Monitoring report form for CDM project activity
(Version 09.0)

MONITORING REPORT			
Title of the project activity	La La Hydropower Project, Vietnam		
UNFCCC reference number of the project activity	4626		
Version number of the PDD applicable to this monitoring report	1.7		
Version number of this monitoring report	5.0		
Completion date of this monitoring report	30/01/2023		
Monitoring period number	1st Monitoring Period		
Duration of this monitoring period	01/10/2017 - 29/04/2019 (first and last day included)		
Monitoring report number for this monitoring period	N/A		
Project participants	- Mai Linh Energy JSC - ecotawa AG		
Host Party	Viet Nam		
Applied methodologies and standardized baselines	AMS.I.D Version 16 Grid connected renewable electricity generation		
Sectoral scopes	01: Energy Industries (renewable/non-renewable sources)		
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013 until 31 December 2020	Amount achieved from 1 January 2021
	0 tCO_2	7,884 tCO_2	0 tCO_2
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	10,933 tCO_2		

SECTION A. Description of project activity

A.1. General description of project activity

The Lala Hydropower project, Vietnam (hereafter referred to as "the Project") includes the operation of a hydropower plant with an in-built capacity of 3 MW in the Tan Lap, Tan Long Commune, Huong Hoa District, Quang Tri Province of Vietnam.
Electricity in Vietnam is mainly generated through fossil fuel. The power is distributed to consumers through the national electricity grid of the national power company (EVN). The purpose of the project is the electricity generation through renewable sources and the supply of the electricity to the national grid. The usage of renewable energy sources reduces GHG emissions.

As designed, the project produces around 12.1 MWh per year. The powerhouse installed 3 turrbine (3x1 MW) with total capacity of 3 MW. The turbines and generators were produce by Ganfa China The power transmission to the national grid is through a 22 kV line to the Khe Sanh station.

The relevant dates for the project activity are listed in the table below:

Table 1: Relevant dates of the Lala Hydropower project, Vietnam

Date	Project Activities	Reference files
12/02/2008	Start of construction (Signing of the construction contract)	File 25
29/03/2011	CDM Registration	see website UNFCC [1]
10/10/2012	Commission of the 1st turbine	File 10
10/10/2012	Commission of the 2nd turbine	File 10
10/10/2012	Commission of the 3rd turbine	File 10

During the monitoring period, the project activity supplied net 13,693.233 MWh into national grid of Vietnam, which results in emission reductions of 7,884 tCO_2. The length of the monitoring period was fixed based on the Decision of Gold Standard on the deviation request of ecotawa AG (see file 37).

A.2. Location of project activity

Host country: Social Republic of Vietnam

Region/State/Province: Quang Tri province

City/Town/Community: Tan Long Commune, Tan Lap, Huong Hoa District

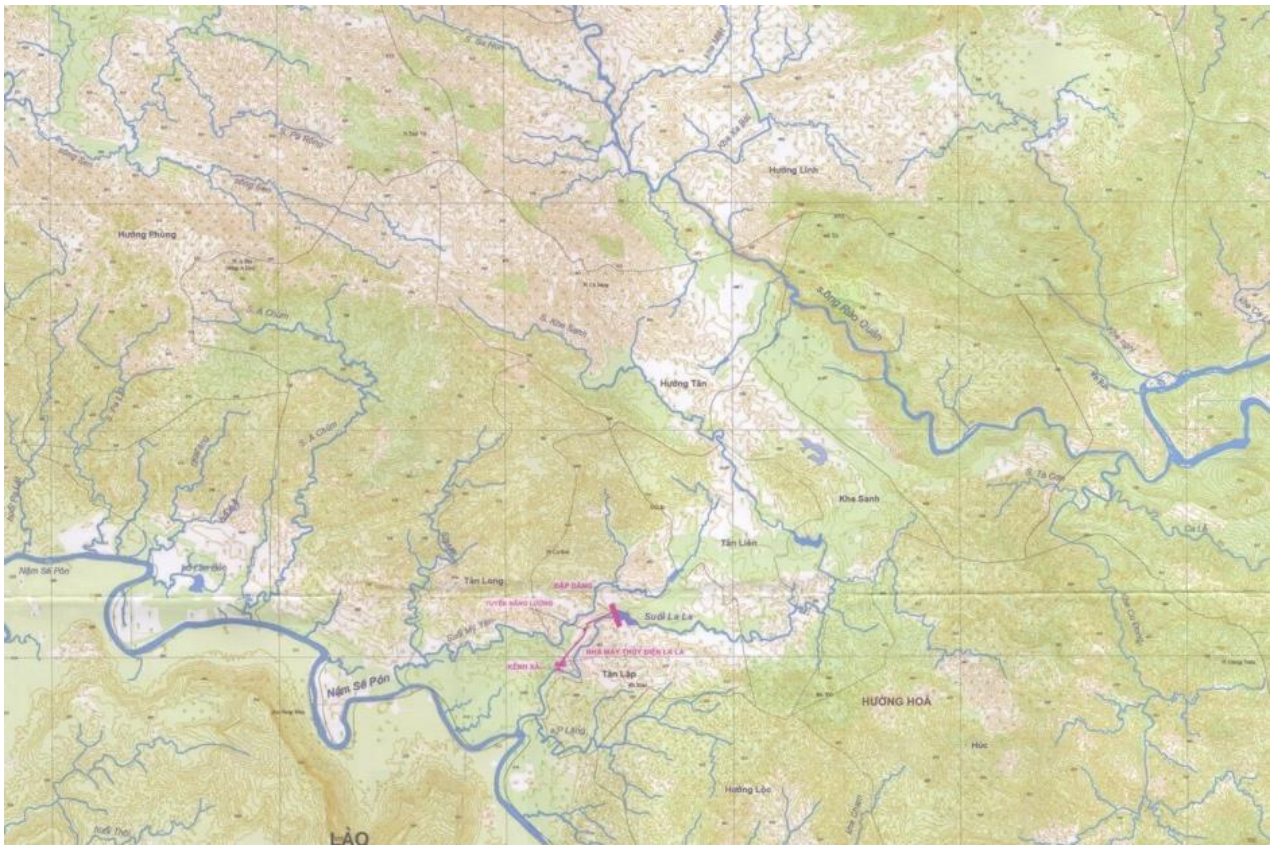
Physical/Geographical location: The coordinates of the spillway and the powerhouse are:

16.607806 N, 106.686518 E (spillway)
16.597494 N, 106.675130 E (powerhouse)

The overview of the project is showed on the map 1 below.

[1] https://cdm.unfccc.int/Projects/DB/RWTUV1301377895.16/view

Map 1. Project Site with Powerhouse, water channel and dam (red marked)



A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Party A (host Party) Viet Nam	Private entity A Mai Linh Energy JSC	No
Party B Switzerland	Private entity B ecotawa AG	No

A.4. References to applied methodologies and standardized baselines

AMS.I.D. Version 16 "Grid connected renewable electricity generation"
https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

Related tools: Tool to calculate the emission factor for an electricity system, Version 02

A.5. Crediting period type and duration

It is a renewable crediting period. The length of the first crediting period is 7 years 0 month. The crediting period started on 30/04/2012 and ended on 29/04/2019.

SECTION B. Implementation of project activity

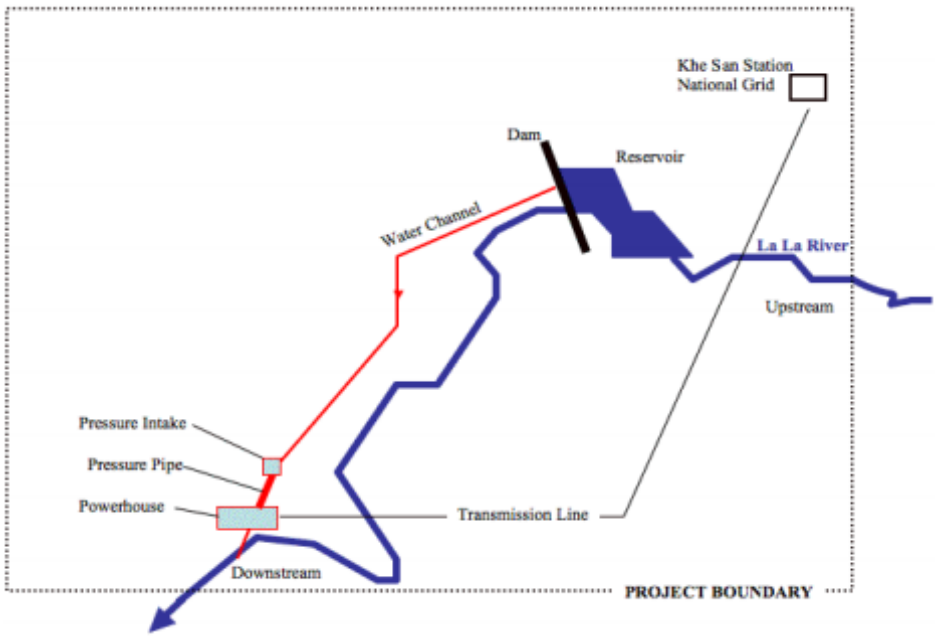
B.1. Description of implemented project activity

The plant was constructed in Tan Lap commune, Huong Hoa district, Quang Tri province. The dam was built in Tan Long commune, stored water of Lala stream that belongs to branch of Sepon river. The water flows through water channels to the pressure tank from where it runs through the penstock into the turbines. There are 3 hydraulic turbines installe with a total capacity of 3 MW (3x1 MW). The electricity generation is connected to national grid that belongs to Vietnam Electricity (EVN) by 6.7 km long transmission line of 22 kV to Khe Sanh 110kV station.

The main and back-up meters are located in the Lala hydropower house. They are sealed by EVN and read monthly by both relevant parties (representative of Lala HPP, EVN).

The water level of the dam is measured daily by worker of Lala HPP. When the reservoir is full the water will overflow the dam.

Figure 1: Layout of the project activity



The set-up of the powerplant is illustrated through the pictures below.

Pict. 1 Turbines & generators

Pict. 2 Transformers

Pict. 3 Powerhouse


Pict 4 Pressure tank


Pict. 5 Open channel


Pict. 6 Dam

Table 2 lists the project activity equipment

Table 2 Technology applied in the Lala Hydropower project, Vietnam (File 11)

Equipment	Unit	Vaule
Turbine[1]		
Number of turbines		3
Type		Francis, horizontal, metal spiral case
Manufacturer		Ganfa-China
Model		HLA550-WJ-62
Diameter of runner	mm	800
Maximum flow rate (for one turbine)	m3/s	1.4
Efficiency	%	88
Capacity (each)	kW	1087
Generators[2]		
Number of generators		3
Type		2 bearing, oil lubrication, open cooling method
Manufacturer		Ganfa-China
Model		SFW-1000-6/1180
Rated voltage	kV	6.3
Rated capacity (each)	kW	1000
Efficiency at full load		Cosj =0.8
Transformer[3]		
Number of transformers		3
Manufacturer		
Type		YMG44TL
Rated capacity	kVA	33
Grid connection – transmission line		
Length		6.7 km from Lala hydropower house to Khe Sanh 110 kV station

There has been no technology change in this monitoring period.
The details for the reservoir are listed in the table below.

Table 3 Characteristics of the reservoir

Parameter	Unit	value
Maximum water level	m	310.62
Normal water height	m	308
Total capacity	10^6 m^3	0.0929
Useful capacity	10^6 m^3	0.0276

Source: Operation procedure of reservoir, File 7

The project activity was implemented as planned and described in the PDD.

No special events occurred influencing CER calculations.

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

No temporary deviation has been applied during this monitoring period (first crediting period)

B.2.2. Corrections

No corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report.

B.2.3. Changes to the start date of the crediting period

During this monitoring period no change of the start date of the crediting period is requested. The starting date was changed during the registration process and has been approved by the UNFCCC (see https://cdm.unfccc.int/Projects/DB/RWTUV1301377895.16/view).

B.2.4. Inclusion of monitoring plan

There was no change of the monitoring plan during the monitoring period.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

There are no changes of the monitoring plan neither from the applied methodology, standardized baselines nor other methodological regulatory documents.

B.2.6. Changes to project design

No change to the project design of the project activity have been approved during this monitoring period or are submitted with this monitoring report.

B.2.7. Changes specific to afforestation or reforestation project activity

Not applicable

SECTION C. Description of monitoring system

1. Monitoring plan

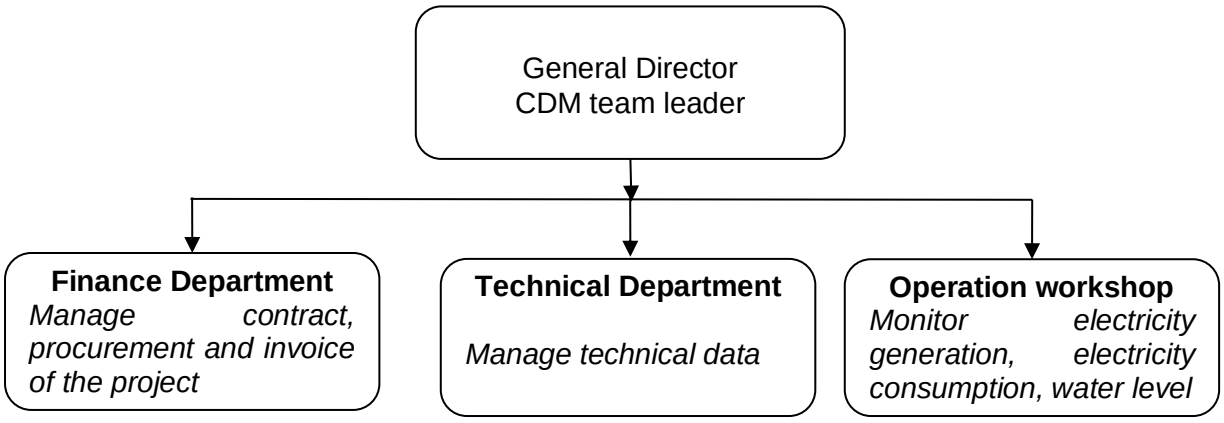
The monitoring methodology is based on AMS.I.D. Version 16.

The system includes the monitoring of the net electricity supplied to the grid with supplied and consumed electricity and the power density based on parameters “in-built capacity” and “reservoir area”.

ecotawa AG has developed and implemented the monitoring manual. Based on this manual, the CDM group of the project owner was familiarized with the monitoring during a special training course realized by ecotawa AG. The manual defines responsibilities and procedures. For each monitored parameter the manual provides detailed information about frequency, data units, quality control measures and steps to be taken in case of data problems. The working excel spread-sheet (see file 20) is used by the monitoring group. ecotawa AG is responsible for data collection, supervision and quality assurance.

2. Organizational structure

The project owner established the CDM group who take responsibilities for data collection, data recording and data storage. The activity is supervised and controlled by the CDM Team leader and ecotawa AG.
ecotawa AG is responsible for the realization of the monitoring report, makes quality assurance and accompanies the verification process for the project owner.



3. Data generation

3.1. Data generation for net electricity supply

Measuring system

The figure below indicates the power metering system. The electricity generated in the powerhouse is led with 22 kV transmission line to the 110 kV Khe Sanh station.

The main meter M11 (with back-up meter M12) measures the supplied electricity to the national grid. Based on M11 the emission reductions are calculated. In case the main meter is not functioning the emission reductions are based on the back-up meter. If both meters (M11 and M12) are out of operation, no emission reductions are claimed.

The main meter (M11) and the back-up meter (M12) are multi-functional/bi-directional meters, which also measure the electricity consumed for starting turbines and generators of the La La hydropower plant.

The main meters are sealed and belong to EVN who maintains, reads and calibrates the meters regularly. The internal electricity consumption from the national grid to the project activity is measured with M11 and M12. The bi-directional meters measured both supply and consumption. The net electricity ($EG_{y,net}$) supplied to the grid is calculated as follows:

$EG_{y,net}$ = M11 supplied - M11 consumed

Figure 1. ***Grid connection scheme with metering system***

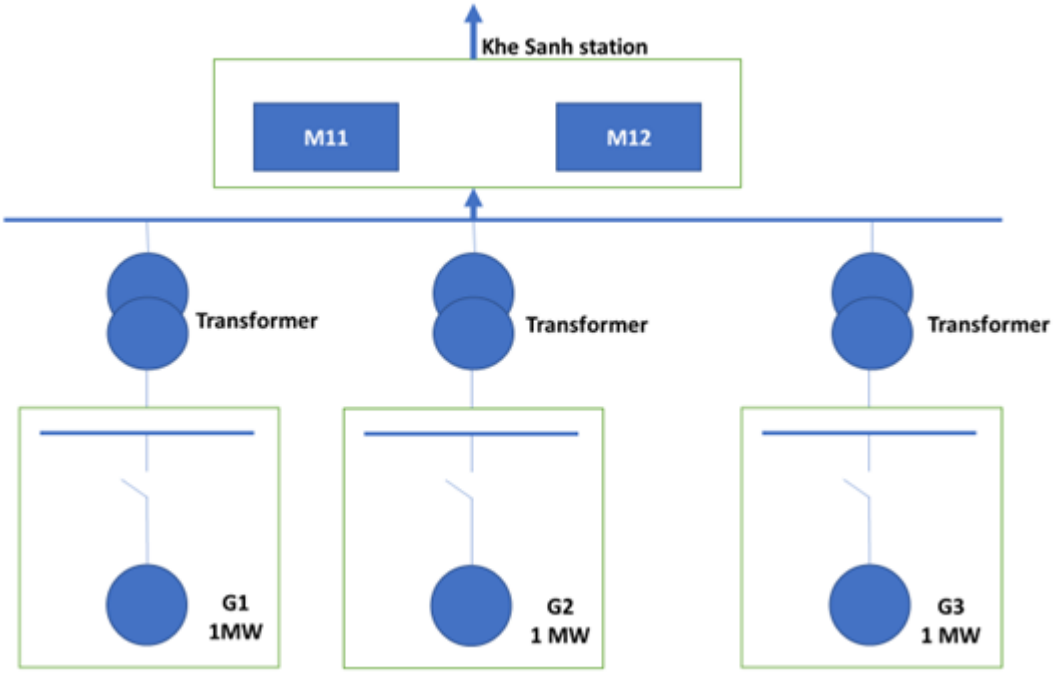


Table 4 Detailed information about measuring equipment

Meter	Type	Serial number	Position	Function	Record frequency
M11 Main meter	Elster A1700	11060674 (details see file 9.2)	At Lala powerhouse	Measuring of supplied and consumed power. Main meter is used for calculating emission reduction	Midnight last day of the month
M12 Back up meter	Elster A1700	11060670 (details see file 9.1)	At Lala powerhouse	Measuring of supplied and consumed power. Back-up meter is used for calculating emission reduction	Midnight last day of the month

Main meter and back-up meter which are in Lala hydropower house measure the total electricity generation to the national grid. Main meter is used for GHG emission reduction calculation. The back-up meter will be used as main meter if main meter is broken.

The accuracy class for main and back-up meters must be 0.5 s. Both, main and back-up meter has an accuracy of 0.5 s and therefore meet the Vietnamese accuracy standards according to the law (see File 17) during the whole monitoring period.

The total generated electricity (TEG according to ACM0002) at the generator sites was not measured because the power density is over 10 W/m2.

Data collection procedure

The net electricity supplied to the grid is measured based on the electricity supplied to the national grid. The process of monitoring the net electricity follows:
The electricity supplied by the project to the grid is measured continuously through the main meter and back-up meter.
The main meter (M11) and back-up meter (M12) are controlled regularly through EVN. EVN also managed meter readings through software managing the system of reading, transmitting and aggregating electricity metering data that must be secured by multiple password levels to ensure the confidentiality, accuracy and reliability of metered data. On the last day of the month the meters are read by both parties - seller and buyer. The reading results are recorded in an official document and signed by both parties.
The project owner provides monthly electricity sales invoices to EVN and keeps copies of invoices. In case of difference between sale invoice and the minutes of the meter-reading for power trading, members of the CDM group will explain these.

Quality assurance and quality control

The electricity meters used for the monitoring belong to EVN. All meters are sealed, maintained and calibrated by EVN.

Table 5 Detail information about equipment and calibration status

Meter	Type	Serial number	Meter accuracy class	Calibration Frequency	In operation during monitoring period	Last calibration date	Validity of calibration
Main meter M11[2]	PB3FAAGHT-5	11060674	0.5	Once per year	Entire time: 10/10/2012 – on going	06/11/2018	01/11/2016 13/11/2017 15/11/2018
Back up meter M12[3]	PB3FAAGHT-5	11060670	0.5	Once per year	Entire time: 10/10/2012 – on going	06/11/2018	01/11/2016 13/11/2017 15/11/2018

Emergency Procedure for the Monitoring System

The main (M11) and the back-up meter (M12) are used for measuring the electricity supplied to and consumed from the grid. The two meters are at La La Powerhouse and are calibrated according to the Vietnamese law at least every two years. Monthly the EVN representative and the project owner read these meters. Any discrepancy between the main and back-up meter is registered. If the discrepancy is bigger than the specific error value allowed (for both 0.5s) then the project owner and EVN will arrange a calibration in order to find out which meter must be adjusted or replaced.

[2] Details about the meter: see File 9.2

[3] Details about the meter: see File 9.2

For the billing of the supplied electricity the result of the main meter is taken.

If the main meter is out of function or malfunctioning the results of the back-up meter are taken. In this case the emission reductions also refer to the back-up meter.

If both meters do not operate EVN and the project owner have a special regulation how the supplied electricity will be assessed. In this case no emission reductions are claimed by the project. This is conservative and thus the regulations between the two parties are not relevant for the CDM project.

For the monitoring ecotawa AG made trainings with the hydropower company and provided monitoring manuals (see file 18 and file 19).

During this monitoring period the La La hydropower plant had no emergency cases.

1.1. Data generation for power density

The power density is assessed based on the reservoir area at the highest water level measured and the nominal in-built capacity mentioned on power generation nameplates. No generator has been replaced since the installation.

The water level is measured with a ruler at dam site. The water level at the ruler is read every day.

Based on the topographical assessment (technical design) made in the framework of the feasibility study the areas can be determined.

The power density can then be calculated => Installed capacity (W) / maximum reservoir area (m2) = power density (W/m2).

Data management:

The CDM group mentioned keeps monitoring data in electronic archives at the end of every month. Also paper documents are stored in electronic format and kept at least in two independent electronic storage systems.

SECTION D. Data and Parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	**$FC_{i,m,y}$**
Unit	Mass or volume unit
Description	Amount of fossil fuel type *i* consumed by power plant *m* in the year *y*
Source of data	MONRE, 2010 (File 22)
Value(s) applied	Dur
Choice of data or measurement methods and procedures	Data years 2006/7/8 used i.e. 3 most recent years prior validation. Once for 1st crediting period determined ex-ante.
Purpose of data/parameter	Calculation of the emission factor of the grid
Additional comments	Data based on fuel efficiency factor per power plant (fuel usage in relation to net electricity generation) as reported by EVN

Data/Parameter	$EG_{m,y}$
Unit	MWh
Description	Net electricity generated by power plant *m* in the project electricity system in the year *y*
Source of data	MONRE, 2010 (File 22)
Value(s) applied	See file 22
Choice of data or measurement methods and procedures	Data years 2006/7/8 used i.e. 3 most recent years prior validation. Once for 1st crediting period determined ex-ante.
Purpose of data/parameter	Calculation of the emission factor of the grid
Additional comments	Gross electricity generated minus internal power consumption as reported by EVN

Data/Parameter	NCV_i
Unit	TJ/Gg
Description	Net calorific value of fossil fuel type *i*
Source of data	MONRE, 2010 (File 22)
Value(s) applied	per power plant
Choice of data or measurement methods and procedures	
Purpose of data/parameter	Calculation of the emission factor of the grid
Additional comments	

Data/Parameter	$EF_{CO2,i}$
Unit	tCO_2/TJ
Description	CO_2 emission factor of fossil fuel type *i*
Source of data	IPCC 2006 guidelines, Chapter 1 Vol. 2 table 1.4, lower limit of the uncertainty at a 95% confidence interval
Value(s) applied	Anthracite Coal: 94.6 Other Bituminous coal: 89.5 Natural gas: 54.3 Fuel Oil: 75.5 Diesel oil: 72.6
Choice of data or measurement methods and procedures	Once for 1st crediting period
Purpose of data/parameter	Calculation of the emission factor of the grid
Additional comments	

Data/Parameter	$EF_{grid,CM}$
Unit	tCO_2/MWh
Description	Combined Margin CO_2 emission factor for grid connected power generation
Source of data	MONRE, 2010 (see file 22)
Value(s) applied	0.5764
Choice of data or measurement methods and procedures	Official Statistical Data Data for the 1st crediting period (0.5 CM + 0.5 BM): OM: 0.6465 BM: 0.5064

Purpose of data/parameter	Used for baseline emission calculation
Additional comments	The value integrates amount of fossil fuel type i consumed in the 3 most recent years y, net electricity generated by power plants, the net calorific value of fossil fuel type i and the CO2 emission factors of the fossil fuel type i (see above mentioned file)

D.2. Data and parameters monitored

Data/Parameter	**$PEG_{y,net}$**
Unit	MWh
Description	Net electricity supplied by the project activity to the grid, in the year *y*
Measured/calculated/ default	Calculated based on measured data for total supply minus total consumption
Source of data	Measurements records collected by La La Hydropower Plant together with Electricity Viet Nam (EVN)
Value(s) of monitored parameter	13,693.233
Monitoring equipment	Bi-directional electrical energy meters are used as monitoring equipment
Measuring/reading/recording frequency	Continuous measurement, monthly recorded
Calculation method (if applicable)	With the meters the electricity supplied to the grid and the imported electricity is measured: the net electricity is the supplied electricity to the grid minus the electricity imported electricity to the hydropower plant $EG_{y,net} = EG_{y,export} - EG_{y,import}$
QA/QC procedures	The reading for the electricity supplied and imported is made through the main meter M11. It can be cross-checked with the back-up meter M12.The difference between these two meters over the whole monitoring period is around 0.05% (influenced by the fact that the backup meter is read shortly after the main meter and thus normally higher values are measured). The data is measured with electric energy meters, which are calibrated according to Vietnamese law at least every two years. See for details on calibration and equipment used table 5, Section C.
Purpose of data/parameter	Baseline emission calculation
Additional comments	The net electricity export/supplied to a grid is the difference between the measured quantities of the grid electricity export and the import. The measurement results can be cross-checked with the sold electricity to EVN (invoice/receipt). EVN and La La Hydropower plant are reading the meters together on the last day of each months.

Data/Parameter	**CAP_{PJ}**
Unit	W
Description	Installed capacity of the hydropower plant after the implementation of the project activity
Measured/calculated/ default	Measured
Source of data	La La Hydropower company based on nameplates of generators
Value(s) of monitored parameter	3,000,000

Monitoring equipment	--
Measuring/reading/recording frequency	Yearly
Calculation method (if applicable)	not applicable
QA/QC procedures	None
Purpose of data/parameter	Project emission calculation
Additional comments	Idem to the value as in the registered PDD

Data/parameter:	**A_{PJ}**
Unit	m^2
Description	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full
Measured/calculated/default	Calculated based on the measured water level
Source of data	Measured by ruler, recorded daily
Value(s) of monitored parameter	45,629
Monitoring equipment	The areas of both reservoirs are measured over the water levels. Based on the topographical survey carried out in the framework of the feasibility study the area can be determined based on the water level (a.s.l.) In 2018 and 2019 the water level was at the highest 309.20 m a.s.l. Based on the topographical graph at the highest water level of 309.20 m a.s.l. the surface of the reservoir is 45,628.504 m2
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Based on the topographical graph: water level vs. surface area (see files 36 and 38). Based on the surface area and the in-built capacity the density of the highest water level can be calculated: 3,000,000 W / 45,629 m2 = 65.748 W/m2
QA/QC procedures:	The highest water level can be cross-checked with the deposited sediments on the ruler.
Purpose of data:	Project emission calculation
Additional comments:	Value of the registered PDD: 96.774 W/m2; based on the in-built capacity (3,000,000 W) and the measured reservoir area the power density during the monitoring period is 65.748 W/m^2. Thus the value is much higher than 10 W/m^2 and no project emissions are calculated due to the reservoir. For details see annual monitoring report of reservoir area (file 36)

D.3. Implementation of sampling plan

No sampling approach was used for monitoring of the data described in D.2

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y} \quad (1)$$

Where:

BE_y	Baseline emissions in year *y* (tCO_2/yr)
$EG_{PJ,y}$	Electricity supplied by the project activity to the grid in the year "y" (MWh)
$EF_{grid,CM,y}$	Combined margin in the year "y" (tCO_2/MWh)

As mentioned in sections C and D of this report the net electricity fed into the national grid is calculated based on the following formula:

$$EG_{PJ,y} = EG_{y,net} = EG_{y,export} - EG_{y,import} \quad (2)$$

Where

$EG_{y,export}$	Electricity supplied to the grid, measure by the main meter
$EG_{y,import}$	Electricity imported for consumption from the grid, measured through various meters

Sample calculation (September 2018)

BE_y = *13693.233 MWh * 0.5764 = 7,884 tCO_2*

The readings from the various meters are integrated in the working spreadsheet (see file 20).
The table below is a summary of the measured electricity supplied to the grid, the imported electricity and the net electricity.

The combined margin (EFgrid,CM,y) with a value of 0.5764 tCO2/MWh is fixed for the first crediting period (see section D.1.).

The baseline emissions are the product of the combined margin multiplied with the net electricity supplied to the grid. The table below summarizes the monthly values and the total baseline emissions over the whole monitored period.

E.2. Calculation of project emissions or actual net removals

According to the used methodology the project emissions of the reservoir shall be calculated according to ACM0002. The project emissions shall be determined if the power density of the project activity is greater than 4 and lower than 10 W/m2.

The power density is calculated as follows:

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

Where:

PD	Power density of the project activity (W/m^2)
Cap_{PJ}	Installed capacity of the hydro power plant after the implementation of the project activity (W)
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 reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)

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). For new reservoirs, this value is zero

The hydropower project is new and thus the baseline parameters included are 0.

The following Table shows the measured in-built capacity and the biggest surface area of the reservoir during the monitoring period and the calculated power density for the monitored period.

Table 9 Power density in the monitoring period

	Installed Capacity [W]	**Reservoir Area (Cap_{PJ}) [m^2]**	**Power Density (BE_y) [W/m^2]**
Total monitoring period	3,000,000	45,629	65.748

The power density of the project activity is over 10 $W/m^2$and thus the project emissions in the monitoring period are 0.

E.3. Calculation of leakage emissions

No leakage emissions are included according to AMS.I.D. Version 16.

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals ($t CO_2e$)	**Project GHG emissions or actual net GHG removals ($t CO_2e$)**	**Leakage GHG emissions ($t CO_2e$)**	**GHG emission reductions or net anthropogenic GHG removals ($t CO_2e$)**			
				Before 01/01/ 2013	**From 01/01/ 2013 until 31/12/ 2020**	**From 01/01/ 2021**	**Total amount**
Total	7,888	0	0	0	7,884	0	7,884

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period ($t CO_2e$)	**Amount estimated ex ante for this monitoring period in the PDD ($t CO_2e$)**
7,884	10,993

E.5.1. Explanation of calculation of "amount estimated ex ante for this monitoring period in the PDD"

The emission reduction was calculated according to the technical design for the hydropower plant. The technical design used the historical water flow of the river. The estimated annual emission

reduction is 6'905 t CO_2e. The expected amount of emission reduction was calculated as follows: 6,905 t CO_2e / 12 months x 19 months.

The achieved electricity production is only 28 % lower of the ex-ante estimated amount.

E.6. Remarks on increase in achieved emission reductions

Not applicable - the achieved emission reduction is much lower the ex-ante estimations.

E.7. Remarks on scale of small-scale project activity

The project activity demonstrates that the installed capacity remains at 3 MW capacity which is much under the limit of 15 MW capacity for type I small-scale project activities.
The project activity had over the first crediting period an average emission reduction of 3,779 tCO_{2e} - and an average production of 6,566 MWh/y. The highest annual electricity production during the first crediting period was 2018 with 9,953 MWh and an emission reduction of 5,730 tCO_{2e}. Thus, all the components for a small (even micro scale) are met.

Appendix 1 Reference Documents

File 1	Central Power Corporation and La La Hydropower Plant; Minutes on meter readings during the whole monitoring period, 2012 - 2019
File 2	Central Power Corporation and Mai Linh Power Joint Stock Company; Electricity purchase contract No 10.2012 LALA-EVN CPC - NLML, October 2012
File 3	Central Power Corporation (the buyer) and Quang Tri Energy Exploiting Joint stock company (the seller); Electricity purchase contract No10.2018 LALA-EVN CPC - NLQT, July 2018
File 4	Dong Nai Material & Construction Investment Join Stock Company (DNC) and Mai Linh Power Joint stock company; Contract No 19-2007 - HDKT on installing equipments of Lala HPP, December 2007
File 5	Department of Planning and Investment of Quang Tri province; Business registration certificate of Quang Tri exploiting energy , 1th November 2017
File 6	The People's Committee of Quang Tri; Association procedure for operation, 26 September 2012
File 7	The People's Committee of Quang Tri; 1715-QD-UBND-isuance manual of reservoir operation , 26 September 2012
File 8	Mai Linh Power Joint stock company and Quang Tri Energy Exploiting Joint stock company; Transfer contract of Lala HPP in Quang Tri province, Viet Nam, 5 June 2018
File 9	Central Electrical Testing Co., Ltd; Certificat of verificaton of meter, Minutes of regular meter checking 2013 - 2019.
File 10	La La Hydropower Plant; Summary test report on testing with load within 72 hours, 10/10/2012.
File 11	Ganfa Company, Contract No 06-08/HDKT _ supply and installation of electro-mechanical equipment, June 2008
File 12	Mai Linh JSC; Invoice for Electricity Supply, for the whole monitoring period: October 2012 to April 2019.
File 13	ecotawa AG; PDD for La La Hydropower Project, Vietnam, final version; 16/03/2011
File 14	Mai Linh Power Joint stock company and Quang Tri environmental monitoring and technical center; Environmental Impact Assessment (EIA), December 2007.
File 15	Mai Linh Power Joint stock company and Quang Tri environmental monitoring and technical center; Environmental Report for the whole monitoring period, 2012 - 2019
File 16	Ministry of industry and trade (MOIT); CIRCULAR 27_2009_TT-BCT - regulation on power metering in the competitive generation market, 25 September 2009
File 17	Ministry of industry and trade (MOIT); CIRCULAR 42_2015_TT-BCT, 1 December 2015
File 18	ecotawa AG; La La HPP - Monitoring Manual, 2012

File 19 ecotawa AG; La La HPP - Monitoring Manual, 2015

File 20 ecotawa AG, working spreadsheet for monitoring, 2019

File 21 La La Hydropower Plant; Measuring of water level over the whole monitoring period, 2012 - 2019.

File 22 MONRE; Official Combined Margin (CM), 26/03/2010; VN and EN version

File 23 ecotawa AG; CER-Spreadsheet for the Monitoring Period May 2012 - April 2019

File 24 Manual of the Electricity Meter A1700

File 25 Construction Contract for the HPP La La, 12/02/2008

File 26 La La Hydropower Plant; File of permanent staff of La La Hydropower Plant in 2000

File 27 La La Hydropower Plant; Example of job training confirmation for staff of the hydropower plant, 22/06/2018

File 28 La La Hydropower Plant; Salary list of the permanent staff from 01/02/2019

File 29 Logbook of the La La Hydropower Plant 2012 to 2019

File 30 License of Surface Water Usage & Exploitation

File 31 Confirmation of the Irrigation Office

File 32 La La River flow investigation between 1981 and 2005

File 33 Coal Prices in Vietnam beetween 2012 and 2019

File 34 Training Evidences for Training for Fire Protection

File 35 Land Use Certification for La La Hydropower Plant

File 36 Annual monitoring of the reservoir area; ecotawa AG

File 37 Decision of Gold Standard concerning the Deviation Request of ecotawa AG; Gold Standard, 22/01/2021

File 38 Investment Project - Basic Design of La La Hydropower Plant Quang Tri Province, Vietnam, P.Q.H Hydropower Consultancy Ltd. Company, October 2007, English translation

ANNEX 2 Gold Standard Monitoring Report

Title of the project activity	**La La Hydropower Project, Vietnam**
GS-Number	GS 840
UNFCCC-Registration No.	4626
Version number of the monitoring report	1.0
Completion Date of the monitoring report	13/05/2022
Crediting Period	30/04/2012 - 29/04/2019
Monitoring period number and Duration of this monitoring period	First Monitoring Period: 01/10/2017 - 29/04/2019 (first and last day included)*
Host Party(ies)	Viet Nam
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	48,334 tCO_2
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	**7,884 tCO_2e** in this monitoring period

*

The Monitoring period is determined based on the decision of Gold Standard concerning the deviation request of ecotawa AG (File 37)

1 Purpose of the Report

The project description, the implementation of the project and the emission reductions based on the monitoring plan are described in the registered PDD and are part of the CDM monitoring report. The monitoring of the sustainable development according to the Gold Standard is summarized in this annex.

2 Monitored Parameters according to the registered passport

The monitoring report is divided in A) eligibility conditions and B) parameters according to monitoring plan of the passport.

A Eligibility Conditions

The eligibility conditons did not change in any point since the validation of the passport. The installed capacity has not been changed (still 3 MW) and therefore it is still eligible for GS. The emission reduction during the crediting period is in average 3,779 tCO2/year, therefore much less than it was expected in the project layout (according to feasibility study: 6'900 tCO2/yr). Based on the reduction the project is a **micro scale project** according to GS standard.

The basic requirements for hydropower project according to table C-2 of Annex C of the toolkit version 2.1 could be met. Nothing changed during the first monitoring period.

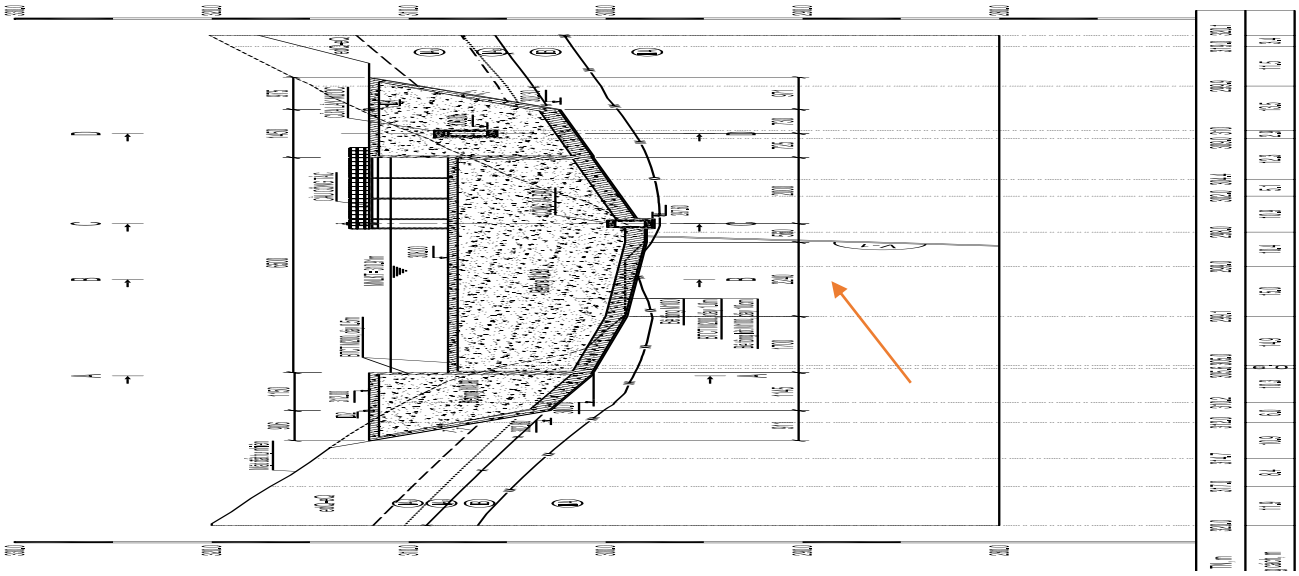
In the following the eligibility shall also be checked with the 6 parameters according to toolkit version 2.2.
In general, for all answer the natural situation must taken into account:

1. The natural flow of La La river depends much on the precipitation and varies immensely: Minimum flow around 0.3 m3/s, maximal flow up to 75 m3/s. The flow can change within two days from 4 to 75 m3/s (see file 31, hydrological research of La La river between 1981 and 2005).
2. The useful part of the reservoir is very small with a little retention time of the water: with an average flow the useful part of the reservoir will be refilled about 8 times a day (= retention time: ≈ 3 hours). That means the natural flow cannot be influenced much with the dam operation.
3. The sensitive area between dam and wateroutlet is 2.4 km long. It is a steep and deep valley with a waterfall of around 10 m at the dam site (ideal site for a hydropower plant).
4. After the water outlet of the hydropower plant, La La river flow is not changing due to the little impact of the hydrological regime through the dam (see point 2).

Competing use of water resources
The sensitive river section impacted by the hydropower plan is between the dam and the water outlet of the hydropower plant (see Map 1 of the Monitoring Report). This section is 2.4 km long. The reservoir is small and compared with an average flow of La La river the reservoir will be refilled about 8 times per day. Based on these figures it is obvious that the reservoir have no significant implications on the natural hydrological regime of the river: during the dry season the flow of the river is little while during the rainy season not all of the water can be used for the hydropower plant and flows freely over the dam. After the sensitive river section the water flow is not changed at all due to the small reservoir size.
Tan Lap commune on a small hill is nearby the hydropower plant. If the commune needs some irrigation water during dry season the water from the reservoir can be used (see File 14 EN, chapter 3.3.3 "positive impacts). The right for irrigation for all cultivation in the area of the project was decided in a meeting between the people's committee and the project owner on 03. August 2020 (see File 31 - irrigation agreement).
The La La Hydropower Project does not have impacts on the hydrological regime. There was never a competition of water use between the project and the people in the surrounding.

Minimum Flow
Lala project meets the requirements approved in the surface water usage exploitation license by Ministry of Natural resource and Environment. According to the surface water usage exploitation license No. 1020/GP-BTNMT dated 9 Jun 2010 by Ministry of Natural Resources and Environment (file 30), regular discharge flow after the dam is not less than 0.3m3/s. If La La hydropower project does not meet the requirements the project will lose the water use license. Therefore, minimum flow is identified and guaranteed. (Surface water usage exploitation license No. 1020/GP-BTNMT, Article 2, Point 2,3,4) (Decree 112/2008 dated 20th Oct. 2008 and Surface water usage exploitation license No. 1020/GP-BTNMT, see file 30)
The minimum flow (around 10% of the average annual flow rate) will be kept through a permanent opening of the sediment flushing channel (see picture and dam design below). During dry season with little flow of the river, La La must stop the electricity production in order to keep minimal water respectively no water is available for the electricity production due to permanent opening of the sediment flushing channel.

Graph Dam Design with the sediment flushing channel on the bottom of the dam (red arrow)



Picture Dam with the sediment flushing opening (red arrow). During rainy season the surplus water flows over dam.

During dry season the hydropower plant cannot work permanently. The hydropower plant produces only during 4'033 hours per year electricity (around 46% of the time).

Impact on Groundwater Level

In the reservoir area the groundwater could be increased. The Environmental Impact Assessment (EIA) mentioned, that the reservoir will have a positive impact on the groundwater (see chapter 3.3.2): "After filling of the reservoir, climate condition will be improved, underground water level will be increased and humidity of soil and air will be improved. This will have positive impact on diversity of plants, increase plantation cover surrounding the reservoir."
In the sensitive river area between dam and water outlet of the hydropower plant (2.4 km) the minimal flow of 0.3 m3/s has to be kept according to the water use regulation between government and the project owner. The minimum flow is kept through an opening in the dam body which is permanently open. In the dry season also the natural flow was around 0.3 m3/s. Therefore, it is quite improbable that in the sensitive section the groundwater flow is changed by the hydropower project.
After the outlet of the water from the hydropower plant, the flow of La La river is not changed through the project - thus also the groundwater is not impacted.
Bref: the groundwater in the area is depending on the precipitation (see point 1 above) and not of the reservoir management.

Design and effectiveness of fish passages
The dam was built at the place of a waterfall of around 10 meters in order to make full use of the natural slope. Therefore, also in the baseline situation the fish migration between the two river section was very limited (or even impossible except for some exotic species). With the dam we have more or less the same situation with very reduced fish migration options between the two sections. Through the permanent opening in the dam body the fish migration is even more probable than before.
The inlet in the conveyance channel is protected in order to eliminate coarse material in the channel. In the penstock inlet tank there is also protection measures in order to prevent the turbines from coarse material. With these protection measures also the fishes cannot pass through the conveyance channel and are therefore protected against injury and death in the turbines.

Sediment management plan
The dam with silt sewer for releasing sedimentation will ensure sufficient transportation of sediment. The silt sewer is always open in order to guarante the minimla flow. During the rainy season deposited sediments in the sensitive zone will be removed by the water flowing over the dam. As the dam has very little impact on the hydrological regime the dam also do not impact on the sediments.
Take into consideration that in the sensitive area between dam and water outlet of the hydropower plant the water flow can be between 0.3 m3/s and around 70 m3/s it is obvious that the sedimentation is fully driven by the natural flow and not by the hydropower plant.

Mitigation measures for reducing soil erosion
After the construction the dam area was again recultivated with food crops. Thus, there is not more soil erosion than before. The reservoir area is situated in the forest area. Thus the trees are protecting soil erosion.
The sensitive river area between dam and water outlet of the hydropower plant is a slope terrain (natural advantage for building a hydropower plant). In this area the flow of the river before the dam was built was much higher and therefore this area was more impacted for soil erosion than during the project operation time. Below of the water outlet of the hydropower plant the natural flow of the La La river was not changed due to the little retention time of the water in the reservoir.
Take into consideration that the water flow can be between 0.3 m3/s and 75 m3/s it is obvious that the sedimentation is fully driven by the natural flow and not by the reservoir of the hydropower plant.

Conclusion:

The justification of the eligibility mentioned in the passport are still valid - no eligibility conditions have been changed. The small reservoir compared to the average flow of the La La river does not influence or change the water regime before the dam and after the water is released to the river after the powerhouse. The sensitive river section of the project between dam and the water outlet after the turbines is very short and a minimum water flow will be kept in the dry season according to Vietnam law. Also in this sensitive river section no impact could be assessed.

B Parameters according to the Monitoring Plan of the Passport

The monitoring of Sustainable Development Indicators was conducted in accordance with the registered GS passport. According to the requirements of the Gold Standard, the project activity must be assessed against a matrix of sustainable development indicators. Indicators that were not scored neutral must be monitored.

B.1 Monitoring Plan of the Passport

The monitoring was made according to the sustainable monitoring plan of the passport (see 9 indicators below).

No		1
Indicator		Air quality
Mitigation measure		Hydropower plants do not impact the air quality during the project activity phase. In the construction period there are air pollution due to equipment use, additional traffic and due to construction dust. The roads during construction
		had been watered to avoid dust. Furthermore only registered vehicles have been allowed to use for construction purposes.
Chosen parameter		Air concentration for dust, SO2, CO, NO2 must be measured annually during construction as well as during project activity time. Furthermore, noise emissions have to been measured during this assessment.
Current situation of parameter		Baseline situation: the parameter was not measured.
Future target for parameter		Measuring annually. The measured values must meet the legal standards of Vietnam.
Way of monitoring	How	Air pollution measurements and noise measurements of 3rd party.
	When	Once per year
	By Who	External laboratory

No	2
Indicator	Water quality and quantity

Mitigation measure		The water quality in the project area (up-stream reservoir area, reservoir, at dam site and after dam) must be controlled by third party annually. The stable flow in the riverbed after the dam will be secured to a permanent open space in the dam body.(see picture below) 
Chosen parameter		**Water quality**: Annually analysis of: pH, DO, TSS, BOD, COD, N, P, Cu, Zn, Pb, Cd and mineral oil content (at 4 sites, see above)
		Water quantity: minimal flow (0.3 m^3/s according to file NN9) during the whole year secured.
Current situation of parameter		Baseline situation impact of the surrounding area on the water quality of La La river was not measured. The natural water flow in the driest months of the year are even below the minimum water flow of 0.3 m3/s as requested in the surface water using license (see file 9)
Future target for parameter		Quality: must meet VN standards Quantity: ≥ 0.3 m3/s permanent flow after dam according to the surface water using license (file 9).
Way of monitoring	How	Quality: analysis through 3rd party Quantity: proof of permanent opening in the dam body with release of minimal flow of ≥ 0.3 m3/s through a construction measure. The project owner has to report to MONRE about the water inflow to the reservoir and the flow after dam and after powerhouse (see file 9).
	When	Quality: annually Quantity: permanent open hole (proof of construction measure; annual report for the attention of MONRE - submitted before December 15 of each year.

	By Who	Quality: External laboratory. Quantity through project owner

No		3
Indicator		Soil Condition Tree planting / lubricants in soil / Erosion
Mitigation measure		A tree planting plan has been prepared to prevent soil erosion
Chosen parameter		Annual planted tree area for preventing soil erosion / contaminated soil through lubricants in the project area after construction
Current situation of parameter		Baseline situation. The project owner already started to make the afforestation within the construction area of the dam.
Future target for parameter		Planting trees around reservoir and hydropower plant areas (m^2) / no visible soil contamination through lubricants / no visible soil erosion through project activity
Way of monitoring	How	Visual soil erosion in the dam and reservoir area (proof with pictures). Lubricants in soil through construction: organoleptical
		monitoring after construction. If the soil is visible and olfactory contaminated, the soil must be analysed on hydrocarbons and measures must be taken according to Vietnamese law. Tree planting see indicator No 4 below
	When	yearly for soil erosion lubricants in soil: organoleptical control after termination of the construction activities.
	By Who	Soil erosion: Staff of Mai Linh Energy JSC Lubricants: project owner - confirmation by the local authorities.

No		4
Indicator		Biodiversity
Mitigation measure		Tree planting plan in La La HPP prepared by Mai Linh Energy JSC. With the tree planting the agricultural activity will be stopped and new plants will start to growth in this area.
Chosen parameter		Total tree planting area according to tree planting plan (see file 6)
Current situation of parameter		Construction places. In the baseline scenario the land was used for banana, coffee and pepper cultivations. There was not much biodiversity in the project area.
Future target for parameter		Planting trees around reservoir and hydropower plant areas total 5 ha within 7 years (2009 - 2015)
Way of monitoring	How	Total cover area (m^2)

	When	yearly
	By Who	Staff of Mai Linh Energy JSC/CDM consultant

No		5
Indicator		Quality of employment
Mitigation measure		Mai Linh will employed local people to work in Lala HPP. Those staffs will be trained and received labour contract according to the Vietnam labour law
Chosen parameter		Number of certificates issued and labour contracts
Current situation of parameter		Currently the recruited people are trained in other companies how to operate a hydropower plant.
Future target for parameter		18 recruited people will be trained to operation hydropower plant
Way of monitoring	How	Certificates issued
	When	Controlled annually
	By Who	Staff of Mai Linh Energy JSC

No		6
Indicator		Quantitative employment and income generation
Mitigation measure		Mai Linh will employed local people to work in Lala HPP. Those staffs will be trained and received labor contract following the Vietnam labor law.
Chosen parameter		Number of local workers and labor contracts and salary level of the employed staff - ratio between the genders
Current situation of parameter		none
Future target for parameter		18 people during operation stage is planned to be employed
Way of monitoring	How	Labor contracts and annually assessment of the salary level, number of employed women vs. men
	When	Annually assessment
	By Who	Staff of project owner and CDM /GS consultant

No	7
Indicator	Balance of payments and investment
Mitigation measure	NA
Chosen parameter	Reduced coal importation per year
Current situation of parameter	none
Future target for parameter	according to the projected energy production it is estimated that around 7,750 tons of coal will be imported less

Way of monitoring	How	Total electricity generated in MWh multiplied with 0.641 t coal/MWh (average consumption according to the calculation of the CM in the PDD of coal thermal power plants).
	When	yearly
	By Who	Staff of Mai Linh Energy JSC / CDM consultant

No		8
Indicator		Technology transfer and technological self-reliance
Mitigation measure		NA
Chosen parameter		Number of trainings and site visits for guests and outsiders
Current situation of parameter		none
Future target for parameter		each year at least 3 delegations
Way of monitoring	How	Number of trainings or site visits organized for outstanders
	When	annually
	By Who	Staff of Mai Linh Energy JSC

No		9
Indicator		Other pollutants (including blasting)
Mitigation measure		The noise during construction phase shall be minimised through use of registered vehicles and equipment.
Chosen parameter		Noise measurement during construction.
Current situation of parameter		natural area with natural noise level in the baseline situation.
Future target for parameter		The noise level shall meet VN law
Way of monitoring	How	Way of monitoring
	When	Annually
	By Who	external laboratory.

No		10
Indicator		Other pollutants: compensation procedure
Mitigation measure		The expropriation is made according to Vietnamese law and according to the licenses for the project
Chosen parameter		all compensations are made according to law
Current situation of parameter		compensation process is terminated and land use right was issued.
Future target for parameter		-
Way of monitoring	How	Control of all available documents for the compensation, interview with the responsible people's committee
	When	After finishing of the construction.
	By Who	Project owner

B.2. Outcome of the Monitoring of the Sustainable Indicators

Indicator 1 Air Quality

Chosen parameter	Air concentration for dust, SO2, CO, NO2 must be measured annually during construction as well as during project activity time. Furthermore, noise emissions have to been measured during this assessment.
Baseline situation of parameter	Baseline situation: the parameter was not measured.
Future target for parameter	Measuring annually. The measured values must meet the legal standards of Vietnam.
Way of monitoring	Air pollution measurements and noise measurements of 3rd party.
Result	The air pollution and the noise was measured twice annually at 4 sites during construction time: - at the National Route 9 where the road leading to the project site - at the dam area - at the quarrying area - at the plant site After the construction time the parameters have been only measured at the National Route and the plant site. The Vietnamese standards were kept in all measurements.
Preliminary Score	**0**
Actual Score	**0**
Source	Center of Natural Resources and Environment Monitoring. Supporting files: EIA Year 2012 - 2019 (File 15-01 to File 15-12)
Conclusion	The set target could be fulfilled
Comments	Hydropower projects are normally not relevant for air pollutant. At the site of the National Road the air quality is influenced by the road and not from the project itself.

Indicator 2 Water Quality and Quantity

Chosen parameter	**Water quality**: Annually analysis of: pH, DO, TSS, BOD, COD, N, P, Cu, Zn, Pb, Cd and mineral oil content (at 4 sites, see above) **Water quantity**: minimal flow (0.3 m^3/s according to file NN9) during the whole year secured.
Baseline situation of parameter	Baseline situation impact of the surrounding area on the water quality of La La river was not measured. The natural water flow in the driest months of the year are even below the minimum water flow of 0.3 m3/s as requested in the surface water using license.
Future target for parameter	Quality: must meet VN standards Quantity: ≥ 0.3 m3/s permanent flow after dam according to the surface water using license (see remarks under baseline situation).
Way of monitoring	Monthly COD-analyses according to the CDM monitoring (see also section D of the monitoring report).
Result	Every year, the surface water was measured once or twice by a third party at the reservoir and in the La La river at the foot of the dam.

	The quality of the surface water met at any time the Vietnamese standard. Quantity: The hole in the dam body with the release of ≥ 0.3 m3/s was permanently open. The Environment Department of Quang Tri Province will install cameras for observing the water quantity in future (agreement between the environmental agency and the project owner).
Preliminary Score	**0**
Actual Score	**0**
Source	Center of Natural Resources and Environment Monitoring. Supporting files: EIA Year 2012 - 2019 (File 15-01 to File 15-12)
Conclusion	All the measured values of the surface water met Vietnamese Standards. The quantity was kept over an release in the dam body which was permanently open.
Comments	The flow could not be measured as it is rather impossible within a river bed with lots of rocks and stones. The future surveillance by cameras will be a good monitoring alternative.

Indicator 3 Soil Condition Tree Planting / Lubricants in soil / Erosion

Chosen parameter	Annual planted tree area for preventing soil erosion / contaminated soil through lubricants in the project area after construction
Baseline situation of parameter	Baseline situation. The project owner already started to make the afforestation within the construction area of the dam.
Future target for parameter	Planting trees around reservoir and hydropower plant areas / no visible soil contamination through lubricants / no visible soil erosion through project activity
Way of monitoring	Visual soil erosion in the dam and reservoir area (proof with pictures). Lubricants in soil through construction: organoleptical
Result	According to the EIA (year 2013 to 2016) there is no visible erosion in the dam area (see files 15-03 to 15-09), measures taken against soil erosion are mentioned. In all EIA lubricant (grease) concentrations have been assessed in the reservoir water as well as in the river after dam. During the whole monitoring period no grease (Hydrocarbons) could be detected in the water samples (see file 15-01 to 15-12). All values are below the detection limit.
Preliminary Score	**0**
Actual Score	**0**
Source	Environmental Impact Assessments (Files 15.3 to 15.9)
Conclusion	The set targets could be met. The monitoring way differs from the monitoring set-up of the passport. With the hydrocarbon concentration of the water the monitoring results are more elaborated than with visiual controls (visible soil contamintations could not be found during the monitoring period).
Comments	

Indicator 4 Other Pollutants

Chosen parameter	Noise reduction during the construction time
Baseline situation of parameter	During the construction time only vehicles and equipment which meet the standards are allowed. Vehicles and construction equipment must have permit of the Register Agency on Technical and Environmental Safety (in which permissive noise regulation is regulated).
Future target for parameter	The noise emissions are measured during construction and during the production phase.
Way of monitoring	Noise measurements in the framework of the annual environmental impact assessments (EIA).
Result	The measurements for 2012 was carried on during the construction time of the hydropower plant. The noise was measured at the National Route 9 at the road leading to the project site, at the dam area, at the quarrying area and at the powerhouse site. In all the places the noise level was withing the permitted standard of 70 dB(A) according to QCVN 26 (National Technical Regulation on Noise). The noise measurements during the production time (2013 onward) was measured at the National Route 9 at the road leading to the project site and in the powerhouse. All the measurements met the national standard of noise regulation.
Preliminary Score	**0**
Actual Score	**0**
Source	During Construction Environmental Impact Assessment 2012 (File 15.1) During production time: EIA 2013 to 2019 (File 15.3 to File 15.12)
Conclusion	The set targets could be met in all environmental impact assessments during the whole crediting period.
Comments	---

Indicator 5 Biodiversity

Chosen parameter	Total tree planting area according to tree planting plan (see file 6)
Baseline situation of parameter	Construction places. In the baseline scenario the land was used for banana, coffee and pepper cultivations. There was not much biodiversity in the project area.
Future target for parameter	Planting trees around reservoir and hydropower plant areas total 5 ha within 7 years (2009 - 2015)
Way of monitoring	Total cover area (m2)
Result	Most of the project area is still agricultural land. Around the reservoir the natural bush forest is still kept. The biodiversity did not change between baseline and project situation.
Preliminary Score	**0**
Actual Score	**0**
Source	Side visits.
Conclusion	The regional administration asked the project owner to plant bananas in order prevent soil erosions. The set targets concerning the biodiversity was not met.
Comments	The objective of the project owner was over-ambitious. After construction the company had to focus on the proper operation of the hydropower plant. Futhermore, the local administration did not ask the project owner to change from agricultural production to forest.

Indicator 6 Quantity of employment and Quality of employment

Chosen parameter	Number of certificates issued and labour contracts
Baseline situation of parameter	Currently the recruited people are trained in other companies how to operate a hydropower plant.
Future target for parameter	18 recruited people will be trained to operation hydropower plant
Way of monitoring	Staff employed in the company with education in operating a hydropower plant
Result	The company started with 18 staff which are trained by the project owner. After some years the permanent staff has been reduced to 11. Some administration jobs could be reduced due to more experience. Some work was outsourced to service providers.
Preliminary Score	**0**
Actual Score	**0**
Source	File 26, List of permanent staff; File 27 confirmation of job training
Conclusion	The project employes currently 11 people from the area. The staff was all educated in operating a hydropower plant. Some of the work was outsourced to private companies. The staff was all educated in operating a hydropower plant. Thus - the targets are fulfilled.
Comments	The area of the project site belongs to the poorest areas of Vietnam. Thus, every job in the field of industry and technology is important. Of course, the project is very small (micro scale style) - thus the positive impacts for the region is limited.

Indicator 7 Livelihood of the Poor

Chosen parameter	Number of local workers and labor contracts and salary level of the employed staff - ratio between the genders
Baseline situation of parameter	In the baseline situation no staff was employed
Future target for parameter	18 people during operation stage is planned to be employed
Way of monitoring	Labor contracts and annually assessment of the salary level, number of employed women vs. men
Result	The company started with 18 staff which are trained by the project owner. After some years the permanent staff has been reduced to 11. Some administration jobs could be reduced due to more experience. Some work was outsourced to service providers. The salary level (see file 27, dated 01/02/2019) is all included such as housing, food, mobility, phone high compared to the area.
Preliminary Score	**0**
Actual Score	**0**
Source	File 27, salary list for the permanent staff, 01/02/2019
Conclusion	The set targets are met.
Comments	The La La Hydropower Project is a microscale project with very limited impacts on social life in the project area. Thus the project has no influence on high level parameters mentioned in the Millenium Development Goals. Thus the created jobs and the little number of trained people can not alter the general poverty in the project area.

Indicator 8 Access to Affordable and Clean Energy Service

Chosen parameter	Amount of kWh supplied to the grid and to the neighborhood
Baseline situation of parameter	No electricity was supplied to the grid, the neigherborhood was not connected to electricity

Future target for parameter	The produced electricity is supplied to grid and to the neighborhood (part of the internal use)
Way of monitoring	kWh supplied according to CER-Spreadsheet
Result	During the first crediting period of the CDM Project more than 25,000 MWh were supplied to the grid. Also the neighbors were connected to the grid and electricity was supplied (part of the internal use).
Preliminary Score	**0**
Actual Score	**0**
Source	CER Spreadsheet
Conclusion	The set targets are met.
Comments	Score of 0 is selected due to the very limited effect of this micro-scale project.

Indicator 9 Human and Institutional Capacity

Chosen parameter	1 Access to primary, secondary and tertiary schooling< 2 Gender equity 3 Changes of empowerment (changes in social structure)
Baseline situation of parameter	The project area is one of the poorest area in Vietnam. Thus the project gives job priority to people who were affected by the project
Future target for parameter	
Way of monitoring	kWh supplied according to CER-Spreadsheet
Result	Currently 11 permanent jobs were created and people were trained in order to run the project. A small step into the right direction (see comments below).
Preliminary Score	**0**
Actual Score	**0**
Source	File 27, salary list for the permanent staff
Conclusion	This micro-scale project is too limited for having real substantial impact for social life and education situation in the project area
Comments	La La hydropower plant is a very small project and therefore the social impact of the project activity is very limited. The selected indicators according to Annex-I of GS refer to essential social changes in the field of education, power and gender equity. Therefore, this sustainability indicator is chosen as neutral.

Indicator 10 Quantitative Employment and Income Generation

Chosen parameter	Number of jobs due to the project activity and salary level
Baseline situation of parameter	Before the project started there were no staff employed
Future target for parameter	During the construction phase 331 additional jobs were created; during operational phase it was expected to have 18 additional working places
Way of monitoring	Counting of permanent jobs, monitoring of the salary level
Result	Currently 11 permanent jobs were created and people were trained in order to run the project. Some of the jobs have been outsourced to external service providers. The salary level (see file 27, dated 01/02/2019) included also such as housing, food, mobility, phone, etc. is high compared to the salary level of the area.
Preliminary Score	**+**
Actual Score	**+**
Source	File 27, salary list for the permanent staff
Conclusion	The set targets could be met partially (only 11 instead of 18 new jobs - some services have been outsorced).

Comments	

Indicator 11 Balance of payments and investment

Chosen parameter	Reduced coal importation per year
Baseline situation of parameter	For the electricity production coal was used
Future target for parameter	according to the projected energy production it is estimated that around 7,750 tons of coal will be imported less
Way of monitoring	Total electricity generated in MWh multiplied with 0.641 t coal/MWh (average consumption according to the calculation of the CM in the PDD of coal thermal power plants).
Result	The hydropower plant produced in the monitored crediting period net 45,960.252 MWh. Thus the coal consumption of Vietnam is about 29,460 tons less with the La La hydropower project. With an average coal price of 60 USD/tcoal around 1.8 Mio fuel costs could be saved (means around 66% of the total investment costs according to the PDD).
Source	Monitoring report - sold electricity to the grid
Conclusion	The projected electricity production according to the feasibility study was much higher than the actual production during the crediting period. Anyway, the micro scale project with no visible environment impact could reduce around 30'000 tons of coal during the first crediting period.
Comments	

Indicator 12 Technology transfer and technological self-reliance

Chosen parameter	Number of trainings and site visits for guests and outsiders
Baseline situation of parameter	None
Future target for parameter	each year at least 3 delegations
Way of monitoring	Number of trainings or site visits organized for outstanders
Result	The company makes annually regular trainings for the staff. The visitors are not listed. The effect of technology transfer for visitors is not measurable
Preliminary Score	+
Actual Score	**+**
Source	----
Conclusion	The target of technology transfer was over ambitious. At least the company can rely on its technical know-how in operating and maintaining a hydropower plant.
Comments	

Final Conclusion

All the set sustainable targets of the projects are met. The project activity has a sustainable impact on the social life in the area and a considerable economic benefit for the company as well as for the employees. The project is environmentally sustainable (see coal substitution, emission reduction).

In some indicators the targets have been set over-ambitious. The hydropower project is a micro-scale project with limited positiv impacts and no obvious negativ impacts.

B.3 Do Not Harm Assessment

In the Do Not Harm Assessment of the passport all safeguarding principles have been assessed as "no risk" or "low risk". Therefore no mitigation measures have been defined in the passport which must be monitored during the verification process.

B.4 Stakeholder Feedback Round

The stakeholder feedback round was made due Covid through a video conference as a remote audit. The following people were participating on September 23, 2020:

- Mr.Sukanta Das (SD), verificator for LGAI Technological Center, S.A.
- Mr. Doan Van Xoa, The Mayor of Tan Thuan village, Tan Lap Ward, Huong Hoa District, Quang Tri Province.
- Mr.Doan Quang Toai, member of Management Board of Lala HPP
- Ms Huong Pham, CEO of the Hydropower Plant (Huong)
- Ms. Dang Tuyet Ly, ecotawa AG Vietnam, translation
- Mr. Daniel Wunderlin, CEO ecotawa AG

The verificator - Mr. Sukanta Das (SD) - was asking the questions according to the sustainable parameters:

1) SD: How was the air quality during the construction phase and how is the air quality during the operation?

Mr. Xoa The air quality during construction and during the operation is still good. The people around the project site do not feel any impact on the air quality due to the hydropower plant.

2) SD: Did the project impact the water quality or did the project activity depletes the groundwater?

Mr. Xoa The water quality in the river during construction and also during operation is not effected. Also the groundwater is still enough and with good quality - the same as before - a loss of groundwater was not detected.

3) SD: How is the soil condition around the project site and in the villages around the site? Is there any erosion of soil due to the project?

Mr Xoa There were two phase. In the first phase of the construction the project owner organized many meetings in order to compensate the people for the land loss. The people were very satisfied with the paid compensation. In the phase of the operation the local stakeholders still can cultivate banana in the project area. Bananas are very suitable for this area. There was and is no soil erosion in the project area.

4) SD: During the construction phase there were also blastings. Were there any resettlement due to the project activity?

Mr Toai There was no resettlement for the project. Also during the construction phase no temporary resettlement was necessary. The reservoir is very small and also the construction of the dam did not effect the people in the surrounding. The project owner had to compensate the stakeholders for some trees which had to be felled.

5) SD: How many employment have been made for local people for this project? How many people have been employed fulltime, how many people have been employed part time? How is the gender distribution?

Ms Huong At the moment there are 15 people employed fulltime, 11 male and 4 female. 10 people are part time employed, all of them are male.

6) SD What kind of training do the project owner provide for fulltime and for part time employees? And what is the frequency of the training?

Ms Huong The hydropower plant is cooperating with the electricity company of Quang Tri Province. Together they provide training for the operation, for the safety and for fire extinguishing. The frequency is once per year for each of these subjects. These trainings are only organized for the fulltime employees. The part time employees are unskilled workers with no specialized job. They cleaning channels or roads during the rainy seasons.

7) SD The next topic is the biodiversity. How is the situation with the tree-planting in the project area and how is management of the fish farming in the upper dam area?

Ms Huong There are two main types of forest tree which are locally dominant in the forest. These kind of trees are planted in the project area.
Concerning the fishes the project activity does not effect the fishery in the river. The local people in the reservoir area manage by themselves the fish farming. There are a lot of indigenous people living in this area who are used to manage the fish farming by themselves.
In the project area near the dam and the reservoir the people of the surrounded villages and also employees of the hydropower plant plant banana for their own benefit.

8) SD What was the noise pollution during the construction phase and how is the noise pollution now during the operation?

Ms Huong There are no people living near the project area. Therefore nobody is affected by the noise during the construction phase and during operation. In the powerhouse they make some measures to reduce the noise pollution.

Ms Huong I would like to summarize for you some facts about this hydropower project for a better understanding. The project area is near the Lao boundary and brings work for the local people here who are poor. The work did also not end after the construction period. The project owner built a new road for the hamlet near the hydropower plant (see pictures below).
Furthermore, within 13 years the project brought around 30 billion VND tax for the local budget, around 5 billion VND for the environmental taxes, around 8 billion VND for income tax, for forest fee around 3 billion.
There are many indigenous people living in this area and the project brings to them more income.

Old Bridge to the nearby hamlet before the project started

Road and bridge renewed by the project activity

In the framework of a small movie for the buyer of the emission reduction of the project some stakeholders of the nearby hamlet were interviewed. Here the summary of these three interviews (see file 30, Video of La La Project).

Hello, my name is Ba Khoong, I am 72 years old. In this hamlet, before this project was launched the residents here had been so drudging and now there is a hydroelectric plant. La La Hydropower Plant hs lightended people's life here. People now have roads, have education, have enough water. People's lives here have changed so much compared to that of 35 years ago. People build houses by concrete now. Here we also have a health station in case of diseases.

My name is Tran Van Trung. I live in Tan Thuan Village, Tan Lap, Huong Hoa District, Quang Tri Province. My previous job was cultivating and the income mainly depended on crops. That was such a hard time. In 2018 I was accepted to work in the La La Hydropower Plant. Our income and family life becomes stable, the living conditions are increasingly developed. When the company entered here, it facilitated the opening of concrete roads for Vay 2 Village to connect with the main roads connecting Lao Bao Town and Khe Sanh Town. Since the, our people have increasingly developed, püurchasing and harvesting agricultural products is more convenient. Also the children do not have to climb passes or wade streams anymore. They can go smoothly on concrete roads.

I am a worker in La La Hydropower Plant. I have been working for the company for over 13 years. Before eentering the company, my family's income was very unstable - depending only on farming and cultivating. Life was difficult at that time. After being accepted to work for the company, under their leadership, my income

has been better. My family life becomes quite brighter. I can buy more things for my family. I would like to thank to the company for creating favorable conditions for me to help myself as well as my family.

Document information

Version	*Date*	*Description*
09.0	8 October 2021	Revision to: • Ensure consistency with version 03.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN).
08.0	6 April 2021	Revision to: • Reflect the "Clarification: Regulatory requirements under temporary measures for post-2020 cases" (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.

Version	*Date*	*Description*
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Issuance
Keywords: monitoring report