by the National authority, the assessment team deemed the project start date is according to the commercial operation date.

VCS PD Template Section - 1.6

Description

The crediting period of the project activity is from 2009-03-24 till 2011-02-28.

Related Findings

[2] EVN has 3 subsidiaries (Power Company No.1, Power Company No.2 and Power Company No.3) to manage and purchase power of the Grid. The subsidiaries are allocated depending on the region in Viet Nam (which is the Northern, Central and Southern).

☐ No CARs, CLs or FARs have been identified in this context
☒ The following finding(s) have been addressed:

Finding:	**1.6-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The crediting period is not clear if the both dates are included in the reporting period.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The crediting period has been revised as 2009-03-24 till 2011-02-28 and both dates are inclusive. This information has been emphasized in the revised PD.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	In Section 1.6 of the PD, version 2.0, the PP had claimed the crediting period from 24 March 2009 until 28 February 2011, both dates are inclusive. Reviewing the evidence for the project start date, monitoring data and registration details of the project activity on the UNFCCC website, the crediting period chosen by the PP could be confirmed as correct. CAR is CLOSED		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

The project crediting period starts from the commercial operation date until the date before the first monitoring period of the CDM project activity starts. As according to the UNFCCC/CDM website, the project activity has been registered on 2011-02-04. However, the starting of the crediting period is from 2011-03-01. Therefore the project crediting period from 2009-03-24 until 2011-02-28 (includes both dates) is confirmed to be correct and there is no overlapping of claiming on the carbon credits.

The total crediting period is 1.937 years (calculated bases on the total days). The crediting period is according to the permission of VCS of not more than 2 years (backwards) from the day of the CDM registration.

The PD has correctly indicated the project crediting period as according to the VCS requirements and the registration of the CDM project activity.

VCS PD Template Section - 1.7

Description

The project activity is a “project” which has an annual VER estimation of 21,416tCO_{2e}.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context
☒ The following finding(s) have been addressed:

Finding:	**1.7-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The estimation of the VERs is not accordance to the registered CDM project.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The estimation of the VERs has been corrected in revised PD		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The PD, version 2.0, has been corrected. The PP had estimated the emission reductions based on ex-ante inputs in Section 1.7. The estimated annual emission reduction is now same as 21,416 tCO_2e as indicated in Table 2 of the registered PDD. CAR is CLOSED.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

This VCS project is reported to be a “project” category as according to the VCS Standard version 3.2. The average annual GHG emission reductions or removals of the project are less than 1,000,000 tCO2e per year. The estimated average annual emission reductions of the project are 21,416tCO2e/year. Therefore, the choice is correctly chosen. The estimation of the average VERs is consistent with the registered CDM project activity.

VCS PD Template Section - 1.9

Description

The project is located at Ong River at the section of Quang Son Commune in Ninh Son District of Ninh Thuan Province.

The physical geographical coordinates of the project are as follow:

	Latitude	Longitude
Water intake	$11^0$45’13’’	$108^0$48’19’’
Power house	$11^0$44’56’’	$108^0$49’20’’

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**1.9-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The location map of the project activity is not found in the PD.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The location map of the project activity has been included in the revised PD.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The project location map was provided in Section 1.9 of the PD, version 2.0. This was cross checked with the registered PDD and verified by onsite confirmations during the site visit by the verification team. The project was located on the Ong River in Quang Son Commune, Ninh Son District of Ninh Thuan province, Viet Nam. CAR is CLOSED		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

The project location was confirmed during the onsite assessment. The geographical coordinates of the project has been confirmed using a handheld GPS unit. The project location had not changed from the registered CDM project activity.

The assessment team had reviewed the Land Use license[/BA1/] to confirm the project is located at Quang Son Commune, Ninh Son District of Ninh Thuan province, Viet Nam. A location map has been provided in the PD to show the project location.

VCS PD Template Section - 1.10

Description

The project activity will reduce GHG emission that will be produced by conventional power plants.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context
☒ The following finding(s) have been addressed:

Finding:	**1.10-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The project prior initiation shall provide description with regards to the baseline scenario.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The project prior initiation has been revised with regards to the baseline scenario in the VCS PD version 2.0		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Section 1.10 of the PD version 2.0, was revised to include information on the baseline scenario of the project activity which is as follows. Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources. Hence, an equivalent amount of annual power output from the Viet Nam national grid to which the proposed project is also connected will be delivered. The database for calculating the baseline is provided by the Institute of Energy, EVN. This was consistent with the baseline scenario identified in the register red PDD and is the same with the real situation perceived by the verification team during the site visit to Song Ong Hydropower Plant. CAR is CLOSED		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

Prior the setup of the project, the equivalent amount of electricity would be generated by those generation units that are connected to the Viet Nam National Grid. The Vietnam National Grid is a combination of mixed fuel mainly dominated by fossil fuel. According to the Study, Definition of Vietnam Grid Emission Factor published by the DNA of Viet Nam, the fossil fuels generation contributes 67.4% of the total generation in year 2008. Therefore, if the project would not be set up, the generation of the equivalent amount of electricity would cause higher Grid emissions.

VCS PD Template Section - 1.12.1

Description

The project activity has accompanied by proof of title with the following rights of use:

a. The right of use arising by virtue of a statutory, property or contractual right in the plant equipment or process that generates GHG emission reductions/removals through the official letter No. 5390/BCN – NLDK on approval to transfer the hydropower plant from Midland Construction Corporation to Song Ong Hydropower Joint Stock Company issued on 2006-09-26 by Ministry of Industry. This document indicates that Song Ong Hydropower Joint Stock Company has full owner ship, which is legally accredited by the Vietnamese authority, for the construction and operation of Song Ong hydropower plant.

b. The right of use arising or granted under statute, regulation or decree by a competent authority through the Electricity Operation License No.39/GP – DTDL dated 2009-05-27 from the Ministry of Industry and Trade licences Song Ong Hydropower Joint Stock Company to legally manage and operate Song Ong Hydropower plant.

c. The enforceable and irrevocable agreement with the holder of statutory, property or contractual right in the plant, equipment, or process, that generates GHG emission reductions and/or removals which vests the right of use in the project proponent through the followings:

   i. Power Purchase Agreement dated 2008-11-11 between Song Ong Hydropower Joint Stock Company and Power Company No. 2

   ii. Land use License issued by the Department of Natural Resources and Environmental of Ninh Thuan Province Peoples Committee dated 2007-03-12.

   iii. Water surface using license issued by the Ministry of Natural Resources and Environmental of Viet Nam dated 2010-04-08

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**1.12.1-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The following proof is required for the rights of the project activity a. LoA issued by the DNA of Vietnam to proof the GHG generations. b. Land use license c. Environmental compliance certificate d. Water surface used certificate		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The evidences of the proof have been complemented in the revised PD and attached herewith with regards to: a. LoA issued by the DNA of Vietnam on 2008-06-30 b. Land use license issued on 2007-03-12 c. Approving EIA report issued on 2003-11-04 d. Water surface use certificate issued on 2010-04-08		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall*	The assessment team had reviewed the following documents submitted by the PP: a. The LoA issued by Vietnam DNA on 30 June 2008. The letter confirmed voluntary participation in CDM and project contribution to sustainable development in Vietnam as the host country. It was		

be added.	cross-checked with the list of project activities receiving LoA on the Vietnam DNA website. The authenticity is therefore confirmed; b. Land use license issued on 12 March 2010 Ninh Thuan provincial Department of Natural Resources and Environment; c. Approval for the Environmental Protection Commitment (EPC) issued by Ninh Thuan provincial Department of Natural Resources and Environment on 4 November 2004; d. Surface water usage license issued by Vietnam Ministry of Natural Resources and Environment on 8 April 2010. With these documented evidences, the rights of the project activity could be confirmed. CAR is CLOSED
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

During the onsite visit, the assessment team has crosschecked the relevant documentation as shown above and on the UNFCCC website (http://cdm.unfccc.int/Projects/DB/RWTUV1289918487.21/view) for Host Country Approval Letter/LoA/. The project proponent (project owner) had obtained the relevant approval from the Host Country to operate the hydropower plant. In the Viet Nam scenario, due to the social rights, it is impossible for the project proponent to operate the hydropower plant if there is no approval from the relevant national authority. Therefore, the proof of title of the project is deemed to be appropriate.

VCS PD Template Section - 1.12.2

Description

The Host country does not have any emission trading program of binding limits.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context
☐ The following finding(s) have been addressed:

Final Assessment

Through the local knowledge of the assessment team, it is confirmed that Viet Nam does not have an emission trading system. The assessment team had also interviewed the local CDM project proponents/IM02/ to confirm the non-existence of emission trading system in Viet Nam.

The host country does not have any national capping on emission reductions. Therefore, the project is not applicable to jurisdiction or sector in which binding limits that are established on GHG emissions

VCS PD Template Section - 1.12.3

Description

The project activity is a CDM registered project activity on 2011-02-04 (Ref 4117).

Related Findings

☒ No CARs, CLs or FARs have been identified in this context
☐ The following finding(s) have been addressed:

Final Assessment

The assessment team had checked the UNFCCC website to confirm the project activity has been registered as a CDM project on 2011-02-04. The project does not involve in seeking for other registration of any other GHG programs. The validation team had confirmed with the project proponent/IM01/ that the project only involve in the CDM program.

VCS PD Template Section - 1.12.4

Description

The project is not involved in any environmental credit schemes except the CDM activity.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context
☒ The following finding(s) have been addressed:

Finding:	**1.12.4-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The declaration provided by the project proponent did not sufficiently provide evident of non-other emissions trading programs and other binding limits for the monitoring period.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The declarations of non-other emissions trading programs and other binding limits for the monitoring period is attached herewith		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	A declaration letter signed off by the General Director of Song Ong Hydropower Joint Stock Company – Project Proponent, was submitted to the assessment team for review. The letter confirmed that Song Ong Hydropower Project did not participate in any other GHG programs during the monitoring period claimed for the project activity. CAR is CLOSED		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

The assessment team had reviewed the declaration by the project proponent/DNP/ to confirm that they have not participated in any other GHG programs for the reporting period. Thus it can be concluded that the PP has not and will not apply for any kind of environmental credit apart from this VCS application before the date of registration with UNFCCC.

VCS PD Template Section - 1.13

Description

The PD of the project did not have such description.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context
☒ The following finding(s) have been addressed:

Finding:	**1.13-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The description of Eligibility Criteria and Leakage Management in the PD is not accordance to the requirement stated in the VCS Standard version 3.2 (clause 3.4.2 and 3.19.1 (1f)).		

Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The description of Eligibility Criteria and Leakage Management has been corrected in the revised PD accordance to the requirement stated in the VCS Standard version 3.2 (clause 3.4.2 and 3.19.1(1f)).
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Section 1.13 of the PD version 2.0, dated 2011-11-03 has been updated. The project activity is a single project activity therefore Eligibility Criteria is not applicable. Furthermore, leakage emissions in hydropower plants are negligible. This is assessed as in line with the requirements of VSC Standard, version 3.2. CAR is CLOSED
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

The project is not a group project. Therefore, as according to the VCS Standard version 3.2, the eligible criteria are not applicable to the project.

The project activity had purchased new generation units from LILAMA Corporation on 2006-01-16/PC1/. According to AMS-I.D version 16, if the generation units are new, there will be no leakage accounted for. Therefore the assumption provided in the PD is correct.

The validation team had interviewed the project proponent to confirm that there is no commercially sensitive information for this project.

2.2.1 Gap Validation

The project activity had been commissioned and started exporting to the National Grid since 2009-03-24 when the Power Company 2 had approved the metering system and accepted the generators commissioning.

The starting date of this VCS project is on 2009-03-24 until 2011-02-28 (includes both dates).

Since there crediting date of the project activity ends before the first monitoring period of the CDM project starts, the team confirms that the application under VCS, those voluntary emission reductions is not double counting of the emission reductions. Therefore, it is a clear delineation between when emissions reductions are generated under the CDM and voluntarily. Hence project is compliance under the VCS rules.

2.2.2 Methodology Deviations

The team has reviewed and there is no deviation submission.

2.2.3 New Project Activity Instances

Not applicable.

2.3 Validation Conclusion

Swiss Carbon Value Ltd. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the supplementary validation of the project "Song Ong Hydropower Project", with regard to the relevant requirements of VCS version 3.2 Standard.

The project activity was undertaken by Song Ong Hydropower Joint Stock Company, Energy Environment Consultancy Joint Stock Company and Swiss Carbon Value Ltd. The project activity is a hydro electricity generation power plant with generator installed capacity of 3 x 2.7MW. The electricity is supplying to Viet Nam National Grid. The expected emission reduction per annum is 21,416 VERs.

The methodology applied for this project is AMS-I.D. Version 16 – Grid connected renewable electricity generation.

This project which was earlier validated as a CDM project activity which 14 CARs and 11 CLs and 2 FARs raised and closed by the DOE also given a positive validation opinion as the project is registered with UNFCCC (Ref. No. 4117, registration date: 2011-02-04). During this validation, two pending FARs from the CDM validation has been verified and closed out including 8 CARs and 2 CLs were raised during the validation and it is successfully closed.

The two FARs rose during the validation, includes the following:

FAR raise	Assessment
Training record of the operator	The assessment team had reviewed the training records/TM/ and interviewed the operators to confirm training was provided to them to meets the operation and maintenance needs.
QA/QC procedures	The assessment team had reviewed the monitoring manual/MM/ established by the project proponent. The manual had provided the procedures on the operation of the hydropower plant including calibration.

Thus as per the VCS policy requirement, the project activity is only subjected supplementary validation. A risk based approach has been followed to perform this limited validation covering the clauses 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS PD.

As a result of the validation of the VCS PD, the validation team confirms that the project activity meets the criteria of the clauses 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 follows the VCS standard, version 3.2 and is like to achieve the estimated emission reductions.

3 VERIFICATION PROCESS

3.1 Method and Criteria

The verification of the project consisted of the following steps:

- Contract review;
- Appointment of team members and technical reviewers;
- Desk review of the Monitoring Report/MR/ submitted by the client and additional supporting documents.
- Verification planning;
- On-Site assessment;
- Background investigation and follow-up interviews with personnel of the
- project proponent and its contractors;
- Draft verification reporting;
- Resolution of corrective actions; (if any)
- Final verification reporting;
- Technical review;
- Final approval of the verification

Table 3.1: Verification sequence

Topic	Time
Assignment of verification	2011-09-12
On-site visit	2011-10-10, 2011-10-11 & 2011-10-14
Draft reporting finalised	2012-01-19
Final reporting finalised	2012-03-19
Technical review on final reporting finalised	2012-03-28
Final corrections	2012-03-29

The main verification steps are described below:

3.2 Document Review

The VCS PD[/PD/] and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this verification are summarized in section 6.

3.3 Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS. During verification the verification team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews were summarized in Table 3-2.

Table 3-2: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Song Ong Hydropower Joint Stock Company Energy and Environment Consultancy Joint Stock Company	• General aspects of the project • Technical equipment and operation • Changes since implementation • Monitoring and measurement equipment • Remaining issues from validation • Calibration procedures • Quality management system • Involved personnel and responsibilities • Training and practice of the operational personnel • Implementation of the monitoring plan • Monitoring data management • Data uncertainty and residual risks • GHG calculation • Procedural aspects of the verification • Maintenance • Environmental aspects • Editorial issues of the Monitoring Report

3.4 Site Inspections

3.4.1 Review of Performance Records

The verification team adopted suitable methodology to ensure that the project is implemented and operated as per the registered CDM PDD. In order to verify that the project

is implemented and operated as per the applicable criteria and the registered CDM PDD, site visits were planned by the team members to verify the machinery installed, the working and operation condition and accuracy of implemented monitoring methodology. Accordingly, the following items were verified in detail:

- Investigation of whether the turbines and generators along with peripheral supporting equipment such as transformers etc were installed and worked as planned and presented in the registered PDD.
- Members of operating staff were interviewed and were observed in order to verify allegiance to stated methods of operation and monitoring.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked; recording of hourly generation, aggregating of data, and monthly reports were verified.
- Maintenance procedures were verified.

The on-site assessment was scheduled for 2011-10-10, 2011-10-11 and 2011-10-14. The site assessment was led by the Team Leader with team member with the requisite technical scope accreditation. During the site visit, the team members were able to check and verify the following records:

- Daily hydrology report which included details of PLF achieved, running hours, total daily generation, auxiliary consumption and cumulative generation and consumption for each month.
- Outage register containing details of forced and planned outages, root cause analysis, and corrective actions implemented.
- Register containing hourly readings from the control room and form the turbine floor.
- Maintenance check list – mechanical and electrical – daily, weekly, monthly and annually.
- Defect register.

The team also verified the following:

- Turbine name plate details.
- Generator name plate details.
- Check and Main meters, make, type and serial numbers.
- Transformer details installed in the transformer yard.
- Main control room instrumentation.

3.4.2 Collection of Measurements

The verification team has carried out interviews and reviews of records to assess if the collection of measurements is in accordance with the monitoring plan of the registered CDM PDD and the relevant VCS criteria. The parameters to be measured and monitored as per the registered CDM PDD are:

- The total electricity imported from the grid by the project activity
- The total electricity exported to the grid by the project activity
- The total fossil fuel consumed in the project activity for back-up electricity

- The surface area of the reservoir area
- The installed capacity of the project activity

The first two parameters mentioned above are measured by main meter (CTC) and backup meter (CTP) located at the substation. Both the meter records the export and import electricity. The generated electricity is exported to the Viet Nam National Grid and this is in accordance with the registered CDM PDD.

The project activity had installed a back-up diesel generator to support the auxiliary needs when the hydropower plant is not in generation. The monitoring of the fossil fuel usage has been monitored as according to the registered CDM PDD where the fuel amount is measured by a gauge ruler and cross checked with purchasing invoice and energy balance on the purchased quantities and stock changes.

According to the registered CDM PDD, the project activity releases no emissions from the created reservoir (as the power density is more than 10W/m^2). However the surface area of the reservoir and the installed capacity of the hydropower plant are monitored to ensure the power density of the hydropower plant remains to be below 10W/m^2. The monitoring of the reservoir area is conducted by third party verifier.

The amount of electricity export to the Grid and imported from the Grid is continously measured (on hourly basis) with electricity meters and recorded monthly by both the project owner and the authority from Power Company 2. During the onsite assessment it was confirmed that the details of meters connected at the generating facilities are as follows:

Table 3-3: Installed Monitoring meter

Details	Instrument Type	Manufacture	Instrument model	Accuracy
$EG_{y,export}$	Electricity meter	Elster	A1700 – PB3KAAGHT-5	0.5s (main meter) 0.5s (back-up meter)
$EG_{y,import}$	Electricity meter	Elster	A1700 – PB3KAAGHT-5	0.5s (main meter) 0.5s (back-up meter)
$FC_{i,j,y}$	Normal ruler gauge	-	-	-
A_{PJ}	Third party assessment			
C_{PJ}	Equipment name plate checking			

3.4.3 Observation of established practices and testing of the accuracy of monitoring equipment

During the on-site visit, the verification team has checked the test methods and practices established for the monitoring instruments whether they are in accordance to local and international requirements and as in the validated PD.

3.5 Resolution of Any Material Discrepancy

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for verification of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 4 of this report.

Table 4-4: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
4.1	Project implementation	6	1	-
4.2	Emission reduction/removal calculations	2	1	-
4.3	Quality of evidence	1	1	-
4.4	Management and operational system	-	-	-
	SUM	**9**	**3**	**-**

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

Description:

The Song Ong Hydropower Project officially commenced its operation since 2009-03-24 (from 1430 hours onwards) when the approval and confirmation of the commercial operation was given by the Power Company 2/COD1/. The approval of the electricity metering system was also issued by Power Company 2 on 2009-03-24/COD2/. Since then the project started to export electricity to the Viet Nam National Grid. The purchasing entity of the electricity, Power Company 2 (subsidiary of EVN) had issued an acceptance letter on 2009-04-14 to Song Ong Hydropower Joint Stock Company to accept the electricity exported since 1430 hours of 2009-03-24.

The generating equipment of the project activity had undergone 72 hours commissioning (with load) on 2009-03-17, 2009-03-19 and 2009-03-22 for generating Unit 2, Unit 3 and Unit 1 respectively. The electricity recorded from the 72 hours commissioning has not been included for the calculation of emission reductions.

The emission reductions are counted since the commercial operation date (COD) of the hydropower plant on 2009-03-24. The project activity is registered with the United Nations Framework Convention on Climate Change (UNFCCC) as a CDM project activity (Reference No. 4117) on 2011-02-04. However, as according to the UNFCCC website, the start date of the crediting period of the CDM project activity is from 2011-03-01 onwards.

During the site visit, it was confirmed that the project has been implemented as per design and as described in the VCS MR. The electricity generation from the Song Ong Hydropower Project is owned and operated by Song Ong Hydropower Joint Stock Company.

There are no changes in the key equipment since the validation of the project during the monitoring period and it was confirmed that the name plate capacity of the installed turbine, generator, transformer and such other generating and peripheral equipment were in accordance with the description provided in the PD.

The monitoring methodology was in line with the chosen methodology. The equipment and instruments installed for monitoring of the project activity were sufficient to monitor the project activity in line with the requirement as described in the PD.

The verification onsite assessment was conducted on 2011-10-10, 2011-10-11 and 2011-10-14. During the site visits it was confirmed that there was no alteration or change effected for the generating equipment and / or monitoring instruments and that the project continued to be in line with the description as narrated in the registered monitoring plan.

During the monitoring period covering 2009-03-24 to 2011-02-28 the project exported 77,041.2MWh net electricity to the Viet Nam National Grid and imported 1.2MWh of electricity from the Viet Nam National Grid. One main meter and one backup meter were installed at the connection point to continuously monitor the export and import electricity. As per the Grid connection agreement, main meter was defined as invoice meter. A backup meter was installed to cross check that the reading of main meter. Therefore, reading from main meter is taken as the final electricity exported to the grid to calculate the ER.

During the monitoring period, it was reported that the hydropower plant was shut down (disconnected from the Grid) from 2009-08-05 till 2009-09-08. The hydropower plant was shut down due transmission cable damage caused by short circuit/PI1/. The hydropower plant resumed generation and reconnected back to the Grid on 2009-09-08 when generating unit 1

and unit 2 were repaired/PI2/. The unit 3 generation unit was only repaired and reconnected back to the Grid on 2009-12-17/PI3/.

Before generation unit 1 and unit 2 are continue to allow exporting electricity the Grid after the repair, a testing was conducted. During the testing, electricity was exported to the Grid and electricity was imported from the Grid. This can be seen in the difference on closing value on 2009-08-31 and opening value on 2009-09-01 as stated in the excel sheet/XLS/. The electricity exported during the testing is not considered in the invoicing of the electricity sales. Therefore the project proponent had excluded these exported values in the emission reduction calculations. However, for conservatism, the imported electricity during the testing is included to calculate the emission reductions. The assessment team had reviewed the Electricity Balance sheet dated 2009-09-08 issued by the Power Company 2 to confirm the opening reading of export and import for the month of September 2009/PI7/

However, the team found the monitoring report format is inaccurate as shown below:

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Project Implementation	**4.1-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Cover page of report: The following corrections are requested: 1. No project ID has been stated 2. The monitoring period did not indicate whether both the dates are inclusive		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	1. The project ID has been stated in revised MR 2. Relevant revision has been made in the revised MR		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The MR version 2.1, dated 19 January 2012 was checked. 1. The project ID "3858" was given in the MR. This has been cross checked with the UNFCCC website and it could be confirmed as correct.(http://cdm.unfccc.int/Projects/DB/RWTUV1289918487.21/view) 2. The monitoring period in the MR was updated as 13 June 2009 to 12 December 2010 (Both the dates are included). CAR is CLOSED		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Project Implementation	**4.1-2**		
Classification	☒ CAR	☐ CL	☐ FAR

Project Implementation	**4.1-2**
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The following are correction requested: 1. The date format is not consistent to VCS monitoring report guideline. 2. In section 1.7 of the MR, the map of the project location shall be included. 3. In section 1.1 of the MR, the estimated VERs for the crediting period is not consistent with the registered CDM PDD.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	1. The date format has been corrected in revised MR 2. The map of project location has been added in revised MR 3. The estimated VERs has been corrected in revised MR
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	1. All the dates used in the MR have been rewritten in the MR version 2.1 dated 19 January 2012 in line with the date format of the VCS requirement. The date format has been made consistent with the VCS requirement. 2. The project location map was provided in Section 1.7 of the MR, version 2.1, dated 19 January 2012. This was cross checked with the registered PDD and verified by onsite confirmations during the site visit by the verification team. The project was located on On River in Quang Son commune, Ninh Son district, Ninh Thuan province, Vietnam. 3. The amount of expected VERs has been revised to be accordance to the registered CDM PDD. CAR is CLOSED
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Project Implementation	**4.1-3**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Section 1.3: Clarification is requested if there is any other project proponents are involved in the project activity which will have direct interaction with the registry as accordance to clause 3.2.1 of the VCS Registration and Issuance Process version 3		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Swiss Carbon Value Ltd is the VER Buyer of Song Ong Hydropower Project and Energy has been added in the revised MR. While Environment Consultancy Joint Stock Company is the VER Consultant for Song Ong Hydropower Project is added as other entities involved.		

Project Implementation	4.1-3
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Section 1.3 of the MR version 2.0 has included one more project participant who has direct interaction with the registry as follows: Swiss Carbon Value Ltd., who is the VER buyer for Song Ong Hydropower Project. This was cross-checked with the ERPA /ERPA/ dated 2011-04-10 signed by and between Swiss Carbon Value Ltd. and the project proponent on 2011-09-07. All the necessary details about the project participant have been provided in Section 1.3 of the MR. The information could be assessed as sufficient and complete. CL is CLOSED
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Project Implementation	4.1-4		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The following are incorrect as according to the interview with the project proponent a. It is not clear in the MR with regards to what equipment has been damage. Furthermore as according to the project proponent, the cable was damaged due to water short circuit b. There are separates dates for reconnection of the hydropower project to the grid. The MR only indicated one.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	a. When emergency occurred, only the cables were damaged. The detail has been corrected in the revised MR b. 2009-12-17 is the 2nd date of reconnection of the hydropower project and has been included in the revised MR. The detail of accomplishment dated on 2009-12-18 is attached herewith.		

Project Implementation	4.1-4
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	a. The assessment team had checked the revised MR version 2.0. Correction had been made according to the information provided by the project proponent. The assessment team had reviewed minutes of the meeting/PI1/ to confirm the damages as stated in the MR. During the onsite assessment, the validation team had reviewed the log-book which had recorded the stopping of the hydropower plant. b. According to the minutes of meeting dated 2009-12-18/PI3/, the cables for generator unit 1 and unit 2 have been fixed and reconnected to the Grid on 2009-09-08. While cables for generator unit 3 was only repaired and reconnected on 2009-12-17. The assessment team had reviewed the letter issued to the Electricity Regulatory Authority of Ninh Thuan Province/PI2/ to confirm that the project resumed exporting electricity to the Grid using generator unit 1 and unit 2 starting from 2009-09-08. The assessment team had checked the emission calculation sheet/XLS/ and the monthly electricity protocol. During the month of August 2009, the amount of electricity is significantly lesser than the other months. Therefore the assessment team concluded that the incident occurred during the reporting period is consistent and correctly reported.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Project Implementation	4.1-6		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Section 1.8, The title of subscribed tool should be included.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Section 1.8, The title of subscribed tool has been included in revised MR, version 2.1		

Project Implementation	4.1-6
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Section 1.8 of the MR version 2.0 was updated with the following information: Applied methodology: AMS – I.D "Grid connected renewable electricity generation" – Version 16 was applied for this proposed project Related tools: Version 02 of the "Tool to calculate the emission factor for an electricity system"; Version 02 of the "Tool to calculate project or leakage CO_2 from fossil fuel combustion". The verification team had checked and compared the MR with Section B.1 of the registered PDD. All applied methodology and related tools are correct, thus, the requirement of the VCS is fulfilled. CAR is CLOSED
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Project Implementation	4.1-7		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Section 4.4: It is requested that the remarks of differences from the estimated value in the reporting period and the estimated ERs.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The remarks of differences from the estimated ERs and actual value in the reporting period has been added in the revised MR		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Section 4.4 of the MR version 2.0 was revised. The remarks of the differences of ex-ante emission reductions and the values during the reporting period have been included. The total monitored emission reductions in the reporting period are 0.035% more than the ex-ante emission reductions. As according to the project proponent/IM01/, during October till December month in year 2010, the water level from the river was still high and it allows longer generation hours. The longer generation hours has enabled more electricity generation. Hence, the emission reductions are more. The assessment team had checked the hourly generation records/MTE/ and it is confirmed that the hourly generation is still less than 8.1MW (which is the install capacity). The assessment team concluded that the increment of the emission reductions comparing the ex-ante estimation is acceptable.		

Project Implementation	4.1-7
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

By means of documentation review and onsite assessment, it can be confirmed that the project activity has been implemented and installed as described in the PD (a supplementary document of the registered PDD). There is no major change in the key equipment since the CDM validation.

During the onsite assessment, it can be verified that the project is a hydropower project which uses water from the Ong River to generate electricity and export to the Viet Nam National Grid. The project is deemed not to have any envisaged changes.

The values for electricity exported during the monitoring period covering 2009-03-24 to 2011-02-28 were verified by the verification team during the onsite assessment by checking the monthly protocol produce jointly by the project proponent (project owner) the Power Company 2 (entity that purchase the power on behalf of EVN)/MEP/. The verification team had cross-checked the monthly protocol with the sales invoice/MEI/ and the plant recorded generation/MTE/. The values are consistent. The final values used to determine the emission reductions are the values from the monthly joint protocol. The application is according to the registered PDD.

During the onsite assessment, it could be observed that all the necessary monitoring instruments are installed. The monitoring instruments are installed according to the registered monitoring plan. Those monitoring parameters that are not continuously monitored (e.g. surface area of reservoir A_{PJ}) are assessed based on third party reports.

The net electricity exported to the Grid is monitored using one main electricity meter (bi-directional) and one backup electricity meter (bi-directional) with accuracy class 0.5 manufactured by ELSTER. The accuracy class of the installed electricity meters are according to the registered monitoring plan (which is class 0.5 accuracy). The project activity is connected to the 22KV transmission line. As according to government decision 37/2006/QD-BCN dated 2006-10-16, any power plant which is connecting to the National Grid with voltage below 110KV is only required to install electricity meter with class 0.5 accuracy. The installation of the electricity meter is accordance to both the local requirement and the registered CDM PDD.

The installed meters had recorded the amount of electricity exported to the Grid and imported from the Grid. The meters are read and recorded monthly jointly by Song Ong Hydropower JSC and Power Company 2 (subsidiary of EVN)/MEP/. The electricity meters were calibrated before the installation on 2008-12-15/CR1/CR3/. The electricity meters were subsequently calibrated on 2010-01-13/CR2/CR4/. The calibration has been conducted by the Electrical Testing Centre of Power Company 2. Since Power Company 2 is an authorized entity of EVN, it is deemed that this entity has sufficient authority and certified by EVN to conduct the calibration in the host country.

As according to the registered monitoring plan, the calibration frequency is every 2 years. Therefore, the calibration is valid during the reporting period.

The recalibration frequency is not indicated in the certificate but regulated according to Section 1.1, Decision No 65/2002/QD-BKHCNMT issued by the Minister of Scientific, Technology and Environment on 19 August 2002. The document indicates a calibration frequency of two years for three phase meters which have been used in the project activity for the measuring of exported electricity. This has been checked during the on-site visit. Further, the calibration procedures and reports on the electricity meters covering the reporting period are traceable. The accuracy of the measurements is assessed as satisfactory due to the highest accuracy electricity meter had been installed for the project.

Despite the ex-ante power density is more than 10W/m^2, the project proponent had decided to set the power density as a monitoring parameter for transparency purpose.

In order to calculate the power density the project proponent had monitored the reservoir area on annual basis/ReR/. The assessment team had reviewed the reservoir area survey report issued by Institute for Hydro Power and Renewable Energy (a third party entity)/ReR/. The results provided by this third party entity are considered reliable because it has been conducted by an institutional entity. As according to the registered monitoring plan, the reservoir area has been estimated using the topographical survey method as shown in the survey report. Hence the monitoring method is according to the description in the registered monitoring plan.

The installed capacity of the hydropower plant is monitored through the installation plate of the generators. During the onsite, the assessment team could identify and confirmed the installation plates of the generators are 2.7MW (each). In order to further confirm the installed capacity, the assessment team had reviewed the generators' specification provided in the equipment supplying contract/PC1/.

All records needed for monitoring are archived in line with the registered monitoring plant. No significant lack of evidence and missing data were detected during the onsite assessment. It could be evidence that the monitoring system ensures for continuous operation.

The assessment team concluded that the submitted monitoring report which is the basis of this verification is accordance with the registered monitoring plan. The monitoring report is complete and in a transparent manner.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

The formulas and factors used in the calculations of emission reductions are in accordance to the AMS-I.D version 16 – Grid connected renewable electricity generation. All aspects related to the direct and indirect GHG emissions relevant to the project have been addressed and calculations are presented in a transparent manner and in line with the applied methodologies, tools and validated PD. The baseline and project emissions have been calculated appropriately. There are no leakages involved in the project activity as per methodology AMS-I.D version 16. The calculations for the emission reduction for the verification period are transparently computed and presented in the spread sheet of VER calculation with the reference sources of data.

As per the selected methodology for the project activity, AMS – I.D, the baseline for the project activity is the MWh produced by the project activity multiplied by the Viet Nam National Grid emission factor calculated as the Combined Margin (CM) being a combination of the Operating Margin (OM) and Build Margin (BM). The Grid emission factor has been calculated using the "Tool to calculate the emission factor of an electricity system" version 2.

As per the registered CDM PDD, the Grid emission factor was calculated to be 0.5355tCO_2e/MWh. The emission factor was calculated from the Grid generation data provided by the EVN (Viet Nam's National Electricity Company). The Grid emission factor is applied as an *ex-ante* value.

The recorded electricity that is exported to the Grid is the difference of the monitored export ($EG_{y,export}$) and import ($EG_{y,import}$) electricity. Therefore, BE_y = net electricity exported to the Grid in MWh x 0.5355tCO_2e.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed

ER Calculations	4.2-1		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The amount of diesel consumed by the project activity is monitored through volume in litres. However the MR only provides the value in tonne. Clarification is requested on what the volume is being utilized during the crediting period to confirm the conversion calculation is correctly calculated.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The amount of diesel is monitored in litre. The clarification has been made in the revised MR.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The records in the diesel consumption logbook had confirmed the recording is in litres/DC/. In order to be consistent with the registered PDD, the recorded diesel consumptions (in litres) are needed to be converted to mass/volume. As according to the Energy Statistic Manual published by the International Energy Agency, 1 ton (1,000kg) of diesel fuel is equivalent to 1,185 litres of diesel. As according to the monitored data, the total diesel consumed during the monitoring period is 0.2817tons. The assessment team concluded that the monitoring is according to the registered PDD. CL is Closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

ER Calculations	4.2-2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Section 3.2: The monitoring of $FC_{i,j,y}$ is not according to the registered CDM PDD.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	$FC_{i,j,y}$ is monitored as per in the registered PDD, the MR has been revised.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The MR version 2.0 has been corrected. The monitoring stated in the MR is now consistent with the registered PDD and the actual implementation onsite. The measuring method as per the registered PDD – using a ruler gauge in the "daily" diesel tank could be observed during the onsite assessment. CAR is Closed.		

ER Calculations	4.2-2
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

ER Calculations	4.2-3		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The values used to calculate the power density in the MR used the ex-ante value. It is requested that the power density is to be calculated according to the annual reservoir size reported by the third party verifier.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The power density has been calculated according to the annual reservoir size reported by the third party verifier in revised MR, version 2.0.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The parameter A_{PJ} - area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full – was updated in the MR version 2.0 as follows: Year | Area (m^2) 2009 | 17,464 2010 | 17,448 The values were determined by a third party entity annually using topographical surveys and maps at normal water level. The reports for 2009 and 2010 by and profiles of the measuring entity were provided to the verification team to check. The measuring entity is the Viet Nam Consulting for Natural Resources and Environment Joint Stock Company. It could be confirmed that the entity has necessary expertise and authority to do so. The measurement results are valid and cover up the monitoring period. Furthermore, under Section 4.2 of the MR, the project proponent had re-calculated the power density from the reservoir for 2009 and 2010. In 2009: $PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} = \frac{8.1 \times 10^6 - 0}{1.7464 \times 10^4 - 0} = 463.8 (W/m^2)$ In 2010: $PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} = \frac{8.1 \times 10^6 - 0}{1.7448 \times 10^4 - 0} = 464.2 (W/m^2)$ In all cases, the project emission from reservoir is zero according to the applied monitoring methodology. The ex-post values of reservoir surface area after project implementation were determined in accordance with the registered monitoring plan. The project emission was also calculated correctly for the project activity during the monitoring period.		

ER Calculations	4.2-3
	CAR is CLOSED
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

The assessment team had checked and confirmed that the net electricity exported to the Grid is calculated from the difference between the total electricity exported and total electricity imported. In order to obtain the final emission reductions of the project, the net exported electricity is multiplied with the Grid emission factor. According to the registered monitoring plan, the Grid emission factor is applied as ex-ante value. The value approved in the monitoring plan is 0.5355tCO_{2e}/MWh.

The project emissions expected from the reservoir is not applicable to the reporting period as the power density calculated for the period is more than 10W/m^2. According to the survey report/ReR/, the power density has been calculated to be 463.8W/m^2 and 464.2W/m^2 for year 2009 and 2010 respectively. The equation to calculate the power density has been defined in the registered monitoring plan.

The project activity has no leakage as the installed generating units are new/EPC/. It is deemed that each hydropower project is unique due to the hydrological cycle of the river. Therefore, it is usually no second-hand generation units will suit a new hydropower plant.

The assessment team had verified the correctness of all the data applied for the calculation. The primary data used to calculate the emission reduction is the monthly electricity protocol/MEP/. The assessment team had cross-checked the data with the available electricity sales invoices and manually recorded values. The values are found to be consistent.

The equation used to calculate the emission reductions is according to the registered PDD. The excel spread sheet provided by the project proponent is clear, viewable and unprotected.

The assessment team concluded that the emission reductions calculated are real, accurate and truly representing the quantity of GHG emission reductions achieved in the reporting period.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

During the on-site visit, the verification team has reviewed and verified the respective documents that were used to determine the emission reductions and the records were easily traceable to reference data or parameter. The verification team had reviewed the data to check on the evidence in support of the emission reductions. All documents reviewed were signed by the responsible person of the project activity. The documents are archived and stored in the server at the power plant and externally at the Plant Manager office. All data for the monitoring period are stored for the whole crediting period and additional 2 years after expiry. Details of the documents are listed in Table 6-1

The parameter for the emission calculation has been assessed. There are discrepancy has been raised.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed

Quality of Evidence	**4.3-1**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Section 3.3: The monitoring plan is not according to the section B.7.2 of registered CDM PDD.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	This section is corrected according to guideline in VCS-MR template version 3.2. So, the update of VCS-MR for this section is not necessary.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Section 3.3 of the MR version 2.0 was revised. The verification team had compared the updated information with Section B.7.2 and Annex 4 of the registered PDD. The description of the monitoring plan in the MR is correct and complete. CL is Closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Quality of Evidence	**4.3-2**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Section 3.3.4: the internal audit information was not provided in the MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Section 3.3.4: the internal audit information has been provided in the revised MR, version 2.0		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The internal regular audit and occasional audits were given in Section 3.3.4 of the MR, version 2.0. This was cross-checked with the internal audit records/IAR/ conducted by the project proponent during the monitoring period and with the CDM monitoring manual/MM/ The information about internal audits can be assessed as sufficient. CAR is Closed		

Quality of Evidence	4.3-2
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

The related document provided by the project proponent on the monitoring and calculation of the emission reductions were traceable and correctly referenced. The assessment team had checked onsite that the documents are archived and stored in secured locations. The project proponent had confirmed that the original protocols, sales invoices and manually recorded data are kept by the Department of Finance in the Head Office. The photocopy is available at the power house for any required reference. The assessment team had sighted the photocopy data at the power plant during the onsite assessment.

The validation team sighted the database of the project consultant to confirm the monitored data are archived electronically. Backup copies are being stored in CDs. The assessment team had randomly selected several data in the database to cross-checked that all monitoring data is being archived as according to the registered monitoring plan.

The project activity is operated using data logger system. With the usage of the data logger, the manually recorded data are trustable. Furthermore, all the relevant generation data (e.g. protocol, invoices and manual records) are consistent with each other. Since the recorded data has been recorded jointly by Song Ong Hydropower JSC and Power Company 2, the assessment team deemed the data cannot be manipulated because the records are custody transfer to the Grid operator (EVN) which is witness by its subsidiary, Power Company No.2.

The assessment team concluded that emission reductions calculated for the reporting period has quality and traceability.

4.4 Management and Operational System

The allocation of responsibilities is documented in a written form and is followed as described in the PD and MR. This has been verified. Routines for the archiving of data are defined and documented. Calculations laid down in the monitoring report are in line with VCS PD.

The monitoring personnel at site are well trained and follow reproducible routines as was evident during the site visit. Members of monitoring team were interviewed. Procedure for training and maintenance of critical equipment were discussed during site visit. Day to day operation is supervised by the technically qualified site engineers who have adequate knowledge. They have the responsibility to supervise various technical staff for around the clock who engage in operation and maintenance of project activity

Training is provided to the concerned personnel as required. The operators are trained through on job training the technology provider and institutional training provided by the project owner to operate and maintain the hydro electricity generation power plant. They thus become competent to carry out the relevant tasks with sufficient accuracy. All necessary monitored and measured raw data were checked during on-site verification. Supervisory personnel in charge of each shift are responsible for recording the total

electricity generation, electricity export, electricity import, plant shut down times, down time, etc.

Such daily data is aggregated and monthly reports are generated. These are submitted to the CDM Group Manager for verification and emission reduction calculations. The CDM Group Manager is responsible for the review of the monitored parameters, for correctness, and corrective measures to be initiated in case of minor errors in the monitored data and preparation of a daily summary on project operation and electricity generation.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed

Final Assessment

The management and operational system of the project is reviewed during the assessment. All management and operational systems are in place. The structure is established in accordance with the registered monitoring plan. The roles and responsibilities of the monitoring personnel are clearly mentioned in the MR and also verified during the site visit and found same as described in the PD.

No discrepancy was identified from the designed management and operation system as described in the validated PD and MR of the VCS project

5 VERIFICATION CONCLUSION

Swiss Carbon Value Ltd. had commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project **"Song Ong Hydropower Project"** implemented at the Ong River at Quang Son commune, Ninh Son district, Ninh Thuan province in Viet Nam with regard to the requirements of VCS 3.2 Standard.

The project activity is to install a 8.1MW hydropower plant which consist of 3x2.7MW electricity generator. The project activity is expected to generate an annual gross electricity of 40,500MWh and of which 39,994MWh net electricity will be exported to the Viet Nam National Grid.

The reporting period is from 2009-03-24 to 2011-02-28 (include both dates). During this reporting period, the total net electricity exported to the Viet Nam National is 77,041.2MWh.

In the course of the verification 9 Corrective Action Requests (CARs), 3 Clarifications (CLs) and 0 Forward Action Request (FARs) were raised. All findings raised were successfully closed. The Forward Action Requests raised in the registered CDM project activity were successfuly closed..

The verification is conducted based on the monitoring report, the registered monitoring plan, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

In summary, the conclusion are as follows:

- All operations of the project are implemented and installed as planned in the registered monitoring plan.
- The monitoring plan is accordance with the applied approved methodology AMS-I.D version 16, "Grid Connected Renewable Electricity Generation"
- The installed equipment is essential and sufficient to measure all the parameters related for calculating the emission reductions. All monitoring frequency is as described in the registered monitoring plan.
- The installed equipments are calibrated appropriately as according to the registered monitoring plan.
- The monitoring system is in place and deemed functional.

As the result of the verification, the assessment team confirms that the GHG emission reductions are calculated without material misstatements. The emission reductions are calculated in a conservative and appropriate manner.

All documents that were checked and obtained by the assessment team in the course of verifying the project will be kept confidential and will not be disclosed at any time other than the Project Proponents consent as which is required by the VCSA.

TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission Reductions Period:	Baseline Emissions (tCO_{2e})	Project Emissions (tCO_{2e})	Leakage (tCO_{2e})	Sum (tCO_{2e})
2009-03-24 to 2009-12-31	14,129	0	0	14,129

2010-01-01 to 2010-12-31	24,011	0	0	24,011
2011-01-01 to 2011-02-28	3,115	0	0	3,115
TOTAL	**41,255**	**0**	**0**	**41,255**

Project emissions 0t CO_2 equivalents

Baseline emissions 41,255CO^2 equivalents

Emission reductions **41,255t CO_2 equivalents**

Malaysia, 2012-03-29

TÜV NORD JI/CDM Certification Program

Validation Team Leader

Cheong, Chun Yuen (Robert)

Essen, 2012-03-29

TÜV NORD JI/CDM Certification Program

Final Approval

Schubert, Jochen

6 REFERENCE

Table 6-1: Documents provided by the project participant

Reference	Document
/BA/	Business Approval 1. Land use license dated 2007-03-12 2. Business license dated 2005-12-08
/COD/	Commercial Operation Date 1. Acceptance to the commercial operational date by Power Company 2 (subsidiary of EVN) dated 2009-04-14. 2. Minutes of meeting of the electricity metering acceptance by the Power Company 2 dated 2009-03-24
/CR/	Calibration record 1. Main meter installation calibration report dated 2008-12-15 2. Main meter first calibration report dated 2010-01-13 3. Backup meter installation calibration report dated 2008-12-15 4. Backup meter first calibration report dated 2010-01-13 5. Diesel tank calibration dated 2008-12-19 6. Diesel tank ruler calibration dated 2008-12-29, 2009-12-23 and 2010-12-17
/DC/	Diesel consumption logbook.
/DNP/	Declaration on no participation in other GHG programs
/IAR/	Internal Audit Report
/EIA/	1. Periodic Environmental Report dated 2009-09-30 2. Periodic Environmental Report dated 2010-03-20
/ERPA/	VCS Emission Reduction Purchasing Agreement dated 2011-04-10
/LoA/	Letter of approval from Viet Nam DNA dated 2008-06-30
/MR/	Monitoring Report 1. Draft Monitoring Report Version 1.0 dated 2011-09-21 2. Monitoring Report Version 2.0 dated 2012-01-04 3. Monitoring Report Version 2.1 dated 2012-03-29
/MEI/	Monthly electricity invoice
/MEP/	Monthly electricity protocol (joint balance sheet)
/MM/	Monitoring Manual dated June 2009
/MRe/	Management Review for year 2009 and 2010

Reference	Document
/MTE/	Monthly Total electricity excel sheet June 2009 – December 2010.
/OP/	Operation Procedure 1. Reservoir Operation Procedure dated 2008-09-04
/PI/	Project implementation 1. Minutes of meeting on the transmission cable damage dated 2009-08-12 2. Letter to the Electricity Regulatory Authority of Ninh Thuan Province on the repairing of the damaged cable dated 2009-09-08 3. Minutes of meeting on the repairing of the damaged transmission cable dated 2009-12-18 4. Generator Units test report (Unit 1) dated 2009-03-25 5. Generator Units test report (Unit 2) dated 2009-03-20 6. Generator Units test report (Unit 3) dated 2009-03-22 7. Joint Balance sheet from Power Company 2 on the testing after repairing of damage dated 2009-09-08
/PD/	Project Document 1. Draft Project Document Version 1.0 dated 2011-09-21 2. Project Document Version 2.0 dated 2012-01-04 3. Project Document Version 2.1 dated 2012-03-29
/PC/	Project contract 1. Engineering, Procurement and Construction (EPC) contract dated 2006-01-16 2. Second EPC contract dated 2006-03-27
/ReR/	Reservoir Survey Report dated 2009-12-25 and 2010-12-25
/SC/	Statutory Document Concern: 1. Equipment transfer approval by the Ministry of Industry dated 2006-09-26 2. Electricity Generation License dated 2009-05-27 3. Power Purchase Agreement dated 2008-11-11 4. Certificate of Environmental Standard confirmation issued by the Ninh Thuan Province People's Committee Department of Natural Resources and Environment dated 2003-11-04 5. Surface water usage license issued by the Ministry of Natural Resources and Environmental dated 2010-04-08
/TI/	Technical Input 1. Electricity connection diagram 2. Electricity meter specification and manufacturer test results 3. Layout diagram 4. Main meter installation report date 2009-03-05 5. Main meter testing report dated 2009-03-24 6. Backup meter installation report date 2009-03-05 7. Backup meter testing report dated 2009-03-24
/TM/	Training and Maintenance 1. Training certificates issue by training institute (Thac Mo Hydropower Joint

Reference	Document
	Stock Company by EVN) 2. CDM training attendance list 3. Sample certificate of the operators who had attended training at the Institute of Energy.
/VD/	Validation document 1. Registered PDD version 2.5 2. Final Validation Report version dated 2010-11-10
/XLS/	ER Calculation sheets for monitoring period from 2010-04-08 to 2011-01-20

Table 6-2: Background investigation and assessment documents

Reference	Document
/AMS.ID/	"Grid connected renewable electricity generation", version 16
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/IPCC/	2006 IPCC Guidelines for National Greenhouse Gas Inventories: General Guidance and Reporting
/ISO 14064/	Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals Greenhouse gases -- Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
/ISO14065/	Greenhouse gases -- Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition
/TEF/	Tool to calculate the emission factor for an electricity system (version 2)
/VCS/	Voluntary Carbon Standard, Version 3.1
/VCS-PD-T/	VCS PD Template version 3
/VPA/	VCS Policy Announcement "Further Guidance for Projects that are Registered in Two GHG Programs"
/VRT/	VCS Verification Report Template
/VVM/	Validation and Verification Manual (Version as per EB 55)

Table 6-3: Websites used

Reference	Link	Organisation
/cd4cdm/	www.cd4cdm.org	UNEP Riso Centre
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/vcs/	www.v-c-s.org	VCSA
/unfccc/	http://cdm.unfccc.int	UNFCCC

Table 6-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms.	Nguyen Hai Quynh	Song Ong Hydropower JSC / General Director
	V	☒ Mr. ☐ Ms.	Nguyen Thanh Hai	Song Ong Hydropower JSC / Plant Manager
	V	☒ Mr. ☐ Ms	Vuong Thi Huong Giang	Song Ong Hydropower JSC / Maanger of Finance and Enginnering Department
	V	☒ Mr. ☐ Ms	Nguyen Le Duy	Song Ong Hydropower JSC / Deputy Plant Manager
	V	☒ Mr. ☐ Ms	Nguyen Van Phe	Song Ong Hydropower JSC / Technician
/IM02/	V	☐ Mr. ☒ Ms	Dang Hong Hanh	VNEEC / Deputy Director
	V	☐ Mr. ☒ Ms	Nguyen Anh Thu	VNEEC / Project Proponent
	V	☒ Mr. ☐ Ms	Vu Van Quang	VNEEC / Project Manager
	V	☒ Mr. ☐ Ms	Nguyen Tien Hai	VNEEC / Project Manager – Team Leader

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)