

VERIFICATION REPORT

DAK PSI 3 AND 4 HYDROPOWER PROJECT



KBS Certification Services Pvt. Ltd.

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Summary:

KBS Certification Services Pvt. Ltd. has been contracted by, "Kyoto Energy Pte Ltd" to undertake independent gap validation and verification and certification for the greenhouse gas (GHG) emission reductions reported from "Dak Psi 3 and 4 Hydropower Project ", for the monitoring period 09/10/2010 up to 05/11/2011, in the initial monitoring report version 1 dated 20/09/2012.

The project activity is the installation of 45 MW run of river hydropower project, located in Dak Ha and Tu Mo Rong districts, Kon Tum Province, Vietnam. The project activity is implemented in 2 separate phases; cascade1 (Dak Psi 3) of total installed 15 MW comprising of 3 units of 5 MW capacity each and cascade 2 (Dak Psi 4) of total installed capacity 30 MW comprising of 3 units of 10 MW capacity each. Cascade 2 (Dak Psi 4) of 30 MW was installed first followed by Cascade 1 (Dak Psi 3) of 15 MW capacity. The purpose of the project activity is to generate renewable electricity and export the net electricity generated to national grid of Vietnam. In absence of the project activity, equivalent electricity would have been generated by mix of power plants connected to national grid. The emission reductions achieved during the monitoring period (09/10/2010 up to 05/11/2011) are **79,544 tCO₂e**.

A risk based approach has been followed to perform the gap validation and verification of the project activity. In the course of the gap validation and verification 04 Corrective Action Requests (CARs) were raised.

The gap validation and verification is based on the registered CDM project design document (PDD), validation report, VCS project description (PD), VCS monitoring report (MR) and other supporting documents made available to the verifiers by project proponent. Our gap validation and verification approach was based on the requirements as defined under the VCS Standards version 3.3.

The management of the 'Kyoto Energy Pte Ltd' responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project final monitoring report Version 1.3 dated 27/02/2013. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the "Kyoto Energy Pte Ltd". The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 1.3 dated 27/02/2013.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 09/10/2010 up to 05/11/2011 based on the reported emission reductions in the final monitoring report Version 1.3 dated 27/02/2013 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

KBS confirms the following;

Reporting period: 09/10/2010 up to 05/11/2011

	Amount	Unit
Baseline emissions (BE)	79,544	tCO ₂ e
Project emissions (PE)	0	tCO ₂ e
Leakage emissions (LE)	0	tCO ₂ e
GHG Emission reductions	79,544	tCO₂e

Abbreviations

BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CERs	Certified Emission Reductions
CL	Clarification Request
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ERs	Emission Reductions
FAR	Forward Action Request
GHGs	Greenhouse Gas(es)
ISO	International Organization of Standardization
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilo Watt Hour
LE	Leakage Emissions
MR	Monitoring Report
MP	Monitoring Plan
MWh	Mega Watt Hour
PE	Project Emissions
PDD	Project Design Document
PLF	Plant Load Factor
QA/QC	Quality Assurance/Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VER	Verified Emission Reductions
DIDJSC	Dak Psi Investment and Development Joint Stock Company
EVN	Electricity of Vietnam

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1 INTRODUCTION

1.1 Objective

KBS has been commissioned by 'Kyoto Energy Pte Ltd.' to perform an independent gap validation and verification of its registered CDM project 'Dak Psi 3 and 4 Hydropower Project', for the reported GHG emission reductions for the given monitoring period 09/10/2010 – 05/11/2011 (both dates included). The VCS projects must undergo an independent third party verification and certification of emission reductions as the basis for issuance of Voluntary Emission Reductions (VERs).

The objectives of this gap validation and verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the project description (PD) and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.
- 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.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of monitoring report, VCS project description (VCS PD), including the monitored data, CDM validation report and other relevant documents made available to verifier and information collected through performing interviews during on-site assessment of the project activity.

The project is assessed against the requirements of VCS standard version 3.3 and related rules and guidance. KBS has, based on the recommendations in the latest version of Verified Carbon standard, and employed a rule-based approach (as criteria) in the verification, focusing on the identification of significant reporting rules and the reliability of project monitoring.

The aspects to be covered under the purview of verification are:

- Ensure that the project activity has been implemented and operated as per the registered CDM PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place as per the documents provided by the client and on-site visit;
- Ensure that the monitoring report and other supporting documents provided are complete

- Ensure that the practiced monitoring system and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved CDM methodology;
- Evaluate the data recorded and stored are as per the monitoring methodology.

1.3 Level of assurance

☒ Reasonable level of assurance

1.4 Summary Description of the Project

The VCS project activity has been established to produce electricity by harnessing hydro energy and leads to reduction of emission reductions. The proposed project activity aims to construct and operate a run-of-river hydropower project with 2 cascades; namely Dak Psi 3 and Dak Psi 4. The project activity is the installation of 45 MW run of river hydropower project, located in Kon Tum Province, Dak Ha and Tu Mo Rong districts in Vietnam. The project activity is implemented in 2 separate phases (cascades), the first one of 30MW (Dak Psi 4) and the second of 15MW (Dak Psi 3). At present, both cascades Dak Psi 4 and Dak Psi 3 have come into operation and their first commercial operation dates were on 09/10/2010 and 29/08/2012 respectively. The project is registered as a CDM project (UN Ref. No. 4891) on 06/11/2011, hence the VCS monitoring period is proposed from 09/10/2010 to 05/10/2011. Only Dak Psi 4 was under operation during the proposed VCS monitoring period and Dak Psi 3 was still under construction. Implementation schedule of different units of Dak Psi 4 under each cascade is indicated in the below table. The commercial operation date is the date on which the unit starts selling electricity to the grid.

Table 1: Operations details

Phase 1 (Cascade 2): Dak Psi 4 ^{7/18/}	Commercial operation date
Unit 1 (10MW capacity)	09/10/2010 ^{14/}
Unit 2 (10 MW capacity)	17/10/2010 ^{14/}
Unit 3 (10 MW capacity)	09/10/2010 ^{14/}

The geographical coordinates of the project activity as mentioned in the validated VCS PD^{/3/} were cross checked at the project site through a GPS device during the site visit and were found to be consistent. The project activity was validated for CDM by Korea Energy Management Corporation (validation report: GHGCCC(A)-10-003, issued on 02/11/2011^{/6/} and it was registered on 6 November 2011 under the UNFCCC reference number 4891^{/6/}. The date of start of crediting period for CDM is 06/11/2011. As emission reductions occur prior to the registration of the project as CDM project activity, these emission reductions cannot be claimed as Certified Emission Reductions (CERs). The emission reductions are thus claimed as Voluntary Carbon Units (VCU) for the period 09/10/2010 (start date) to 05/11/2011 under this verification. A gap validation of the registered CDM project activity has been undertaken in accordance with clause 4.1.5 of VCS registration and issuance process version 3. Based on the information seen and evaluated, the verified and certified emission reductions achieved for the current monitoring period from 09/10/2010 to 05/11/2011 are 79,544 tCO₂e.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

The project activity is already registered under CDM programme; the registered Project Design Document (PDD), validation report and letter of approval issued by Ministry of Natural Resources and Environment of Vietnam are available on UNFCCC project webpage^{/6/}. The process taken by the validating DOE is described below:

2.2 Validation Findings

2.2.1 Gap Validation

Since, the project is already validated under other approved GHG program only the validation of following additional clauses (supplementary validation), in accordance with clause 3.11.8 of VCS standard version 3.3, was undertaken for section indicated below:

- Sections 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

Clause 1.2 of VCS PD (Sectoral Scope and Project Type)

The project activity falls under the following scope as defined by UNFCCC:

- Sectoral Scope: TA1.2 : Energy industries (renewable - / non-renewable sources)
- Project Type: Renewable Energy Projects.

The information has been verified from the registered PDD and project web page was found correct.

Clause 1.3 of VCS PD (Project Proponent)

The information in VCS PD^{/3/} has been verified with the letter of approval^{/16/} issued to the project proponent & registered CDM PDD^{/5/} and found consistent. The roles and responsibilities of the PP are same for the VCS crediting period as defined in registered CDM PDD^{/5/}. The detailed roles

and responsibilities are included in the registered PDD^{/5/} and same was found consistent during the onsite audit.

Clause 1.5 of VCS PD (Project Start Date)

The project's start date as per clause 3.7.1 of VCS standard is 9th October 2010 i.e. the date at which the project started generating emission reductions. The start date of the project activity was verified from certificate of first commercial operation of both cascades of the project activity and found consistent.

Clause 1.6 of VCS PD (Project Crediting Period)

Based on the validated project start date, as mentioned above, the project crediting period for CDM and VCS is identified as under:

CDM Programme: 06th November 2011 – 05th November 2018 (Renewable)

VCS Programme: 09th October 2010 - 08th October 2020 (Renewable)

As per clause 3.8.3 VCS standard version 3.3, the projects registered under other GHG programs are not eligible for VCU issuance beyond the end of the total crediting period under those programs. Therefore, the PP in VCS PD has confirmed that the last date of the VCS crediting period would end at the end of the 21 years of the CDM crediting period. Since the VCS and CDM crediting period are overlapping, the PP, through a written confirmation, has confirmed that emission reductions will not be claimed simultaneously under both mechanisms. The verification team confirms that the crediting period under CDM is consistent with the information available on UNFCCC project web page.

Clause 1.7 of VCS PD (Project Scale and Estimated GHG ERs or Removals)

The estimated annual average GHG emission reduction indicated in the registered PDD^{/5/} confirms that project is not 'Large Project' but 'project' only as it will generate less than 1,000,000 tCO₂e per year. The estimated annual average GHG emission reductions under the CDM programme, as specified in the registered PDD are 88,752 tCO₂e per year over the crediting period of 7 years (Renewable).

Clause 1.9 of VCS PD (Project Location)

The project activity is the installation of 45 MW run of river hydropower project, located in Dak Ha and Tu Mo Rong districts, Kon Tum Province, Vietnam and geographically located at 14°46'30"N Latitude and 107°59'50"E Longitude.

Using GPS coordinates; the project location is verified through <http://itouchmap.com/latlong.html> and confirmed during the site visit.

Clause 1.10 of VCS PD (Conditions prior to Project Initiation)

In the absence of the project activity the 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.

Currently, due to shortfalls in the amount of electricity available, Viet Nam imports electricity from China, where the grid emission factor is much higher than that of Viet Nam. The project will

generate power to offset the combustion of thousands of tonnes of fossil fuels and, in doing so; will help preserve non-renewable resources by promoting the exploitation and use of renewable resources and technologies. The operation of the project will offset the combustion of thousands of tonnes of fossil fuels, which would have been used to generate electricity for the Viet Nam electricity grid in the baseline scenario.

Clause 1.12.1 of VCS PD (Proof of Title)

Project title has been validated from Letter of Approval^{16/}, available on UN project web page.

Clause 1.12.2 of VCS PD (Emissions Trading Programs and Other Bindings Limits)

The Letter of Approval^{16/} issued towards the project activity by the host Party DNA confirms that the project is voluntary initiative by the PP. Viet Nam is a non-Annex I country under CDM and has not taken any legally binding target to cut down GHG emissions. Therefore, GHG emission reductions generated from the project activity are not used to meet any compliance.

Clause 1.12.3 of VCS PD (Participation under Other GHG Programs)

The project is already registered under CDM program and key details are mentioned below;

Title of project activity:	Dak Psi 3 and 4 Hydropower Project
UNFCCC Registration No:	4891
Registration Date:	06/11/2011
Applied Methodology:	ACM0002 Version 12.1.0
UNFCCC Crediting Period	06/11/2011 – 05/11/2018 (Renewable)
Location of the project activity:	Socialist Republic of Viet Nam, Kon Tum Province, Dak Ha and Tu Mo Rong Districts
Project web page	http://cdm.unfccc.int/Projects/DB/KEMCO1307604296.67/view

Clause 1.12.4 of VCS PD (Other Forms of Environmental Credit)

Since the VCS and CDM crediting period are overlapping, the PP, through a written confirmation, has confirmed that emission reductions will not be claimed simultaneously under both mechanisms. The project activity is a registered CDM project, during the monitoring period PP has not claimed any other form of environmental credit. Same has been confirmed in the monitoring report. The PP has further confirmed in a letter that during 09/10/2010-05/11/2011 the PP is not claiming any emission reductions under any other GHG program.

Clause 1.13 of VCS PD (Additional Information relevant to the Project)

The project is not a grouped project and therefore no eligibility criteria on this account needs to be evaluated. The applied methodology do not prescribes leakage emissions therefore the same has not been considered in registered PDD^{/5/}. The registered PDD and VCS PD do not contain any commercially sensitive information, which might affect the application of CDM or VCS rules. No further information is required and the content in the VCS PD^{/3/} is accepted by the verification team.

2.2.2 Methodology Deviations

The verification team confirms that the registered PDD complies with the requirements in the applied monitoring methodology ACM0002 version 12.1.0^{/17/}. Therefore, no methodology deviations are applied during the monitoring period.

2.2.3 New Project Activity Instances

The project activity is not identified as a grouped project as per the description in the registered PDD and VCS PD.

2.3 Validation Conclusion

The project activity complies with the validation criteria defined under CDM Program as confirmed from the validation report of the project activity.

It is confirmed that the validation of the project has completed within 2 years from the project start date (as per VCS definition) as per the requirement 3.7 VCS Standard Version 3.3^{/4/}.

The selected project crediting period (under VCS) is acceptable in accordance with para 3.8 of VCS Standard Version 3.3^{/4/}.

3 VERIFICATION PROCESS

3.1 Method and Criteria

A risk-based approach was followed to carry out verification and access all the factors and concerns that relate to the issuance of emission reductions from a project activity.

They include:

- The review of the calculation of the carbon emission factor for the electricity grid.
- Identification of all the sources contributing to the project emissions and emission reductions.
- Authenticity of the provided data is checked.
- A risk based analysis is carried out to ensure a clear and transparent assessment. The risks involved in this process are mainly with the informational flows and data recording.

KBS follows a risk based verification approach, wherein a desk review of the project documentation is undertaken, which is followed by an onsite visit by the members of verification team. The verification protocol is filled by the verification team that is based on standard auditing practices and VCS requirements. The verification protocol provides transparent means to record the observations by the verification team members and the non-conformities, if any. The verification protocol is an internal document, and available on request.

Duration of Verification:

Verification Contract	04/10/2012
On site verification	25/09/2012-26/09/2012
Findings raised	07/01/2013
Draft Verification Report	22/02/2013
Final Verification Report, Version 1.1	28/02/2013

3.2 Document Review

A desk review is undertaken, involving but not limited to,

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

The list of document reviewed is included in the section 'References'

3.3 Interviews

The site visit for this verification assessment was undertaken by Mayank Kumar Jain (Team Leader and Technical Expert). Summary of on-site activities are mentioned below;

Location	Socialist Republic of Viet Nam , Kon Tum Province, Dak Ha and Tu Mo Rong Districts		
Dates	25/09/2012-26/09/2012		
Key points discussed	Name of person interviewed	Designation, Organization	
Operational data	Arijit Paul	Regional Manager, Kyoto Energy	

Calibration	Arijit Paul	Regional Manager, Kyoto Energy
Data collection	Doan Vinh Quang	Assistant Director, DIDJSC
QA/QC procedures	Doan Vinh Quang	Assistant Director, DIDJSC
Calculation of ERs	Nguyen Manh Khuong	CDM Executive, Kyoto Energy
VCS requirements	Nguyen Manh Khuong	CDM Executive, Kyoto Energy

3.4 Site Inspections

A site visit is undertaken by members of verification team, involving but not limited to,

- An assessment of the implementation and operation of the project activity as per the registered CDM PDD;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the approved monitoring plan;
- A cross-check between information provided in the monitoring report and data from other sources such as plant log books, inventories, purchase records or similar data sources;
- A check of the monitoring equipments including calibration performance and observations of monitoring practices against the requirements of the registered CDM PDD and the selected methodology^{17/};
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

3.5 Resolution of Any Material Discrepancy

Date	Type & Number	Raised by	Reference
07/01/2013	CAR 01	Assessment team	D -30
Non conformities raised			
(a) The technical specifications of the turbines and generators have not been stated in Project Description version 1.0 dated 20/09/2012.			
Project Participant's response		Date: 22/01/2013	
(a) The technical specifications of the turbines and generators are now included in section 1.1 of the VCS PD.			
Documentation Provided as Evidence by Project Participant			
(a) Please refer to SD12a_Tech Spec_ Turbine_DP4, SD12b_Tech Spec_ Generator_DP4, SD13a_Tech Spec_ Turbine_DP3 and SD13b_Tech Spec_ Generator_DP3			
Information Verified by Team Leader		Date of review: 29/01/2013	
(a) SD12a_Tech Spec_ Turbine_DP4, (b) SD12b_Tech Spec_ Generator_DP4, (c) SD13a_Tech Spec_ Turbine_DP3 (d) SD13b_Tech Spec_ Generator_DP3 (e) MR version 1.1 dated 03/01/2013 (f) Project Description version 2.0 dated 03/01/2013			
Reasoning for not acceptance or close out			
(a) Rated speed (500 rpm) of TG set mentioned in VCS PD does not match with registered PDD available on CDM EB webpage. Please check the foot note mentioned in section 1.1 of VCS PD(Open)			

(b) The change in rated speeds mentioned above in (a) and (b) have not been described and justified in the MR version 1.1 dated 03/01/2013. Also the timeline as to when these changes occurred and the reason for the change in rated speeds mentioned above in (a) and (b) have not been stated in the MR version 1.1 dated 03/01/2013.(Refer clause 3.6.1 of VCS Standard version 3.3)		
Date of acceptance or non- acceptance	Date: 29/01/2013	Status: Open
Project Participant's response	Date:	
(a) The difference in rated speed of the TG set between the registered PDD under CDM and the actually installed TG set at the project site is acknowledged. However, it is to be noted, that this small change in rated speed does not have any impact on the design capacity of the actually installed turbine generator set. The design capacity of the turbine generator set remains unchanged as per the registered PDD. Further a written confirmation is available from the technology supplier that that the change in rated speed of Dak Psi 4 turbine generator set from 600 rpm to 500 rpm has no impact on the gross output of Dak Psi 4 hydropower plant as stated in the FS. The data from FS was used as the basis for estimation of emission reduction for The CDM - PDD uploaded for CDM Global Stakeholder Consultation (date 24/08/2010). It needs to be mentioned that this change in design speed of the turbine-generator set was known to the PP at the time of CDM validation of the project activity. The PP called tender for the procurement of the electro-mechanical equipment. In the tender document, (SD14, dated Feb 2008), the PP specified the turbines/alternators as per the feasibility Study (FS) prepared for the project activity for the Dak Psi 4 cascade. The selected supplier offered a turbine/alternator matching the capacity stated the FS and which could deliver the output specified in the FS, but with a rated speed of 500 rpm instead of 600 rpm as mentioned in the FS and requested in the tender document. The rotation speed is dependent on the amount of poles of the alternator. To produce a frequency of 50Hz, various options are available: 12 poles with a rotation speed of 500 rpm or 10 poles at 600 rpm. The supplier provided a 12 poles alternator hence a required rotation speed of 500 rpm (Please refer to section 1.1 of SD15 where polarity of the generator has been specified). This information was thus available during CDM validation and the equipment was already installed when the site visit by the validating DOE took place (01/09/2010). While the TG set's rated speed installed at the site is not matching the registered PDD, it has no impact on the project design: the output power of the turbine generator set supplied and installed is in line with the FS and PLF study used to make the decision to proceed with the project activity.		
(b) The description with respect to the change in rated speed of the TG set is now included in VCS MR.		
Documentation Provided as Evidence by Project Participant		
Tender document, Feasibility report, Bidding invitation		
Information Verified by Team Leader	Date of review: 15/02/2013	
Response of PP and Bidding Document		
Reasoning for not acceptance or close out		
(a) The issue is closed due to following reason: Based on the review of the tender document, information provided by technology supplier and response of PP, the validation team concludes the following: 1. In accordance with paragraph 269 and 270 of VVS, this post registration change is categorized under 'changes to the project design of a registered project activity' as the rated speed of turbine and generator, in all three units, (under Dak Psi 4) has changed from the registered PDD. The implementation of the project activity does not conform to the project design of the registered project activity. 2. The change in rated speed of turbine and generator does not impact the capacity of turbine and thus overall output remains the same. 3. The design change does not have any impact of additionality, applicability of methodology or the appropriateness of the baseline scenario and the project remains in compliance with the applied methodology. 4. The PP has modified the PDD to reflect the rated speed of turbine and generator (under Dak Psi 4) as 500 rpm. The KBS team has submitted the revised PDD for approval to UNFCCC.		
(b) Description of deviation from the project description, when changes occurred and reasons for the changes is included in the monitoring report. The details have been assessed and found meeting the		

requirement of clause 3.6.1 of VCS standard. Closed.		
Date of acceptance or non- acceptance	Date: 15/02/2013	Status: Closed

Date	Type & Number	Raised by	Reference
07/01/2013	CAR 02	Assessment team	D -30

Non conformities raised

- In section 1.6 of the MR Version 0.1 dated 20/09/2012 the VCS Crediting period is not consistent with the current monitoring period for Pre CDM VERs.
- The excel sheets for emission reduction for the current monitoring period has not been submitted.
- The net electricity generation calculation in section 4.4 of the MR version 0.1 dated 20/09/2012 is inconsistent with the net electricity export in EVN invoices for the current monitoring period.
- The calibration frequency of energy meters in Section 5.2 of MR Version 0.1 dated 20/09/2012 is inconsistent with PPA and calibration certificates. The calibration frequency of energy meters is defined as 'one year' in Annex C of PPA dated Aug 2010 (Ref. no: 08/2010 DAK PSI 4/EVN CPC-DAK PSI) for Dak Psi 4. Also, the dates of calibration in Section 5.2 of the MR Version 0.1 dated 20/09/2012 are inconsistent with the calibration certificates. The dates of validity of calibration has not been mentioned in section 5.2 of MR Version 0.1 dated 20/09/2012. Also section 3.3 of MR Version 0.1 dated 20/09/2012 states that the calibration is due every three years which is inconsistent with frequency of calibration mentioned in calibration certificates submitted to KBS.

Project Participant's response

Date: 22/01/2013

- The VCS Crediting period in section 1.6 of the MR is now corrected.
- The excel sheets for emission reduction for the current monitoring period is now submitted
- The net electricity generation calculation in section 4.4 of the MR is now corrected as per the EVN receipt. The ER sheet is also corrected accordingly.
- The calibration frequency of the meters is now changed to 1 year as per the PPA. Section 5.2 of the MR is also updated the calibration validity for all meters.

Documentation Provided as Evidence by Project Participant

- No additional evidence is provided
- Please refer to SD07_ Historical hydrological_FS, SD08a_Flooding news_Nov 2010 and SD08b_Flooding news_Oct 2011
- Please refer to "VCS ER-Dak Psi"
- No additional evidence is provided
- No additional evidence is provided

Information Verified by Team Leader

Date of review: 29/01/2013

- MR version 1.1 dated 03/01/2013
- Project Description version 2.0 dated 03/01/2013
- Project Description version 2.0 dated 03/01/2013
- SD07_ Historical hydrological_FS,
- SD08a_Flooding news_Nov 2010
- SD08b_Flooding news_Oct 2011
- VCS ER-Dak Psi
- Calibration Certificates (SD01a,SD01b, SD01c, SD01d, SD01e, SD01f)

Reasoning for not acceptance or close out

- The end date of VCS crediting period stated in section 1.6 in the MR version 1.1 dated 03/01/2013 is not consistent with the variable CDM crediting period mentioned in the registered PDD on CDM webpage and project start date(commissioning of first unit of Dak psi 4. (Please refer para 3.8.3 of VCS Standard version 3.3(Open)
- The ER sheet has been submitted and emission reductions during the current monitoring period have been verified with log books for electricity generation and cross checked with EVN receipts. Closed
- The net electricity generation calculation in section 4.4 of the MR version 1.1 dated 03/01/2013 is now consistent with the EVN receipts. The ER sheet is also consistent with the EVN receipts. Closed
- The frequency , dates of calibration and validity of calibration for the current monitoring period In section 5.2 of the MR version 1.1 dated 03/01/2013are now consistent with the PPA and calibration certificates. (SD01a,SD01b, SD01c, SD01d, SD01e, SD01f) (closed)The frequency of calibration has

been corrected in section 3.3.4 of the MR version 1.1 dated 03/01/2013.(Closed)		
Date of acceptance or non- acceptance	Date: 29/01/2013	Status: Open
Project Participant's response	Date:	
a) The end date of the VCS crediting period is now corrected in the MR.		
Documentation Provided as Evidence by Project Participant		
VCS crediting period		
Information Verified by Team Leader	Date of review: 15/02/2013	
VCS crediting period		
Reasoning for not acceptance or close out		
VCS crediting period has now been corrected in VCS PD and monitoring report in accordance with clause 3.8.1 of VCS standard version 3.3. Closed.		
Date of acceptance or non- acceptance	Date: 15/02/2013	Status: Closed

Date	Type & Number	Raised by	Reference
07/01/2013	CAR 03	Assessment team	D -30
Non conformities raised			
a) In Section 3.2 of MR Version 0.1 dated 20/09/2012, the value of $EG_{facility,y}$ is not evaluated correctly. b) In Section 3.2 of MR Version 0.1 dated 20/09/2012, the monitored value of A_{PJ} has not been substantiated with documentary evidence. c) In Section 3.3.1 of MR Version 0.1 dated 20/09/2012, the metering system is not clear from the description, since the diagrammatic representation does not adequately explain the connection of back up meters with electricity transmission system.			
Project Participant's response		Date: 22/01/2013	
a) The value of $EG_{facility,y}$ in section 3.2 of the MR is now corrected. b) The evidence for A_{PJ} monitoring including daily water level record at the site, the water level- reservoir area chart issued by third party and the A_{PJ} calculation are now provided. Please see SD09_Water level and SD10_ A_{PJ} calculation. c) The metering system diagram in section 3.3.1 of the MR is now described in more detail to explain the connection of back up meters with the electricity transmission system.			
Documentation Provided as Evidence by Project Participant			
a) No additional evidence is provided b) Please refer to SD09_Water level and SD10_ A_{PJ} calculation c) No additional evidence is provided			
Information Verified by Team Leader		Date of review: 29/01/2013	
a) SD09_Water level b) SD10_ A_{PJ} calculation c) MR version 1.1 dated 03/01/2013 d) ER sheet.			
Reasoning for not acceptance or close out			
a) The value of $EG_{facility,y}$ in section 3.2 of the revised MR version 1.1 dated 03/01/2013 has been corrected to 137,967,238 KWh and the value is consistent with the ER sheet.(Closed) b) The documentary evidence for A_{PJ} calculation ,daily water level record at the site, the water level- reservoir area chart have been submitted to the assessment team.(Closed) c) The metering system diagram in section 3.3.1 of the MR version 1.1 dated 03/01/2013 depicts that the turbine generators are connected to a common busbar, the busbar is connected to backup meters and the backup meters are eventually connected to the main meter.(Closed)			
Date of acceptance or non- acceptance		Date: 29/01/2013	Status: Closed

Date	Type & Number	Raised by	Reference
07/01/2013	CAR 04	Assessment team	D -30
Non conformities raised			
a) The section 1.1 of Project description version 1.0 dated 20/09/2012 does not mention the latest version of VCS Standard. The relevant section of the registered PDD under CDM has not been			

provided. The link to the registered PDD under CDM has not been provided. b) The sections 1.1, 1.4, 1.8, 1.11 and section 2 of Project description version1.0 dated 20/09/2012 do not mention the relevant section and link to the registered CDM project activity. c) The section 1.6 of Project description version1.0 dated 20/09/2012 does not mention the VCS crediting period correctly as the current verification is for the Pre CDM VERs d) The section 1.7 of Project description version1.0 dated 20/09/2012 is not representative of current monitoring period (as the current verification is for Pre CDM VERs) e) The section 1.12.3 of Project description version1.0 dated 20/09/2012 has not been substantiated by documentary evidence Declaration from the Project proponent that the project activity does not form part of any other carbon credit program from 09/10/2010 to 05/11/2012;has not been submitted. f) The section 1.12.5 of Project description version1.0 dated 20/09/2012 has not been substantiated by documentary evidence. Declaration from the project proponent stating that the project activity is claiming carbon credits under the VCS Program and has not been rejected under any GHG program; has not been submitted. g) Sections 4, 5 and 6 of Project description version1.0 dated 20/09/2012 do not mention the relevant sections and link to the registered CDM project activity.	
Project Participant's response	Date: 22/01/2013
a) The version of VCS Standard mentioned in section 1.1 of the Project Description is now corrected to the latest version (3.3). The relevant section of the registered PDD under CDM is now provided. The link to the registered PDD under CDM is now also provided. b) The relevant section of the registered PDD under CDM corresponding to section 1.1, 1.4, 1.8, 1.11 and section 2 of Project description are now provided. The link to the registered PDD under CDM is now also provided. c) The VCS Crediting period in section 1.6 of the PD is now corrected so that the crediting period matches with the CDM crediting period. d) The VCS Crediting period in section 1.7 of the PD is now corrected so that it does not exceed the crediting period under the CDM scheme. e) A confirmation letter from the PO to declare that the project activity does not form part of any other carbon credit program from 09/10/2010 to 05/11/2011 is now provided f) A confirmation letter from the PO to declare that the project proponent has not been rejected by any other GHG project is now provided. g) The relevant section of the registered PDD under CDM corresponding to section 4, 5 and 6 of Project description are now provided. The link to the registered PDD under CDM is now also provided.	
Documentation Provided as Evidence by Project Participant	
a) No additional evidence is provided b) No additional evidence is provided c) No additional evidence is provided d) No additional evidence is provided e) Please refer to SD11a_Confirmation letter_no other GHG f) Please refer to SD11b_Confirmation letter_no rejection g) No additional evidence is provided	
Information Verified by Team Leader	Date of review: 29/01/2013
(a) MR version 1.1 dated 03/01/2013 (b) Project Description version 2.0 dated 03/01/2013 (c) SD11a_Confirmation letter_no other GHG (d) SD11b_Confirmation letter_no rejection	
Reasoning for not acceptance or close out	
a) The version of VCS Standard mentioned in section 1.1 of the Project Description version 2.0 dated 03/01/2013 has been corrected to the latest version (3.3). The relevant section of the registered PDD under CDM has been mentioned in section 1.1 of the MR version 1.1 dated 03/01/2013 The link to the registered PDD under CDM has been mentioned in section 1.1 of the MR version 1.1 dated 03/01/2013.(Closed) b) The relevant sections of the registered PDD under CDM corresponding to section 1.1, 1.4, 1.8, 1.11 and section 2 of Project description CDM have been mentioned in section 1.1 of the MR version 1.1 dated 03/01/2013. The link to the registered PDD under CDM have been mentioned in section 1.1 of	

the MR version 1.1 dated 03/01/2013.(Closed)		
c) The end date of VCS crediting period stated section 1.6 in the MR version 1.1 dated 03/01/2013 is not consistent with the variable CDM crediting period mentioned in the registered PDD on CDM webpage.(Please refer para 3.8.3 of VCS Standard)(Open)		
d) The VCS Crediting period in section 1.7of the Project Description version 2.0 dated 03/01/2013 is not consistent with the variable CDM crediting period mentioned in the registered PDD on CDM webpage.(Please refer para 3.8.3 of VCS Standard) (Open)		
e) Documentary evidence to declare that the project activity does not from part of any other carbon credit program from 09/10/2010 to 05/11/2011 has been submitted by the PP and accepted by the assessment team.(Closed)		
f) Documentary evidence to declare to declare that the project proponent has not been rejected by any other GHG programme has been submitted by the PP and accepted by the assessment team.(Closed)		
g) The relevant sections of the registered PDD under CDM corresponding to section 4,5 and 6 of Project description have been mentioned in the Project Description version 2.0 dated 03/01/2013 . The links to the registered PDD under CDM have been mentioned in the sections 4,5 and 6 of Project Description version 2.0 dated 03/01/2013.(Closed)		
Date of acceptance or non- acceptance	Date: 29/01/2013	Status: open
Project Participant's response	Date:	
(c) The end date of VCS crediting period is now corrected in the MR		
(d) The VCS crediting period in the VCS PD is now corrected		
Documentation Provided as Evidence by Project Participant		
Revised VCD PD		
Information Verified by Team Leader	Date of review: 15/02/2013	
Revised VCS PD		
Reasoning for not acceptance or close out		
(c) VCS crediting period has now been corrected in VCS PD and monitoring report in accordance with clause 3.8.1 of VCS standard version 3.3. Closed.		
(d) VCS crediting period has now been corrected in VCS PD and monitoring report in accordance with clause 3.8.1 of VCS standard version 3.3. Closed.		
Date of acceptance or non- acceptance	Date: 15/02/2013	Status: Closed

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity is the installation of 45 MW run of river hydropower project, located in Kon Tum Province, Dak Ha and Tu Mo Rong districts in Vietnam. The project activity is implemented in 2 separate phases (cascades), the first one of 30MW (Dak Psi 4) and the second of 15MW (Dak Psi 3). At present, both cascades Dak Psi 4 and Dak Psi 3 have come into operation and their first commercial operation dates were on 09/10/2010 and 29/08/2012 respectively. Only Dak Psi 4 was under operation during the proposed VCS monitoring period and Dak Psi 3 was still under construction. Implementation schedule of different units under each cascade and the commercial operation dates for the project activity is discussed below: .

Phase 1 (Cascade 2): Dak Psi 4 ^{/7//8/}	Commercial operation date
Unit 1 (10MW capacity)	09/10/2010 ^{/14/}
Unit 2 (10 MW capacity)	17/10/2010 ^{/14/}
Unit 3 (10 MW capacity)	09/10/2010 ^{/14/}

Verification of technical specifications of turbines and generators for phase 1 (cascade 2, Dak Psi 4) of the project activity is discussed in table below:

Table 2: Equipment details

Phase 1 (cascade 2, Dak Psi 4):			
Equipment	Items	Specification	Means of Verification and Opinion
Turbines	Quantity	3	Three turbines of rated capacity 10.3093 MW each are commissioned under Dak Psi 4. Turbines were physically verified during site visit by the assessment team.
	Capacity	10.3093MW	Three turbines of rated capacity 10.3093 MW each are commissioned under Dak Psi 4. Rated capacity of turbines was checked from the technical specification on the name plate of the turbine during site visit. The name plate capacity of turbine was found consistent with the registered PDD ^{/5/} .
	Rated speed	500 rpm	All three turbines are of rated speed of 500 rpm. Same has been confirmed during site visit. The rated speed of each turbine was stated as 600 rpm in the registered PDD^{/5/}, however the technical specifications^{/7/} plate on each turbine states a rated speed of 500 rpm. The assessment team reviewed the tender/bidding document^{/18/} (dated 02/02/2008) released by PP for supply for mechanical-electrical equipments and technical services for Dak Psi 4 hydro power project. From the tender document it is clear that the PP ordered turbines and generators of rated speed (600 rpm) as indicated in the registered PDD^{/5/}. However, the technology provider supplied power generating equipments of similar capacity (as indicated in PDD^{/5/}) but of rated speed 500 rpm. Impact of change in rated speed of turbines and generators on capacity and gross generation is clarified with the technology supplier and the PP. Based on written confirmation from technology supplier and interview of the PP the assessment team concluded that following: • The technology supplier supplied 3 turbines of rated capacity 10.3093 MW and 3 generators of rated capacity of 10 MW to give the same overall output as requested in the bidding document by PP; • The technology supplier supplied 3 turbines and 3 generators of rated speed 500 rpm against 600 rpm ordered by PP; • The rotational speed is dependent on poles of alternator. The PP requested supplier to provide 10 poles alternator with a rated speed of 600 rpm in order to produce current at 50 Hz. The supplier

			delivered 12 poles alternator with a rotational speed of 500 rpm to get same output. Based on the review of the tender document^{/18/}, information provided by technology supplier^{/19/} and response of PP, the validation concludes the following: 1. The implementation of the project activity does not conform to the project design of the registered project activity^{/5/}. 2. The change in rated speed of turbine and generator does not impact the capacity of turbine and thus overall output remains the same. 3. The design change does not have any impact of additionality, applicability or baseline scenario of the project activity.
Generators	Quantity	3	Three generators of nameplate capacity 10MW each are implemented under Dak Psi 4. Same was confirmed during site visit by the assessment team.
	Capacity	10MW	Three generators of nameplate capacity 10MW each are implemented under Dak Psi 4. Same was confirmed with technical specifications on name plate of generators during site visit by the assessment team.
	Type	3 phase synchronization with horizontal axis	The type of the generator was confirmed on site visit by the assessment team.
	Rated speed	500 rpm	All three generators are of rated speed of 500 rpm. Same has been confirmed during site visit. The rated speed of each generator was stated as 600 rpm in the registered PDD ^{/5/} , however the technical specifications ^{/8/} plate on each turbine states a rated speed of 500 rpm. This same has been discussed above.

Further it was noticed that during the monitoring period the project activity operated under normal conditions and no shutdown was reported. Same has been checked from the operational data during site visit.

Findings: Please refer to CAR#01 and CAR#02 in section 3.5 of this report.

Opinion:

The assessment team confirms that the change in rated speed of turbine and generator (for all 3 units under Dak Psi 4) does not affect the conclusions of the validation report^{/6/} of the registered PDD^{/5/} with regard to:

- Additionality of the project activity;
- Appropriateness of the baseline of the project activity;
- Applicability and application of approved baseline methodology ACM0002 version 12.1.0;

- The compliance of the monitoring plan with the monitoring methodology;
- The level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

Discussion:

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002 (version 12.1.0), the formulae given in the VCU monitoring report^{/1/} version 1.3 dated 27/02/2013 and also based on the validation opinion stated in the CDM validation report^{/6/}.

Parameter monitored:

4.2.1 $EG_{\text{facility}, y} = EG_{P,J,y} \text{ (MWh)}$

Quantity of net electricity generation supplied by the project plant/unit to the grid in year y

	Discussion and verification assessment
Purpose of data	Parameter is used in baseline emissions calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Details of energy meters mentioned in table 2 below were confirmed during the site visit. The meter details were found consistent with the calibration certificates of energy meters. As per the registered PDD^{/5/}, calibration of energy meters will occur as per manufacturer's recommendation.. It is noted that as per signed PPA, the Central Electrical Testing Company, a subsidiary of Vietnam Electricity-EVN, is responsible for installation, replacement and calibration of energy meters in the project. The calibration frequency of energy meters is defined as 'one year' in Annex C of PPA dated Aug 2010 (Ref. no: 08/2010 DAK PSI 4/EVN CPC-DAK PSI) for Dak Psi 4 and PPA dated July 2012 (Ref. no: 7/2012 DAK PSI 3/EVN CPC-DIHC) for Dak Psi 3. Energy meters are calibrated on yearly basis during the monitoring period^{/20/}. No delay in calibration is noticed.
Measuring/Reading / Recording frequency	As per registered PDD ^{/5/} , the parameter is being monitored on continuous basis and recorded on monthly basis.
Data collection (from data generation, aggregation, to recording, calculation and reporting)	Export and import electricity readings are continuously measured by the main and check meters. Monthly readings are jointly recorded by PP and EVN. Monitored data is reported on monthly basis in the monitoring report. Net electricity supplied to grid is calculated by subtracting import electricity and transmission losses from electricity exported to the grid. The EVN at its sole discretion considers transmission losses at 1.03%^{/22/} on electricity exported to grid. Electricity export readings reported in spreadsheet are calculated after accounting the transmission losses^{/22/}. Calculation is performed by EVN and the final

	export readings are reported in monthly receipts. Same values are used in emission reductions calculation.
Verified value	138,003 MWh the monthly values of electricity export, electricity import and net electricity supplied to grid have been checked from log books ^{/23/} and EVN receipts ^{/22/} and found consistent. The assessment team observed that for the month of Nov 2011, the export and import values were calculated from the daily record of export and import generation and its difference with the corresponding export & import EVN receipt of previous month (October) which was checked by the assessment team on site and found to be ok. Thus the calculation of net electricity generation has been checked and found correct.
Cross checks	Electricity export, electricity import and net electricity supplied to grid have been cross checked from monthly plant log books. Values in plant log books ^{/23/} and EVN receipts ^{/22/} have been found consistent.
QA/QC procedures applied	During the monitoring period, no replacement of meter was observed. Cross check of electricity supplied will be done with records for sold electricity. The energy meters are calibrated as per the signed PPA i.e., on a yearly basis. The same has been confirmed during the site visit and found acceptable by the assessment team.

Table 2: Measuring equipment details

Data / Parameter	Tag	Model, serial number and manufacture	Accuracy class	Calibration frequency	Calibration dates	Calibration Validity	Event during the monitoring period
Main meter	MM	Type: Energy meter Manufacturer: Elster Model: A1700 Serial: 10001847	0.2%	1 years	29/07/2010 15/07/2011	28/07/2011 14/07/2012	None
Backup meter	BM1	Type: Energy meter Manufacturer: Elster Model: A1700 Serial: 10018260	0.5%	1 years	29/07/2010 15/07/2011	28/07/2011 14/07/2012	None
Backup meter	BM2	Type: Energy meter Manufacturer: Elster Model: A1700	0.5%	1 years	29/07/2010 15/07/2011	28/07/2011 14/07/2012	None

		Serial: 10018259					
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4.2.2 Cap_{PJ} (W)

Installed capacity of the hydro power plant after the implementation of the project activity

	Discussion and verification assessment
Purpose of data	This parameter is used in calculation of project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Determined based on technical specifications ^{/8//10/} and name plate capacity of generators installed at site.
Measuring/Reading/ Recording frequency	Yearly, as per registered PDD ^{/5/} .
Data collection (from data generation, aggregation, to recording, calculation and reporting)	Installed capacity is determined based on technical specifications ^{/7//8//9//10/} and name plate capacity of generators installed at site on yearly basis.
Verified value	30,000,000 W for cascade 2, Dak Psi 4).
Cross checks	This has been crosschecked with technical specification of generators ^{/8//10/}

4.2.3 A_{PJ} (m²)

Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.

	Discussion and verification assessment
Purpose of data	This parameter is used in calculation of project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Water level of the reservoir is determined from water level gauge on the side of the reservoir. Area of reservoir is determined based on the water level chart prepared by third party ^{/24/} .
Measuring/Reading/ Recording frequency	Reservoir area is determined on yearly basis.
Data collection (from data generation, aggregation, to recording, calculation and reporting)	Water level of the reservoir is recorded on daily basis by water level gauge and maximum water level noticed during the year is taken to calculate reservoir area using area/level chart. The reservoir area for Dak Psi 4 is determined by monitoring the water level and using the water level/area chart (issued by third party) which confirms that the constructed reservoir is in accordance with

	the design of reservoir for Dak Psi 4 in the project's FSR ^{/25/} . The chart linking the reservoir area to the water level (area/level chart) ^{/24/} from the projects FSR ^{/25/} is used in conjunction with the maximum water level to arrive at the maximum surface area of the reservoir.
Verified value	Dak Psi 306,715 m ² (for maximum water level of 756.40m) ^{/24/}
Cross checks	The reservoir area-water level chart (issued by third party) ^{/24/} was cross checked against daily recorded values for each day during the monitoring period. It is confirmed that water level and the reservoir area has been determined accurately.

Finding: Please refer to CAR#02 CAR#03 and CAR#04 in section 3.5 of this report.

Opinion: The verification team confirms;

- The monitoring plan has been implemented as per the registered PDD;
- The monitoring complies with the requirement of the applied methodologies;
- The information inflow (from data generation, aggregation, to recording, calculation and reporting) is included above under each parameters and confirms to the requirement of the PDD;
- The values included in the monitoring report and corresponding emission reduction sheets are verified and included under each monitoring parameter, wherever appropriate;

Parameters not monitored/ex-ante:

4.2.4 EF_{Res} (kgCO₂e/MWh)

Default emission factor for emissions from reservoirs

	Discussion and verification assessment
Purpose of data	Calculation of project emissions
Verified value	90 kgCO ₂ e/MWh
Source of value	Decision by EB23/ ACM002 version 12.1.0 (EB 58 Annex 7)
Justification	ACM002 version 12.1.0 (EB 58 Annex 7)

4.2.5 EF_{grid,CM,y} (tCO₂/MWh)

Combined margin CO₂ emission factor for grid connected power generation

	Discussion and verification assessment
Purpose of data	Calculation of baseline emissions
Verified value	0.5764
Source of value	As per the "Tool to calculate the emission factor for an electricity system" and Combined Margin defined in issued "Study, Definition of

	Viet Nam Grid Emission Factor, 2009" by the Department of Meteorology, Hydrology and Climate and issued by DNA
Justification	Values are checked from registered PDD (GEF calculation at validation) ^{/6/}

4.2.6 A_{BL} (m²)

Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m2).

	Discussion and verification assessment
Purpose of data	Calculation of project emissions
Verified value	0
Source of value	ACM0002 version 12.1.0 (EB 58 Annex 7)
Justification	For new reservoirs, this value is zero as per methodology ACM0002 version 12.1.0 ^{/17/}

4.2.7 Cap_{BL} (w)

Installed capacity of the hydro power plant before the implementation of the project activity.

	Discussion and verification assessment
Purpose of data	Calculation of the project emissions
Verified value	0
Source of value	ACM0002 version 12.1.0 (EB 58 Annex 7)
Justification	For new reservoirs, this value is zero as per methodology ACM0002 version 12.1.0

Opinion:

In the opinion of assessment team, the assumptions, emission factors and default values that were applied in the calculations have been justified.

Assessment of Data and Calculation of GHG emission reductions:

The baseline emissions (BE_y) are determined using the formula: $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$

Where,

EG_{PJ,y}: Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in the year y;

EF_{grid,CM,y}: Combined margin CO2 emission factor for grid connected power generation in year y

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y} = 138,002.593 \times 0.5764 = 79,544 \text{ tCO}_2$$

As per the guidance in methodology ACM0002, there are no expected project emissions for hydropower plants which have a run-of-river reservoir with a power density greater than 10 W/m².

The Dak Psi 4 hydropower project has a total installed capacity of 30 MW (or 30,000,000 W) and its run-of-river reservoir has a surface area of 306,715 m². To calculate the power density, the below formula is used:

$$PD = (Cap_{PJ} - Cap_{BL}) / (A_{PJ} - A_{BL}) = (30,000,000 - 0) / (306,715 - 0) = 97.81 \text{ W/m}^2$$

As per the registered PDD^{5/} and the methodology used, the power density of the project is greater than 10 W/m², hence there are no project emissions due to the implementation of the project activity.

Therefore PE_y= 0

Where;

PD is the Power density of the project activity (W/m²)

Cap_{PJ} : Installed capacity of the hydropower plant after the implementation of the project activity (W)

Cap_{BL} : Installed capacity of the hydropower plant before the implementation of the project activity.

A_{PJ} : Area of the reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoirs are full (m²)

A_{BL} : Area of the reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoirs are full.

There are no leakage emissions in the project activity. Therefore, **LE_y = 0**

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y = 79,544 - 0 - 0 = 79,544 \text{ tCO}_2e$$

Findings:

Please refer to CAR#02 in section 3.5 of this report.

Opinion:

The verification team confirms that

- The complete data set for the identified and required parameters for the operational days in the current monitoring period was available, as indicated in section 3.5 above;
- The reported data has been cross checked with available records, as indicated in the section 4.2 above under each monitored data, wherever appropriate;
- The baseline, project and leakage emissions have been determined in accordance with the requirement of the applied methodologies, as contained in the final monitoring report and corresponding emission reductions spreadsheet;
- The assumptions, emission factors and default values used are justified, as indicated in the section 4.2 above.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

Evidences (Documents/interview/site visit) referred for verification of individual monitoring parameter and fixed parameters are defined section 4.2. We further confirm that, sufficient evidence covering the entire monitoring period and at the required frequency were available. A list of referred documents for verification is also included in section 6 of this report.

4.4 Management and Operational System

The operation and management system of the project activity is implemented in line with the registered PDD^{/5/}. The monitoring of the project activity is also the responsibility of Dak Psi Investment and Development Joint Stock Company. The responsibilities and authorities for monitoring are in accordance with the responsibilities and authorities stated in the registered PDD^{/5/}. The site visit confirmed that monitoring and reporting is carried out consistently and records are kept in a secure and consistent manner. The training records have been checked and found Ok. The assessment team concludes that the CDM project along with its management system is in place and properly justified.

5 VERIFICATION CONCLUSION

The verification is based on the validated and registered PDD^{/5/}, VCS PD^{/3/} and the monitoring report^{/1/} for this project. Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive Board and the VCS Standard Version 3.3^{/4/}.

The management of the Kyoto Energy Pte Ltd is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Final Monitoring Report^{/1/} Version 1.3 and dated 27/02/2013. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the Kyoto Energy Pte Ltd. The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report^{/1/} Version 1.3 and dated 27/02/2013.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 09/10/2010 to 05/11/2011 based on the reported emission reductions in the Final Monitoring Report Version 1.3 dated 27/02/2013 for the same period.

As a result of the verification, the verification team confirms that:

- All operations of the project are implemented and installed as planned and described in the project description.
- The monitoring system is in place and functional.
- The installed equipment essential for generating emission reductions runs reliably.
- The GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

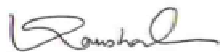
Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

Monitoring period: From 09/10/2010 – 05/11/2011

Verified GHG emission reductions or removals in the above reporting period:

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	79,544
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	79,544

Location: Faridabad, Haryana, India
Date: 08/03/2013



Authorized Signatory: Kaushal Goyal
Designation: Managing Director
KBS Certification Services Pvt. Ltd.

6 REFERENCES

/1/	/1.1/ Monitoring Report, Version 01, dated 29/09/2012 (Initial Version) /1.2/ Monitoring Report, Version 1.1, dated 03/01/2013 /1.3/ Monitoring Report, Version 1.2, dated 12/02/2013 /1.4/ Monitoring Report, Version 1.3 dated 27/02/2013 (Final Version)
/2/	/2.1/ Emission Reduction calculation sheet, Version 0.1 dated 29/09/2012 (corresponding to initial Version of VCS –PD and MR) /2.2/ Emissions Reduction calculation Sheet, Version 1.3 dated 27/02/2013 (corresponding to final Version of VCS –PD and MR)
/3/	/3.1/ VCS –PD version 0.1 dated 20/09/2012 (Initial Version) /3.2/ VCS - PD version 2.0 dated 03/01/2013 /3.2/ VCS-PD version 2.2 dated 12/02/2013 /3.3/ VCS-PD version 2.3 dated 27/02/2013 (Final Version)
/4/	VCS Standard Version 3.3 dated 04/10/2012
/5/	Registered PDD version 4.0 dated 02/11/2011 http://cdm.unfccc.int/Projects/DB/KEMCO1307604296.67/view
/6/	Web-Link for the Registered project activity for Validation Report, LoA and Grid Emission factor calculation http://cdm.unfccc.int/Projects/DB/KEMCO1307604296.67/view
/7/	Technical Specification of Turbines Dak Psi 4
/8/	Technical Specification of Generators Dak Psi 4
/9/	Technical Specification of Turbines Dak Psi 3
/10/	Technical Specification of Generators Dak Psi 3
/11/	Feasibility Study of Turbines Dak Psi 4 issued by VATECH Hydro, India
/12/	Feasibility Study of Generators Dak Psi 4 issued by VATECH Hydro, India
/13/	Certificate for Commercial operation Date Dak Psi 3, dated 12/09/2012 issued by Central Power Corporation , Vietnam
/14/	Certificate for Commercial operation Date Dak Psi 4, dated 08/12/2010 issued by Central Power Corporation , Vietnam
/15/	Registration and Issuance Process VCS Version 3
/16/	/16.1/ Letter of Approval issued by Ministry of Natural Resources and Environment of Viet Nam dated 17/05/2011, (Viet Nam) /16.2/ Letter of Approval issued by Federal Office for the Environment , Climate Division dated 23/12/2010, (Switzerland) http://cdm.unfccc.int/Projects/DB/KEMCO1307604296.67/view
/17/	Consolidated baseline methodology for grid-connected electricity generation from renewable

	sources ACM0002, version 12.1.0 (EB 58 Annex 07) dated 26/11/2010
/18/	Bidding Document for Supply Mechanical-Electrical Equipments and Technical Services Dak Psi 4 Hydropower project dated 02/02/2008
/19/	Technology Supplier Confirmation issued by VATECH Hydro for change in rated capacity and RPM as requested in the bidding document by PP;
/20/	Calibration Certificates for the monitoring period (06/11/2011- 31/08/2012) issued by Central Electrical Testing Company
/21/	Metering system of Dak Psi 4
/22/	EVN Receipts for the current monitoring period (09/10/2010- 05/11/2011)
/23/	Logbooks for Electricity Generation Data for the monitoring period (09/10/2010- 05/11/2011)
/24/	/24.1/ Reservoir Water level area chart issued by Manh Viet Construction Consultancy Join Stock Company /24.2/ A_{Pj} calculation sheet for estimation of area of reservoir