



Monitoring report form
(Version 05.1)

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.

MONITORING REPORT

Title of the project activity	Hedcor Sibulan 42.5 MW Hydroelectric Power Project	
UNFCCC reference number of the project activity	1620	
Version number of the monitoring report	1.0	
Completion date of the monitoring report	19/08/2016	
Monitoring period number and duration of this monitoring period	003 26/12/2013 – 25/08/2016 (inclusive)	
Project participant(s)	Hedcor Sibulan, Inc., Klinkenberg Traders B.V.	
Host Party	Republic of the Philippines	
Sectoral scope(s)	Sectoral scope 1: Energy industries (renewable - / non - renewable sources)	
Selected methodology(ies)	ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 06)"	
Selected standardized baseline(s)	N/A	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	252,407 tCO ₂ e	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	0	400,181 tCO ₂ e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The Hedcor Sibulan 42.5 MW Hydroelectric Power Project ("Project"), undertaken by Hedcor Sibulan Inc. ("HSI") as the project company, is a cascade development of two run-of-river type hydro power plants; namely, an upstream Sibulan Plant A with an installed capacity of 16.5 MW and a downstream Sibulan Plant B with an installed capacity of 26MW.

The purpose of the Project is to generate carbon neutral electricity harnessing the water of the Sibulan and Baroring Rivers to generated electricity. The energy to be generated is and will be exported to the Mindanao grid. In doing so, the Project will displace fossil fuel-fired power generation of the same grid, contributing to a reduction of greenhouse gases (GHGs).

A.2. Location of project activity

The project site, consisting of the upper and lower project areas, is located approximately 19 kilometers from the south-eastern boundary of Davao City, in the Mindanao Province. The lower project area where Plant B is situated is about a 45-minute drive from the city. The upper project area, where Plant A is situated, is about a 2-hour drive away from the city.

The geographical coordinates for the plants as actually measured after project implementation are as indicated below, where the coordinates are consistent with the PDD:

Table 1: GPS coordinates

Plant	PDD	Actual
Plant A	6°57'45.57"N, 125°22'17.03"E	N6°57'45.8", E125°22'18.0"
Plant B	6°56'25.50"N, 125°26'27.17"E	N6°56'24.5", E125°26'27.7"

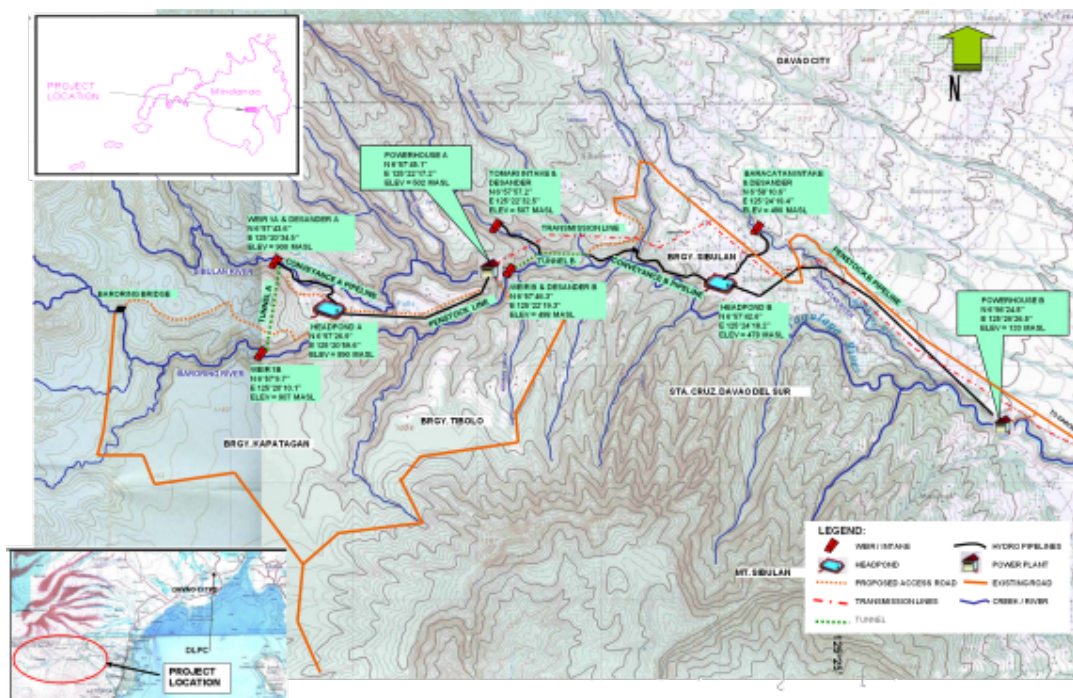


Figure 1: Map indicating Sibulan plant site

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
Republic of the Philippines	Hedcor Sibulan, Inc.	No
United Kingdom of Great Britain and Northern Ireland	Hedcor Sibulan, Inc.	No
Netherlands	Klinkenberg Traders B.V.	No

A.4. Reference of applied methodology and standardized baseline

The approved baseline and monitoring methodology ACM0002 Version 06: *Consolidated baseline methodology for grid-connected electricity generation from renewable sources* ("ACM0002") is applied to the Project.

A.5. Crediting period of project activity

Choice of the crediting period: Renewable (7 years 0 month)

First crediting period: 26/02/2010 – 25/02/2017

Start date of crediting period: 26/02/2010

A.6. Contact information of responsible persons/entities

Entity responsible for the completing the CDM-MR-FORM:

Carbon Partners Asiatica
Suite 1402, World Commerce Centre,
11 Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
(Tel: +852 31010131 1045/ Fax: +852 3622 1360)
kyoko.tochikawa@cp-asiatica.com

Carbon Partners Asiatica is the CDM advisor to the Project and is not a project participant.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

(a) *Implementation status*

The Project has been constructed and implemented as per the actual schedule described in Table 2 below. During the monitoring period under consideration (i.e. 26/08/2016 – 25/08/2016), there was no event or situation that would impact the applicability of the applied methodology.

Table 2: Implementation timeline of the project

Status	Date
CDM Registration Date	06/06/2008
Starting date of 26MW Plant B	27/02/2010
Starting date of 16.5MW Plant A	11/07/2010
1 st Monitoring Period	26/02/2010 - 25/04/2011
2 nd Monitoring Period	26/04/2011 - 25/12/2013
3 rd Monitoring Period	26/12/2013 – 25/08/2016

(b) *Technical description*

As per the registered CDM-PDD, the implemented Project is a cascade development of two power plants – the upstream Sibulan Plant A with an installed capacity of 16.5 MW and the downstream Sibulan Plant B with an installed capacity of 26MW. The plants are of the run-of-river type that include an intake weir, short tunnel, surface pipeline, desander, headpond, high pressure surface penstock, surface power plant, substation, switchyard, and transmission line. The plants each house two multi-jet pelton type turbines and generating units that create power.

No major dam or reservoir has been constructed. Instead, the plants utilize small, off-river head ponds which will regulate the output daily. The two ponds at Plant A and Plant B together allow for sufficient water storage to cater for the peak demand of the off-taker, Davao Light Power Corporation, Inc. (DLPC).

The Plants are connected to the DLPC system through a 69 KV transmission line to DLPC's ERA Main Substation.

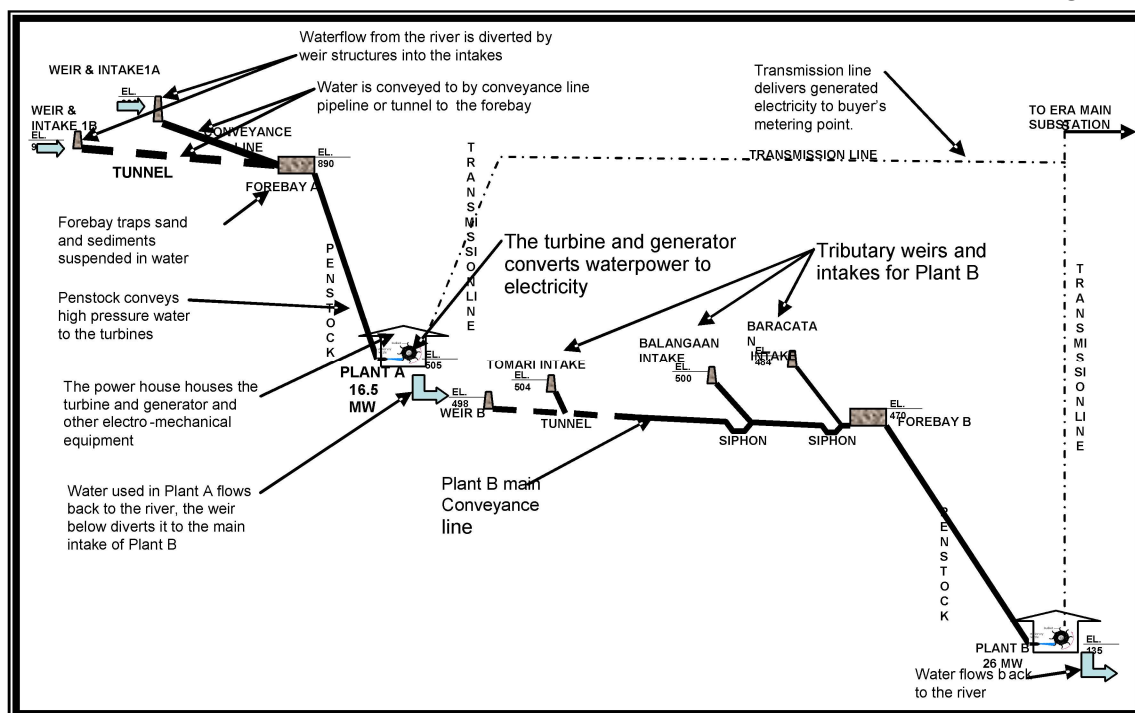


Figure 2: Diagram of technical system

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

The section is left blank intentionally.

B.2.2. Corrections

The section is left blank intentionally.

B.2.3. Changes to start date of crediting period

The section is left blank intentionally.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

The section is left blank intentionally.

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

The section is left blank intentionally.

B.2.6. Changes to project design of registered project activity

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B.2.7. Types of changes specific to afforestation or reforestation project activity

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SECTION C. Description of monitoring system

C.1. Monitoring points

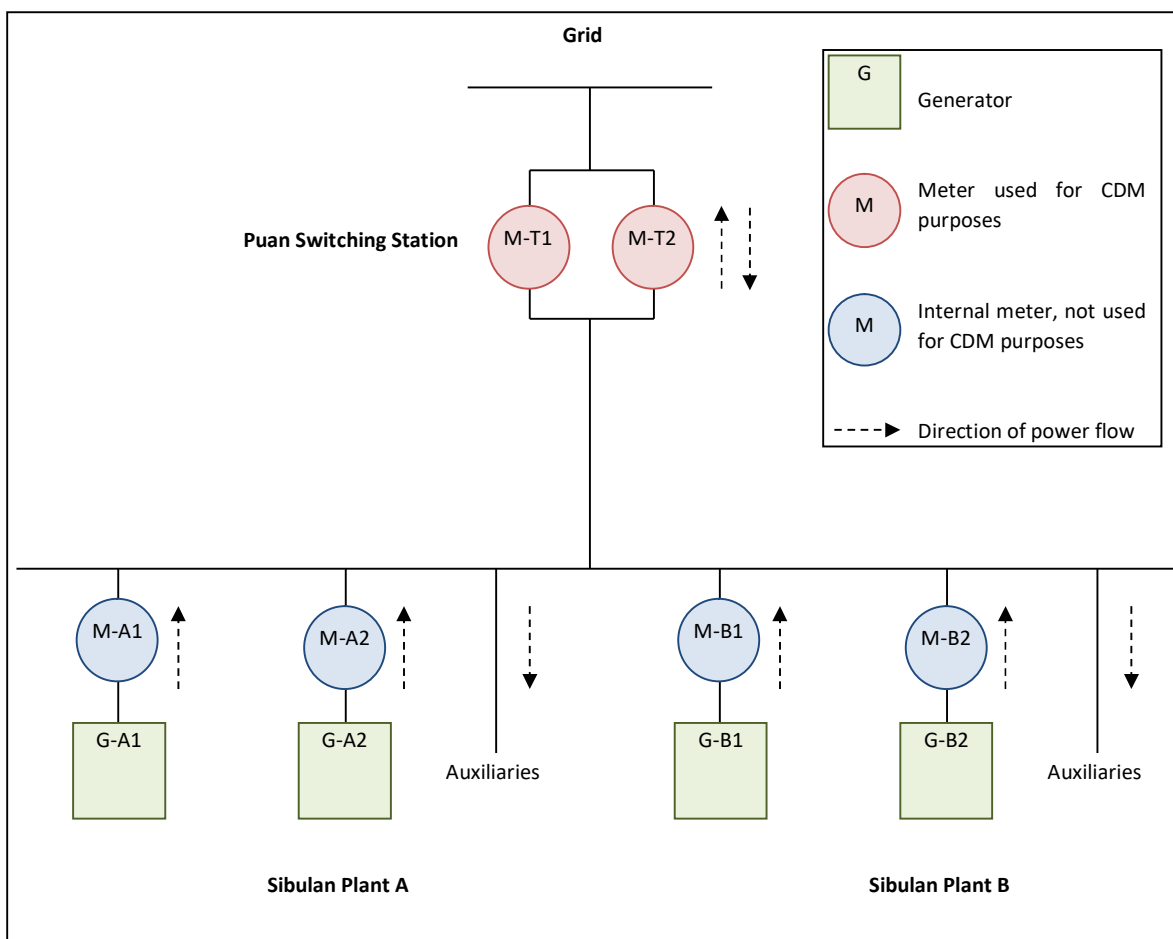


Figure 3: Simplified diagram of monitoring points

C.2. Organizational structure

Consistent with the registered CDM-PDD, an operational and administrative team as outlined below is responsible for monitoring and reporting. The team is composed of a Vice President of Operations, an Operations Manager as well as a group of engineers, operators, technicians and administrative staff.

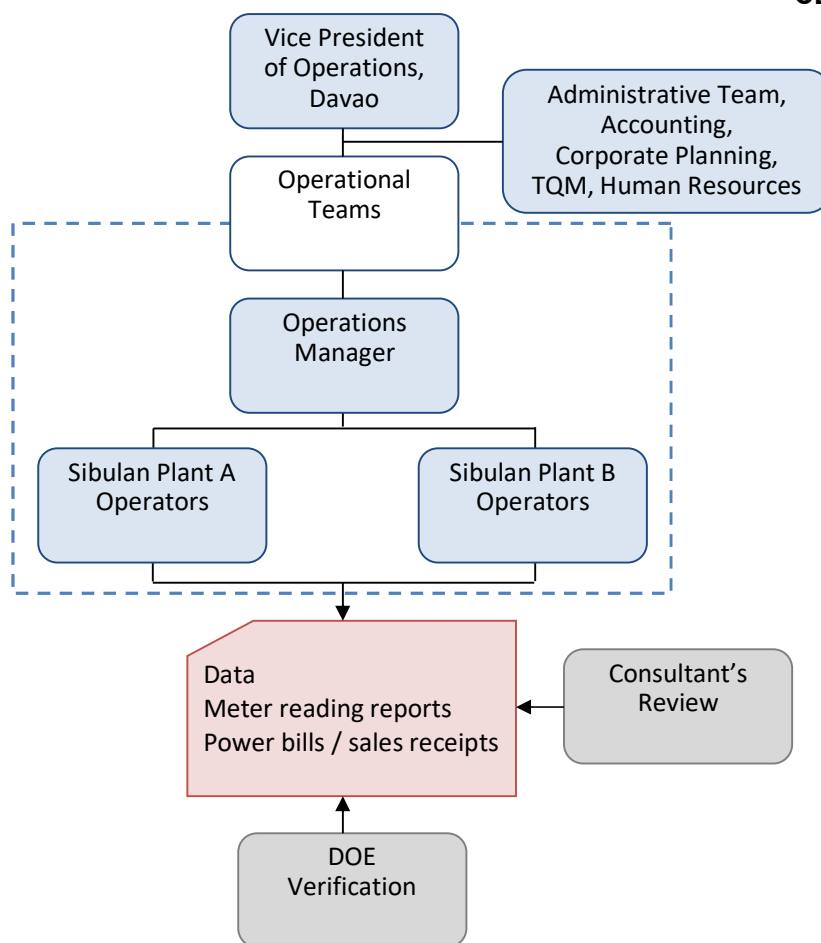


Figure 4: Operational and management structure for monitoring activity

The responsibilities of each team / person are summarized below.

Vice President of Operations, Davao: Final sign off on all data and QA/QC.

Administrative Team, Accounting Corporate Planning, TQM, Human Resources: These groups are all support teams, not directly related to operations and monitoring. However, much of the data for the purpose of double checking the monitored data is sourced here. For example, Accounting is responsible for interaction with DLP and final billing, where the invoice is an important part of QA/QC for the parameter EG_y. Also, Human Resource keeps a comprehensive database of personnel training.

Operations Manager: Oversight of the plants' operations, including managing the maintenance, continuous normal plant operations and maintaining the reliability of the plants.

Sibulan Plant A and B Operators: Responsible for day to day monitoring and reporting to management for any anomalous occurrences.

C.3. Data collection procedures

The collection of data is based on the billing reports submitted to the off-taker DLPC. The data in the billing reports is in turn based on the data downloaded from the revenue meter's internal memory, carried out by a National Grid Corporation of the Philippines (NGCP) representative in the presence of DLPC and HSI representatives. NGCP is the default metering services provider. All

data are recorded in accordance with the procedures and stored electronically in a systematic, transparent and traceable manner.

The Operational and Administrative Teams will review the data archived and submit a complete set of documentation, which indicates the calculation procedure as well as the ex-post emission reduction estimate to the Corporate Planning Department for internal verification on a monthly basis.

CDM trainings were provided to operators regularly throughout the monitoring period.

C.4 Emergency procedures for the monitoring system

The plant has a Standard Operation Procedure that is in line with ISO standards.

The electricity meter was replaced in accordance to the Philippines Grid Code. In any case that the records from main meter cannot be used, the data recorded by the backup meter will be used.

SECTION D. Data and parameters**D.1. Data and parameters fixed ex ante or at renewal of crediting period**

Data/parameter:	W_{OM}, W_{BM}	
Unit	Fraction	
Description	Weight of Operating Margin in the Combined Margin, weight of the Build Margin in the Combined Margin	
Source of data	ACM0002 Version 06	
Value(s) applied)	W _{OM}	0.5
	W _{BM}	0.5
Choice of data or measurement methods and procedures	Per methodology ACM0002 Version 06	
Purpose of data	Baseline emission calculations	
Additional comments	N/A	

Data/parameter:	CO₂ emission factor	
Unit	kgCO ₂ /TJ	
Description	CO ₂ emission factor of fuels	
Source of data	IPCC 2006 Volume 2 Table 2.2	
Value(s) applied)	Residual fuel oil	77,400
	Gas / diesel oil	74,100
	Coal (anthracite)	98,300
Choice of data or measurement methods and procedures	Accepted data source per methodology ACM0002 Version 06	
Purpose of data	Baseline emission calculations	
Additional comments	N/A	

Data/parameter:	NCV	
Unit	TJ/kt	
Description	NCV of fuels	
Source of data	Philippines Department of Energy	
Value(s) applied)	Residual fuel oil	43
	Gas / diesel oil	46
	Coal (anthracite)	23
Choice of data or measurement methods and procedures	Accepted data source per methodology ACM0002 Version 06 (national data)	
Purpose of data	Baseline emission calculations	
Additional comments	N/A	

Data/parameter:	Density	
Unit	kg/l	
Description	Density of fuels	

Source of data	Philippines Department of Energy	
Value(s) applied)	Residual fuel oil	0.94
	Gas / diesel oil	0.84
	Coal (anthracite)	1
Choice of data or measurement methods and procedures	Accepted data source per methodology ACM0002 Version 06 (national data)	
Purpose of data	Baseline emission calculations	
Additional comments	N/A	

D.2. Data and parameters monitored

Data/parameter:	Surface area at full reservoir level
Unit	m ²
Description	Surface area of the reservoir / head pond to show the level of project emissions
Measured/calculated/default	Measured
Source of data	HSI
Value(s) of monitored parameter	31,000m ² (Plant A = 16,900 m ² , Plant B = 14,100 m ²)
Monitoring equipment	N/A
Measuring/reading/recording frequency:	Once at the start of the project activity
Calculation method (if applicable):	N/A
QA/QC procedures:	N/A
Purpose of data:	Project emission calculations
Additional comments:	N/A

Data/parameter:	EG _y					
Unit	MWh					
Description	Electricity supplied to the grid by the Project					
Measured/calculated/default	Measured					
Source of data	HSI through DLPC					
Value(s) of monitored parameter	516,034					
Monitoring equipment	Electricity meters					
	Type	Accuracy Class	Serial Number	Calibration Frequency	Date of Last Calibration	Validity
	Main (AMETEK Ci20)	0.2	114525770	As per NGCP practice	03/14/2015	As per NGCP standard
	Alternative (ELSTER A3RALN)	0.2	15883083	As per NGCP practice	03/14/2015	As per NGCP standard
Measuring/reading/recording frequency:	Monitored continuously, recorded monthly					

Calculation method (if applicable):	N/A
QA/QC procedures:	The measured amount will be double checked against sales receipts. Meters are tested by NGCP as per their practice.
Purpose of data:	Baseline emission calculations
Additional comments:	N/A

Data/parameter:	EF_y
Unit	tCO ₂ /MWh
Description	CO ₂ emission factor of the grid
Measured/calculated/default	Calculated
Source of data	N/A (calculated)
Value(s) of monitored parameter	2010: 0.835 2011: 0.751 2012: 0.767
Monitoring equipment	N/A
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	$EF_y = w_{OM} \times EF_{OM,y} + w_{BM} \times EF_{BM,y}$, as per Equation 2 of Section E.1.
QA/QC procedures:	N/A
Purpose of data:	Baseline emission calculations
Additional comments:	N/A

Data/parameter:	EF_{OM,y}
Unit	tCO ₂ /MWh
Description	CO ₂ emission factor of set of plants in the Operating Margin
Measured/calculated/default	Calculated
Source of data	N/A (calculated)
Value(s) of monitored parameter	2010: 0.785 2011: 0.796 2012: 0.790
Monitoring equipment	N/A
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	$EF_{OM,y} = EF_{OM,simple_adjusted,y} = (1 - \lambda_y) \times \frac{\sum_{ij} F_{ij,y} \times COEF_{ij}}{\sum_j GEN_{j,y}} + \lambda_y \times \frac{\sum_{ik} F_{ik,y} \times COEF_{ik}}{\sum_k GEN_{k,y}}$, as per Equation 3 of Section E.1.1.
QA/QC procedures:	N/A
Purpose of data:	Baseline emission calculations
Additional comments:	N/A

Data/parameter:	EF_{BM,y}
Unit	tCO ₂ /MWh
Description	CO ₂ emission factor of set of plants in the Build Margin
Measured/calculated/default	Calculated
Source of data	N/A (calculated)
Value(s) of monitored parameter	2010: 0.886 2011: 0.706 2012: 0.745

Monitoring equipment	N/A
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	$EF_{BMF} = \frac{\sum_m F_{i,m,y} \times COEF_{i,m}}{\sum_m GEN_{m,y}}$, as per Equation 3 of Section E.1.2.
QA/QC procedures:	N/A
Purpose of data:	Baseline emission calculations
Additional comments:	N/A

Data/parameter:	F _{i,y}				
Unit	Mass or volume				
Description	Amount of fuel consumed type i consumed by each power source / plant				
Measured/calculated/default	Measured and Calculated				
Source of data	Philippines Department of Energy, CDM Baseline Construction for The Electricity Grids in the Philippines, <i>Tool to calculate the emission factor for an electricity system</i>				
Value(s) of monitored parameter	Method A: Host country data				
	Source	Fuel consumed 2010 (L or t)	Fuel consumed 2011 (L or t)	Fuel consumed 2012 (L or t)	
	Residual fuel oil	1,013	51	165	
	Gas / diesel oil	360,073	246,162	297,221	
	Coal (anthracite)	698,180	658,943	682,191	
	Method B: <i>Tool to calculate the emission factor for an electricity system</i>				
	Source	Fuel consumed 2010 (L or t)	Fuel consumed 2011 (L or t)	Fuel consumed 2012 (L or t)	
	Residual fuel oil	1,030	51	168	
	Gas / diesel oil	353,986	242,001	292,197	
	Coal (anthracite)	686,377	647,804	670,658	
	For conservatism, the fuel consumption based on host country data and the default efficiencies in the <i>Tool to calculate the emission factor for an electricity system</i> were compared, and the lower (Method B) taken for the CER calculations.				
	Monitoring equipment	N/A			
	Measuring/reading/recording frequency:	Annually			
	Calculation method (if applicable):	N/A			
QA/QC procedures:	N/A				
Purpose of data:	Baseline emission calculations				
Additional comments:	N/A				

Data/parameter:	COEF_i
Unit	tCO ₂ / unit fuel
Description	CO ₂ emission coefficient of each fuel type i
Measured/calculated/default	Calculated
Source of data	IPCC, Philippines Department of Energy

Value(s) of monitored parameter	Source	CO ₂ emission factor (kgCO ₂ /L or t) for 2010, 2011 and 2012
	Residual fuel oil	3,554.69
	Gas / diesel oil	4,023.25
	Coal (anthracite)	2,281.54
Monitoring equipment	N/A	
Measuring/reading/recording frequency:	Annually	
Calculation method (if applicable):	N/A	
QA/QC procedures:	N/A	
Purpose of data:	Baseline emission calculations	
Additional comments:	N/A	

Data/parameter:	GEN_{j/k/n,y}			
Unit	MWh			
Description	Electricity generation of each power source / plant <i>j</i> , <i>k</i> or <i>n</i>			
Measured/calculated/default	Measured			
Source of data	Philippines Department of Energy			
Value(s) of monitored parameter		2010	2011	2012
	GEN _{j,y}	3,813,089	3,052,537	3,405,835
	GEN _{k,y}	4,589,680	5,650,113	5,721,036
Monitoring equipment	N/A			
Measuring/reading/recording frequency:	Annually			
Calculation method (if applicable):	N/A			
QA/QC procedures:	N/A			
Purpose of data:	Baseline emission calculations			
Additional comments:	N/A			

Data/parameter:	Plant name (OM)
Unit	Text
Description	Power source / plant for constituting the Operating Margin
Measured/calculated/default	Measured
Source of data	Philippines Department of Energy

Value(s) of monitored parameter	Source (j or k)	Plant type	Plant name		
			2010 & 2011	2012	
		j	Coal	Mindanao Coal I Mindanao Coal II	Mindanao Coal I Mindanao Coal II
j		Diesel	Mindanao Energy Systems 1 Cotabato Light Davao Light (Bajada DPP) Gen Santos (SPPC) PB104 Power Barge 117 Power Barge 118 Western Mindanao Power Corp NMPC I (Iligan Diesel Plant) NMPC II	Mindanao Energy Systems 1 Mindanao Energy Systems 2 Cotabato Light Davao Light (Bajada DPP) King Energy Gen Santos (SPPC) PB104 Power Barge 117 Power Barge 118 Western Mindanao Power Corp NMPC I (Iligan Diesel Plant) NMPC II	
j		Residual fuel oil			
k		Geothermal	Mindanao I (Mt. Apo) Mindanao II (Mt. Apo)	Mindanao I (Mt. Apo) Mindanao II (Mt. Apo)	
k		Hydro	Agus 1 Unit 1 Agus 1 Unit 2 Agus 2 Agus 4 Agus 5 Agus 6 Agus 7 Pulangi 4 Agusan Bubunawan Talomo HEPP Balactasan Kumalarang Mountain View Matling	Agus 1 Unit 1 Agus 1 Unit 2 Agus 2 Agus 4 Agus 5 Agus 6 Agus 7 Pulangi 4 Agusan Bubunawan Talomo HEPP Balactasan Kumalarang Mountain View Matling	
k		Solar	Solar Photovoltaic	Solar Photovoltaic	
k		Biomass		Crystal Sugar	
Monitoring equipment				N/A	
Measuring/reading/recording frequency:				Annually	
Calculation method (if applicable):				N/A	
QA/QC procedures:				N/A	
Purpose of data:				Baseline emission calculations	
Additional comments:				N/A	

Data/parameter:	Plant name (BM)
Unit	Text
Description	Power source / plant for constituting the Build Margin
Measured/calculated/default	Measured

Source of data	Philippines Department of Energy																																																				
Value(s) of monitored parameter	<table border="1"> <tr><td colspan="2">2010</td></tr> <tr><td>Plant type</td><td>Plant name</td></tr> <tr><td>Hydro</td><td>Bubunawan</td></tr> <tr><td>Solar</td><td>Solar Photovoltaic</td></tr> <tr><td>Diesel</td><td>PB104</td></tr> <tr><td>Coal</td><td>Mindanao Coal I</td></tr> <tr><td>Coal</td><td>Mindanao Coal II</td></tr> </table> <table border="1"> <tr><td colspan="2">2011</td></tr> <tr><td>Plant type</td><td>Plant name</td></tr> <tr><td>Geothermal</td><td>MAGPP II</td></tr> <tr><td>Hydro</td><td>Bubunawan</td></tr> <tr><td>Solar</td><td>Solar Photovoltaic</td></tr> <tr><td>Diesel</td><td>PB104</td></tr> <tr><td>Coal</td><td>Mindanao Coal I</td></tr> <tr><td>Coal</td><td>Mindanao Coal II</td></tr> </table> <table border="1"> <tr><td colspan="2">2012</td></tr> <tr><td>Plant type</td><td>Plant name</td></tr> <tr><td>Geothermal</td><td>MAGPP II</td></tr> <tr><td>Hydro</td><td>Bubunawan</td></tr> <tr><td>Solar</td><td>Solar Photovoltaic</td></tr> <tr><td>Diesel</td><td>PB104</td></tr> <tr><td>Coal</td><td>Mindanao Coal I</td></tr> <tr><td>Coal</td><td>Mindanao Coal II</td></tr> <tr><td>Diesel</td><td>Mindanao Energy System 2</td></tr> <tr><td>Diesel</td><td>King Energy</td></tr> <tr><td>Biomass</td><td>Crystal Sugar</td></tr> </table>	2010		Plant type	Plant name	Hydro	Bubunawan	Solar	Solar Photovoltaic	Diesel	PB104	Coal	Mindanao Coal I	Coal	Mindanao Coal II	2011		Plant type	Plant name	Geothermal	MAGPP II	Hydro	Bubunawan	Solar	Solar Photovoltaic	Diesel	PB104	Coal	Mindanao Coal I	Coal	Mindanao Coal II	2012		Plant type	Plant name	Geothermal	MAGPP II	Hydro	Bubunawan	Solar	Solar Photovoltaic	Diesel	PB104	Coal	Mindanao Coal I	Coal	Mindanao Coal II	Diesel	Mindanao Energy System 2	Diesel	King Energy	Biomass	Crystal Sugar
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Calculation method (if applicable):	N/A																																																				
QA/QC procedures:	N/A																																																				
Purpose of data:	Baseline emission calculations																																																				
Additional comments:	N/A																																																				

Data/parameter:	λ_y
Unit	Fraction
Description	Fraction of time during which low-cost/must-run resources are on the margin
Measured/calculated/default	Measured and calculated
Source of data	NGCP, Philippines Department of Energy, CDM Baseline Construction for The Electricity Grids in the Philippines
Value(s) of monitored parameter	2010 = 0 (no intersection) 2011 = 0.009 2012 = 0.005
Monitoring equipment	N/A
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	As per steps (i) – (iv) in Section E.1.1, which follows ACM0002 Version 06.
QA/QC procedures:	N/A
Purpose of data:	Baseline emission calculations

Additional comments:	N/A
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Data/parameter:	GEN_{j/k/n,y_IMPORTS}
Unit	MWh
Description	Electricity imports to the project electricity system
Measured/calculated/default	Measured
Source of data	Philippines Department of Energy
Value(s) of monitored parameter	2010 = 0 2011 = 0 2012 = 0
Monitoring equipment	Baseline emission calculations
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures:	N/A
Purpose of data:	Baseline emission calculations
Additional comments:	N/A

Data/parameter:	COEF_{i,j,y_IMPORTS}
Unit	tCO ₂ /mass or volume unit
Description	CO ₂ emission coefficient of fuels used in connected electricity system (if imports occur)
Measured/calculated/default	Measured
Source of data	Philippines Department of Energy
Value(s) of monitored parameter	N/A (no imports) for 2010, 2011 and 2012
Monitoring equipment	Baseline emission calculations
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures:	N/A
Purpose of data:	Baseline emission calculations
Additional comments:	N/A

D.3. Implementation of sampling plan

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SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

Consistent with ACM0002 Version 06 and the registered CDM-PDD, the baseline emissions BE_y are calculated as:

Equation 1

$$BE_y = EG_y \times EF_y$$

where:

EG_y = Electricity supplied to the grid by the Project in year y (MWh);

EF_y = Emission factor for grid electricity for year y (tCO₂/MWh).

The grid emission factor, EF_y , is calculated as the Combined Margin emission factor, which is the weighted average of the Operating Margin emission factor and the Build Margin emission factor, as follows.

Equation 2

$$EF_y = w_{OM} \times EF_{OM,y} + w_{BM} \times EF_{BM,y}$$

where:

w_{OM} = Weight of Operating Margin in the Combined Margin;

w_{BM} = Weight of Build Margin in the Combined Margin;

$EF_{OM,y}$ = Emission factor of set of plants in the Operating Margin in year y (tCO₂/MWh);

$EF_{BM,y}$ = Emission factor of set of plants in the Build Margin in year y (tCO₂/MWh).

As per the registered CDM-PDD, both the Operating Margin and Build Margin emission factors are to be monitored and determined *ex post*. The steps and values are delineated in the ensuing sections.

E.1.1. Calculation of the Operating Margin ($EF_{OM,y}$)

For the Operating Margin, consistent with the registered CDM-PDD, the Simple Adjusted OM is applied and is calculated according to the following formula.

Equation 3

$$EF_{OM,y} = EF_{OM, \text{simple_adjusted}, y} = (1 - \lambda_y) \times \frac{\sum_{i,j} F_{i,j,y} \times COEF_{i,j}}{\sum_j GEN_{j,y}} + \lambda_y \times \frac{\sum_{i,k} F_{i,k,y} \times COEF_{i,k}}{\sum_k GEN_{k,y}}$$

where:

λ_y = Fraction of time during which low-cost/must-run resources are on the margin in year y (fraction);

$F_{i,j,y}$ = Amount of fuel consumed by relevant power sources j in year y , where j refers to the power sources in the grid excluding low-cost/must-run power plants and including any imports to the grid;

$F_{i,k,y}$ = Amount of fuel consumed by relevant power sources k in year y , where k refers to the low-cost/must-run power sources in the grid;

$COEF_{i,j}$ = CO₂ emission coefficient of fuel i used in power sources j (tCO₂/mass or volume unit);

$COEF_{i,k}$ = CO₂ emission coefficient of fuel i used in power sources k (tCO₂/mass or volume unit);

$GEN_{j,y}$ Electricity supplied to the grid by source j (MWh);
 $GEN_{k,y}$ Electricity supplied to the grid by source k (MWh).

$EF_{OM,simple_adjusted,y}$ is calculated based on 2010, 2011 and 2012^{1,2} data, as follows:

Step (i) Plot a Load Duration Curve

The hourly system load data was collected and sorted from highest to lowest MW level. This is then plotted against 8,760 hours in the year, in descending order.

Table 3: Extract of hourly system load for Mindanao grid in 2010

Hour	Date (mm/dd/yyyy)	Time (hh:mm)	System Load (MW)
1	12/2/2010	18:00	1,287.78
2	11/23/2010	18:00	1,286.27
3	12/13/2010	18:00	1,278.77
<hr/>			
8,758	4/2/2010	08:00	603.60
8,759	8/13/2010	14:00	601.84
8,760	4/2/2010	07:00	593.60

Table 4: Extract of hourly system load for Mindanao grid in 2011

Hour	Date (mm/dd/yyyy)	Time (hh:mm)	System Load (MW)
1	21/12/2011	18:00	1,297
2	27/10/2011	18:00	1,282
3	14/12/2011	18:00	1,281
<hr/>			
8679	24-04-11	8:00	647
8680	18-02-11	3:00	645
8681	22-04-11	10:00	645
<hr/>			
8758	23-04-11	2:00	543
8759	22-04-11	8:00	539
8760	22-04-11	7:00	514

Table 5: Extract of hourly system load for Mindanao grid in 2012

Hour	Date (mm/dd/yyyy)	Time (hh:mm)	System Load (MW)
1	19-12-12	18:00	1257
2	14-06-12	19:00	1252
3	20-09-12	18:00	1251
<hr/>			
8742	01-01-12	10:00	652
8743	06-12-12	4:00	652
8744	25-12-12	6:00	650
<hr/>			
8782	05-12-12	1:00	503

¹ Requested and obtained from National Grid Corporation of the Philippines

² Full data set submitted to DOE during verification

8783	05-12-12	4:00	503
8784	04-12-12	13:00	478

Based on the above, the load duration curve is plotted. The curves for 2010, 2011 and 2012 are shown below.

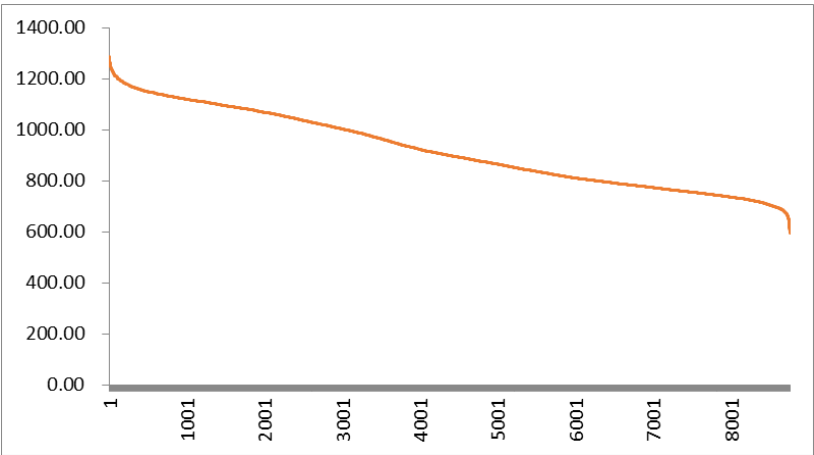


Figure 5: Load duration curve (1) for Mindanao grid in 2010

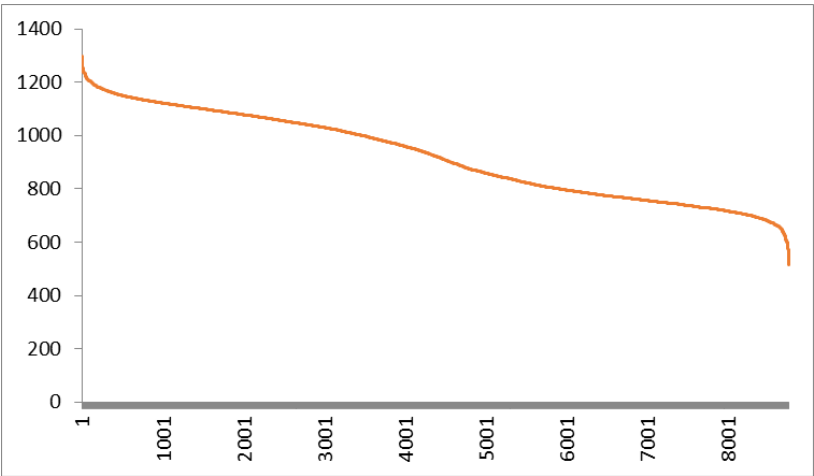


Figure 6: Load duration curve (1) for Mindanao grid in 2011

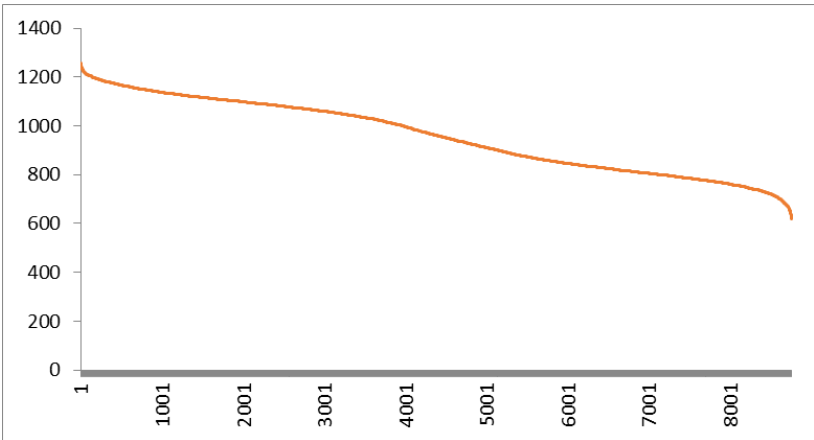


Figure 7: Load duration curve (1) for Mindanao grid in 2012

Step (ii) Organize data by generating sources

The annual generation from low-cost/must-run resources ($\sum_k GEN_{k,y}$) is deduced from the following grid data.

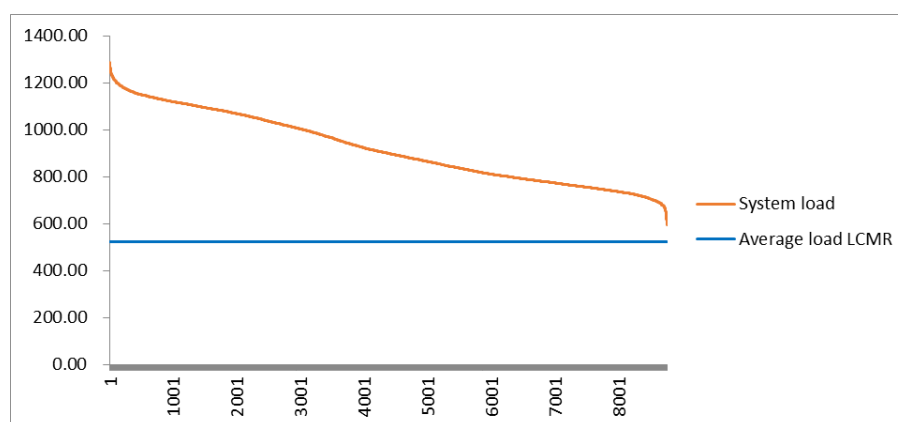
Table 6: Annual power generation for Mindanao grid in 2010, 2011 and 2012^{3,4}

Plant Type	Annual Power Generation (MWh)		
	2010	2011	2012
Coal	1,725,839	1,628,848	1,686,314
Oil-based			
Diesel	2,082,124	1,423,433	1,718,684
Oil	5,126	256	837
Geothermal	834,439	840,956	731,089
Hydro	3,753,987	4,807,945	4,913,491
Solar	1,254	1,212	1,320
Biomass	-	-	75,136
Total	8,402,769	8,702,650	9,126,871
Total LCMR	4,589,680	5,650,113	5,721,036

Consistent with ACM0002, hydro and geothermal, solar and biomass power sources were deemed to be low-cost/must-run resources. Generation from these plants totalled 4,589,680MWh, 5,650,113MWh and 5,721,036MWh in 2010, 2011 and 2012 respectively.

Step (iii) Fill Load Duration Curve

The average load (in MW) from low-cost/must-run resources in a year is calculated by dividing the total generation from low-cost/must-run resources, determined in Step (ii) as 4,589,680MWh, 5,650,113MWh and 5,721,036MWh in 2010, 2011 and 2012 respectively, by 8,760 hours of the year. This gives an average load of 524MW in 2010, 645MW in 2011 and 651MW in 2012s.

**Figure 8: Load duration curve (2) for Mindanao grid in 2010**

³ Philippines Department of Energy, www.doe.gov.ph

⁴ As per AM_CLA_0038, the data from the year previous to generation is used

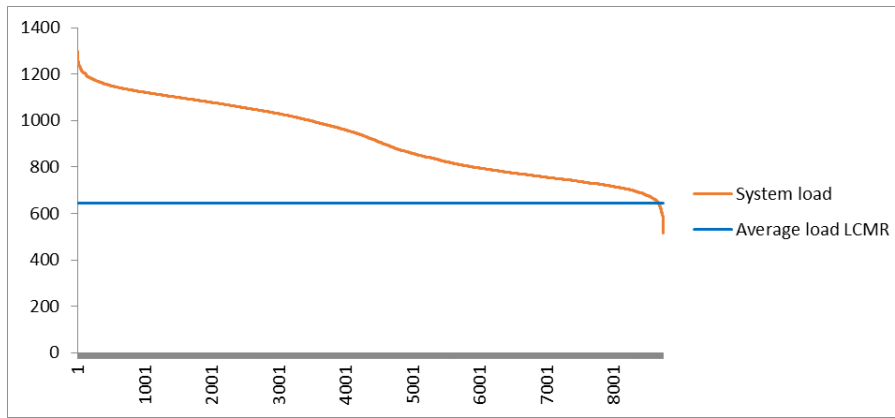


Figure 9: Load duration curve (2) for Mindanao grid in 2011

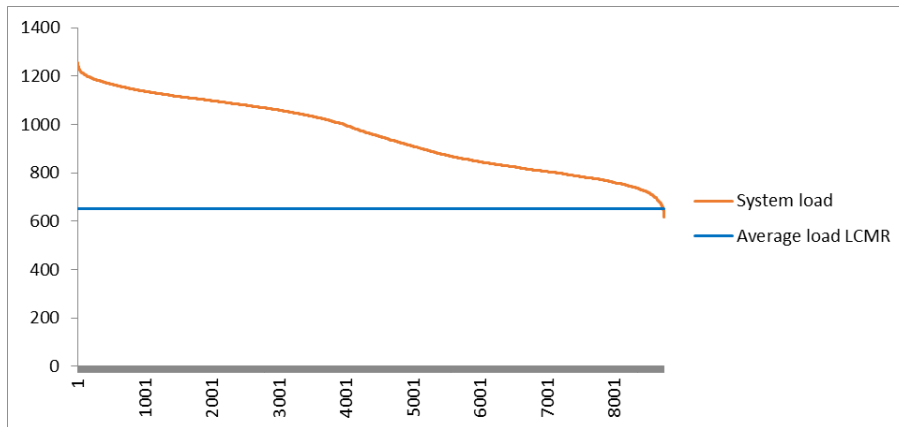


Figure 10: Load duration curve (2) for Mindanao grid in 2012

Step (iv) Determine the number of hours per year for which low-cost/must-run sources are on the margin.

The fraction of time during which low-cost/must-run resources are marginal is the number of hours to the right of the intersection of the two lines as shown for 2011 and 2012 in Figure 9 and Figure 10 respectively. As the lines intersect at the 8,680th hour in 2011 and 8,743th hour in 2012, the low-cost/must-run resources are considered to be marginal for 80 hours (8,760 hours – 8,680 hours) of the year 2011 and 41 hours (8,784 hours – 8,743 hours) of the year 2012. This is divided by the total number of hours in the year to obtain λ_y , which is 0.009 and 0.005 in 2011 and 2012 respectively. For 2010, the lines do not intersect. Hence, λ_y for 2010 is 0.

The next step is to calculate the Simple Adjusted OM emission factor using Equation 3. As the power sources k – low-cost/must-run plants – consist of hydro, geothermal and solar resources, emission from this source is considered zero. Therefore, Equation 3 can be simplified to the following.

Equation 4

$$EF_{OM,simple_adjusted,y} = (1 - \lambda_y) \times \frac{\sum_{ij} F_{ij,y} \times COEF_{ij}}{\sum_j GEN_{j,y}}$$

Table 7: 2012 statistics for fossil fuel fired plants in Mindanao grid

Plant Type	Annual Power Generation (MWh)			Fuel Consumption (TJ)		
	2010	2011	2012	2010	2011	2012
Coal	1,725,839	1,628,848	1,686,314	15,931	15,036	15,566
Oil-based						
Diesel	2,082,124	1,423,433	1,718,684	19,220	13,139	15,865
Oil	5,126	256	837			
Total	3,813,089	3,052,537	3,405,835	47	2	8

The above data is used in conjunction with IPCC values as provided in Section D.1, to obtain a weighted average emission factor of 0.785 tCO₂/MWh. Adjusting for $\lambda_y = 0$ the Simple Adjusted OM emission factor is:

$$EF_{OM, simple_adjusted, y} = (1-0) \times 0.785 \text{ tCO}_2/\text{MWh} \\ = 0.785 \text{ tCO}_2/\text{MWh}$$

Repeating the same steps for 2011 and 2012 gives 0.796 tCO₂/MWh and 0.790 tCO₂/MWh respectively.

E.1.2. Calculation of the Build Margin ($EF_{BM, y}$)

The Build Margin is calculated as the generation-weighted average emission factor of a sample of power plants m , as follows.

Equation 5

$$EF_{BM, y} = \frac{\sum_{i,m} F_{i,m,y} \times COEF_{i,m}}{\sum_m GEN_{m,y}}$$

where

- $F_{i,m,y}$ Amount of fuel consumed by sample group m in year y , where sample group m consists of either the five power plants that have been built most recently, or the power plant capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently;
- $COEF_{i,m}$ CO₂ emission coefficient of fuel i used in sample group m (tCO₂/mass or volume unit);
- $GEN_{m,y}$ Electricity supplied to the grid by sample group m (MWh).

As can be seen in Table 8, the five newest plants represent 20% of the total grid power generation.

Table 8: Build Margin power plants⁵

Plant Name	Year Commissioned	Power Generation (MWh)			Fuel Consumption (L or t)		
		2010 ⁶	2011 ⁷	2012 ⁸	2010	2011	2012
MAGPPII	1999	401,346	390,626	295,285	0	0	0
Bubunawan Hydro	2001	23,952	20,651	0	0	0	0

⁵ Philippines Department of Energy

⁶ No publicly available generation data for "Bubunawan Hydro", "Solar Photovoltaic" and "PB104" plants. For the most conservative estimate theoretically possible, assumed maximum load for the first two renewable plants, and zero load for PB104 diesel plant.

⁷ No publicly available generation data for "Bubunawan Hydro", "Solar Photovoltaic" and "PB104" plants. For the most conservative estimate theoretically possible, assumed maximum load for the first two renewable plants, and zero load for PB104 diesel plant.

⁸ No publicly available generation data for "PB104", "Mindanao Energy System 2" and "King Energy" plants. For the most conservative estimate theoretically possible, assumed zero load for the three diesel plants.

CDM-MR-FORM							
Solar Photovoltaic PB104	2004	1,254	1,190	1,299	0	0	0
	2005	48,017	30,898	24,828	8,163	5,253	4,221
Mindanao Coal I	2006	1,550,014	1,458,429	1,514,351	616,451	580,027	602,267
Mindanao Coal II	2006						
Sibulan Hydro (the Project)	2010	N/A	N/A	N/A	N/A	N/A	N/A
Mindanao Energy System 2	2012			39,921			6,787
King Energy	2012			2,264			385
Crystal Sugar	2012			27,053			0
Total Generation		1,623,237	1,901,794	1,905,005			
% Total Grid Generation		20.3%	22.9%	22.0%			

The CO₂ emission factor for the Build Margin is calculated in the same manner as the Operating Margin. The Build Margin is therefore 0.886 tCO₂/ MWh for 2010, 0.706 tCO₂/ MWh for 2011 and 0.745 for 2012.

E.1.3. Calculate the baseline emission factor (EF_y)

The baseline emission factor is calculated as the Combined Margin, which is the weighted average of the Operating Margin and Build Margin emission factors, as given in Equation 2. Default weightings of 50% each, as given in Section D.1, are used.

The simple average of 0.785 tCO₂/MWh and 0.886 tCO₂/MWh is 0.835 tCO₂/MWh. The baseline emission factor is therefore 0.835 tCO₂ / MWh for year 2010. For 2011 and 2012, the simple average results in 0.751 tCO₂ / MWh and 0.767 tCO₂ / MWh respectively.

E.1.4. Calculate baseline emissions (BE_y)

The baseline emission is calculated by multiplying the electricity supplied by the Project to the grid with the baseline grid emission factor, as per Equation 1.

Since the Sibulan plants supplied 516,034 MWh of electricity during this monitoring period, the total baseline emissions is 400,181 tCO₂

E.2. Calculation of project emissions or actual net GHG removals by sinks

According to ACM0002, project emissions may arise for hydro power projects with new reservoirs. The Project is run-of-the-river type that does not require a reservoir. It only has small head ponds for the purpose of regulating daily output. The size of these head ponds are such that no project emissions need to be accounted for, as shown in the following table.

Table 9: Power density of the Sibulan plants

Plant	Installed Capacity (MW)	Head Pond Surface Area (m ²)	Power Density (W/m ²)
Plant A	16.5	16,900	976
Plant B	26	14,100	1,844
Total	42.5	31,000	1,370

The power density of the Project is well over 10W/m². Therefore, there are no associated project emissions.

E.3. Calculation of leakage

ACM0002 Version 06 stipulates that neither positive nor negative leakage in relation to activities such as power plant construction, fuel handling and land inundation are not to be accounted for. No leakage is associated with the Project.

E.4. Summary of calculation of emission reductions or net GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	GHG emission reductions or net GHG removals by sinks (t CO ₂ e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	400,181	0	0	0	400,181	400,181

E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO ₂ e)	252,407 (adjusted to 968 days)	400,181

E.6. Remarks on difference from estimated value in registered PDD

A significant difference in CERs between the estimated value in the PDD and MR has consistently been observed for the Project, i.e. for the first, second and this (third) monitoring period. For the third monitoring period, as can be seen in Section E.5, the amount of CERs in the MR is greater than the PDD estimate by 59%.

The CER amount is a product of (a) the electricity supplied to the grid by the Project (EGy) and (b) the CO₂ emission factor of the grid (EFy), where for the 32-month monitoring period:

(a) The electricity supplied to the grid by the Project was lower than the estimated performance in the PDD by 7%.

(b) The CO₂ emission factor of the grid, which is to be monitored *ex post* as per the registered PDD, increased significantly – by 70% – largely due to the commissioning of two large coal plants in Mindanao.

The 7% decrease in electricity generation as compared to the PDD is well within the sensitivity analysis conducted in the PDD, and considering that the overall actual electricity generation for the crediting period thus far also averages to be -7%, can be considered negligible. Consistent with previous monitoring periods, the increase in CERs can almost solely be explained by the change in the grid emission factor, which in no way affects the Project's additionality. Hence, no further discussion is made.

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Hedcor Sibulan Inc.
Street/P.O. Box	1 Ladislawa, Ladislawa Avenue, Buhangin
Building	
City	Davao City
State/region	Region 11
Postcode	8000
Country	Republic of the Philippines
Telephone	+63 82 222 4839
Fax	+63 82 221 5346
E-mail	inquiry@hedcor.com
Website	http://www.hedcor.com
Contact person	
Title	
Salutation	Ms.
Last name	Arguelles
Middle name	
First name	Darlene
Department	
Mobile	
Direct fax	
Direct tel.	+63 424 4763
Personal e-mail	darlene.arguelles@aboitiz.com

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Klinkenberg Traders B.V.
Street/P.O. Box	Beursplein 5
Building	
City	Amsterdam
State/region	
Postcode	1012 JW
Country	Netherlands
Telephone	+31 20 5782054
Fax	+31 20 5782054
E-mail	info@ktraders.nl
Website	www.ktraders.nl
Contact person	Adrianus Klinkenberg
Title	
Salutation	Mr.
Last name	Klinkenberg
Middle name	
First name	Adrianus
Department	
Mobile	
Direct fax	+31 20 5782054
Direct tel.	+31 20 5782054
Personal e-mail	

Project participant and/or responsible person/ entity	<input type="checkbox"/> Project participant <input checked="" type="checkbox"/> Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	Carbon Partners Asiatica
Street/P.O. Box	11 Canton Road
Building	World Commerce Centre
City	Tsim Sha Tsui
State/Region	Kowloon
Postcode	
Country	Hong Kong S.A.R.
Telephone	+852-3101-0131
Fax	+852-3622-1360
E-mail	
Website	www.cp-asiatica.com
Contact person	
Title	Chief Carbon Advisor
Salutation	Ms.
Last name	Tochikawa
Middle name	
First name	Kyoko
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	kyoko.tochikawa@cp-asiatica.com

Attachment. Instructions for filling out the monitoring report form

1. General instructions

1. When monitoring the project activity and completing the CDM-MR-FORM, in addition to following the the "[CDM Project standard](#)" (Project standard), the applied approved baseline and monitoring [methodology\(ies\)](#) (hereinafter referred to as the applied methodology(ies)) and, where applicable, the applied approved [standardized baseline\(s\)](#) (hereinafter referred to as the applied standardized baseline(s)), consult the "[Rules and Reference](#)" section of the UNFCCC CDM website. This section contains all regulatory documents for the CDM, such as [standards](#) (including [methodologies](#), [tools](#) and [standardized baselines](#)), [procedures](#), [guidelines](#), [clarifications](#), [forms](#) and the "[Glossary: CDM terms](#)". Make any data, values and formulae included in electronic spreadsheets provided accessible and verifiable.
2. Complete the CDM-MR-FORM and all attached documents in English, or include a full translation of relevant sections in English.
3. Complete the CDM-MR-FORM using the same format without modifying its font, headings or logo, and without any other alteration to the form.
4. Do not modify or delete tables and their columns in the CDM-MR-FORM. Add rows to the tables as needed. Add additional appendices as needed.
5. If a section of the CDM-MR-FORM is not applicable, explicitly state that the section is left blank intentionally.
6. Use an internationally recognized format for presentation of values in the CDM-MR-FORM, for example use digit grouping in thousands and mark a decimal point with a dot (.), not with a comma (,).
7. Complete the CDM-MR-FORM deleting this "Attachment: Instructions for filling out the monitoring report form".

2. Specific instructions

1. Indicate on the cover page the following information:
 - (a) Title of the project activity;
 - (b) Reference number of the project activity;
 - (c) Version number of the monitoring report;
 - (d) Completion date of the monitoring report (DD/MM/YYYY);
 - (e) Monitoring period number and duration of this monitoring period. The monitoring period number is an ordinal number referring to the chronological order of monitoring periods (e.g. "first monitoring period"). For the monitoring period dates, first and last days are included (DD/MM/YYYY – DD/MM/YYYY);
 - (f) Project participant(s);
 - (g) Host Party;
 - (h) Sectoral scope(s). List all sectoral scopes applicable to the project activity;
 - (i) Selected methodology(ies). List all the selected methodologies and combination of methodologies applicable to the project activity;
 - (j) Selected standardized baseline(s). List all the selected standardized baseline applicable to the project activity;
 - (k) Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD;
 - (l) Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period - GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012 (if applicable); GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards (if applicable).

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

1. Provide a brief summary of the detailed description given in section B.1 in terms of:
 - (a) Purpose of the project activity and the measures taken for GHG emission reductions or net GHG removals by sinks;
 - (b) Brief description of the installed technology and equipment;
 - (c) Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.);
 - (d) Total GHG emission reductions or net GHG removals by sinks achieved in this monitoring period.

A.2. Location of project activity

1. Provide the following information on the location of the project activity:
 - (a) Host Party;
 - (b) Region/state/province, etc.;
 - (c) City/town/community, etc.;
 - (d) Physical/geographical location.

A.3. Parties and project participant(s)

1. List in the table Party(ies) and project participant(s) involved in the project activity.

A.4. Reference of applied methodology and standardized baseline

1. Indicate the exact reference (number, title, version) of:
 - (a) The applied methodology(ies) (e.g. ACM0001: "Large-scale consolidated methodology: Flaring or use of landfill gas" (version 15.0));
 - (b) Any tools and other methodologies to which the applied methodology(ies) refers (e.g. "Methodological tool: Tool for the demonstration and assessment of additionality" (version 07.0.0));

- (c) The applied standardized baseline(s), where applicable (e.g. ASB0001 "Standardized baseline: Grid emission factor for the Southern African power pool" (version 01.0)).
2. Refer to the UNFCCC CDM website for the exact reference of the applied methodologies, tools and standardized baselines.

A.5. Crediting period of project activity

1. Provide the type, start date and length of the crediting period corresponding to this monitoring period.

A.6. Contact information of responsible persons/entities

1. Provide contact information of the person(s)/entity(ies) responsible for completing the CDM-MR-FORM and indicate whether the person(s)/entity(ies) is(are) also a project participant(s) in Appendix 1

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

1. Provide information on the implementation status of the project activity during this monitoring period in accordance with the applicable provision for description of implemented registered CDM project activity in the Project standard.
2. For the description of the installed technology(ies), technical process and equipment, include diagrams, where appropriate.
3. If applicable, present information on any request for prior approval by the Board of changes to the registered CDM project activity in section B.2.1, B.2.2, B.2.3, B.2.4, B.2.5 and/or B.2.6.

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

1. Indicate whether any temporary deviations have been applied during this monitoring period. If applied, provide a description of the deviation(s) in accordance with applicable provisions for temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baseline in the Project standard.
2. Include the reasons for the deviation(s), how it deviates from the monitoring plan, applied methodology(ies) and/or applied standardized baseline, the duration for which the deviation(s) is(are) applicable and justification on the conservativeness of the approach.
3. For deviation(s) that require prior approval by the Board, include the date of approval and reference number. Otherwise, provide the version number and the completion date of the revised PDD and DOE assessment opinion on the request for post-registration changes that is being submitted with this monitoring report.

B.2.2. Corrections

1. Indicate whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report.
2. In cases where the correction(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD and the DOE assessment opinion on the request for post-registration changes that is being submitted with this monitoring report.

B.2.3. Changes to start date of crediting period

1. Indicate whether any changes to the start date of the crediting period have been approved during this monitoring period or submitted with this monitoring report.
2. In cases where the changes and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

1. Indicate whether the inclusion of a monitoring plan into the PDD for which the delayed submission of the monitoring plan was chosen by the project participants at the time of the registration of the project activity, has been approved by the Board prior to the submission of this monitoring report or is being submitted together with this monitoring report.
2. If the inclusion of a monitoring plan into the registered PDD has been approved by the Board prior to the submission of this monitoring report, provide the date of approval and reference number.

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

1. Indicate whether any permanent changes from the registered monitoring plan, applied methodologies or applied standardized baseline have been approved during this monitoring period or submitted with this monitoring report.
2. In cases where the change(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD and DOE assessment opinion on the request for post-registration changes that is being submitted with this monitoring report.

B.2.6. Changes to project design of registered project activity

1. Indicate whether any changes to the project design of the project activity have been approved during this monitoring period or submitted with this monitoring report.
2. In cases where the change(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD and DOE assessment opinion on the request for post-registration changes that is being submitted with this monitoring report.

B.2.7. Types of changes specific to an afforestation or reforestation project activity

1. Indicate whether any changes specific to afforestation or reforestation project activities have been applied during this monitoring period based on applicable provisions in the Project standard that do not require prior approval by the Board. If changes were applied, provide the version number and the completion date of the revised PDD and DOE assessment opinion on the request for post-registration changes that is being submitted with this monitoring report.

SECTION C. Description of monitoring system

1. Provide a description of the monitoring system based on the applicable provision for description of monitoring system in the Project standard. Include diagrams of the monitoring system and the information flow where appropriate.

SECTION D. Data and parameters

1. Provide information on all data and parameters in accordance with applicable provisions for data and parameters in the Project standard, using the tables provided in sections D.1 and 0.
2. For "Purpose of data" in the tables in D.1 and 0, choose one of the following options:
 - (a) Calculation of baseline emissions or baseline net GHG removals by sinks;
 - (b) Calculation of project emissions or actual net GHG removals by sinks;
 - (c) Calculation of leakage.
3. Where the applied standardized baseline(s) standardizes baseline emissions, apply the standardized value(s) of the parameter(s) in section D.1 and/or 0 in accordance with applicable provisions related to data and parameters in the Project standard.

D.1. Data and parameters fixed ex ante or at renewal of crediting period

1. Include data that are fixed before registration and/or at the renewal of crediting period and are used during this monitoring period under section D.1.
2. For "Value(s) applied", use one table to report multiple values referring to the same data and parameter, if applicable. Use reference(s) to electronic spreadsheets, if necessary.

D.2. Data and parameters monitored

1. For "Monitoring equipment" in the table, provide information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity.
2. For "Value(s) of monitored parameter", use one table to report multiple values referring to the same data and parameter, if applicable. Use reference(s) to electronic spreadsheets, if necessary.

D.3. Implementation of sampling plan

1. If data and parameters monitored described in section D.2 above are determined by a sampling approach, provide a description on how project participants implemented the sampling efforts and surveys for those data and parameters according to the sampling plan. Include:
 - (a) Description of implemented sampling design;
 - (b) Collected data (attach and provide reference to electronic spreadsheets, if necessary);
 - (c) Analysis of the collected data;
 - (d) Demonstration on whether the required confidence/precision has been met.

SECTION E. Calculation of emission reductions or GHG removals by sinks

1. For the parameter global warming potentials (GWPs), from 1 January 2013, include the values adopted by decision 4/CMP.7 to calculate the emission reductions achieved in the second commitment period of the Kyoto Protocol in accordance with the applicable provisions in the Project standard.

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

1. Provide sample calculations for all formulae used and calculation of baseline emissions or baseline net GHG removals by sinks, applying actual values. Attach electronic spreadsheets to present full calculations in the monitoring report.

E.2. Calculation of project emissions or actual net GHG removals by sinks

1. Provide sample calculations for all formulae used and calculation of project emissions or actual net GHG removals by sinks, applying actual values. Attach electronic spreadsheets to present full calculations in the monitoring report.

E.3. Calculation of leakage

1. Provide sample calculations for all formulae used and calculation of leakage, applying actual values. Attach electronic spreadsheets to present full calculations in the monitoring report.

E.4. Summary of calculation of emission reductions or net GHG removals by sinks

1. Summarize the results of sections E.1, E.2, E.3 above and provide GHG emission reductions or net GHG removals by sinks for this monitoring period, using the table.
2. If the monitoring period starts before 31 December 2012 and ends anytime thereafter, provide actual GHG emission reductions or net GHG removals by sinks achieved for the following two periods respectively:
 - a) Up to 31 December 2012 (first commitment period); and
 - b) From 1 January 2013 onwards.
3. Calculate the achieved GHG emission reductions or net GHG removals by sinks proportionally for each period. In cases where annual caps were applied in the calculations, prorate the annual caps to each period.

E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

1. Provide a comparison of actual GHG emission reductions or net GHG removal of the project activity achieved during this monitoring period with the estimates in the registered PDD.

E.6. Remarks on difference from estimated value in registered PDD

1. Explain the cause of any increase in the actual GHG emission reductions achieved during this monitoring period based on the applicable provision for calculation of GHG emission reductions in the Project standard.

Appendix 1. Contact information of project participants and responsible persons/entities

1. In accordance with section A.6 above, complete the table, with the following mandatory fields: Project participant and/or responsible person/entity, Organization, Street/P.O. Box, City, Postcode, Country, Telephone, Fax, E-mail and Name of contact person. Copy and paste the table as needed.

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • 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.
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 (EB70, 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	28 May 2010	EB 54, Annex 34. Initial adoption.
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