VALIDATION REPORT THE RENEWAL OF THE CREDITING PERIOD

'210 MW MUSI HYDRO POWER PLANT, BENGKULU'

Document Prepared By RINA Services S.p.A. (RINA)

Project Title	210 MW Musi Hydro Power Plant, Bengkulu
Version	1.0Aa
Report ID	2017-IQ-53-MD

Report Title	Validation report the Renewal of the crediting period '210 MW Musi Hydro Power Plant, Bengkulu'
Client	South Pole Carbon Asset Management Ltd.
Pages	*29*
Date of Issue	05/03/2018
Prepared By	RINA Services S.p.A.
Contact	Address: Via Corsica 12, 16128 Genova, Italy Phone: (39) 01053851 Email: ghg.services@rina.org Website: http://www.rina.org
Approved By	**Laura Severino** (Authorized officer signing for the DOE)
Work Carried Out By	Champok Burgohain (Team Leader, validator and Technical expert TA 1.2)

Summary:

RINA Services S.p.A. (RINA), commissioned by South Pole Carbon Asset Management Ltd., has validated the renewal of the crediting period of the project “210 MW Musi Hydro Power Plant, Bengkulu” in Indonesia, with regard to the relevant requirements for VCS activity. The project activity is a run--of-river type hydro power plant. Total installed capacity of the project is 210 MW, consisting of three (3) x 70 MW turbines. The project is owned and developed by PT. PLN (Persero), a state-owned electricity company. The project supplies electricity to the connected Sumatra grid. Annual energy output is expected to be 1,140 GWh; harnessing a gross water head of 404.4 m by diverting water at 42.3 m3/sec from the Musi river to the Simpangaur river, in an adjacent watershed, through a 7.5 km long waterway and an underground powerhouse.

The objective of the validation is to have an independent evaluation of a project activity by a designated operational entity against the requirements of the VCS guide version 3.7 and GHG program applied, on the basis of the project design document. The validation scope is to review the VCS PD against the UNFCCC criteria for CDM and VCS Version 3.7 Requirements.

Validation was conducted using RINA procedures in line with the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques. The validation consisted of desk review, on-site assessment and the resolution of outstanding issues and the issuance of the final validation report.

During this validation, 02 Corrective Action Request (CAR) and 1 Clarification Requests (CRs) were identified related to operation, GHG emission reduction estimation, monitoring and baseline scenario of the VCS project activity in relation to all relevant VCS requirements for the project activity and the applied baseline and monitoring methodology, and these CARs and CRs are successfully closed after necessary corrections/clarifications by the client. The same has been discussed in Appendix B of this validation report.

In conclusion, it is RINA’s opinion that the project activity “210 MW Musi Hydro Power Plant, Bengkulu”, in “Indonesia”, as described in the VCS-PD version 3.0 of 28/02/2018, meets all relevant requirements for VCS activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology “ACM0002”, “Grid-connected electricity generation from renewable sources”, version 17.0 of 13/05/2016

Table of Contents

CONTENTS

1 INTRODUCTION

1.1 Objective

South Pole Carbon Asset Management Ltd. has commissioned RINA to carry out the validation of renewal of crediting period of the project “210 MW Musi Hydro Power Plant, Bengkulu” project in Indonesia.

This report summarizes the findings of the validation of the project, performed on the basis of VCS Requirements and UNFCCC criteria for CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The objective of the validation is to have an independent evaluation of a project activity by a designated operational entity against the requirements of the VCS Version 3.7 and GHG program applied, on the basis of the project design document. In particular, the validity of project's baseline and regulatory surplus are validated in order to confirm the compliance as outlined under paragraph 3.8.5 of VCS standard version 3.7. Validation 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 Voluntary Carbon Units (VCUs).

1.2 Scope and Criteria

The validation scope is to review the VCS PD against the UNFCCC criteria for CDM and VCS Version 3.7 Requirements.

Validity of the original baseline scenario reviewing the following criteria:

- Evaluation of the impact of new relevant national and/or sectoral policies and circumstances on the validity of the baseline scenario.
- Assessment of the GHG emissions associated with original baseline scenario using the latest version of the CDM Tool to assess the validity of the original/ current baseline.
- If the original baseline scenario is no longer valid, whether current baseline scenario is established in accordance with the VCS rules.
- The project description, containing updated information with respect to the baseline, the estimated GHG emission reductions or removals and the monitoring plan, submitted for validation is based upon the latest approved version of the methodology or its replacement.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the procedures for registration of program of activity as a single CDM and the subsequent decisions by the CDM Executive Board.

Validation is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

1.3 Level of Assurance

All the revisions of the validation report before being submitted to the client were subjected to an independent internal technical review to confirm that all validation activities had been completed according to the pertinent RINA instructions, with reasonable level of assurance.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme VCS VER validation and verification. The validation team and the technical reviewers consist of the following personnel:

Role/Qualification	Last Name	First Name	Country
VCS Team Leader, validator & Technical Expert (TA 1.2)	Buragohain	Champok	India
Technical Reviewer	Liu	Huifeng	China

1.4 Summary Description of the Project

The project activity is a run--of-river type hydro power plant. Total installed capacity of the project is 210 MW, consisting of three (3) x 70 MW turbines. The project is owned and developed by PT. PLN (Persero), a state-owned electricity company. The project supplies electricity to the connected Sumatra grid. Annual energy output is expected to be 1,140 GWh; harnessing a gross water head of 404.4 m by diverting water at 42.3 m3/sec from the Musi river to the Simpangaur river, in an adjacent watershed, through a 7.5 km long waterway and an underground powerhouse.

The project area of the Musi Hydroelectric Power Plant is situated in Bengkulu Province about 30 km northeast of Bengkulu city, the capital of the Province. It involves the inter--basin transfer of water from the Musi river in Rejang Lebong Regency to the Simpangaur river in North Bengkulu Regency through a 7.5 km long waterway and an underground powerhouse. The exact location is 03^{0}37'6.59" S and 102^{0}27'25.87" E.

The project is already registered under VCS (VCS Ref. No: 487) and the project was fully operational during the first crediting period from 01/08/2006 to 31/07/2016.

2 VALIDATION PROCESS

2.1 Method and Criteria

Validation was conducted using RINA procedures in line with the VCS Version 3.7 requirements and the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The validation consisted of the following three phases:

- Document review;
- On-site assessment;
- The resolution of outstanding issues and the issuance of the final validation report and certification.

2.2 Document Review

The validation is performed primarily as a document review of the registered VCS PD /01/, the updated VCS PD version 01 of 11/12/2017, version 02 of 19/01/2018 and version 03 of 28/02/2018 /**02**/, in particular the applicability of the methodology, the baseline determination, the additionality of the project activity, the monitoring plan, the emission reduction calculations provided in the form of a spreadsheet "171211_300358_Musi_ER Calculation v1.0_lsa.xlsx" of 11/12/2017 /**03**/, were assessed as part of the validation. In addition, the validation report applicable for the first crediting period /**13**/, previous verification report /**14**/ were reviewed.

The following table lists the documentation that was reviewed during the validation:

/1/	South Pole Carbon Asset Management Ltd.: Registered VCS PD for "210 MW Musi Hydro Power Plant, Bengkulu" in Indonesia, version 3 of 09/11/2009
/2/	South Pole Carbon Asset Management Ltd.: Revised VCS PD for "210 MW Musi Hydro Power Plant, Bengkulu" in Indonesia, version 01 of 11/12/2017, version 02 of 19/01/2018 and version 03 of 28/02/2018
/3/	South Pole Carbon Asset Management Ltd: Emission reduction calculation Spreadsheet "171211_300358_Musi_ER Calculation v1.0_lsa.xlsx' of 11/12/2017 and 180228_300358_Musi_ER Calculation v2.0_lsa.xlsx of 28/02/2018
/4/	VCS Verified Carbon Standard: VCS Program Guide, VCS Version 3.7 of 21/06/2017
/5/	VCS Verified Carbon Standard: VCS Standard, VCS Version 3.7 of 21/06/2017
/6/	VCS Verified Carbon Standard: VCS Validation Report Template VCS Version 3.4 of 19/10/2016
/7/	VCS Verified Carbon Standard: VCS Project Description Template VCS Version 3.3 of 19/10/2016
/8/	VCS Verified Carbon Standard: VCS Validation and Verification Manual VCS Version 3.2 of 19/10/2016
/9/	CDM Executive Board: Clean Development Mechanism Project Standard for project activities, version 01 of 03/03/2017, Annex 5 of EB93
/10/	CDM Executive Board: Clean Development Mechanism Validation and Verification Standard for project activities, version 01 of 03/03/2017, Annex 5 of EB93
/11/	CDM Executive Board: Large-scale Consolidated Methodology; ACM0002: Grid-connected electricity generation from renewable sources, Version 17.0 of 13/05/2016
/12/	VCS Board: '210 MW Musi Hydro Power Plant, Bengkulu' Indonesia Website http://www.vcsprojectdatabase.org/#/project_details/487 in English language retrieved on 05/01/2018
/13/	RINA: Validation report (validation report N° 2009 IQ ME 132 of 16/11/2009) for the project activity "210 MW Musi Hydro Power Plant, Bengkulu"
/14/	RINA: Verification report (2017-IQ-51-MD) (3rd verification) covering monitoring period from 01/04/2013 to 31/07/2016 for the project activity '201 MW Musi Hydro Power Plant, Bengkulu'
/15/	Website: https://mer.markit.com/br-reg/public/index.jsp?entity=project&sort=project_name&dir=ASC&start=0&entity_domain=Markit,GoldStandar Argument: Gold Standard Registry Language: English, Retrieved on: 21/09/2017
/16/	Website: http://cdm.unfccc.int/Projects/projsearch.html

	Argument: UNFCCC CDM project search Language: English, retrieved on 21/09/2017
/17/	Department of Energy, Indonesia: Copy of commissioning certificate dated 19/07/2006
/18/	UNFCCC: Methodological tool: Tool to calculate the emission factor for an electricity system, version 06 of 01/11/2017
/19/	P.T.PLN (Persero) certification services
/20/	Decree of Ministry of Energy and Mineral Resources No. 1415/K/20/MEM2017 dated on 29 March 2017 concerning Ratification of PT. PLN (Persero)'s Electricity Supply Business Plan Year 2017 – 2026
/21/	Ministry of Energy & Mineral Resources - Directorate General of Electricity: Sumatra Grid Emission calculation dated 13/02/2018
/22/	The Ministry of Energy and Mineral Resource: regulation number 37 year 2008 dated November 27, 2008 on the Grid Code Sumatra Electricity Power System, the calibration of kWh meter must be done every 5 (five) years.
/23/	Department of Energy: Copy of Commissioning certificates for all the three units dated 19/07/2006
/24/	PT. PLN (Persero): Operational worthiness certificate for unit 1 dated 20/01/2017 valid until 20/01/2022
/25/	Ministry of Energy and Mineral Resources: Operation worthiness certificate of unit no 2 dated 10/02/2016 valid until 10/02/2021
/26/	PT. PLN (Persero): Operational worthiness certificate for unit 3 dated 16/03/2017 valid until 16/03/2022
/27/	Governor of Bengkulu: Environmental worthiness certificate for 210 MW Musi Hydro Power Project dated 25/08/2004
/28/	Agreement between PT. PLN (Persero) and South Pole Carbon Asset Management Ltd dated 18/11/2008
/29/	PT. Indra Karya in association with Nippon Koei Co. Ltd.: Copy of Project Report (Completion Report) on Engineering Services for Detailed Design dated June 1993

2.3 Interviews

The key personnel interviewed and the main topics of the interviews are summarized in the table below:

	Date	Name and Role	Organization	Topic
/a/	20/12/2017	Leonardo Sidabalok- Project Manager	South Pole Carbon Asset Management Ltd.	Monitoring report, emission reduction calculations, records of monitoring parameters, VCS rules, application of methodology etc.
/b/	20/12/2017	Pirwan- Assistant Manager	PT. PLN (Persero)	Technical aspects of the project activity. Operational life, environmental aspects etc.
/c/	20/12/2017	Akhmad Juari – SPV operation and planning control		
/d/	20/12/2017	Iwan Rosario S.- Supervisor (LK2)	PT. PLN (Persero)	Operational details of the project, management structure, legal compliance, health, safety and environmental aspects, data monitoring and recording procedure, safety practices,
/e/	20/12/2017	Syaifa Laila Sany- Inventory Control		

				production controls, internal audits etc.

2.4 Site Inspections

On 20/12/2017, RINA visited project site of Musi hydro power (210 MW), which is located in Bengkulu Province about 30 km northeast of Bengkulu city, the capital of the Province. It involves the inter--basin transfer of water from the Musi river in Rejang Lebong Regency to the Simpangaur river in North Bengkulu Regency through a 7.5 km long waterway and an underground powerhouse. The geographical coordinate of Musi Hydroelectric Power Plant is located on 3.618497 South Latitude and 102.457186 East Longitude. During the on-site assessment of the project, there were no hindrance and all the equipment's and the systems were accessible. RINA assessed the implementation and operation of the proposed project activity, reviewed the information flows for generating, aggregating and reporting the monitoring parameters, interviewed key personnel of the plant to confirm the applicability of the methodology, eligibility criteria, baseline scenario, and project boundary. The quality control and quality assurance procedures were confirmed through the onsite observation and interviews with the project employee.

2.5 Resolution of Findings

The objective of this phase of the validation is to resolve any outstanding issues, which need to be clarified for RINA's positive conclusion on the project design.

To guarantee transparency a validation protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of validation and the results from validating the identified criteria. The validation protocol consists of three tables. The completed validation protocol is enclosed in Appendix B to this report.

A corrective action request (CAR) is raised if one of the following occurs:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions.
- The VCS Version 3.7 requirements have not been met.
- There is a risk that the emission reductions cannot be monitored or calculated.

A clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable VCS Version 3.7 requirements have been met.

In summary, 1 CR and 2 CARs were raised which have been successfully closed and are discussed in detail under Appendix B of this report.

2.5.1 Forward Action Requests

No FAR raised.

3 VALIDATION FINDINGS

3.1 Project Details

Project type, technologies and measures implemented, and eligibility of the project:

The project applies UNFCCC approved methodology ACM0002, version 17 /**11**/ which is used under UNFCCC CDM and therefore an approved GHG programme. The project type and eligibility as per ACM0002 has been accessed as below:

Project type and eligibility: The project involves power generation from hydro power which is categorised as renewable energy source and hence consistent with methodology applied (Scope 01: Energy industries (renewable -/ non-renewable sources).

Technology and measures: The project hydroelectric plant consist of 3 power station units (unit 1, unit 2 and unit 3). The generation capacity of each unit is 70 MW. This is confirmed from commissioning certificates of each unit /**23**/.

Project proponent

The project proponent (PT. PLN (Persero)) is unchanged during this second crediting period. PT. PLN (Persero) is the owner of the project which has been cross checked from the valid operational license copies /**24-16**/, EIA approval copy /**27**/, validation report and previous verification report /**13-14**/. Hence, project proponent is as per VCS *Program Definitions, v3.7* and accepted by validation team. The other entity involved in the project activity is South Pole Carbon Asset Management Ltd. as buyer of the carbon credit generated from the project activity which has been cross checked from the emission reduction purchase agreement copy executed between PT. PLN (Persero) and South Pole Carbon Asset Management Ltd. /**28**/.

Project start date

The project start date is same as mentioned in registered VCS-PD /01/. Project start date is considered the date on which each unit started to operate. Therefore, commissioning date has been considered as the project start date. All the three units were commissioned on 19/07/2006 as verified from commissioning certificates /**23**/. Therefore, the start date of the project activity is correct as per VCS rule.

Project crediting period

The project was registered under VCS version 01 and VCS does not have any rule or definition for the fixed 10 years crediting period, therefore length of crediting period was not determined in the registered PD.

Project proponent has considered crediting period of 10 years from 01/08/2006 to 31/07/2016. However as per the guidance outlined under foot note in section 3.8.5 of VCS standard v3.7 “The project crediting period under VCS Version 1 shall be deemed as 10 years, and commences at the specific project crediting period start date. Note also, VCS Version 1 allowed an earlier project start date than subsequent versions and such projects remain eligible for project crediting period renewal under VCS Version 3”.

The assessment team has verified the project activity against the requirements of VCS standard v3.7 section 3.8.5(3) "The updated project description shall be validated in accordance with the VCS rules. In addition, the project shall be validated against the (current) scope of the VCS. Such validation report shall be issued within two years of the end of the (previous) project crediting period. Additional time is granted for projects to complete such validation where they are switching to a new VCS methodology (new VCS methodology in this context has the same meaning as set out in Section 3.7.2) when renewing the project crediting period. Specifically, projects switching to a new VCS methodology and completing such validation within one year of the approval of the methodology by the VCSA may complete such validation within three years of the end of the (previous) project crediting period.

It is noted that previous crediting period of the project activity ended on 31/07/2016 and the validation is completed within 2 years as recommended under the above paragraph.

Therefore, the project activity in compliance with all the requirements, hence eligible for crediting period renewal. It is to be noted that the project technical life is 30 years and hence the second crediting period is within the technical life of the project.

The first crediting period considered was 01/08/2006 to 31/07/2016 and the second crediting period is from 01/08/2016 to 31/07/2026.

Project scale and estimated GHG emission reductions or removals

The estimated average annual emission reductions from the project are estimated to be on the average 953,128 tCO_2e per year over the selected 10 year crediting period.

Projects are categorized by size according to their estimated average annual emission reductions or removals according to VCS Standard /**05**/. Since the estimated annual emission reductions resulting from the project is greater than 300,000 tCO_2e per year, the category of the project is defined as "Large Project" as per the VCS Standard /**05**/.

Project location

The project site is located in Bengkulu Province about 30 km northeast of Bengkulu city, the capital of the Province. It involves the inter--basin transfer of water from the Musi river in Rejang Lebong Regency to the Simpangaur river in North Bengkulu Regency through a 7.5 km long waterway and an underground powerhouse. The geographical coordinate of Musi Hydroelectric Power Plant is located on 3.618497 South Latitude and 102.457186 East Longitude. This is same as registered VCS PD /**01**/.

Project compliance with applicable laws, statutes and other regulatory frameworks

The project is a voluntary initiative by the project proponent and has not been implemented to meet any local / national laws or regulatory compliances. The project activity is in compliance with current laws and regulations and there are no legal and/or regulatory requirements that prevent the project implementation. Also the validation team has confirmed that there is no such compliance requirement with an emission trading program or any binding limits on GHG emissions for the project activity in Indonesia (host country) as it is a non-annex 1 country. The project has obtained valid consents for the installation and operation from the state nodal agencies and is in compliance with local laws and regulations.

Ownership and other programs

Right of use: The ownership of the project belong to PT. PLN (Persero) as verified from valid operational license copies /**24-26**/, EIA approval copy /**27**/. Other entity South Pole Carbon Asset Management Ltd. acts as buyer of the carbon credit generated from the project activity which has been cross checked from the emission reduction purchase agreement copy executed between PT. PLN (Persero) and South Pole Carbon Asset Management Ltd. /**28**/.

Emissions trading programs and other binding limits: The project is not participating in other emission trading programs. The assessment team checked other emission trading programmes (UNFCCC, Gold Standard, ACX) and found that the project is not listed in any other emission trading programme.

Participation under other GHG programs:

The project is registered only under VCS project activity.

Project ID: 487

Other forms of environmental credit sought or received: The project is not listed in any other forms of environmental credit as confirmed by project proponent.

Rejection by other GHG programs: The project has not been rejected by other GHG programme.

Additional information relevant to the project

Eligibility criteria for grouped projects:

The project is not a grouped project in consistent with registered VCS PD.

Commercially sensitive information:

Not applicable.

Any further information:

Not applicable

3.2 Application of Methodology

3.2.1 Title and Reference

The project activity was registered using ACM0002 ‘Grid-connected electricity generation from renewable sources’ version 10.

For the renewal of the crediting period, the PP has updated the applied methodologies to its latest version and below is the methodology applied:

ACM0002 ‘Grid-connected electricity generation from renewable sources’ version 17.

Tool referenced in the applied methodologies are:

- Tool to calculate the emission factor for an electricity system

Assessment team has checked the UNFCCC website it is confirmed that the selection of the applied methodology and methodological tool has been done correctly in line with the applicable requirements for the renewal of crediting period.

3.2.2 Applicability

Applicability conditions of applied methodolgy ACM0002 'Grid-connected electricity generation from renewable sources' version 17 are discussed below:

Applicability conditions	Justification assessment
This methodology is applicable to grid--connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).	The project is a grid connected hydro power project (renewable) which has been verified during site visit and commissioning certificates /**23**/. Hence, applicability condition is met.
The methodology is applicable under the following conditions: (a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; (b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	The project activity is a greenfield run of the river based hydro power plant. This has been verified from commissioning certificates /**23**/, EIA approval copy /**27**/.
In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3) of ACM0002 version 17.0, is greater than 4 W/m_2; or (c) The project activity results in new single or multiple reservoirs and the power density,	The project activity is constructed as a run-of-river hydropower project with a design for temporary storage called daily regulating storage (a run-of-river reservoir) having a power density of 184.211 W/m^2. The total installed capacity of the project is 210,000,000 Watt and area of reservoirs is 1140,000 m2 as verified from project completion report /29/. Hence, power density is greater than 4 W/m2.

calculated using equation (3) of ACM0002 version 17.0, is greater than 4 W/m2; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3) of ACM0002 version 17.0, is lower than or equal to 4 W/m2, all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4) of ACM0002 version 17.0, is greater than 4 W/m2; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m2 shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project	
In the case of integrated hydro power projects: Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity	The project activity is a run-of-river type hydro power plant as verified from the project completion report /**29**/. Hence, the criteria is not applicable.
The methodology is not applicable to: a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; b) Biomass fired power plants/units	Not applicable to the project activity,
In the case of retrofits, rehabilitations, replacements, or capacity additions, this	The project is a greenfield project and hence the criteria is not applicable.

methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance"	

3.2.3 Project Boundary

In line with the applied methodologies ACM0002, version 17 'the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to". The generated electricity will be delivered to the Sumatra grid. The project boundary found consistent with registered project activity in line with applied methodologies and confirmed from site visit observations. Project boundary is correctly described in the updated VCS PD.

	GHGs involved	Description
Baseline emissions	CO_2	Net electricity delivered to the grid by the project activity that would otherwise have been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid. Emission source is corrected considered as per the project scenario and applied methodology.
Project emissions	CO_2	The project uses DG set for emergency purpose only. Therefore, CO2 emissions from fossil fuel consumption for the backup generator is neglected as per the applied methodology. Also power density being more than 10 W/m^2, CH_4 emissions are neglected in line with the methodology.
	CH4	
Leakage	N/A	The project activity does not have any leakage emission as per the applied methodology.

By checking the information and evidences available and by the physical site, the validation team can confirm that all the emission sources and gases have been included in the project boundary and the description in the PD is accurate and complete, and also that the selected sources and gases are justified for the proposed project activity.

3.2.4 Baseline Scenario

The project activity is a green field grid connected renewable energy power plant; hence, according to the applied methodology ACM0002, version 17.0, the baseline scenario is determined properly as:

"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,

as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

According to VCS Standard, v3.7, paragraph 3.8.5-2) the validity of the original baseline scenario shall be demonstrated when renewing the project crediting period, by means of impacts of new relevant national and/or sectoral policies and actual circumstances.

Paragraph 3.8.5, Clause (2-a) “The validity of the original baseline scenario shall be assessed. Such assessment shall include an evaluation of the impact of new relevant national and/or sectoral policies and circumstances on the validity of the baseline scenario”.

VVB assessment:

Law No. 30 (2007) on Energy and Law No. 30 (2009) on Electricity (Electricity Law) are the main laws that govern the electricity sector in Indonesia. Their implementation is regulated under Government Regulation No. 14 (2012) on Electricity Supply Business Activity, as amended by Government Regulation No. 23 (2014) (GR 14/2012). National policy and regulation does not mandate setting up renewable power plants only and as per PLN's Electricity Supply Business Plan (RUPTL PT. PLN (Persero)) year 2017-2026 there is no mandatory for PT. PLN (Persero) to set up new hydro power plants /**20**/. Thus it can be concluded that original baseline scenario will remain valid for next crediting period.

Paragraph 3.8.5, Clause (2-b) “Where it is determined that the original baseline scenario is still valid, the GHG emissions associated with the original baseline scenario shall be reassessed using the latest version of the CDM Tool to assess the validity of the original/ current baseline and to update the baseline at the renewal of a crediting period”.

VVB assessment:

The project participant has included the assessment of the validity of the original baseline in line with UNFCCC in section 2.4 of the revised VCS PD, including the assessment of original baseline as per the "Tool to assess the validity of the original/ current baseline and to update the baseline at the renewal of a crediting period, Version 3.0.1", which has been concluded to be still valid and applicable for the project

The tool consists of two steps. The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period.

Step 1: Assess the validity of the current baseline for the next crediting period

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

As verified above (Para 3.8.5 2-a), there are no national or local laws or regulations that entail the installation of hydropower project. Hence it can be concluded that current baseline is in compliance with relevant mandatory national and sectoral policies.

Step 1.2: Assess the impact of circumstances

The project activity is a green field hydro power project; the electricity generated from the project would have been generated in grid. Hence grid was considered as appropriate and correct baseline. There is no change observed in this regard and it can be concluded that the conditions used to determine the baseline emissions in the previous crediting period are still valid.

Complete assessment on the current operation of grid-connected power plants and addition of new generation sources is provided in the revised PD; from which it can be concluded that in the actual baseline scenario it is still predominant the installed capacity based on fossil fuel sources.

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.

The lifetime of the project activity is 30 years as per registered PD; hence an investment is not the most likely scenario for the renewal crediting period under consideration.

Step 1.4: Assessment of the validity of the data and parameter

"Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity".

In the registered PD, the grid emission factor was calculated as per the combined margin approach described in the methodology ACM0002 version 10. The grid emission factor has been

calculated as the weighted average of OM & BM; and has been fixed ex-ante for the entire crediting period.

The OM and BM was obtained from official data provided by Ministry of Energy & Mineral Resources - Directorate General of Electricity for the year 2016 /**21**/. This is the most recent data available during the validation of renewal of crediting period.

Considering the guidance provided under this step, calculation of emission factor and baseline emissions are updated for the next crediting period as per step 2.

Step 2: Update the current baseline and the data and parameters

"Update the current baseline emissions for the subsequent crediting period, without reassessing the baseline scenario, based on the latest approved version of the methodology applicable to the project activity. The procedure should be applied in the context of the sectoral policies and circumstances that are applicable at the time of request for renewal of the crediting period".

As demonstrated above the reassessment of baseline scenario is not required. However the as per the latest version of applied methodology ACM0002 version 17, data and parameters are updated as following:

As referred in the methodology ACM0002 v17 recommends the latest version of the "Tool to calculate the emission factor for an electricity system" (version 06.0) is used for calculation of emission factor and consequently the baseline emissions.

The Project proponent has adopted the combined margin approach for determination of the grid emission factor as per Tool to calculate the emission factor of an electricity system' Version 6.0. The PP opted for combined margin emission factor ($EF_{,CM,y}$) for the project activity and it has been estimated ex-ante as 0.857 tCO_2/MWh of Sumatra grid. It will remain fixed throughout the crediting period for the project activity as opted by PP. The combined margin emission factor is obtained from the three years generation weighed average of the operating margin emission factor and the latest year build margin emission factors by applying suitable weights (i.e. 25 % to operating margin emission factor (EFgrid,OM,y) and 75 % to build margin emission factor (EFgrid,BM,y)) as referred to the EF tool version 6.0

The average operating margin value of 0.735 tCO_2/MWh and build margin value of 0.898 tCO_2/MWh for Sumatra grid in Indonesia have been referred from official data calculation provided by Ministry of Energy & Mineral Resources - Directorate General of Electricity for the year 2016 /**21**/. This is the latest available CO_2 baseline data at the time of the VCS PD submission for validation of the project activity. This is found to be appropriate and it is accepted.

The assessment team is able to conclude that:

- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable.

- Documentary evidence used in determining the baseline scenario is relevant, and correctly quoted and interpreted in the project description.

- Relevant national and/or sectoral policies and circumstances have been considered and are listed in the project description

- The procedures for identifying the baseline scenario have been correctly followed and the identified scenario reasonably represents what would have occurred in the absence of the project.

Finally it can be concluded that the identified baseline scenario is justified and according to the VCS Standard v. 3.7 and the "Tool for the assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period v3.0.1.

3.2.5 *Additionality*

In accordance with the paragraph 3.8.5 clause 1 of VCS standard v 3.7, "A full reassessment of additionality is not required when renewing the project crediting period. However, regulatory surplus shall be demonstrated in accordance with Section 4.6.3) and the project description shall be updated accordingly".

As per the above guidelines, the assessment team has reviewed the sectoral and national policies implemented for hydro power projects in host country Indonesia.

Law No. 30 (2007) on Energy and Law No. 30 (2009) on Electricity (Electricity Law) were reviewed.

In view of the above assessment, it can be concluded that the proposed project is not mandated by any law, statute or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically enforced law, statute or other regulatory framework and hence continued to be voluntary.

3.2.6 *Quantification of GHG Emission Reductions and Removals*

Baseline Emissions:

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

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

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

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

$EF_{grid,CM,y}$ is updated and fixed for the entire crediting period to be 0.857 tCO_2/MWh.

Project Emissions:
Project emission applicable for the project activity as per the applied methodology is

$PE_y = PE_{HP,y}$

Where,

PE_y = Project emissions in year y (t CO_2e/yr)

$PE_{HP,y}$ = Project emissions from from water reservoirs of hydro power plants in year y (t CO_2e/yr)

If the power density of the project activity (PD) is greater than 10 W/m2, the $PE_{HP,y}$ =0 as per para 43 (c) of ACM0002 version 17.0.

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

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

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W). The installed capacity of the project is 210,000,000 Watt as verified from commissioning certificates /**23**/.

Cap_{BL}= Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

A_{PJ}= Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m2). Area of the reservoir is 1,140,000 m2 as verified from project completion report /**29**/.

A_{BL}= Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m2). For new reservoirs, this value is zero.

Therefore, PD is 184.211 W/m2. In line with the methodology, being power density more than 10 W/m2 emissions from reservoir is neglected.

Leakage emissions are zero as per the applied methodology.

Ex-ante baseline emissions are calculated to be 976,980 tCO_2/year for all three units, project emissions to be 0 tCO_2 and hence the emission reductions to be 976,980 tCO_2 per year with average of 953,128 tCO2e per year for 10 years crediting period

Conclusion:

The assessment team is able to conclude that the calculation of emission reductions is done as per the applied methodology. Changes due to the upgraded version of the methodology and the

re-assessment of the baseline have been considered suitably. The calculation of the emission reductions provided in the in the ER spreadsheet and the corresponding calculation in the relevant section of the PD have been checked and found to be satisfactory. The estimation of emission reductions for the second crediting period is deemed plausible and conservative.

All relevant assumptions and data are listed in the project description, including their references and sources.

All estimates of the baseline emissions can be replicated using the data and parameter values provided in the project description.

The emission reductions were calculated in accordance with the methodology and tool.

3.2.7 Methodology Deviations

No methodology deviations identified.

3.2.8 Monitoring Plan

The proposed project uses CDM approved methodology ACM0002 Version 17: Grid-connected electricity generation from renewable sources.

The project satisfies all criteria for ACM0002, version 17. The application of monitoring methodology is assessed as correct.

The monitoring plan in the PD provides detailed information related to the collection and archiving of all relevant data needed to:

- Net electricity delivered to the grid by the project activity ($EG_{PJ,y)}$ in MWh. This shall be monitored using calibrated energy meters. Meters will be calibrated once in five years as per national standard /**22**/.

The validation team during site visit verified the monitoring arrangements and interviewed site personnel to confirm the monitoring plan. The monitoring arrangements are feasible within the project design. The PP has the ability to implement the monitoring plan as per the PD.

3.3 Non-Permanence Risk Analysis

Not applicable, non-permanence risks were not identified.

4 SAFEGUARDS

4.1 No Net Harm

The project being a hydro power project has done environmental impact assessment in line with host country requirement and received environmental clearance /**27**/. The measures as per impact assessment divided into two parts: construction stage and operational stage. The project

is currently operational phase and all measures as per impact assessment has been implemented. Hence, there is no net harm from the project activity.

4.2 Environmental Impact

The project being a hydro power project has done environmental impact assessment in line with host country requirement and received environmental clearance /**27**/. The measures as per impact assessment divided into two parts: construction stage and operational stage. The project is currently operational phase and all measures as per impact assessment has been implemented. Hence, there is no net harm from the project activity.

4.3 Local Stakeholder Consultation

Not applicable since this is validation for renewal of crediting period. The stakeholder consultation conducted by PP during registration of the project activity has been outlines in the updated VCS PD.

4.4 Public Comments

Not applicable.

5 VALIDATION CONCLUSION

RINA Services Spa (RINA) has performed validation of the project activity "210 MW Musi Hydro Power Plant, Bengkulu" in Indonesia, with regard to the relevant requirements for VCS Version 3.7 activities.

The review of the project design document and the subsequent follow-up interviews have provided RINA with sufficient evidence to determine the fulfillment of the stated criteria.

The project correctly applies the approved baseline and monitoring methodology "ACM0002", "Grid-connected electricity generation from renewable sources", version 17.0 of 13/05/2016.

By generating renewable energy from hydro power, the project results in reduction of CO_2 emissions that are real measurable and giving long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the "210 MW Musi Hydro Power Plant, Bengkulu" are estimated to be on average 953,128 tCO_2e per year over the selected 10 years crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring plan provides for the monitoring of the project's emission reductions and of the sustainable development indicators. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is RINA's opinion that the project participants are able to implement the monitoring plan.

In conclusion, it is RINA's opinion that the project activity "210 MW Musi Hydro Power Plant, Bengkulu" in Indonesia, as described in the VCS PD version 3 of 28/02/2018, meets all relevant

UNFCCC and VCS Version 03.7 requirements for the VCS VER and all relevant host Party criteria and correctly applies the baseline and monitoring methodology “ACM0002”, “Grid-connected electricity generation from renewable sources”, version 17.0 of 13/05/2016.

RINA thus requests registration of the project as a VCS project activity.

APPENDIX A: ABBREVIATIONS

Abbreviations	Full texts
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH4	Methane
CR	Clarification Request
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
COD	Chemical Oxygen Demand
CRT	Coordination and Technical Control Staff
DCI	Certification Division of RINA Services Spa
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EF	Emission Factor
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MoV	Means of Verification
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document

PE	Project Emission
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services S.p.A.
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VER	Voluntary Emission Reductions
VVS	Validation and Verification Standard

APPENDIX B: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUEST

Table 1. CR from this validation

CR ID	01	**Section no.**	3.1	**Date:** 08/01/2018
Description of CR				
a) EIA approval copy is requested. b) Agreement between PT. PLN (Persero) and South Pole Carbon Asset Management Ltd. is requested				
Project participant response				**Date:** 10/01/2018
a) EIA approval copy has been provided b) Agreement between PT. PLN (Persero) and South Pole Carbon Asset Management Ltd. has been provided				
Documentation provided by project participant				
a) a_2004_Musi_EIA Approval.pdf b_2008_Musi Hydro_300358_ERPA_PT. PLN_SP_signed.pdf				
DOE assessment				**Date:** 07/02/2018

PP has provided relevant documents. EIA approval copy pertains to the project activity and is valid. The ERPA copy states relation between PP and other entity as defined in the VCS-PD. Hence, response is accepted and CR is closed.

Table 2. CAR from this validation

CAR ID	01	**Section no.**	3.1	**Date:** 21/09/2017
Description of CAR				
1. The project scale highlighted in section 1.7 of the VCS PD is not correct as per VCS rule. 2. The project proponent detailed in section 1.3 of the VCS PD is not in line with VCS rule. 3. Kindly provide the basis with supporting documents based on which power density is calculated. 4. Latest version of the 'Tool to calculate the emission factor of an electricity system' is not referred.				
Project participant response				**Date:** 10/01/2018
1. The estimated average annual GHG emission reductions of the project is 953,128 tCO_2e per year, and according to the VCS Standard v3.7 for average annual GHG emission reductions greater than 300,000 tonnes of CO_2e per year is categorized as Large Project. Hence the project scale highlighted in section 1.7 of the VCS PD is already correct as per VCS rule. 2. The project proponent detailed in section 1.3 of the VCS PD has been revised to make it in-line with VCS rule. 3. The basis on which power density is calculated has been provided in revised VCS PD v2.0 section 3.4, and the supporting document has been provided as well. 4. Latest version of the 'Tool to calculate the emission factor of an electricity system' has been referred in revised VCS PD v2.0.				
Documentation provided by project participant				
1. 180110_Musi_VCS PD v2.0_lsa.docx 2. 180110_Musi_VCS PD v2.0_lsa.docx 3. 3_1993_Musi_Project Report (Completion Report) on Engineering Services for Detailed Design.pdf 4. 180110_Musi_VCS PD v2.0_lsa.docx				
DOE assessment				**Date:** 07/02/2018
PP has done necessary corrections and provided supporting documents for the same. The revisions are in line with VCS standard 3.7 and applied methodological tools. Hence, response is accepted and CAR is closed.				

CAR ID	02	**Section no.**	3.2.8	**Date:** 08/01/2018
Description of CAR				
The VCS PD in section 4.2 mention calibration frequency to be five years whereas, in section 4.3 mention annual test. PP is requested to clarify the same.				

Project participant response	**Date:** 10/01/2018
There was a typo error in section 4.3 mention annual test (no annual test), whereas the correct one is in section 4.2 mention calibration frequency to be five years, hence the same has been revised in VCS PD v2.0.	
Documentation provided by project participant	
180110_Musi_VCS PD v2.0_lsa.docx	
DOE assessment	**Date:** 07/02/2018
PP has corrected the PD for calibration frequency. Calibration frequency mentioned in PD is in consistent with host country regulations and hence accepted by the assessment team. CAR is closed.	

Table 3. FAR from this validation

FAR ID	01	**Section no.**		**Date:** DD/MM/YYYY
Description of FAR				
No FAR raised.				
Project participant response				**Date:** DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				**Date:** DD/MM/YYYY

RINA SERVICES
classification, certification, inspection & testing

CERTIFICATO DI QUALIFICA PER GLI SCHEMI VOLONTARI*
*QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES**

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms: **Champok Buragohain**

è qualificato come:
is qualified as: **TEC, VAL, VER, TL, ITR, Local Expert**

per le seguenti aree tecniche:
for the following technical areas:

AREE TECNICHE *TECHNICAL AREAS*	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.2	Renewables	1
2.1	Electricity distribution	2
13.1	Solid waste and wastewater	13
13.2	Manure	13

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	19/07/2016	First issue with new template (this certificate is linked to CDM qualification)
1	11/07/2017	Qualification update

Responsabile di schema
Scheme Leader
Laura SEVERINO

*SCHEMI VOLONTARI/ VOLUNTARY SCHEMES: ACR American Carbon Registry, CCB The Climate, Community & Biodiversity Alliance, GS Gold Standard, JI Joint Implementation, SCS Social Carbon Standard, VCS Verified Carbon Standard.

TEC: Technical expert; VAL: Validator; VER: Verifier; TL: Team leader; FIN EXP: Financial Expert; ITRP: Indipendent technical reviewer

RINA Services S.p.A. è accreditato/riconosciuto da
RINA Services S.p.A. Is accredited /recognized by

UNFCCC	quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM *as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects*
VCSA	per condurre la Validazione e la Verifica di Progetti VCS *to carry out Validation and Verification of VCS Projects*
GS Foundation	per condurre la Validazione e la Verifica di Progetti GS *to carry out Validation and Verification of GS Projects*
Ecologica Institute	per condurre la Validazione e la Verifica di rapporti SCS *to carry out Validation and Verification of SCS Reports*
American Carbon Registry ACR	per condurre la Validazione e la Verifica di Progetti ACR *to carry out Validation and Verification of ACR projects*
The Climate, Community & Biodiversity Alliance CCB	per condurre la Validazione e la Verifica di Progetti co-benefit CCB *to carry out Validation and Verification of co-benefit CCB projects*

RINA SERVICES
classification, certification, inspection & testing

CERTIFICATO DI QUALIFICA PER GLI SCHEMI VOLONTARI*
*QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES**

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Hui Feng Liu

è qualificato come:
is qualified as:

TEC, VAL, VER, TL, ITRP

per le seguenti aree tecniche:
for the following technical areas:

AREE TECNICHE *TECHNICAL AREAS*	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.1	Thermal energy generation	1
1.2	Renewables	1
8.1	Mining and mineral processes	8
9.2	Iron, steel and Ferro alloy production	9
13.1	Solid waste and wastewater	13

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	19/07/2016	First issue with new template (this certificate is linked to CDM qualification)

Responsabile di schema
Scheme Leader
Rita Valoroso

*SCHEMI VOLONTARI/ VOLUNTARY SCHEMES: ACR American Carbon Registry, CCB The Climate, Community & Biodiversity Alliance, GS Gold Standard, JI Joint Implementation, SCS Social Carbon Standard, VCS Verified Carbon Standard.

TEC: Technical expert; VAL: Validator; VER: Verifier; TL: Team leader; FIN EXP: Financial Expert; ITRP: Indipendent technical reviewer

RINA Services S.p.A. è accreditato/riconosciuto da
RINA Services S.p.A. is accredited /recognized by

UNFCCC	quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM *as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects*
VCSA	per condurre la Validazione e la Verifica di Progetti VCS *to carry out Validation and Verification of VCS Projects*
GS Foundation	per condurre la Validazione e la Verifica di Progetti GS *to carry out Validation and Verification of GS Projects*
Ecologica Institute	per condurre la Validazione e la Verifica di rapporti SCS *to carry out Validation and Verification of SCS Reports*
American Carbon Registry ACR	per condurre la Validazione e la Verifica di Progetti ACR *to carry out Validation and Verification of ACR projects*
The Climate, Community & Biodiversity Alliance CCB	per condurre la Validazione e la Verifica di Progetti co-benefit CCB *to carry out Validation and Verification of co-benefit CCB projects*

GHG_QUAL_CERT_EN_07_16 Voluntary(Certificate) Page 1 of 1