



**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**

<b>Title of the project activity</b>	Mae Klong Hydropower Project	
<b>UNFCCC reference number of the project activity</b>	9554	
<b>Version number of the monitoring report</b>	Version 01	
<b>Completion date of the monitoring report</b>	15/10/2015	
<b>Monitoring period number and duration of this monitoring period</b>	Monitoring period 01 and duration of this monitoring period is 01/01/2014-31/12/2014 (first and last days included)	
<b>Project participant(s)</b>	Electricity Generating Authority of Thailand	
<b>Host Party</b>	Thailand	
<b>Sectoral scope(s)</b>	Sectoral Scope 1: Energy industries (renewable sources / non-renewable resources)	
<b>Selected methodology(ies)</b>	Methodology AMS-I.D / Version 17 "Grid connected renewable electricity generation"	
<b>Selected standardized baseline(s)</b>	n/a	
<b>Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD</b>	41,741 tCO <sub>2</sub> per year	
<b>Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period</b>	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
	n/a	3,272 tCO <sub>2</sub>

## SECTION A. Description of project activity

### A.1. Purpose and general description of project activity

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*Mae Klong hydropower project* is a small-scale greenfield run-of-the-river hydroelectric power plant with an installed capacity of 12.35 MW at Mae Klong river. Prior to implementation of the project activity, there are two existing water ways for Mae Klong river; 1) Main water way (pass through the Mae Klong irrigation dam) and 2) By-pass water way (left bank of the Mae Klong irrigation dam). There are no any hydro power projects for both water ways. The project is implemented on the left bank of the existing Mae Klong irrigation dam by using the by-pass water flow to generate the electricity. The proposed project developed by the Electricity Generating Authority of Thailand (herein after as EGAT) would utilise the hydro resource of Mae Klong river in the Kanchanaburi Province of Thailand.

The proposed project includes installation of two generators of 6.176 MW and two turbines of 6.4 MW each to generate 12.35 MW<sup>1</sup> of electricity at 6.6kV which will be stepped up to 22kV to export from the Mae Klong Powerhouse to existing Provincial Electricity Authority (PEA) transmission line. All the net generated electricity will be exported to the PEA. Since the project activity generates electricity by using renewable hydro resources with the total capacity of 12.35 MW, the project activity is fall into type I (Renewable energy project) and small scale project (the installed capacity <15 MW).

The electricity generated from the project activity would reduce GHG emissions produced by the grid which is currently dominated by fossil fuel based power plants. Emission reduction from hydroelectric power projects arise as they replace grid electricity with a zero-emission source of electricity generation. Project activity will reduce greenhouse gas of about 41,741 tCO<sub>2</sub>e annually throughout crediting period of 7 years.

Relevant dates of the project activity shown in table 1 below;

**Table 1: Relevant date for project activity**

Event	Date	Evidence
EGAT signed EPC (Engineering Procurement Construction) contract with EPC contractor	11/12/2008	EPC contract
EGAT started exporting the electricity to the grid	29/01/2014	Photo of exporting date event

Total GHG emission reductions achieved in this monitoring period is 3,272 tCO<sub>2</sub>

### A.2. Location of project activity

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**Host Party:** Kingdom of Thailand

**Region/State/Province:** Kanchanaburi Province

**City/Town/Community etc.:** Ban Muang Chum, Amphor Tha Muang

**Physical/Geographical Location:** The proposed project is located in Ban Muang Chum, Amphor Tha Muang in Kanchanburi province, of Thailand.

The geographical coordinates of the project is latitude of 13° 57' 09.1946" N and longitude of 99° 37' 32.453" E. Figure 1 below shows the location of the project.

<sup>1</sup> General Guidelines for SSC CDM Methodologies (Version 18)



Project activity



Figure 1: Location of the project activity

**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)
Thailand (host)	Electricity Generating Authority of Thailand (EGAT)	No

**A.4. Reference of applied methodology and standardized baseline**

&gt;&gt;

The approved baseline and monitoring methodology used for this project activity is AMS-I.D “Grid connected renewable electricity generation”, version 17<sup>2</sup>

Methodology also refers to following tool:

- Tool to calculate the emission factor for an electricity system, version 02.2.1<sup>3</sup>;

Reference: Guidelines on the Demonstration of Additionality of Small-scale project version 09.0 (EB 68, Annex 27)<sup>4</sup>

**A.5. Crediting period of project activity**

&gt;&gt;

**Type of crediting period:** 7 year renewable crediting period

**Starting date of the crediting period:** 01/01/2014

**Length of the crediting period corresponding to this monitoring period:** 7 years and 0 month from 01/01/2014 - 31/12/2020

**A.6. Contact information of responsible persons/entities**

&gt;&gt;

Mr. Sarun Sritammaratch

Mr. Chayaphol Aroontheerawong

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Forum Tower Building, floor 28  
184/177, Ratchadapisek Rd.  
Huay Kwang, Bangkok,  
Thailand. 10310

E-mail: sarun\_s@aep.co.th,  
chayaphol\_a@aep.co.th

The person/entity is not a project participant as indicated in Appendix 1.

**SECTION B. Implementation of project activity****B.1. Description of implemented registered project activity**

&gt;&gt;

<sup>2</sup> [http://cdm.unfccc.int/filestorage/V/9/L/V9LRSXKP24Q7YT6HZDUBO3C0ING8AJ.1/EB61\\_repan17\\_Revision\\_AMS-I.D\\_ver17.pdf?t=OUx8bnVjNXU0fDDgejy26c-hBwV4X722bAOL](http://cdm.unfccc.int/filestorage/V/9/L/V9LRSXKP24Q7YT6HZDUBO3C0ING8AJ.1/EB61_repan17_Revision_AMS-I.D_ver17.pdf?t=OUx8bnVjNXU0fDDgejy26c-hBwV4X722bAOL)

<sup>3</sup> <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf>

<sup>4</sup> [https://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC\\_guid05.pdf](https://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC_guid05.pdf)

The project activity was installed and implemented according to the registered PDD. EGAT signed an EPC agreement to implementation/construction of the project on 11/12/2008. The project activity was constructed and installed and then export the electricity to the grid since 29/01/2014.

#### Description of installed technology

The project involves installation of two turbines of 6.4 MW each to produce electricity at 6.6kV which will be stepped up to 22 kV to export from the Mae Klong Powerhouse to existing PEA transmission line. The powerhouse is situated at a distance of 2.7 km from the existing PEA transmission line. The turbines are horizontal axis type with a design head of 9.20 m and design discharge of 75.56 m<sup>3</sup>/sec. The turbine generator shaft rotates at a speed of 166.7 rpm. Start up electricity for auxiliaries of turbine will be imported from PEA to open a guide vane, which is a part of the turbine controlling the water flow to the turbine. The backup power supply in the event of power plant shut down (in case of emergency and Power plant maintenance) will be grid supply. All the electricity imported from the grid will be monitored.

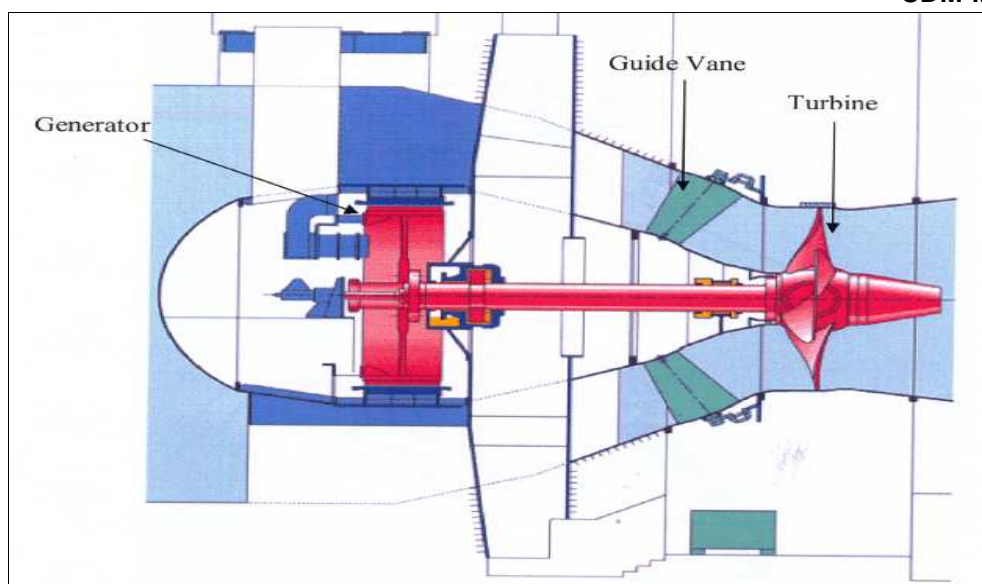
The general specifications and cross section drawing of the turbine and generator are shown in table 2 and figure 2 respectively:

**Table 2: General specification of turbine and generator**

<b>Turbine</b>	<b>UNIT I</b>	<b>UNIT II</b>
Type	GZC19-WP-315	GZC19-WP-315
Rated Power	6.4MW	6.4MW
Rated Head	9.2m	9.2m
Rated Flow	75.56m <sup>3</sup> /s	75.56m <sup>3</sup> /s
Rated Speed	166.7 r/min	166.7 r/min
Runaway Speed	484.5 r/min	484.5 r/min
Layout Type	Horizontal Axis	Horizontal Axis

<b>Generator</b>	<b>UNIT I</b>	<b>UNIT II</b>
Type	SFWG6176-36/3800	SFWG6176-36/3800
Rated Capacity	7265.9 kVA	7265.9 kVA
Rated Power	6,176kW	6,176kW
Rated Voltage	6,600V	6,600V
Rated Current	635.6A	635.6A
Rated Frequency	50Hz	50Hz



**Figure 2: Bulb turbine and generator**

There are no events or situations that occurred during the monitoring period that may impact the applicability of the applied methodology AMS-I.D version 17.

The monitoring plans of the project activity are changed as described in section B.2. These changes have been submitted to this monitoring report as they are not required prior approval by the Executive Board as per para 5 in Appendix 1 of Project Standard version 09.0.

## **B.2. Post-registration changes**

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

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During this monitoring period, there are no any temporary deviations from registered monitoring plan or applied methodology.

### **B.2.2. Corrections**

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During this monitoring period, there is one correction on the Runaway Speed of Turbine in unit I and II which are submitted with this monitoring report as indicated below.

<b>Turbine</b>	<b>UNIT I</b>		<b>UNIT II</b>	
	Registered PDD	Correction	Registered PDD	Correction
Type	GZC19-WP-315	GZC19-WP-315	GZC19-WP-315	GZC19-WP-315
Rated Power	6.4MW	6.4MW	6.4MW	6.4MW
Rated Head	9.2m	9.2m	9.2m	9.2m
Rated Flow	75.56m <sup>3</sup> /s	75.56m <sup>3</sup> /s	75.56m <sup>3</sup> /s	75.56m <sup>3</sup> /s
Rated Speed	166.7 r/min	166.7 r/min	166.7 r/min	166.7 r/min
Runaway Speed	463 r/min	484.5 r/min	463 r/min	484.5 r/min
Layout Type	Horizontal Axis	Horizontal Axis	Horizontal Axis	Horizontal Axis

The Change of Runaway Speed above does not increased the installed capacity of the project activity or amount of generated electricity due to both of them are depended on the Rated Power. As a result, these changes are not affected to the additionality or IRR calculation.

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

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There is no change of crediting period to the project activity.

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

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During this monitoring period, there is no any inclusion that was not included at registration.

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

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During this monitoring, there are permanent changes from the registered monitoring plan which are submitted with this monitoring report as described below;

#### EG<sub>export,y</sub> (B.7.1)

Data	Registered monitoring plan	Permanent changed from registered monitoring plan
Source of data	Energy meter reading from plant records	Measured data from electricity meter
Measurement methods and procedures	<p>There are two meters for two generators (Type code: ZMD 402 CT44 - LANDIS + GYR) with Automated meter reading installed inside EGAT's control room. These meters are two-way meter through which export and import data will be continuously monitored. These data will be printed and recorded on a monthly basis. Additionally, two back up meters will also be installed for each generator.</p> <p>Moreover, a logbook will be maintained on site to record hourly readings from the energy meter. The readings will be taken by the shift supervisor. This hourly data will be signed off at the end of every shift by the engineer in charge of the shift and again at the end of each day by the power plant manager.</p>	Measured continuously by using electricity meter. There are two main electricity meters for two generators installed inside EGAT's control room. Consolidated readings will be recorded in monthly basis.
QA/QC procedures	<p>Data measured by meters and recorded in logbook will be cross checked by electricity sales receipt. This will act as a check against the electricity export-import meter readings.</p> <p>The energy meter will be calibrated at least once in two year subject to national standards.</p>	<p>The reading data from the electricity meters are recorded in the reading export meter report by EGAT officer. Then these data shall be verified by off-taker party (PEA officer). The verified data shall be countersigned by PEA and EGAT officer.</p> <p>In case of main meter failure, the</p>

		data from back up meter will be applied in such period. The energy meter will be calibrated at least once in two year subject to national standards.
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**EG<sub>import,y</sub> (B.7.1)**

<b>Data</b>	<b>Registered monitoring plan</b>	<b>Permanent changed from registered monitoring plan</b>
Source of data	Energy meter reading from plant records	Measured data from electricity meter
Measurement methods and procedures	<p>There are two meters for two generators (Type code: ZMD 402 CT44 - LANDIS + GYR) with Automated meter reading installed inside EGAT's control room. These meters are two-way meter through which export and import data will be continuously monitored. These data will be printed and recorded on a monthly basis. Additionally, two back up meters will also be installed for each generator.</p> <p>Moreover, a logbook will be maintained on site to record hourly readings from the energy meter. The readings will be taken by the shift supervisor. This hourly data will be signed off at the end of every shift by the engineer in charge of the shift and again at the end of each day by the power plant manager.</p>	Measured continuously by using electricity meter. There are two electricity meters installed outside of the plant. Consolidated readings are recorded in monthly basis.
QA/QC procedures	Data measured by meters and recorded in logbook will be cross checked against electricity invoice sent by PEA for electricity import. The energy meter will be calibrated at least once in two years subject to national standards.	The electricity import data shall be verified PEA and send to EGAT as the electricity import invoice. The energy meter will be calibrated at least once in two years subject to national standards.

**Monitoring Procedure (B.7.2)**

<b>Data</b>	<b>Registered monitoring plan</b>	<b>Permanent changed from registered monitoring plan</b>
<b>Monitoring Procedure (B.7.2)</b>	There will be three 8 hour shifts and the readings from energy meters will be taken on an hourly basis by the shift supervisor and recorded in logbooks. This hourly data will be signed off at the end of every shift by the engineer in charge of the shift and again at the end of each day by the power plant manager. The power plant manager will analyze the data every month and report to the head office. The data will be archived electronically every	EGAT is well aware of the importance of having a good operational and management team in order to execute a well-defined monitoring plan for the project activity. So, it has an operational and management structure created exclusively for monitoring data. The responsibilities of data monitoring, archiving and analyzing will fall on different members of the monitoring



	month and invoices of electricity sales will be maintained.	team. This team will be composed of head office, power plant manager and shift supervisor. The shift supervisor will record the monitoring data. The power plant manager will cross-check the monitoring data and system to be properly functional and the head office will analyze the power plant performance through the monitoring data.
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#### B.2.6. Changes to project design of registered project activity

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During this monitoring period, there are no any changes to the project design of registered project activity

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

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Not applicable

### SECTION C. Description of monitoring system

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The readings data from electricity meters will be recorded in monthly basis by shift supervisor. The reading data will be cross-checked by the power plant manager. The power plant manager will analyze the data every month and report to the head office. The data will be archived electronically every month and invoices of electricity sales will be maintained.

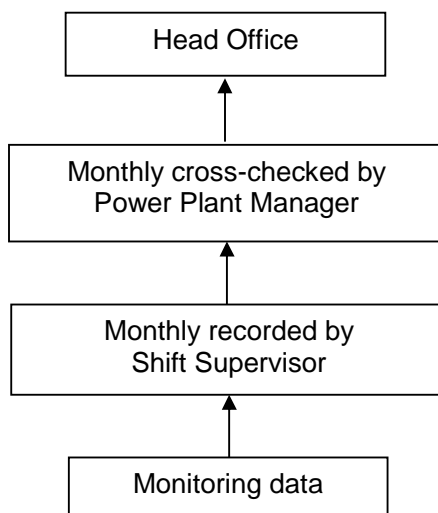


Figure 3: Data flow diagram

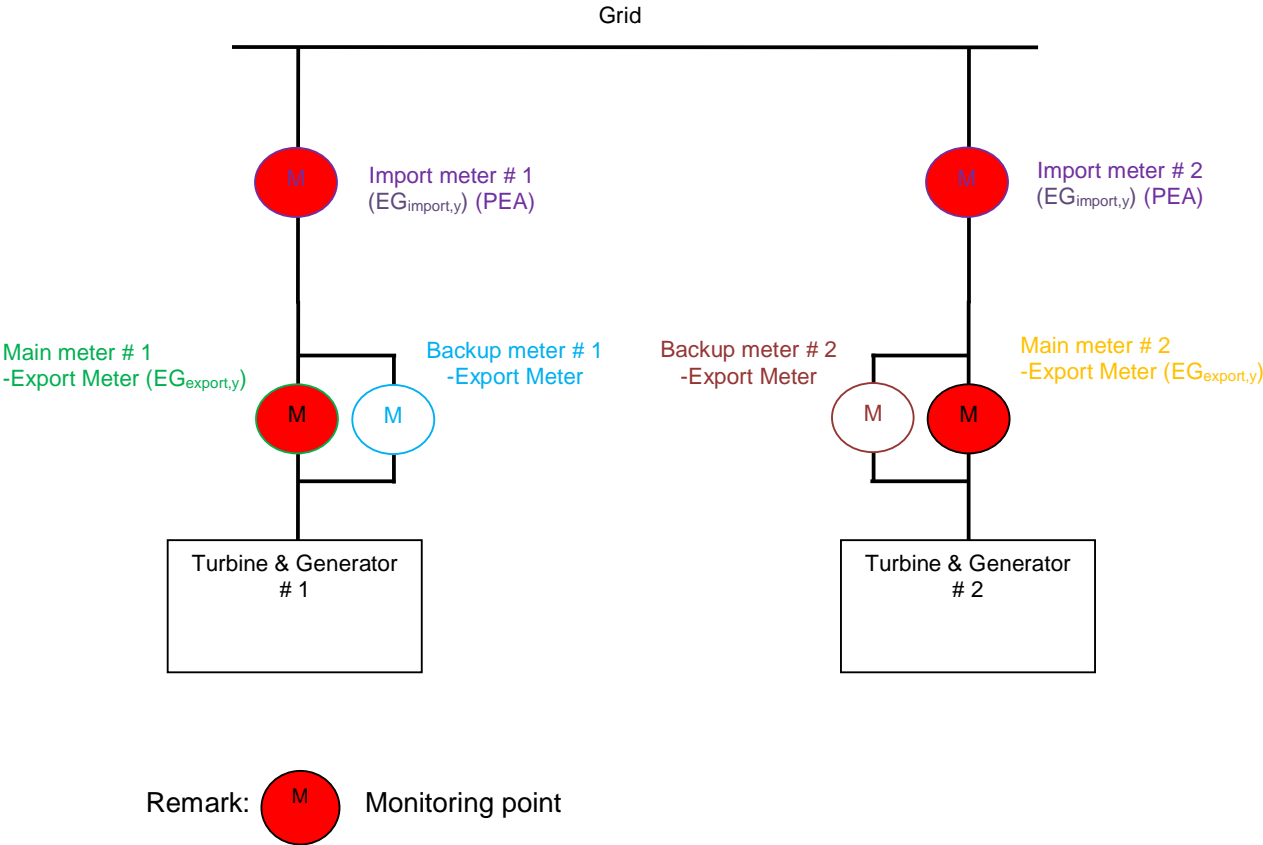


Figure 4: Monitoring diagram

Parameter monitored		
1	EG <sub>export,y</sub>	Power supplied by the project activity to the grid in year y
2	EG <sub>import,y</sub>	Power purchased by the project activity from the Grid in year y
3	EG <sub>BL,y</sub>	Net electricity exported by the project activity in year y

SECTION D. Data and parameters

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

<b>Data/parameter:</b>	<b>EF<sub>grid,OM</sub></b>
Unit	tCO <sub>2</sub> /MWh
Description	Simple Operating Margin
Source of data	All data used to calculate the emissions factor is publically available and detailed in Annex 3. Data for electricity production and fuel use of power plant in the Thailand Grid is available from the Thailand Department of Alternative Energy Development and Efficiency (DEDE) for the years 2006, 2007 and 2008. Additional information for Small Power Producer (SPP) plants is available from the Thailand Energy Policy and Planning Office, Ministry of Energy.
Value(s) applied	0.543
Choice of data or measurement methods and procedures	According to the methodology, the estimation is based on the calculation of - A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in "Tool to calculate the emission factor for an electricity system" For full details of the choice of data and methods applied refer to Annex 3 of PDD.
Purpose of data	Calculation of baseline emissions or baseline net GHG removes by sinks
Additional comments	

<b>Data/parameter:</b>	<b>EF<sub>grid,BM</sub></b>
Unit	tCO <sub>2</sub> /MWh
Description	Build Margin
Source of data	All data used to calculate the emissions factor is publically available and detailed in Annex 3 of PDD. Data for electricity production and fuel use of power plant in the Thailand Grid is available from the Thailand Department of Alternative Energy Development and Efficiency (DEDE) for the years 2006, 2007 and 2008. Additional information for Small Power Producer (SPP) plants is available from the Thailand Energy Policy and Planning Office, Ministry of Energy.
Value(s) applied	0.569
Choice of data or measurement methods and procedures	According to the methodology, the estimation is based on the calculation of - A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in "Tool to calculate the emission factor for an electricity system" For full details of the choice of data and methods applied refer to Annex 3 of PDD.
Purpose of data	Calculation of baseline emissions or baseline net GHG removes by sinks
Additional comments	

<b>Data/parameter:</b>	<b>EF<sub>grid,CM</sub></b>
Unit	tCO <sub>2</sub> /MWh
Description	Build Margin
Source of data	All data used to calculate the emissions factor is publically available and detailed in Annex 3 of PDD. Data for electricity production and fuel use of power plant in the Thailand Grid is available from the Thailand Department of Alternative Energy Development and Efficiency (DEDE) for the years 2006, 2007 and 2008. Additional information for Small Power Producer (SPP) plants is available from the Thailand Energy Policy and Planning Office, Ministry of Energy.
Value(s) applied	0.569

Choice of data or measurement methods and procedures	According to the methodology, the estimation is based on the calculation of - A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in "Tool to calculate the emission factor for an electricity system" For full details of the choice of data and methods applied refer to Annex 3 of PDD.
Purpose of data	Calculation of baseline emissions or baseline net GHG removes by sinks
Additional comments	

**D.2. Data and parameters monitored**

<b>Data/parameter:</b>	<b>EG<sub>export,y</sub></b>
Unit	MWh/yr
Description	Power supplied by the project activity to the grid in year y
Measured/calculated/default	Measured
Source of data	Electricity meter
Value(s) of monitored parameter	6,602 MWh

Monitoring equipment	Main meter unit 1	
	<b>Type</b>	Electricity meter
	<b>Manufacturer</b>	EDMI (Mk6E)
	<b>Serial number</b>	211377799 (Main unit 1)
	<b>Calibration frequency</b>	At least once in 2 years
	<b>Accuracy</b>	0.2S
	<b>Calibration year 2013</b>	17/10/2013 (s/n 210270751)
	<b>Calibration year 2015</b>	12/02/2015 (s/n 211377799)
	<b>Validity</b>	11/02/2017
	Main meter unit 2	
	<b>Type</b>	Electricity meter
	<b>Manufacturer</b>	EDMI (Mk6E)
	<b>Serial number</b>	212500667 (Main unit 2)
	<b>Calibration frequency</b>	At least once in 2 years
	<b>Accuracy</b>	0.2S
	<b>Calibration year 2013</b>	21/01/2014 (s/n 211377855)
	<b>Calibration year 2015</b>	12/02/2015 (s/n 212500667)
	<b>Validity</b>	11/02/2017
	Back up meter unit 1	
	<b>Type</b>	Electricity meter
	<b>Manufacturer</b>	EDMI (Mk6E)
	<b>Serial number</b>	208269615 (Back up unit 1)
	<b>Calibration frequency</b>	At least once in 2 years
	<b>Accuracy</b>	0.2S
	<b>Calibration year 2013</b>	17/10/2013 (s/n 206657637)
	<b>Calibration year 2015</b>	12/02/2015 (s/n 208269615)
	<b>Validity</b>	11/02/2017
	Back up meter unit 2	
	<b>Type</b>	Electricity meter
	<b>Manufacturer</b>	EDMI (Mk6E)
	<b>Serial number</b>	210161015 (Back up unit 2)
	<b>Calibration frequency</b>	At least once in 2 years
	<b>Accuracy</b>	0.2S
<b>Calibration year 2014</b>	21/01/2014 (s/n 210278026)	
<b>Calibration year 2015</b>	12/02/2015 (s/n 210161015)	
<b>Validity</b>	11/02/2017	

Measuring/reading/recording frequency:	<b><u>Main meter unit 1 &amp; 2</u></b> <b>Measuring</b> – Continuously <b>Reading</b> – Continuously <b>Recording frequency</b> - Monthly  <b><u>Backup meter unit 1 &amp; 2</u></b> <b>Measuring</b> – Continuously <b>Reading</b> – Continuously <b>Recording frequency</b> - Monthly
Calculation method (if applicable):	-
QA/QC procedures:	<p>The reading data from the electricity meters are recorded in the reading export meter report by EGAT officer. Then these data shall be verified by off-taker party (PEA officer). The verified data shall be countersigned by PEA and EGAT officer.</p> <p>In case of main meter failure, the data from back up meter will be applied in such period.</p> <p>The energy meter will be calibrated at least once in two year subject to national standards.</p>
Purpose of data:	Calculation of baseline emissions or baseline net GHG removes by sinks
Additional comments:	All data will be kept for a minimum of 2 years following issuance of certified emission reductions or the end of the crediting period, whichever is later.

<b>Data/parameter:</b>	<b>EG<sub>import,y</sub></b>
Unit	MWh/yr
Description	Power purchased by the project activity from the Grid in year y
Measured/calculated/default	Measured
Source of data	Electricity meter
Value(s) of monitored parameter	551 MWh (Value +adjust value = 716 MWh)

Monitoring equipment	Unit 1	
	Type	Electricity meter
	Manufacturer	EDMI GENIUS
	Serial number	20664937
	Calibration frequency	PEA's regulation
	Accuracy	0.5S
	Calibration	23/07/2015
	Validity	22/07/2017
	Unit 2	
	Type	Electricity meter
	Manufacturer	EDMI GENIUS
	Serial number	18322116
	Calibration frequency	PEA's regulation
	Accuracy	0.5S
Calibration	23/07/2015	
Validity	22/07/2017	
Measuring/reading/recording frequency:	<b>Unit 1</b> <b>Measuring</b> – Continuously <b>Reading</b> – Continuously <b>Recording frequency</b> - Monthly  <b>Unit 2</b> <b>Measuring</b> – Continuously <b>Reading</b> – Continuously <b>Recording frequency</b> - Monthly	
Calculation method (if applicable):	-	
QA/QC procedures:	The electricity import data shall be verified by PEA and send to EGAT as the electricity import invoice. The energy meter will be calibrated at least once in two years subject to national standards.	
Purpose of data:	Calculation of baseline emissions or baseline net GHG removes by sinks	
Additional comments:	All data will be kept for a minimum of 2 years following issuance of certified emission reductions or the end of the crediting period, whichever is later.	

<b>Data/parameter:</b>	<b>EG<sub>BL,y</sub></b>
Unit	MWh/yr
Description	Net electricity exported by the project activity in year y
Measured/calculated/default	Calculated
Source of data	Electricity meter (referred to the meters of <b>EG<sub>export,y</sub></b> and <b>EG<sub>import,y</sub></b> )
Value(s) of monitored parameter	5,886 MWh
Monitoring equipment	Electricity meter (referred to the meters of <b>EG<sub>export,y</sub></b> and <b>EG<sub>import,y</sub></b> )
Measuring/reading/recording frequency:	<b>EG<sub>export,y</sub></b> <b>Measuring</b> – Continuously <b>Reading</b> – Continuously <b>Recording frequency</b> - Monthly  <b>EG<sub>import,y</sub></b> <b>Measuring</b> – Continuously <b>Reading</b> – Continuously <b>Recording frequency</b> - Monthly

Calculation method (if applicable):	<b>EG<sub>BL,y</sub></b> will be calculated by taking readings from both export and import meters. <b>EG<sub>BL,y</sub></b> is calculated as ( <b>EG<sub>export,y</sub></b> – <b>EG<sub>import,y</sub></b> ). <b>EG<sub>export,y</sub></b> and <b>EG<sub>import,y</sub></b> will be monitored continuously by the meter. This reading (export-import) will act as the basis for calculation of emission reductions.
QA/QC procedures:	The meters will be calibrated as described in parameter <b>EG<sub>export,y</sub></b> and <b>EG<sub>import,y</sub></b>
Purpose of data:	Calculation of baseline emissions or baseline net GHG removes by sinks
Additional comments:	All data will be kept for a minimum of 2 years following issuance of certified emission reductions or the end of the crediting period, whichever is later.

### D.3. Implementation of sampling plan

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There are no any data and parameter monitored described in section D.2 are determined by a sampling approach. Then this section is not applicable for this project activity.

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

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

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According to registered PDD, *Ex-post* baseline emission has been demonstrated as formula below;

$$BE_y = EG_{BL,y} \times EF_{CO_2,grid,y} = (EG_{export,y} - EG_{import,y}) \times EF_{CO_2,grid,y}$$

Baseline emission for Year 2014:

$BE_y = EG_{BL,y} \times EF_{CO_2,grid,y} = (EG_{export,y} - EG_{import,y}) \times EF_{CO_2,grid,y}$			
Parameter	Description	Value	Source
BE <sub>y</sub>	Baseline emissions in year 'y' (tCO <sub>2</sub> /yr)	<b>3,272</b>	Calculated
EG <sub>BL,y</sub>	Net electricity exported by the project activity in year y (MWh/yr)	<b>5,886</b>	Calculated
EF <sub>CO<sub>2</sub>,grid,y</sub>	Thai grid CO <sub>2</sub> Emission Factor in year y, (tCO <sub>2</sub> /MWh)	<b>0.556</b>	Calculated
EG <sub>export,y</sub>	Power supplied by the project activity to the grid in year y (MWh/yr)	<b>6,602</b>	Electricity meter
EG <sub>import,y</sub>	Power purchased by the project activity from the Grid in year y (MWh/yr)	<b>716</b>	Electricity meter

Therefore, total project emission of year 2014 is 3,272 tCO<sub>2</sub>

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

>>

Accordingly to the methodology AMS-I.D. version 17 para 20, *for most renewable energy activities, PE<sub>y</sub> = 0. However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of ACM002.*

- Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption)
- Emissions from water reservoirs of hydro power plants

The project activity is a hydro power plant and it has no reservoir, hence, does not result in any project emissions. Project emissions, therefore, are zero.



**E.3. Calculation of leakage**

&gt;&gt;

The methodology AMS-I.D. version 17 para 22, specifies

*If the energy generating equipment is transferred from another activity, leakage is to be considered*

No equipment transfer takes place thus no leakage is considered in the project activity.

**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 <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (t CO <sub>2</sub> e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
<b>Total</b>	3,272	0	0	0	3,272	3,272

**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 <sub>2</sub> e)	41,741	3,272

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

&gt;&gt;

The actual figures less than estimated in registered PDD because the water in Mae Klong irrigation dam is low, therefore the electricity generation in this period is less than estimation.

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

<b>Project participant and/or responsible person/ entity</b>	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
<b>Organization name</b>	Electricity Generating Authority of Thailand
<b>Street/P.O. Box</b>	53 Moo2, Charansanitwong Road
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<b>City</b>	Bang Kruai, Nonthaburi
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<b>Country</b>	Thailand
<b>Telephone</b>	+66-2-4361140
<b>Fax</b>	+66-2-4361190
<b>E-mail</b>	<a href="mailto:waraporn.k@egat.co.th">waraporn.k@egat.co.th</a>
<b>Website</b>	
<b>Contact person</b>	
<b>Title</b>	
<b>Salutation</b>	Ms
<b>Last name</b>	Kunawanakit
<b>Middle name</b>	
<b>First name</b>	Waraporn
<b>Department</b>	
<b>Mobile</b>	
<b>Direct fax</b>	
<b>Direct tel.</b>	
<b>Personal e-mail</b>	

<b>Project participant and/or responsible person/ entity</b>	<input type="checkbox"/> Project participant <input checked="" type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
<b>Organization name</b>	Advance Energy Plus, Co., Ltd.
<b>Street/P.O. Box</b>	184/177 Rachadaphisek Rd.,
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<b>Contact person</b>	Mr. Sarun Sritammaratch
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<b>Project participant and/or responsible person/ entity</b>	<input type="checkbox"/> Project participant <input checked="" type="checkbox"/> Responsible person/ entity for completing the CDM-MR-FORM
<b>Organization name</b>	Advance Energy Plus, Co., Ltd.
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<b>Website</b>	-
<b>Contact person</b>	Mr. Chayaphol Aroontherawong
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**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"> <li>• Include provisions related to delayed submission of a monitoring plan;</li> <li>• Provisions related to the Host Party;</li> <li>• Remove reference to programme of activities;</li> <li>• Overall editorial improvement.</li> </ul>
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> <li>• Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0));</li> <li>• Include provisions related to standardized baselines;</li> <li>• Add contact information on a responsible person(s)/entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1;</li> <li>• Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>;</li> <li>• Editorial improvement.</li> </ul>
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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