


Validation report form for post-registration changes for CDM project activities
(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for post-registration changes for CDM project activities" at the end of this form.

VALIDATION REPORT ON POST-REGISTRATION CHANGES (PRCs)

Title and reference number of the project activity	Asahan 1 Hydroelectric Power Plant 2 x 90 MW 4118
Process track	<input type="checkbox"/> Prior approval <input checked="" type="checkbox"/> Issuance <input type="checkbox"/> Renewal of crediting period
Version number of the validation report on PRCs	1.1
Completion date of the validation report on PRCs	25 January 2017
Type(s) of PRCs	<input checked="" type="checkbox"/> Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline <input type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan to a registered project activity <input type="checkbox"/> Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline <input type="checkbox"/> Changes to the project design of a registered project activity <input type="checkbox"/> Types of changes specific to afforestation and reforestation project activities
Version number of PDD to which this report applies	Version 5, 11/11/2014
Project participant(s)	PT Bajradaya Sentranusa (Private Company) EcoSecurities International Limited
Host Party	Republic of Indonesia
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Sectoral Scope 01 - Energy industries (renewable - / non-renewable sources) ACM0002: "Consolidated baseline methodology for grid connected electricity generation from renewable sources" Version 11
Name of DOE	ERM Certification and Verification Services

**Name, position and signature of the
approver of the validation report on PRCs**



Melanie Eddis, Head of Climate Change

25th January 2017

SECTION A. Executive summary

>> ERM Certification and Verification Services (ERMCVS) was commissioned by PT Bajradaya Sentranusa to verify and certify the emissions reductions reported for the period 01 June 2012 – 01 April 2015 as set out in the monitoring report of the CDM project activity Asahan 1 Hydroelectric Power Plant 2 x 90 MW, Registration Reference 4118. As per Annex 1 of the Project Standard, if project participants have temporarily not monitored parameters related to project GHG emissions or are unable to produce evidence related to such monitoring, prior approval by the Board is not required if project participants or the coordinating/managing entity estimate these parameters assuming that the source of the GHG emissions operated at maximum capacity for the full period of the missing data. Therefore the project participant has applied the same conservative approach as used in the first monitoring period for estimating project emissions from diesel consumption, by defining the theoretical maximum quantity of fuel combustion that could have been achieved by the diesel generator during this monitoring period. ERM CVS has verified that the most conservative approach has been used and the requirements of the project standard applying to PRCs have been followed.

ERM CVS therefore submits the request for post registration changes through the issuance track and requests the Executive Board to approve the changes, or provide further guidance.

SECTION B. Validation team, technical reviewer and approver

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B.1. Validation 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)	Validation findings
1.	Team Leader and Validator	IR	Avis	Jonathan	ERM CVS London	Y	Y	Y	Y

B.2. Technical reviewer and approver of the validation report on PRCs

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	IR	Pumputyte	Neringa	ERM CVS London
3.	Approver	IR	Eddis	Melanie	ERM CVS London

SECTION C. Means of validation**C.1. Desk review**

>> A detailed desk review was undertaken prior to the site visit. This included the PDD /3/, the monitoring plan /4/, the validation report /5/, the applied monitoring methodology, previous verifications reports if applicable /6/, relevant external data and reports, on-site documents, and relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board. The desk review included

- A review of the data and information presented to verify completeness and consistency in accordance with relevant CDM requirements
- A review of the monitoring plan and monitoring methodology, including applicable tools, paying particular attention to the frequency of measurements, quality of metering equipment (including calibration requirements) and the quality assurance and quality control (QA/QC) procedures
- An evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of emission reductions.
- Review of the monitoring report to ensure it is completed as per the standardised format

C.2. On-site inspection

Duration of on-site inspection: 27/04/2015 to 29/04/2015				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the project implementation and operation as per the registered PDD /03/ (including site walk through to confirm physical existence and operation of project components) or any approved revised PDD;	Sub District of Parmaksian and Pintu Pohan Meranti, Region of Toba Samosir, Medan, North Sumatera, Indonesia	27/04/2015 to 29/04/2015	Jonathan Avis
2.	Review of information flows for generating, aggregating and reporting the monitoring parameters;			
3.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan /04/. A list of all interviewees is included in Annex 2.			
4.	A cross-check between information provided in the monitoring report /1/ and data from other sources such as log books, inventories, purchase records or similar data sources to establish the existence of a clear audit trail and records that validate or invalidate the stated data;			
5.	A check of monitoring equipment including calibration performance and observations of the monitoring practices against the requirements of the PDD /03/ and the selected methodology(ies) and corresponding tool(s), where applicable;			
6.	A review of calculations and assumptions made in determining the GHG data and emission reductions;			
7.	Identification of quality control procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters			

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Oktiviana	Hariati	Corporate Secretary, PT Bajradaya Sentranusa, responsible for the CDM Project	27/04/2015 to 29/04/2015	MR and methodology, Project operation, data record, QA/QC procedure. etc	Jonathan Avis

C.4. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	-	-
Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline	-	-	-
Corrections	-	-	-
Changes to the start date of the crediting period	-	-	-

Inclusion of a monitoring plan to a registered project activity	-	-	-
Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline	-	-	-
Changes to the project design of a registered project activity	-	-	-
Types of changes specific to afforestation and reforestation project activities	-	-	-
Others (please specify)	-	-	-
Total	0	0	0

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	Not applicable – the PDD did not need to be updated
Findings	
Conclusion	

D.2. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

Means of validation	ERM CVS reviewed the monitoring report and spreadsheet and compared actual monitoring with the monitoring plan set out in the registered PDD.
Findings	<p>As per Annex 1 of the Project Standard, if project participants have temporarily not monitored parameters related to project GHG emissions or are unable to produce evidence related to such monitoring, prior approval by the Board is not required if project participants or the coordinating/managing entity estimate these parameters assuming that the source of the GHG emissions operated at maximum capacity for the full period of the missing data. During the verification site visit, it was observed that a small tank is used to supply diesel to the emergency backup diesel generator. Based on interviews with on site personnel responsible for managing and maintaining this diesel generator and fuel tank, the generator has never been used to supply emergency power. This is because the site generates power most of the time, and when it is not able to generate, power is obtained from the grid. There has, according to site personnel, never been an instance when the site was not generating and the grid supply was also down. Therefore the only time the diesel generator has been used is for testing of the generator every two weeks. According to the same personnel, the diesel tank has never been refilled. The verification team observed on site that it remains mostly full. The tank contains a level meter / ruler gauge to determine the volume of the fuel consumed, which is part of the daily tank. However it has not been calibrated at least once a year as per the requirements of the tool. In addition, monitoring records for diesel consumption, i.e. a book of control for recording the measurements (on a daily basis or per shift, as required by the tool) were not available during the site visit. Furthermore the PPs demonstrated that taking daily readings from this fuel meter is practically challenging because monthly usage of the diesel generator was only for 5 – 15 minutes of regular testing (ERM CVS reviewed monthly operation records of the diesel generator for the period 1 January 2014 – 31 March 2015 to confirm this /03/), and 1 cm of movement on the fuel gauge is equivalent to 17.9 litres of fuel consumption (ERM CVS has reviewed a calculation from the Indonesian Calibration Agency to confirm this /04/). Fuel consumption for 60 minutes operation under no load condition is 24 litres (ERM CVS reviewed the technical specifications of the generator to confirm this /02/), thus for 5 - 15 minutes operation, the diesel generator consumed 2 litres - 6 litres of fuel, i.e. 0.11 cm - 0.33 cm of movement of the fuel gauge monthly. Therefore only very small movements of the fuel gauge occur and these are difficult to discern and record with any degree of accuracy.</p> <p>Monitoring of parameter FCy (quantity of fuel combusted in the diesel generator) therefore does not comply with the measurement procedure required from the tool to calculate project or leakage CO2 emissions from fossil fuel combustion.</p> <p>In summary, project participants have temporarily not monitored parameters related</p>

to project GHG emissions or are unable to produce evidence related to such monitoring, and hence the project participant has applied the same conservative approach as used in the first monitoring period for estimating project emissions from diesel consumption, by defining the theoretical maximum quantity of fuel combustion that could have been achieved by the diesel generator during this monitoring period, based on the manufacturer's specifications of generator fuel consumption assuming that the generator ran constantly throughout the entire monitoring period.

The PP has done this by defining two numbers:

- (a) based on the fuel consumption rate from manufacturer's specifications, in litres per hour, assuming the generator ran constantly 24 hours a day during the monitoring period
- (b) based on the fuel consumption rate, also from manufacturer's specifications, in kg of fuel per kWh of electricity generated, assuming the generator worked at maximum capacity for the entire monitoring period.

These two approaches are explained in more detail as follows:

(a) Based on fuel consumption rate in l/hr:

- the fuel consumption rate has been defined by the equipment manufacturer as 111.6 litres per hour. ERM CVS has reviewed the manufacturer's specifications to confirm the number /12/
- the consumption rate in litres per hour was multiplied by the total number of hours in the monitoring period (1,034 days x 24 hours/day) = 2,769,465.6 litres
- the consumption in litres was multiplied by the fuel density. The fuel density is taken from official national statistics provided by the fuel supplier, Pertamina /xx/. Thus 2,769,465.6 litres x 0.92 kg/l = 2,547,908.4 kg

(b) Based on fuel consumption rate in kg/kWh:

- a cap for the fuel combusted (FCy_cap) which represents the theoretical maximum quantity of fuel combustion that could have been achieved by the diesel generator during this monitoring period. The FCy_cap is calculated as follows:
 - $FCy_cap = \text{diesel generator installed capacity} \times \text{number of days in the monitoring period} \times 24 \text{ hours} \times \text{unit fuel consumption of the diesel generator}$
 - ERM CVS verified through visual inspection of the project diesel generator during the site visit, and against the diesel generator technical specifications /12/:
 - The diesel generator installed capacity is 400 kW
 - The unit fuel consumption of the diesel generator is 0.208 kg/kWh
 - The number of days in this monitoring period is 1,034 days, therefore FCy_cap is calculated as follows:
 - $FCy_cap = 400 \text{ kW} \times 1,034 \text{ days} \times 24 \text{ hours} \times 0.208 = 2,064,961 \text{ kg}$

The value for FCy is higher than the value for FCy_Cap, and therefore the higher value is taken for determination of project emissions, in order to be conservative.

The net calorific value and the CO2 emission factor of diesel fuel is taken from IPCC default values at the upper limit (more conservative) of the uncertainty at a 95% confidence interval as provided in table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.

Thus the project emissions are conservatively calculated as:

PEy

$FCy \times NCVy \times EFCO2,y$

PEy = 8,253 tCO2

This is a very conservative result, since the diesel generator is only used during emergencies, and according to interviews on site there had been no use of the diesel generator, other than testing, during the monitoring period.

ERM CVS notes that monitoring of parameter FCy is not required by the methodology since the project is a hydropower project and the diesel generator is

	<p>used for emergency backup purposes only. It is clearly stated in the methodology that project emissions from fossil fuel consumption for hydroelectric projects are taken to be zero. Nevertheless, diesel consumption shall be monitored, as the monitoring plan in the registered PDD included monitoring of this parameter even though it may not be required by the methodology.</p> <p>Please see the verification report for further details on how the project emissions were verified.</p>
Conclusion	ERM CVS has verified that the most conservative approach has been used and the requirements of the project standard applying to PRCs have been followed. The temporary deviation is for the whole monitoring period. The reasons for the temporary deviation have been explained in the monitoring report, and validated above.

D.3. Corrections

Means of validation	Not applicable
Findings	
Conclusion	

D.4. Changes to the start date of the crediting period

Means of validation	Not applicable
Findings	
Conclusion	

D.5. Inclusion of a monitoring plan to a registered project activity

Means of validation	Not applicable
Findings	
Conclusion	

D.6. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

Means of validation	Not applicable
Findings	
Conclusion	

D.7. Changes to the project design of a registered project activity

Means of validation	Not applicable
Findings	
Conclusion	

D.8. Types of changes specific to afforestation and reforestation project activities

Means of validation	Not applicable
Findings	
Conclusion	

SECTION E. Internal quality control

>> The validation activities and content of the report are subject to a review by an independent technical reviewer. The role of the Technical Reviewer is to provide oversight that all procedures have been followed by the validation team and all conclusions justified and supported by evidence. The Technical Reviewer will either accept or reject the recommendations made by the validation team.

SECTION F. Validation opinion

- >> ERM CVS based its work on:
- the approved methodology applied in the project design document (PDD)

- the registered PDD
- the previous verification report
- the CDM Validation and Verification Standard (VVS)
- the CDM Project Standard (PS) and Project Cycle Procedure (PCP)
- UNFCCC criteria referred to in the Kyoto Protocol criteria and the CDM modalities and procedures as agreed in the Bonn Agreement and the Marrakech Accords
- Relevant decisions, guidance and clarifications of the CMP and CDM Executive Board and any other information and references relevant to the project activity's reported emission reductions
- Relevant guidance and clarification of the Executive Board applicable to this project

Based on the validation activities undertaken, ERM CVS concludes that the temporary deviation from the registered monitoring plan has been correctly applied and justified in the monitoring report. As per Annex 1 of the Project Standard, if project participants have temporarily not monitored parameters related to project GHG emissions or are unable to produce evidence related to such monitoring, prior approval by the Board is not required if project participants or the coordinating/managing entity estimate these parameters assuming that the source of the GHG emissions operated at maximum capacity for the full period of the missing data. Therefore the project participant has applied the same conservative approach as used in the first monitoring period for estimating project emissions from diesel consumption, by defining a cap for the fuel combusted (FCy_cap) which represents the theoretical maximum quantity of fuel combustion that could have been achieved by the diesel generator during this monitoring period.

ERM CVS therefore submits the request for post registration changes through the issuance track and requests the Executive Board to approve the changes, or provide further guidance.

Appendix 1. Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
EB	Executive Board
CER	Certified Emission Reduction(s)
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
PCP	Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PS	Project Standard
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention for Climate Change
VVS	CDM Validation and Verification Standard
Project specific abbreviations	
PPA	Power Purchase Agreement

Appendix 2. Competence of team members and technical reviewers

Jonathan Avis is CDM Business Manager for ERM CVS, and a GHG Assessor and Technical Reviewer with over ten years of experience in the CDM, Gold Standard and VCS. Since joining ERM CVS Jonathan has worked as a Technical Reviewer or GHG Assessor on more than 50 CDM validations in Renewable Energy (scope 1), more than 10 CDM validations in Manufacturing Industries (scope 04), 10 CDM validations in Mining (scope 8), and 10 CDM validations in Waste Handling and Disposal (scope 13). Jonathan's previous work experience involved screening and due diligence of carbon projects, Project Design Document (POA-DD & CPA-DD) development, quality assurance and technical review of CDM and GS project documentation, the development of carbon monitoring plans, and management of carbon projects through the validation, registration and verification stages. Jonathan has completed the ERM CVS CDM training as well as the GHGMI Renewable Energy training and Gold Standard training. Jonathan holds a BA in Geography and an MSc in Environmental Change and Management from the University of Oxford.

Neringa Pumputyte is a lead assessor at ERM CVS, where she conducts validations and verifications of CDM and Gold Standard projects and Programmes of Activities (PoAs), and works on assurance projects. She has more than six years of experience in climate change and GHG emission reductions, having worked as a consultant and project developer prior to joining ERM CVS. Neringa has successfully completed 7 validations of PoAs in the sectors of renewable energy, energy demand, and manufacturing; 5 Gold Standard verifications in the sector of energy demand; and worked on project validations in the sectors of landfill gas

and fugitive emissions (oil and gas), as well as corporate GHG assurances. She has led development of the Gold Standard programme in ERM CVS. Before joining ERM CVS, Neringa worked on hydro, cook stove and animal waste handling projects as a project developer. Neringa has completed the ERM CVS CDM training, Gold Standard training, and GHGMI renewable energy training. Neringa also has a BSc and MSc in Geography, and an MSc in Environmental Change and Management from the University of Oxford.

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	PP	Updated monitoring report for the project activity	Version 05, 27 December 2016	PP
2	Beijing PaT Mechanical & Equipment Electrical C. Ltd	Technical specifications of the diesel generator	Undated	PP
3	PP	Monthly operation records of the diesel generator (copies of the monthly log book records from the site) for the period 1 January 2014 – 31 March 2015	2014-2015	PP
4	PEMERINTAH PROPINSI SUMATERA UTARA	Calibration document for the fuel gauge by PEMERINTAH PROPINSI SUMATERA UTARA	24 September 2012	PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	xx	Section no.	Date: DD/MM/YYYY
Description of CL			
No CLs raised			
Project participant response			Date: DD/MM/YYYY
Documentation provided by project participant			
DOE assessment			Date: DD/MM/YYYY

Table 2. CAR from this validation

CAR ID	xx	Section no.	Date: DD/MM/YYYY
Description of CAR			
No CARs raised			
Project participant response			Date: DD/MM/YYYY
Documentation provided by project participant			
DOE assessment			Date: DD/MM/YYYY

Table 3. FAR from this validation

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

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Registration Keywords: post-registration change, project activities, validation report		