

18 MW KEMPHOLE MINI HYDEL SCHEME (KMHS), BY INTERNATIONAL POWER CORPORATION LIMITED, INDIA



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Summary:

Verification purpose: The main purpose of this grouped project activity is to generate clean form of electricity through Hydro power source. The project activity involves installation of 18 MW hydro energy generators consisting 3 numbers of 6 MW hydro Turbo-generator. The hydro power plant is installed in the state of Karnataka, India. The hydro project has been developed by the International Power Corporation Private Limited.

The project displaces 51,800 MWh amount of electricity from the generation-mix of power plants connected to the Southern regional grid, which is mainly dominated by thermal/fossil fuel based power plant, thereon avoids anthropogenic emissions of greenhouse gases (GHG's), which is estimated to be approximately 44,548 tCO₂e per year.

During the Current Monitoring Period from 01/12/2014 to 19/10/2017 (First and last date included) the project activity has supplied 125,781 MWh of electricity, and thus contributing to the GHG reductions 108,170 tCO₂e.

During the current monitoring period, project activity undergoes continued operation and no major breakdown had taken place.

The objective of this verification activity is to have an independent third party for the assessment of the project design, Actual ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against "ACM0002 version 12.0"
- the project's monitoring plan is assessed against "ACM0002 version 12.0"
- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard, version 3.7
- CDM Validation and Verification Standard for project activities, version 02
- CDM Project Standard for project activities, version 02
- CDM project cycle procedure for project activities, version 02

- VCS standard, v3.7¹
- VCS guideline, v3.7

GAP Validation purpose: The project is registered under CDM mechanism (reference number: 0312). The present validation (gap validation) is under VCS mechanism and assessment of clause 1.1, 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, 1.13 and 2.6 of the VCS Project Description Template. The same is in line with Para 3.11.10 of VCS standard version 3.7.

A risk based approach has been followed to perform this verification activity. In the course of gap validation and verification, 05 Corrective Action request (CAR) and 00 Clarification Requests (CLs) were raised and successfully closed (Including GAP validation & verification). The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided APPLUS with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

¹<http://www.v-c-s.org/project/vcs-program/rules-and-requirements/>

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Hereinafter referred as Applus+ Certification) has been appointed by “**Kosher Climate India Pvt. Ltd**” to perform the gap validation and verification of the project entitled “18 MW Kemphole Mini Hydel Scheme (KMHS), by International Power Corporation Limited, India” under VCS standard and guideline version 3.7. The objective of this gap validation & verification activity is to have an independent third party for the assessment of the VCS project design clause (1.1, 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, 1.13 and 2.6) & Monitoring Report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against “ACM0002 version 12.0”
- the project's monitoring plan is assessed against “ACM0002 version 12.0”
- the project's compliance with the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM Validation and Verification Standard for project activities, version 02
- CDM Project Standard for project activities, version 02
- CDM project cycle procedure for project activities, version 02
- VCS standard, v3.7²
- VCS guideline, v3.7

Gap Validation & verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of estimated verified emission reductions (VERs).

1.2 Scope and Criteria

The scope of the gap validation and verification is the independent and objective review of the Project Description clause (1.1, 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, 1.13 and 2.6) & Monitoring Report. The VCS PD & MR are reviewed against the relevant criteria (see 1.1) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The validation and verification was based on the guidance given in the CDM Project Standard for project activities, version 02.0, CDM Project Cycle Procedure for project activities, version 02.0, VCS guideline and standard, version 3.7

²<http://www.v-c-s.org/project/vcs-program/rules-and-requirements/>

The assessment team has employed a risk-based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the VCS PD & MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VERs. The validation and verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design and monitoring report combined.

The only purpose of the gap validation and verification is its usage during the registration /issuance process as part of the VCS project cycle. Therefore, LGAI Technological Center S.A. (Applus+ Certification) can't be held liable by any party for decisions made or not made based on the validation/verification opinion, which will go beyond that purpose.

1.3 Level of Assurance

The verification and validation has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS.

1.4 Summary Description of the Project

The main purpose of this project activity is to generate clean form of electricity through renewable hydro energy sources. The project activity aims to harness hydro energy through installation of hydro power project with total installed capacity of 18 MW hydro power project and located in the state of Karnataka. The project is promoted by International Power Corporation Limited.

The Project activity is a new facility (Greenfield) and the electricity delivered by the project activity is exported to the Indian electricity grid. The project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid.

The project activity results in replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 44,548 tCO₂e per year, thereon displacing 51,800 MWh/year amount of electricity from the grid. The project is registered under CDM and the details are given below:

Project Title	18 MW Kemphole Mini Hydel Scheme (KMHS), by International Power Corporation Limited, India
Reference No	0312
Registration date	25/05/2006
Crediting period	1 st Crediting period: 20/10/2003 – 19/10/2010 2 nd Crediting period: 20/10/2010 – 19/10/2017
Current CDM PDD	Version 8, Dated 11/03/2011
Applied Methodology	ACM0002, ver. 12
CERs issued up to	30/11/2014

Now the project is proposed to be registered under VCS with the crediting period of 01/12/2014 to 19/10/2024³. Hence present validation is a gap validation is under VCS mechanism which includes assessment of clause 1.1, 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, 1.13 and 2.6 of the VCS Project Description Template. The same is in line with Para 3.11.10 of VCS standard version 3.7.

During the Current Monitoring Period from 01/12/2014 to 19/10/2017 (First and last date included) the project activity has supplied 125,781 MWh of electricity, and thus contributing to the GHG reductions 108,170 tCO₂e.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Validation and Verification Scope: The scope is defined as an independent and objective review of the project design document (PD Clause: 1.1, 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, 1.13 and 2.6) and Monitoring report. The VCS PD and MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard and guideline version 3.7, including the approved baseline and monitoring methodology ACM0002 version 12.0. The validation and verification were based on the requirements in the Validation and Verification Standard for project activities, version 02.0, Project standard for project activities, version 02.0, and VCS guideline and standard, version 3.7.

The validation and verification are not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the combined project description and the Monitoring report.

Validation and Verification Process: The project assessment is based on the Clean Development Mechanism Validation and Verification Standard for project activities, version 02.0 and VCS standard and guideline, version 3.7 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

Once the project is received by the assessment team, the members of the assessment team carried out:

- I A desk review of the project design documentation (Clause 1.1, 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, 1.13 and 2.6) and monitoring report;

³ Under the CDM 1st crediting period (20/10/2003 to 19/10/2010), CERs are claimed for the complete crediting period. In the 2nd crediting period (20/10/2010 to 19/10/2017), CERs are claimed up to 30/11/2014. Hence, start date for VCS crediting period is taken from 01/12/2014. Further, PP has limited VCS crediting period upto 19/10/2024 which is the end date for 3rd CDM crediting period inline with para 3.8.3 of VCS Standard, version 3.7.

- II Follow-up interviews with project stakeholders;
- III The resolution of outstanding issues and the issuance of the final verification/ validation report and opinion.

The prepared gap validation and verification report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the VCS executive board for registration and issuance of retroactive credits as per Para 3.11.10 of VCS standard version 3.7.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. LGAI Technological Center, S.A. (Applus+ Certification) has developed a specific checklist customized for the project. The checklist demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from validating/verifying the identified criteria.

Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, LGAI Technological Center S.A. (Applus+ Certification) has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of LGAI Technological Center S.A. (Applus+ Certification).

The composition of audit team shall be approved by the LGAI Technological Center S.A. (Applus+ Certification) ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT).
- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Dr. Atul Takarkhede	LA/TE	YES	YES	YES	YES
Denny Xue	TR	YES	YES	YES	NA

The complete list of CVs is included as Appendix 3 of this report.

Document review

The VCS PD & MR submitted by the Client was reviewed against the approved methodology and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in this report below in appendix 1.

Follow-up interviews

A site visit was conducted by LGAI Technological Center S.A. (Applus+ Certification) who performed interviews, telephone conferences, and physical site inspection with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in this report in the below sections.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the gap validation and verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for LGAI Technological Center S.A. (Applus+ Certification) positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by LGAI Technological Center S.A. (Applus+ Certification) were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the appendix 2.

The VCS PD, version 2 and Monitoring Report Version 02 submitted by project owners on 22/07/2019 & 22/07/2019 respectively serve as the basis for the final assessment presented. Additional changes to the project during the gap validation and verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

As final step of a gap validation and verification of the final documentation including the final verification report and the checklist have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of Interest.

After confirmation of the project owners the positive validation/verification opinion and relevant documents are submitted to the VCS secretariat through the VCS web-platform.

2.2 Document Review

The details of the document observed during the gap validation and verification process are listed below in appendix 1 of this report.

2.3 Interviews

The site visit for the project activity was carried out from 20/07/2019 to 21/07/2019. No sampling procedures were adopted either in document verification and all the document were cross checked to ensure conservative estimation of emission reduction. Kindly find below names of the persons interviewed (during onsite and telephonic interview later) for the site.

Sr. No.	Name of Persons	Role/Designation
1)	Mr. Mahesh Kumar. S	GM (Operations), International Power Corporation Ltd (IPCL)
2)	Mr. Vithal M Navade	DGM – O&M, International Power Corporation Ltd (IPCL)

3)	Mr. Swaminathan	Manager-O&M, International Power Corporation Ltd (IPCL)
4)	Mr. Vamsi Krishna	Sr. Manager, Kosher Climate India (Pvt.) Limited

2.4 Site Inspections

Duration of on-site inspection: 20/07/2019 to 21/07/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring. Assessment team also checked that whether the monitoring plan as described in the CDM PDD is actually practised onsite. Also assessment team checked any change in host country criteria which may affect the baseline of the project activity.	Heggadde village, Sakaleshpura Taluk, Hassan District, Karnataka, India	20/07/2019 to 21/07/2019	Mr. Atul Takarkhede

2.5 Resolution of Findings

The objective of this phase of the gap validation and verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for LGAI Technological Center S.A. (Applus+ Certification)'s positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by LGAI Technological Center S.A. (Applus+ Certification) were resolved during communications between the Client and LGAI Technological Center S.A. (Applus+ Certification) to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the appendix 2.

The final VCS PD, version 02 & MR Version 02 submitted by project owners on 22/07/2019 serves as the basis for the final assessment presented. Additional changes to the project during the validation and verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	00	02	00
Description of project activity	00	00	00
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	00	00	00
- Deviation from methodology	00	00	00
- Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
- Demonstration of additionality	00	00	00

- Emission reductions	00	00	00
- Monitoring plan	00	00	00
-Stakeholders consultation process	00	00	00
- Public comments	00	00	00
Others (please specify)-Matter related to double counting- for validation	00	01	00
Others (please specify)-Matter related to Emission reduction calculation- for verification ER achieved, Matter related to feeder details, breakdown and Calibration- for verification	00	02	00
Total	00	Validation+ Verification: 05	00

The list of findings and their resolution is presented in appendix 2 of this report.

2.5.1 Forward Action Requests

No FAR was raised during this gap validation and verification process.

2.6 Eligibility for Validation Activities

The Validation and verification body holds accreditation to carry out both Gap validation and verification activities. The accreditation scope can be checked from the below link:

<http://cdm.unfccc.int/DOE/list/DOE.html?entityCode=E-0032>

3 VALIDATION FINDINGS

The present project activity is registered under CDM mechanism (UN reference number: 0312). The project can be traced via link (<https://cdm.unfccc.int/Projects/DB/SGS-UKL1142326439.29/view?cp=1>)

The gap validation is performed for the project activity as per Para 3.11.10 of VCS standard version 3.7. As per the requirement of this template following are the observation of the assessment team:

1. The project is registered under CDM mechanism and UN reference number of the project is 0312. The project title is '18 MW Kemphole Mini Hydel Scheme (KMHS), by International Power Corporation Limited, India'
2. The project is eligible under Para 3.11.10 of VCS standard version 3.7.
3. Assessment team adopted a step wise procedure to assess the respective clause required for gap validation under VCS vide Para 3.11.10 of VCS standard version 3.7:
 - Clause 1.1: The main purpose of this project activity is to generate clean form of electricity through hydro energy sources. The project activity aims to harness hydro energy through installation of 18 MW (3 Nos. of 6 MW turbo-generator) and located at Kemphole stream in Heggadde village, Sakaleshpura taluk of Hassan district of Karnataka in India. The project is promoted by International Power Corporation Limited (IPCL). The electricity generated is supplied to Southern Grid and hence it displaces equivalent amount of electricity from fossil fuel power plants connected to the grid and there by reduces associated the GHG emission. It is estimated that about 44,548 tCO₂e will be avoided though the operation of the project. The project summary provided in the section is found to be consistent with the CDM PDD and

also in line with actual site condition which is verified during site visit. Hence, Clause 1.1 as depicted in the VCS PD for gap validation is acceptable to the assessment team.

- Clause 1.2: According to the categorization system of the Clean Development Mechanism, which is part of Green House Gas (GHG) program that has been approved by the VCS board, the project is categorized as:

Type I: Renewable energy projects

Category: Grid connected renewable electricity generation – ACM0002, version 12

Sectoral Scope: Scope 1

Assessment team checked the type and category of the project activity and found that the project is eligible under Type I and renewable category of project. Hence the project is eligible under Clause 1.2 of VCS PD.

- Clause 1.3: As per CDM registered PDD “M/s International Power Corporation Limited (IPCL)” is the project proponent. In VCS PD also the PP name is correctly mentioned as “M/s International Power Corporation Limited (IPCL)”. The name of the person, address and phone number is assessed correct for VCS (combined validation and verification) purpose. Hence, Clause 1.3 as depicted in the VCS PD for gap validation is acceptable to the assessment team.
- Clause 1.5: The start date of the project is considered as 20/10/2003 which is the commissioning date of the first unit and the same is correct as per the definition of start date of VCS. Hence, Clause 1.5 as depicted in the VCS PD for gap validation is acceptable to the assessment team.
- Clause 1.6: The Project activity is commissioned on 20/10/2003 (Commissioning certificate is checked). In CDM, the CERs are claimed up to 30/11/2014. Hence, the VCS crediting period is considered from 01/12/2014. The project crediting period shall be a maximum of ten years which will be renewed at most twice.

The start date of the VCS crediting period is considered as 01/12/2014 and the end date of the VCS crediting period is considered as 19/10/2024 based on the end date of 3rd crediting period of CDM. This is in line with VCS Standard, section 3.8.3. Thus clause 1.6 as depicted in the VCS PD for gap validation is acceptable to the assessment team

- Clause 1.7: The proposed project activity was categorized as Project, since the estimated average annual GHG emission reductions is 44,548 tCO₂e, which is less than or equal to 300,000 tCO₂e per year as per the registered CDM PDD
- Clause 1.9: Through reviewing the registered CDM PDD and validation report at UNFCCC website <https://cdm.unfccc.int/Projects/DB/SGS-UKL1142326439.29/view?cp=1>, it was validated that the project is located in Heggadde Village, Sakaleshpura Taluk, Hassan District, Karnataka State, India. Geographical coordinates of weir site of the project activity is Latitude 12°50'30"N and Longitude 75°40'30"E and of the power house is Latitude 12°50'17.98 "N and Longitude 75°40'11.88"E. The location of the project activity has been confirmed during site visit

- Clause 1.10: Through reviewing the registered CDM PDD and validation report at UNFCCC website <https://cdm.unfccc.int/Projects/DB/SGS-UKL1142326439.29/view?cp=1>, it is confirmed that the project is a Greenfield project. The project activity replaces the carbon intensive grid electricity. The proposed project activity effectively utilises renewable hydro energy to generate electricity which will be feed into the coal intensive Southern regional Grid. Thereby the project activity reduces the dependence on fossil fuel based generation units and as there are no associated emissions with this project it contributes to the reduction of greenhouse gases (GHG) emissions. Assessment team checked the same during the onsite visit and also cross checked with CDM PDD and validation report. Thus clause 1.10 as depicted in the VCS PD for gap validation is acceptable to the assessment team.
- Clause 1.12.1: The ownership details of International Power Corporation Limited (IPCL) (project owner/ project participant) were checked using: Power agreement between owner and State Utility, Commissioning certificate and Purchase order of the WTGs. Thus clause 1.12.1 as depicted in the VCS PD for gap validation is acceptable to the assessment team.
- Clause 1.12.2: The project is registered under CDM and UNFCCC (Registration ID -0312). The project is also approved by the DNA and a copy of the approval is available on the UNFCCC page. Project Proponent has submitted undertaking that they will not claim same GHG emission reductions of the project from CDM and VCS. PP would not use net GHG emission reductions by the projects for compliance with emission trading program to meet binding limits on GHG emissions. Thus clause 1.12.2 as depicted in the VCS PD for gap validation is acceptable to the assessment team.
- Clause 1.12.3: Project has been registered with UNFCCC under Clean Development Mechanism program. Registration reference number is 0312. Project Proponent has submitted undertaking for not availing other forms of environmental credit for the same crediting period under consideration. Thus clause 1.12.3 as depicted in the VCS PD for gap validation is acceptable to the assessment team
- Clause 1.12.4: Project has been registered with UNFCCC under Clean Development Mechanism program, Registration reference number is 0312. In CDM, the CERs are claimed up to 30/11/2014. Hence, the PP is registering the VCS program with the crediting period effective from 01/12/2014. And PP also confirmed that the project will not claim CERs for the period when the VCUs are claimed under VCS.
PP also submitted undertaking for Project neither has any intends to generate any form of GHG related environmental credit for neither GHG emission reductions nor removals claimed under the VCS program. Thus clause 1.12.4 as depicted in the VCS PD for gap validation is acceptable to the assessment team
- Clause 1.13: As per VCS standard version 3.7: Grouped projects are projects structured to allow the expansion of a project activity subsequent to project validation. For the present project at this stage of validation there is no any plan for structural expansion of the project activity. Assessment team confirms that the project do not fall under a group project activity as the project is single project activity generating electricity from hydro power and the same structure will be used for future verification as well. No leakage involved as per the direction of ACM0002, version 12 and CDM registered PDD. There is no commercially sensitive

information which is being excluded for the project activity. Thus, clause 1.13 as depicted in the VCS PD for gap validation is acceptable to the assessment team

- Clause 2.6: No methodology deviation is applied in the VCS PD. Thus, clause 2.6 as depicted in the VCS PD for gap validation is acceptable to the assessment team

The respective undertaking for Clause 1.12.2, 1.12.3 and 1.12.4 were not submitted to the assessment team. CAR was raised regarding the same and after submission of satisfactory documents the Non Conformity (=NC) is closed. The detail regarding the Non Conformity could be found in Appendix 2 of this report.

3.1 Participation under Other GHG Programs

As mentioned above, Project has been registered with UNFCCC under Clean Development Mechanism program, Registration reference number is 0312. As per VCS Standard, section 3.10.11, the CDM registered projects are eligible under VCS when a gap validation is undertaken. Along with the verification report a gap validation is done by assessing sections 1.1, 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, 1.13 and 2.6 of the project description.

In CDM, the CERs are claimed up to 30/11/2014. Hence, the PP is registering the VCS program with the crediting period effective from 01/12/2014. And PP also confirmed that the project will not claim CERs for the period when the VCUs are claimed under VCS.

PP also submitted undertaking for Project neither has any intends to generate any form of GHG related environmental credit for neither GHG emission reductions nor removals claimed under the VCS program

Hence, the project is eligible to participate under the VCS Program.

3.2 Methodology Deviations

The project activity used ACM0002, version 12 which is as per the registered CDM PDD and thus no deviation is sought regarding the methodology. The project complies with all the requirement of the methodology and thus deviation to the methodology is not a requirement for the present project activity.

3.3 Project Description Deviations

The project is implemented as per the description in the CDM PDD and thus no technical or any other deviation is sought. The same is confirmed during the site visit and interview. Hence, the applicability of the methodology, baseline and additionality as mentioned in the CDM PDD will not undergo any change and thus deemed appropriate for the project activity

3.4 Grouped Project

The project do not involve any addition of new project activity and thus the project do not falls under grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the verification site visit it was concluded that the project is implemented as per the instruction of the registered CDM PDD and Final Validation report. During the current monitoring period it was observed that no unforeseen situation evolved which can impact the operation of the project activity. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team.

It was observed that the monitoring plan was implemented as per the requirement of the registered PD, FVR and approved methodology ACM0002 version 12. The organisational role and responsibility as mentioned in the registered CDM PDD is followed onsite. The calibration is done as per the required frequency mentioned in the CDM PDD. All the emergency preparedness as mentioned in the registered CDM PDD is followed onsite and no discrepancies were found regarding the same.

It was observed during the verification process is that project is not rejected by any other GHG program around the world. The project is registered under CDM mechanism and the same is checked by the assessment team from UN web page (<https://cdm.unfccc.int/Projects/DB/SGS-UKL1142326439.29/view?cp=1>)

The project is not involved in any other form of GHG emission program and VERs generated from this verification will not be used for other trading program to avoid any kind of double counting. The same is confirmed by the PP during the verification site visit. Assessment team also conducted independent review regarding the same and found that the statement of the PP is accurate and project is not involved in any other kind of GHG trading for the present verifications/monitoring period

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the VCS PD and MR.
Findings	CAR 04 is raised on this section and closed successfully. Please refer Appendix 2 for further details
Conclusion	<u>Baseline emission:</u> The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor. The grid in this case would be the 'Southern Regional Grid' Formula Used:- $BE_y = EG_y \times EF_y$ Where: BE_y is baseline emissions in year y, tCO₂e EG_y is the net electricity supplied to the grid in year y and is applied directly from JMR certified by state utility. This value can also be cross checked from the invoice. EF_y is the CO₂ emission factor of the grid (0.86 tCO₂e/MWh fixed ex-ante). The verification team has checked the entire monthly JMR report (B.Form) and invoices applicable for the monitoring period as per the project activity applied for verifications and found all the parameters are monitored and recorded as per the

	monitoring plan in the CDM registered PDD. The verification team has crosschecked the emission reduction sheet and monitoring report data with the JMR sheet and invoice bills and found all the values are matching. <u>Project Emission:</u> As per the MR, the parameter 'Installed capacity of the hydro power plant after the implementation of the project activity' (Cap_{PJ}) is 18000000 W (18 MW). This is crosschecked with the name plate details of the turbine generator during site visit. Further, parameter installed capacity of the hydro power plant before the implementation of the project activity (Cap_{BL}) for new hydro power plants, value is zero. Thus, $Cap_{BL} = 0$. Also parameter (A_{BL}); Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2) is zero for new reservoirs. Thus, $A_{BL} = 0$. 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' is mentioned 40000 m^2 which is verified from the topographical survey data during site visit. As per the above data, the power density (PD) is calculated as 450 W/m^2. Since the power density is above 10 W/m^2, the project emission is considered as zero which is found to be appropriate and in line with the applied methodology <u>Leakage:</u> As per registered PDD the leakage is zero. Since, the project emission and leakage are zero, the baseline emission is equal to emission reduction.
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4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log for the monitoring period. During the verification site visit the energy meters of both Line 1 and Line 2 are also checked. The Calibration details of the monitoring meters are also checked with calibration certificates.
Findings	CAR 05 is raised on this section and closed successfully. Please refer Appendix 2 for further details
Conclusion	The metering arrangement is tri-vector bi-directional energy meters (main and check for both line 1 and line 2) at the State Electricity Board (SEB) substation. These meters record several parameters including electricity exported & imported. Moreover, the meters are located at the HT side of the transformer and are of accuracy class of 0.2s for each project activity applied for verification. These electricity meters are being used by state electricity board for JMR (Joint Meter Reading/B.Form) electricity generation statements. The Net electricity supplied to the grid is then calculated from export and import values. The electricity Export, Import and Net electricity exported to the grid are cross checked from the invoices raised to respective state electricity board which is in line with Methodology requirement for large scale project activity. Hence assessment team confirmed that the value of net electricity exported to the grid as used in emission reduction calculation is correct. Electricity export to the grid and import from the grid is metered by main and check tri-vector energy meters. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and PP. In the event of failure of main meter, the check meter will be used in monitoring the electricity data. The PP is

	experienced in the monitoring system as the monitoring is continuously done as per the CDM monitoring requirements since commissioning. The validation team therefore is of the opinion that the project participant is capable of implementing the monitoring plan in the context of the project activity. Calibration of all the meters is done by state electricity board officials as per the industry standards. However, the calibration is done once in a year as per registered CDM PDD. The details of Calibration of the meters are mentioned in Appendix 5 of this report. The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. It is reported that the data will be kept for 2 years following the end of the crediting period or till the last issuance of VERs for the project activity whichever occurs later. The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit. On-site visit and interview with site personnel also confirms that the operational and organizational chart as mentioned in CDM PDD is as per the site practice and thus assessment team confirms that the details are correct. The break down log is checked and found that the plant undergone scheduled maintenance and break down. No unforced error observed.
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4.4 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Not applicable	Not applicable	Not applicable	Not applicable

5 SAFEGUARDS

5.1 No Net Harm

Before the start of the project, environmental assessment studies (two) have been carried out in a corridor of 10 Km on the either side of Kemphele. The reports fully follow the guidelines of the Ministry of Environment and Forest, Government of India issued time to time. Accordingly the environment impact of the project area is evaluated bringing out the beneficial and ill-effect of the project.

As per the findings of the report, the project does not have any negative effect on the environment on the whole. There are many beneficial effects such as increase in aquatic fauna, improvement in ground water level and increase in the vegetation density etc. which has brought

over all enhancement of the environment and improvement in the socio-economic condition and living standards of the people in the area

EIA studies conducted by the project developers before start of the project activity revealed that the project will generate the much needed electricity with least disturbance to the eco-systems of the surroundings. It has been observed that project has been able in accomplishing this assessment very well. There were some normal temporary inconvenience during construction phase but developers have been successful in mitigating those through a proper Environment Management Plan.

As per the prevailing rules and regulations at that time Environmental Management Plan (EMP) was prepared & implemented by PP to mitigate adverse impacts and maximize beneficial impacts. The Project Proponents have made sufficient provision in the Project Cost to implement EMP provisions. Same are already mentioned in the registered CDM PDD and verified during site visit.

5.2 Local Stakeholder Consultation

All the stakeholders are happy with the implementation and operation of the project activity and no negative comments envisaged for the project activity. There was no change in project description from the registered CDM PDD. Assessment team confirmed the same during the verification site visit.

6 VERIFICATION CONCLUSION

Applus+ Certification has been engaged by **Kosher Climate India Pvt. LTd** to perform the gap validation and verification of the **“18 MW Kemphole Mini Hydel Scheme (KMHS), by International Power Corporation Limited, India - Crediting Period Renewal Request”**

The management of the project participant/owner is responsible for the preparation of the GHG emissions data and the reported/estimated GHG emissions reductions on the basis set out within the project's Monitoring Plan in the CDM PDD and MR and the approved methodology ACM0002 version 12.0.

Our Verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is operated as planned and described in the project document;
- the monitoring plan is as per the applied methodology;
- the monitoring process in Monitoring Report is as per the PD
- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately

- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.
- No limitation observed for the present verification

Verification period: From 01/12/2014 to 19/10/2017 (first and last date included)

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2014	1,496	0	0	1,496
2015	36,869	0	0	36,869
2016	37,305	0	0	37,305
2017	32,500	0	0	32,500
Total	108,170	0	0	108,170

The estimated emission reduction to be achieved from the project activity for the current monitoring period is 128,640⁴ tCO₂e, whereas actual emission reductions achieved are 108,170 tCO₂e, which is approximately 16% lower than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, and not within the control of the project participant. No justification is required for reduction in emission reduction due to reduction in generation as this has negative impact on additionality.

⁴ These estimation is based on annual (365 days) estimation of ER and current monitoring period days.

APPENDIX 1: DOCUMENTS REVIEWED DURING VALIDATION AND VERIFICATION

No.	Author	Title	References to the document	Provider
1.	NA	Commissioning certificates	Commissioning certificates of the Hydro turbine units	Project participant
2.	NA	Contract of the other entity with the DOE	Contract of the other entity with the DOE	Project participant
3.	NA	Technical specifications	Technical specifications of WTGs	Project participant
4.	NA	Power Purchase agreement for the project activity	Manufacturer technical specifications	Project participant
5.	NA	Registered CDM PDD	Version 8 dated 11/03/2011	UNFCCC
6.	NA	Final CDM Validation report (RCP)	Revision 3, dated 12/03/2011	UNFCCC
7.	NA	First CDM MR (of 2 nd crediting period)	Version 1, dated 01/01/2015	UNFCCC
8.	NA	First CDM Verification report (of 2 nd crediting period)	Version 2, dated 27/02/2015	UNFCCC
9.	NA	Draft Joint VCS PD&MR	Version 01.1, dated 10/07/2019	Project participant
10.	NA	Final VCS Project Description	Version 02, dated 22/07/2019	Project participant
11.	NA	Final Monitoring report	Version 02, dated 22/07/2019	
12.	NA	Emission Calculation sheet- Actual	Version 1.1, dated 26/02/2019	Project participant
13.	NA	Emission Calculation sheet- Actual	Version 02, dated 22/07/2019	Project participant
14.	NA	The operational lifetime of the project activity from the manufacturer = (Technical specifications)	Manufacturer technical specifications	Project participant
15.	NA	SERC order of the respective states RBI: Reserve Bank of India www.rbi.org.in Ministry of Environment and forest: www.envfor.nic.in UNFCCC www.cdm.unfccc.int CEA: Central electricity authority www.cea.nic.in Income tax act 1961 http://law.incometaxindia.gov.in/DIT/ VCS: Verified Carbon Standard www.v-c-s.org Ministry of New & Renewable Energy (MNRE) http://mnre.gov.in	Reference link provided	Independent Search

No.	Author	Title	References to the document	Provider
		Central Electricity Regulatory Commission www.cercind.gov.in Renewable Energy Certificate Registry of India https://recregistryindia.nic.in		
16.	NA	Tools/ guidelines used in the project activity - UNFCCC Methodology: ACM0002 version 12.0 - VCS validation Report template, version 3.3 - VCS verification report template Version 3.4 - VCS Standard, version 3.7	UNFCCC CDM web site VERRA website	UNFCCC
17.	NA	Calibration details of the project activity undergoing verification	From Dec 2014 to Oct 2017	Project participant
18.	NA	JMR records+ Invoices for the complete monitoring period	From Dec 2014 to Oct 2017	Project participant
19.	NA	PPA Agreement	Power purchase Agreement between Project Proponent & State Utility/buyer	Project participant
20.	NA	Break down details of the complete monitoring period	Log Sheet	Project participant
21.	NA	VCS Declaration	Declaration from PP for Participation under Other GHG Programs	Project participant

APPENDIX 2: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS, FORWARD ACTION REQUESTS (CAR/CL/FAR)

VALIDATION FINDINGS

Project Implementation Status

CAR ID	01	Section no.	VCS PD	Date: 21/07/2019
Description of CAR				
PP requested to follow VCS standard guideline vide section 3.11.10 and resubmit revised documents viz. Project Description Template and MR etc. as applicable.				
Project participant response				Date: 22/07/2019
<i>The Project Description and Monitoring report are prepared separately in the respective template as per the VCS standard guideline vide section 3.11.10. The same are submitted now for verification.</i>				
Documentation provided by project participant				
<i>Project Description, version 2</i>				
<i>Monitoring report, version 2</i>				
DOE assessment				Date: 22/07/2019
The submitted Project description and Monitoring report are verified and found to be in line with the follow VCS standard guideline vide section 3.11.10. CAR closed				

CAR ID	02	Section no.	VCS PD	Date: 21/07/2019
Description of CAR				
During the document review it was observed that				
1. Monitoring period mentioned in the documents is not clear about inclusion of first and last dates. Correction requested. 2. PP requested to complete all sections of VCS PD and MR as applicable. 3. PP requested to provide details of the CERs issued till date under UNFCCC CDM mechanism in MR and also copy of undertaking in effect of no double counting of CDM & VCS emission reductions achieved will take place.				
Project participant response				Date: 22/07/2019
1. <i>The monitoring period is from 01-December-2014 to 19-October-2017 which includes both the starting date and ending date. The same is now explained in the Joint PD & MR.</i> 2. <i>All sections of VCS PD and MR has been now explained as applicable.</i> 3. <i>Under the CDM mechanism, the CERs are issued up to 30-November-2014 and the VCS monitoring period starts only from 01-December-2014. Also PP will not claim CERs from 01-December-2014. The same is explained in the Joint PD & MR. Hence, there is will not be any double counting. An undertaking confirming the same is provided to DOE.</i>				
Documentation provided by project participant				
<i>Monitoring report, version 2</i>				
<i>Undertaking confirming no double counting</i>				
DOE assessment				Date: 22/07/2019
1. The submitted monitoring report checked and found the monitoring period is mentioned with the note of that includes both starting and ending date.				

2. All sections of VCS PD and MR has been now explained as applicable and found appropriate. CAR closed.
3. PP has included the CERs date issued till date under UNFCCC in the project description submitted. The same is crosschecked with UNFCCC project page and found to be correct. Also PP submitted undertaking in effect of no double counting of CDM & VCS emission reductions achieved will take place. CAR closed

VERIFICATION FINDINGS

Project Implementation Status

CAR ID	03	Section no.	VCS MR	Date: 21/07/2019
Description of CAR				
PP requested to submit Monitoring Report for the current monitoring period.				
Project participant response				Date: 22/07/2019
Now the Monitoring report as per the latest template is prepared separately and submitted to DOE.				
Documentation provided by project participant				
Monitoring report, version 2				
DOE assessment				Date: 22/07/2019
PP submitted a separate monitoring report for the current monitoring period. CAR closed				

Accuracy of GHG Emission Reduction and Removal Calculations

CAR ID	04	Section no.	MR	Date: 21/07/2019
Description of CAR				
PP requested to submit JMR and invoices for complete monitoring period in support of net electricity exported by the project activity.				
Project participant response				Date: 22/07/2019
The JMRs (B.Forms) & Invoices for the complete monitoring period is submitted to DOE				
Documentation provided by project participant				
Joint meter readings/B.Forms Electricity Invoices				
DOE assessment				Date: 22/07/2019
The JMRs and invoices for the complete monitoring period is submitted by PP in support of net electricity exported by the project activity. The import, export and net electricity data mentioned in the ER calculation sheet is verified against the respective month JMRs and invoice copies and all the data are found to be correct. CAR closed.				

Quality of Evidence to Determine GHG Emission Reductions and Removals

CAR ID	05	Section no.	MR	Date: 21/07/2019
Description of CAR				
PP requested to furnish details of calibration carried out in compliance with calibration frequency along with calibration certificates of the monitoring meters involved in the project activity..				
Project participant response				Date: 22/07/2019
The calibration certificates of all the energy meters are submitted to DOE. As per the CDM PDD, calibration frequency is yearly. The calibration is done within the one year frequency during the monitoring period.				
Documentation provided by project participant				
Calibration certificates				

DOE assessment	Date: 22/07/2019
The energy meter calibration certificates are checked and found to be matching with the calibration dates mentioned in the MR. Also from the verification of the calibration certificate it is found that no error is found in energy meters during calibrations. It is also noticed that the energy meters are calibrated within 1 year frequency as required by CDM PDD. CAR Closed.	

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Lead Auditor/ Technical Expert	OR	Takarkhede	Atul	TQC- Outsourced entity	Yes	Yes	Yes	Yes

Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (TR)	EI	Xue	Denny	LGAI Technological Center S.A. (Applus+ Certification)
2.	Approver	IR	Sendin	Juan	LGAI Technological Center S.A. (Applus+ Certification)

Short CVs of the Team:

- Dr. Atul Takarkhede counts with 9 years of experience in field of Environmental Auditing, consulting and accreditation. He is an Expert in ISO 9001-14001, CO2/GHG Reporting, Carbon Foot Print, Energy, Water and Waste Management Reporting for organizations environmental performance. His professional portfolio is mainly related with carrying out EIA, conducting QA/QC of EIA Reports; Conducting Environmental/water Audits; NABET requirements appliance. Furthermore, he counts with solid experience on CDM-VCS-GS consultancy and auditing. He has Ph.D. (Environmental Science) from Institute of Science, RTM Nagpur University, Nagpur, and he has already published different technical reports related to environmental science. Currently he is associated with True Quality Certifications Private Limited and is empanelled with APPLUS certification to carry out GHG audit.
- Mr. Hanshen (Denny) Xue has a Bachelor's Degree on Thermal Energy Engineering and Master's Degree on Environmental Engineering. He has more than 10 years of experience on CDM project development. Before he joined Applus+ LGAI, he has been worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development. He is working with Applus+ since 2011 carrying out Validation and verification for CDM/GS/VCS project under scope 1 and 13 as auditor, lead auditor, technical expert and technical reviewer.

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
OM	Operating Margin
GWP	Global Warming potential
JMR	Joint Metering reading
RBI	Reserve Bank Of India

APPENDIX 5: CALIBRATION DETAILS

Line	Meter Serial No.	Date of Calibration	Calibration due date	Calibration compliance
Line 1	Main Meter: 02048056 Check Meter: 03129382 Accuracy class 0.2s	16/09/2014	15/09/2015	Yes
		19/03/2015	18/03/2016	Yes
		10/02/2016	09/02/2017	Yes
		16/07/2016	15/07/2017	Yes
		27/06/2017	26/06/2018	Yes
Line 2	Main Meter: 03129375 Check Meter: 03129379 Accuracy class 0.2s	16/09/2014	15/09/2015	Yes
		19/03/2015	18/03/2016	Yes
		10/02/2016	09/02/2017	Yes
		16/07/2016	15/07/2017	Yes
		27/06/2017	26/06/2018	Yes

Since the calibration frequency of the meters are once in a years, the calibration is valid during the current monitoring period. Hence, no error factor has been applied due to delay in calibration.