CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA-DD)
Version 01

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NOTE:

(i) This form is for submission of CPAs that apply a small scale approved methodology using the provision of the proposed small scale CDM PoA.

(ii) The coordinating/managing entity shall prepare a CDM Small Scale Programme Activity Design Document (CDM-SSC-CPA-DD)[1,2] that is specified to the proposed PoA by using the provisions stated in the SSC PoA DD. At the time of requesting registration the SSC PoA DD must be accompanied by a CDM-SSC CPA-DD form that has been specified for the proposed SSC PoA, as well as by one completed CDM-SSC CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the SSC PoA must submit a completed CDM-SSC CPA-DD.

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[1] The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

[2] At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

SECTION A. General description of small scale CDM programme activity (CPA)

A.1. Title of the small-scale CPA:

"Biomass Power Development Programme in Thailand" CPA <Insert Number>
Version: <Insert version number>
Date: <DD/MM/YYYY>

A.2. Description of the small-scale CPA:

The project owner and implementer of <CPA number> is <Project proponent name>.<CPA Number> is setting up a <power plant installed capacity>MW biomass power plant at <the location details along with village, district and province> of Thailand. The project activity is a biomass based power plant that uses *only* *renewable biomass* residues such as <Insert the details of primary renewable biomass residues used in the power plant> to produce and sale the generated electricity under the "Very Small Power Producer" (VSPP) scheme in Thailand. *In the case of fuel shortage, it is expected to use other renewable biomass fuels as such as* <Insert the details of other biomass residues that are anticipated to be used in the power plant, if any>. The installed capacity of the power plant is <Insert the power plant capacity>MW and it is expected to supply <Insert the power plant capacity planned to supply electricity to grid> MW to < Insert the name of the electricity power distribution company>).

The biomass power plant employs <Insert the boiler technology details and suitability of technology in the context of primary residues planned to be used in the power plant>. The technology based on <Insert the source> will have <Insert the quantity> set of Boiler to generate steam from the thermal energy released in the combustion process, <Insert the quantity> set of Steam Turbine which converts the thermal energy into mechanical energy, <Insert the quantity> set of Generator responsible for final conversion to electricity power, <Insert the quantity> set of Biomass power plant transformer station, and <Insert the quantity> set of Distribution system including transmission line from power plant to the PEA/MEA connection point (national grid). It is estimated that the project would supply an electrical energy output of <Insert the electricity to be supplied to the national gird> MWh/year to the national grid of Thailand under a dedicated Power Purchase Agreement (PPA) with <Insert the details of electricity authority of which the project is having PPA signed> under the VSPP scheme.

The use of biomass residue as a fuel, for power generation, displaces an equivalent amount of grid power which would otherwise be produced by grid connected power plants. Grid power is comprised of a large share of fossil fuel based power generation systems. The project activity will result in the reduction of <Insert the emission reduction details> tCO_2e per year by replacing electricity generated from fossil fuel fired power plants in the electricity grid of Thailand.

Contribution to the Sustainable Development of the Host Country

Social well being:

- The proposed project would engage both genders in the construction of the project, biomass collection, and biomass processing etc. during the operational lifetime of the project. Thus the

created jobs will lead to income generation, contribute to an increase in gender equity and hence prevent social disparities.

Economic well being:

- The project might stimulate other economic activities such as cottage industries, shops, hotels etc. around the area, contributing to the economic development around the project area and would also lead to an increase in the land values.

- Use of surplus biomass residues such as <insert the type of primary biomass sources for this project> as a renewable energy resource for generation of power helps conserve foreign exchange by reducing the need to import fossil fuels to meet the country's growing energy demand.

Environmental well being:

- The project utilizes surplus biomass residues such as <insert the type of primary biomass sources for this project > which in the absence of the project activity were burnt or left to decay and thus leading to a sustainable usage of locally available resource.

- The project implementation will lead to the avoidance of uncontrolled burning of biomass residues and therefore contributes to the reduction of local emissions. It therefore results in an improvement in air quality and human health. The project also reduces the demand for energy generation through fossil fuels such as coal, lignite, gas and oil thereby reduces associated CO_2 emissions.

Technological well being:

- The project showcases an approach to use biomass residues generated as byproduct, for power generation from renewable resources.

- Project activity leads to the implementation of an efficient and clean energy technology.

In light of the information presented above, the project activity contributes to sustainable development. Renewable energy sources, currently account for a very small proportion of Thailand's electricity generation, which is dominated by natural gas, lignite and imported fuel oil. The project will directly complement the efforts of Government of Thailand to reduce the country's dependency on imported fossil fuels by producing electricity from biomass residues. The project will also play an important role for the country in meeting electricity demand while using less fossil fuel.

Confirmation that the implementation of the proposed project is voluntary

The proposed project activity by <CPA Number> is implemented purely on a voluntary basis. There is no regulation in Thailand enforcing the use of biomass sources as fuel to generate electricity to the national grid. <CPA number> has provided the following documents proving that the implementation of proposed project is voluntary:

<Each SSC-CPA must have the following documentation confirmed and stored in the database>

1. Minutes of Board Meeting of <CPA number> related to implementation of the project activity
2. Non-Disclosure Agreement signed between C/ME and <CPA number> ☐
3. Complete Screening Form of <CPA number> ☐
4. Memorandum of Understanding (MoU) signed between C/ME and <CPA number> ☐
5. Declaration of Non-ODA letter signed be <CPA number> ☐

A.3. Entity/individual responsible for the small-scale CPA:

Each Power Plant Company or project proponent proposing a small scale project activity to be included in the POA is the entity responsible for the implementation of the proposed SSC-CPA.
<Power Plant Company Name/Project Proponent Name> is the entity responsible for implementation of <CPA number> and has given its consent to <Entity Name of C/ME >, the C/ME of this POA, for its proposed project activity to be considered for participation in this PoA as a CPA voluntarily.

<The following should be attached for validation>:

1. Business registration of <Power plant Company Name> and the Power Purchase Agreement (PPA) signed between the Power Plant Company of <CPA number> and < Insert the name of the electricity power distribution company>
2. Signed Non-Disclosure Agreement between <CPA number> and <C/ME Name >
3. Completed Screening Form by <CPA number>
4. MoU on CERs ownership and mandate to ACSV signed by <CPA number> to <C/ME Name >

A.4. Technical description of the small-scale CPA:

A.4.1. Identification of the small-scale CPA:

Record Keeping
Each CPA will need to provide the following information to CME for record keeping and to allow C/ME to perform various audit such as double counting and de-bundling check.

No.	Parameter	Input <Please insert detail for each parameter>
1	Unique prospect CPA identification number	
2	Project Implementer/Proponent Name	
3	Business Registration No	
4	Power Purchase Agreement (PPA) Number	
5	Company Name registered in the PPA	
6	Location (district/province) as per PPA	
7	GPS Coordinates	
8	CEO of the project company	
9	Type of technology/measure	

10	Demonstration on whether technology transfer could happen	
11	Maximum supply capacity as per PPA	
12	Signing date or expected signing date of major equipment contract	
13	Expected Commercial Operating Date as per PPA or Project schedule	
14	CPA crediting period start date and end date and rationale for the choice of period	
15	Type of benchmark for financial decision making	
16	Availability of information for demonstration of investment barriers	
17	Type of on-site diesel usage	
18	State the distance of main biomass suppliers that sufficient to cover up to above 1.25 times as per the guidance of Attachment C to Appendix B (general guidance on leakage from biomass projects) of the requirement including utilization of the project activity	
19	Main biomass type	

Description of technology used in CPA <Number>
CPA <Number> will employ <the name of technology and system> and will have the following major components:

1. a Boiler to generate steam from the thermal energy released in the combustion process; and
2. a Steam Turbine which converts the thermal energy into mechanical energy; and
3. a Generator responsible for final conversion to electricity power
4. a Biomass power plant transformer station
5. Distribution system including transmission line from power plant to the PEA/MEA connection point (national grid)

The Technical Specification of the Major Equipments used in the Project Activity is further tabulated below:

Table :Technical Specification of Major Equipment used in the Project Activity

Equipment	Parameters	Details <Please insert detail for each parameter>
Boiler Specification (<insert quantity>)	Type	
	Maximum Continuous Rating	
	Steam pressure	
	Steam temperature	
	Efficiency of the boiler	
	Feed water temperature	

Equipment	Parameters	Details <Please insert detail for each parameter>
Generator Turbine Specification (<insert quantity>)	Type	
	Steam temperature at turbine inlet	
	Condenser Pressure	
	Generator Rating	

The data source for the technical specification is sourced from <please insert the data source>

A.4.1.1. Host Party:

Thailand

A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the small-scale CPA (maximum one page):

The unique identification details of the <CPA number>is as below:
Latitude: <Insert the latitude>
Longitude: <Insert the longitude>

Figure 1: Map of Project Location <Insert the province map and locate the project site >

A.4.2. Duration of the small-scale CPA:

A.4.2.1. Starting date of the small-scale CPA:

<Insert the start date of CPA DD/MM/YYYY>

As justified through the signing date of the <name of major equipment contract> between <Contractor/Supplier Name> with <Power Plant Company Name> for <CPA number> project activity.

A.4.2.2. Expected operational lifetime of the small-scale CPA:

<Insert the operational lifetime of project> years

<CPA number> is designed based on < operational lifetime and provide the justification document for this CPA>

A.4.3. Choice of the crediting period and related information:

Fixed Crediting period of 10 years

A.4.3.1. Starting date of the crediting period:

<Insert the start date of crediting period> (based on the expect COD date as planned in the <Project Schedule/PPA information> of <CPA number>) or the date of POA registration which-ever is later

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

10 Years (and limit to the end date of the registered PoA lifetime period of 28 years)

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

Table 1: Emission reductions from the biomass power plant

Years	Estimation of annual emission reductions in tonne of CO_2e
<Insert the year>	<annual emission reductions>
<Insert the year>	<annual emission reductions>
<Insert the year>	<annual emission reductions>
<Insert the year>	<annual emission reductions>
<Insert the year>	<annual emission reductions>
<Insert the year>	<annual emission reductions>
<Insert the year>	<annual emission reductions>
<Insert the year>	<annual emission reductions>
<Insert the year>	<annual emission reductions>
<Insert the year>	<annual emission reductions>
Total estimated reductions (tonne of CO_2e)	<annual total emission reductions>
Total number of crediting years	**10**
Annual average of the estimated reductions over the crediting period (tonne of CO_2e)	<annual emission reductions>

A.4.5. Public funding of the CPA:

No public funding or Official Development Assistant (ODA) from Annex I Party is involved in the implementation of <CPA number>.This is a voluntary unilateral project implemented by a private power plant company.

<CPA number> has provided a declaration letter of Non-ODA from Annex I Party for the project activity.

A.4.6. Information to confirm that the proposed small-scale CPA is not a de-bundled component

<CPA number> is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity because:

(a) The C/ME of this POA, ACSV does not manage another similar large scale POA of same sectoral scope

(b) Option 1: Although there is another activity currently implementing by the same project proponent <Power Plant Company Name>, the project activity is not in the transport sector involving boundaries/sources that are mobile and the project site is located <Insert Distance> from <CPA number> On top of that, <CPA Number> has provided its confirmation through screening form to C/ME confirming that there is no similar project activity within 1km surrounding the project site.

OR

(c) Option 2: There is no other activity currently implementing by the same project proponent <Power Plant Company Name>. On top of that, <CPA Number> has provided its confirmation through screening form to C/ME confirming that there is no similar project activity within 1km surrounding the project site.

The detail of de-bundling check result is stored in the <CPA number> database along with the declaration statement from <C/ME Name> and screening form and is available for validation request.

A.4.7. Confirmation that small-scale CPA is neither registered as an individual CDM project activity or is part of another Registered PoA:

<CPA number> has provided a declaration letter confirming at their best knowledge that the project activity is neither registered as an individual CDM project activity or is part of another Registered POA. A further audit check by C/ME based on the UNFCCC database further confirm that CPA is neither registered as an individual CDM project activity or is part of another Registered POA.

<Please describe whether TGO database is made available to C/ME to cross check this information, if yes, the audit result from this database and the information from the database should be made available to DOE for validation>

SECTION B. Eligibility of small-scale CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which small-scale CPA is added:

Biomass Power Development Programme in Thailand
Version: <Insert version number>
Date: <DD/MM/YYYY>

B.2. Justification of the why the small-scale CPA is eligible to be included in the Registered PoA :

With reference to Biomass Power Development Programme in Thailand PoA section A.4.2.2. The eligibility criteria stated under the SSC-PoA are confirmed by the <CPA number>'s implementer asfollow:

#	Eligibility Criteria	Status
1	Each CPA proposed in this PoA must be located within the geographical boundary of Thailand. Thailand stretches from latitude 5° 37' to 20° 27' N and longitude 97° 22' to 105° 37' E.	
2	Each CPA is a standalone biomass based power plant with a power generation capacity of less than 10 MW. Each CPA that employs Biomass combustion system will have the following major components (1) a Boiler to generate steam from the thermal energy released in the combustion process, and (2) a Steam Turbine which converts the thermal energy into mechanical energy and (3) a Generator responsible for final conversion to electricity power (4) a biomass power plant transformer station and (5) distribution system including transmission line from the power plant to the PEA/MEA connection point (national grid). The technical specification of the major equipment used for each CPA must be provided in section A.4.1 of each CPA-DD.	
3	Each CPA is a new installation of biomass based power plant and is connected to national power grid. Supply the generated electricity under a dedicated PPA from the PEA or MEA. Each CPA proposed in this POA can be uniquely identified to avoid double counting of emissions based on the information recorded in CPA database under C/MEs record keeping system, including geographic information and specific PPA number. The expected COD is also recorded to estimate the crediting period. The record keeping database of CPA must be reported in Section A.4.1 of each CPA-DD.	
4	The start date of each CPA proposed into this POA must be justified through documentary evidence such as signing date of major equipment contract	
5	Each CPA must meets all the criteria in the applied methodology AMS I.D Version 17 as recorded in the latest valid POA-DD document	
6	Each CPA must demonstrate additionality based on investment barrier analysis by justifying that the financial indicator represented by Project IRR of each CPA is below the determined applicable benchmark. Each	

	CPA must comply with the key criteria and data for assessing additionality as per Section E.5.2 and Section E.5.1 of the latest valid POA-DD document	
7	Each CPA must undertake local stakeholder consultation at CPA Level. Each CPA must describe the process and report the comments of the local stakeholder consultations at CPA level in each CPA-DD. Each subsequent CPA must provide the C/ME with the justification of passing the environmental analysis assessment as accordance to the latest approved version of the POA-IEE-SD framework.	
8	Each CPA must satisfy that the proposed CPA of a POA is not deemed to be a de-bundled component of a large scale activity and demonstrate the eligibility based on the de-bundling criteria as described in section A4.4.1 of POA-DD. The result of the de-bundling should be reported in Section A.4.6 of each CPA-DD	
9	A proposed CPA must declare that it is not registered or in the process of registration as a standalone CDM project and it is also not registered CPA from another POA. The confirmation must be reported in Section A.4.7 of each CPA.	
10	Proposed CPAs must declare that no ODA has been received for the implementation of the project and purchase of the CERs	
11	Each CPA must demonstrate that it is aware that the project activity has apply to this POA and the initiative is voluntary	
12	All biomass to be used in the proposed activity must be classified as renewable biomass as defined in Annex 18 EB 23, paragraph 4	
13	Each CPA must conduct surveys with potential suppliers within or less than 200km radius and must demonstrate that the quantity of biomass available at the region is more than 25% of the total utilized including the proposed project activity. The information from the survey forms would confirm the availability of the residues and the existing conditions of the residues. The reference guide for this condition is based on the EB document "EB answer to SSC_329, for excluding of emissions from transportation and EB document "EB47 Version 03" on biomass leakage and project emissions for renewable energy project"	
14	Fossil fuel is only allowed to power gen-set for emergency back-up purposes and/or for start-up purposes only. If fossil fuel is used for other purposes such as wheel loader, CPA must include the emissions as project emissions. If there are still other possible emissions more than 1% of the total emission reductions apart from fossil fuel consumption, the emissions shall be included.	
15	Each CPA must acknowledge by signing the Memorandum of Understanding with the C/ME of this POA, ACSV in relation to the CERs ownership and assignment of mandate to C/ME to undertake the role for coordination, communication, transaction and distribution of CERs and CERs' revenue to respective CPA to support the implementation of each CPA project activity. This MOU confirms that the project implementer/proponent remain as the owner of the CERs	

	issued until it is transacted to Annex I Party.	
16	Each CPA must submit the CPA-DD together with the completed supporting documents and evidences as requested to C/ME for compliance check prior to submission to DOE and DNA	
17	Each CPA implementer is a power plant producer under VSPP scheme in Thailand evidence through a dedicated power purchase agreement and a legal business registration certificate. Thus the PPA from PEA can prove that the CPA power plant design is legal.	

<CPA Number> meets all the eligibility criteria.

B.3. Assessment and demonstration of additionality of the small-scale CPA , as per eligibility criteria listed in the Registered PoA:

Additionality demonstration of the SSC-CPA is defined at the PoA level and is provided in SSC-PoA-DD sectionE.5.1 and E.5.2. The investment analysis description presented there is also prevalent in the SSC-CPA. Project IRR for <CPA number> is calculated based on the main parameters as described in the POA-DD document section E.5.1

Parameters	Unit	Description
Timeline		
Board approval for CDM Consideration and Inclusion as CPA		Sourced from Minutes of Boards Meeting
Investment Decision		EPC Contract Signed
Technical Lifespan		The technical lifetime of the project equipment is sourced from Techno-offer.
Technical data		
Installed Capacity		Sourced from Techno-offer
Supply Capacity		Capped as per info in the PPA
Auxiliary consumption		Sourced from Techno-offer
Capacity for sale to 3rd party (if any)		Sourced from Draft of Power Sales Agreement or other relevant source (if any)
Running Hours		In the Techno-offer, minimum operation days is 340days, 24hours per day
Plant Load Factor		Sourced from Techno- offer
Station requirement (Gross plant heat rate)		Sourced from Techno-offer
Financial Data		
Electricity tariff rate from PEA/MEA – Peak Rate		Can be source from PEA website http://www.pea.or.th/vspp/vspp/vspp_rate.pdf
Electricity tariff rate from PEA/MEA – Off-		Can be source from PEA website http://www.pea.or.th/vspp/vspp/vspp_rate.pdf

Peak Rate		
Fuel transfer rate from EGAT		Can be source from EGAT website: http://www2.egat.co.th/ft/Web/TAB1.1%20may53_aug53.htm
Electricity Tariff for 3rd party – Peak Rate (if applicable)		Sourced from Electricity Tariff, TOU Rate, Web Link - http://www.pea.co.th/rates/rates_tou_tod_ft.htm
Electricity tariff for 3rd party – Off- Peak Rate (if applicable)		Sourced from Electricity Tariff, TOU Rate, Web Link - http://www.pea.co.th/rates/rates_tou_tod_ft.htm
Fuel transfer rate for 3rd party (if applicable)		Sourced from Ft Rate, Web Link - http://www2.egat.co.th/ft/Web/TAB1.1%20may53_aug53.htm
Adder rate from EPPO under VSPP scheme		Announcement by EPPO
Inflation rate		Can be source from: http://www.indexpr.moc.go.th/price_present/cpi/stat/
Project Investment Cost		All major investment cost is supported using proposals
Yearly O&M costs		Sourced from Feasibility Study
Administration costs		Sourced from Feasibility Study
Fuel expenses costs		Sourced from Feasibility Study

The result of the assessment is a pre-tax Project IRR of <.please insert the Project IRR> without CDM revenues.

Determination of applicable benchmark for CPA1<CPA Number>
<Please insert the choice of the benchmark based on the result from study on determination of appropriate benchmark in Annex 6 and the source of the benchmark. Insert the period under review. Insert the value of the of benchmark or the statement retrieved from the official letter from financial institution or government institution>

Option 1: The investment barrier analysis is demonstrated below:

Particulars	%
IRR with CDM	<Insert details>
(Benchmark)	<Insert details>
IRR without CDM	<Insert details>

The Project IRR without CDM revenue is <Insert IRR without CDM> and is below the applicable benchmark of <Insert Benchmark>. The revenue from the CDM will improve the financial feasibility of the Project IRR to <Insert IRR with CDM> and thus <CPA number> is deemed additional.

Option 2: The investment barrier analysis is demonstrated based on official document from financial institution or government institution for CPA <Number>

<Please insert the statement from the official letter from financial institution or government institution confirming that the CDM revenues has supported the funding offer that would otherwise not approve for this project>

Sensitivity Analysis (should be conducted if the SSC-CPA chooses benchmark not using official letter from financial institution or government institution).
CPA <Number> has conducted sensitivity analysis as per the guide in Section E.5.1 of the latest POA-DD. The sensitivity analysis is demonstrated below:

Variation of Project IRR	Investment Cost	O&M and Admin	Biomass Fuel Cost	Electricity Tariff
+10%				
0				
-10%				
At Benchmark of <Insert number>(approx)				

<Please insert the result for each of the parameters analysed for variations>

Hence, <CPA Number> is deemed additional because the calculated Project IRR without CDM revenues even after considering the sensitivity analysis is still below the applicable pre-tax benchmark under all assumed parameters variations.

B.4. Description of the sources and gases included in the project boundary and proof that the small-scale CPA is located within the geographical boundary of the registered PoA.

The GHG focused in ***<CPA Number>*** is only CO_2. ***<CPA Number>*** will replace an equivalent amount of grid electricity which is produced based on fossil fuels. <Please insert the description of project boundary>

Table 4: Overview of emissions sources included in or excluded from the project boundary

	Source	Gas	Included (yes/No)	Justification / Explanation
Baseline	Grid electricity generation	CO_2	**Yes**	**Main emission source.**
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.
	Uncontrolled burning or decay of surplus biomass residues.	CO_2	No	It is assumed that CO_2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector. In addition this POA does not consider the emissions reductions from the

	Source	Gas	Included (yes/No)	Justification / Explanation
				burning or decay of biomass residues. Thus it has been excluded for simplification.
		CH_4	No	Excluded. Not a significant source
		N_2O	No	Excluded for simplification. Emissions from natural decay of biomass are not included in GHG inventories as anthropogenic sources.
Project Activity	On-site fossil fuel and electricity consumption due to the project activity (stationary or mobile)	**CO_2**	**Yes**	**Main emission source.**
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small.
	Off-site transportation of biomass residues	CO_2	No	Excluded for simplification. The project emissions due to transport of biomass for <CPA Number> is excluded for consideration based upon the results from the availability of biomass contracts, surveys and surplus availability study within 200 km of the project site demonstrating that the biomass residues availability is above 25% of the total utilized including the proposed CPA1.
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	No	
	Combustion of biomass residues for electricity	CO_2	No	It is assumed that CO_2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector. Thus it is excluded.

	Source	Gas	Included (yes/No)	Justification / Explanation
	generation	CH_4	No	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	No	
	Waste water from the treatment of biomass residues	CO_2	No	Not a significant source. Thus it is excluded.
		CH_4	No	Since no wastewater will be generated from handling, storing, combustion and treatment of biomass residues in a biomass power plant, it is excluded for simplification.
		N_2O	No	

Confirmation that <CPA Number> is located within the geographical boundary of Thailand
Please refer to section A.4.1.2 of this CPA-DD document. The proposed project activity is located within geographical boundary of Thailand.

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

Data / Parameter:	**$EF_{CO2, grid, y}$**
Data unit:	tCO_2/MWh
Description:	A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the "Tool to calculate the Emission Factor for an electricity system".
Source of data used:	<Please reference against the latest study report published by TGO at www.tgo.or.th>
Value applied:	<Insert details as per TGO information availability>
Justification of the choice of data or description of measurement methods	The data is publicly available

and procedures actually applied :	
Any comment:	Fixed *ex-ante*.

Data / Parameter:	**$EF_{grid,OM,y}$**
Data unit:	tCO_2/MWh
Description:	Operating margin CO_2 emission factor in year *y*
Source of data to be used:	<Please reference against the latest study report published by TGO at www.tgo.or.th>
Value applied:	<Insert details as per TGO information availability>
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as per the data presented in the above source
Any comment:	Fixed *ex-ante*.

Data / Parameter:	**$EF_{grid,BM,y}$**
Data unit:	tCO_2/MWh
Description:	Build margin CO_2 emission factor in year *y*
Source of data to be used:	<Please reference against the latest study report published by TGO at www.tgo.or.th>
Value of data	<Insert details as per TGO information availability>
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated as per the data presented in the above source
Any comment:	Fixed *ex-ante*.

Data / Parameter:	**NCV_i**
Data unit:	MJ/litre
Description:	Net calorific value of fossil fuel type *i*
Source of data to be used:	Electric Power in Thailand 2008, Department of Alternative Energy Development and Efficiency, Ministry of Energy or latest version
Value of data	<Insert the details>
Justification of the choice of data or description of measurement methods and procedures actually applied :	Country specific data.
Any comment:	Fixed *ex-ante*.

Data / Parameter:	**$EF_{CO2,i}$**
Data unit:	tCO_2/TJ
Description:	Carbon dioxide emission factor of each fossil fuel type *i*
Source of data to be used:	IPCC default values
Value applied:	<Insert the details>
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC default values at the upper limit as provide in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories or the latest version.
Any comment:	Fixed *ex-ante.*

Data / Parameter:	**$\% M_k$**
Data unit:	%
Description:	Moisture content of the biomass type k (wet basis)
Source of data to be used:	On-site measurements. Ex-ante estimates will be use during the crediting period
Value applied:	<Insert the value applied>
Justification of the choice of data or description of measurement methods and procedures actually applied :	On-site measurements. The moisture content of biomass of homogeneous quality shall be determined ex ante. The weighted average should be calculated and used in the calculations.
Any comment:	Fixed *ex-ante.*

Data / Parameter:	**$SHR_{biomass}$**
Data unit:	kJ/kWh
Description:	Efficiency of energy generation of biomass power plant
Source of data to be used:	<Insert source of data>
Value applied:	<Insert value>
Justification of the choice of data or description of measurement methods and procedures actually applied :	<Insert justification of data>
Any comment:	Fixed *ex-ante.*

B.5.2. Ex-ante calculation of emission reductions:

<CPA Number> involve a new grid connected renewable power plant and the baseline scenario is the electricity delivered to the grid by the project activity that would have been generated by the operation of grid-connected power plants and by the addition of new generation sources. Emission Reduction calculations will be calculated using the applied Methodology Category AMS I.D. ***<latest version> as applied in the latest POA-DD document.***

<CPA Number> have intention to supply net ***<x MWh>*** of electricity to the national grid based on the supply capacity dedicated in the PPA agreement and the plant availability hours.

The formula to calculate baseline emissions is as follow:

$$BE_y = EG_{BL,y} * EF_{CO2,grid,y}$$

Where,

BE_y = Baseline Emissions in year y (t CO2)
$EG_{BL,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{CO2,gridy}$ = CO_2 emission factor of the grid in year y (t CO2/MWh)

Hence, BE_y = <Please insert (MWh)> * 0.5812 (tCO_2/MWh)
= <Please insert x> tCO_2/y

Project Emissions

Project emissions from renewable energy project activities is normally considered zero. However, should any of the following project emissions is emitted during the crediting period of CPA 1, the emissions will be accounted and deducted from the baseline emissions.

Please kindly indicate the type of project emissions for <CPA Number>

☐	Project emissions due to the combustion of fossil fuels other than boiler (DG set) ($PE_{FC,y}$)
☐	Project emissions due to transportation of biomass residues ($PE_{T,y}$)

Please choose the relevant paragraph to represent the type of project emissions for <CPA Number>

Project emissions due to the combustion of fossil fuels other than boiler (DG set) ($PE_{FC,y}$):

<CPA Number> declares that the proposed project activity:

☐	No Diesel installation at all at the project site and hence $PE_{FC,y} = 0$
☐	Diesel generation will be installed for start-up purposes
☐	Diesel generation will be installed for emergency back-up use only
☐	Diesel will be used for wheel loader and the emissions source from this activity needs to be accounted during crediting period

The project emissions due to the combustion of diesel in the back up diesel generator and on-site usage such as wheel-loader or back-hoe are considered as zero due to the expected very limited amount of diesel consumption for the estimation of ex-ante calculations of emission reductions. The project emissions due to the combustion of diesel for on-site usage such as wheel-loader or back-hoe will be monitored ex-post.

$PE_{FC,y} = FC_{i,jy} * COEF_{i,,y}$

Where,

$FC_{i,y}$ = Quantity of fossil fuel combusted other than boiler during year, y (monitored parameter)

$COEF_{i,,y}$ = Carbon Dioxide Emission Coefficient of fossil fuel (based on " Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" EB 41, Annex 11

= $EF_{CO2,i}$ (Carbon Emission Factor of fossil fuel) * NCV_i (Net Calorific Value of fossil fuel)

= 0 tCO_2/y

Project emissions due to the transportation of biomass residues:

According to the SSC WG 22, F-CDM-SSCwg ver 01 SSC_329, the project emissions due to transport of biomass to the project site can be neglected if these are transport over a distance of less than 200 kilometers.

Therefore, $PE_{T,y}$ = 0 tCO_2/yr

Total Project Emissions (*PE $_y$*):

$PE_y = PE_{FC,y} + PE_{T,y}$

PE_y = 0+ 0 = 0 tCO_2/yr

Hence, PE_y= 0 tCO_2/y

LEAKAGE

Leakage is not considered because:

- This proposed project activity will not involve transferring of any energy generating equipment from another activity since all equipment will be new one, therefore leakage is not considered.

- ***<CPA Number>*** has evaluate using results from the surveys conducted at ***<total number of surveyed mills> <type of processing mills and potential suppliers>*** that the quantity of available biomass within 200km radius of the project is 25% larger than the quantity of biomass that is utilised including the project activity, therefore the source of leakage from competing use of Biomass can be neglected as per guidance of Attachment C to Appendix B (General guidance on leakage in biomass project activities).

.

Hence L_y = 0 tCO_2/y

EMISSION REDUCTIONS

Total emission reductions can be calculated based on the following formula:

ERy = BEy – PEy – LEy

Where,

ERy = Emission reductions in year y (t CO2/y)
BEy = Baseline Emissions in year y (t CO2/y)
PEy = Project emissions in year y (t CO2/y)
LEy = Leakage emissions in year y (t CO2/y)

Hence ERy = <calculated value> tCO_2/y

B.5.3. Summary of the ex-ante estimation of emission reductions:

>>

Table 14: Overall emission reduction through <*x.*> MW biomass power project

Year	Estimation of project activity emission (tonnes of CO_2e)	Estimation of baseline emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of overall emission reductions (tonnes of CO_2e)
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>

Year	Estimation of project activity emission (tonnes of CO_2e)	Estimation of baseline emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of overall emission reductions (tonnes of CO_2e)
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>
	<Insert the details>	<Insert the details>	<Insert the details>	<Insert the details>
Total (tonnes of CO_2e)	**<Insert the details>**	**<Insert the details>**	**<Insert the details>**	**<Insert the details>**

B.6.1. Description of the monitoring plan:

SSC-CPA confirms to the monitoring plan as described in the Biomass Power Development Programme in Thailand PoA in section A.4.4.2 and section E.7.2. A list of parameters to be monitored during the implementation of a CPA <Number> is adapted from the SSC-PoA-DD section E.7.1 and E7.2.

Parameter:	**$EG_{actual,y}$**
Unit:	MWh/y
Description:	Quantity of net electricity supplied by the project activity to the grid during the year *y*
Source of data:	Plant records of electricity export to the grid via the PEA energy meter for export and electricity import from the grid via PEA energy meter for import. The quantity of net electricity supplied to the grid is the difference between the measured quantities of the electricity export to the grid and electricity import from the grid ($EG_{export,y} – EC_{import,y}$)
Value of data:	-
Brief description of measurement methods and procedures to be applied:	Continuously monitoring, hourly measurement and at least monthly recording. Measurements are undertaken using energy meters of PEA. There are 2 units of PEA energy meters to be installed and measured. 1 unit of energy meter is use only to record export of electricity to the grid, and another 1 unit of energy meter is use only to record the import of electricity from the grid. The quantity of net electricity supplied to the grid is the difference between the measured quantities of the electricity export to the grid and electricity import from the grid. Measurement results shall be cross checked with records for sold and purchased

	electricity (e.g. invoice issued and/or paid by PEA and receipts for import of electricity billed by PEA). Further cross checking can be done through the measurement undertaken through the internal plant's main energy meter monitored by the project implementer. The internal plant's main energy meter is a bilateral meter that will record the export, import and net supply of electricity in the same meter. In the event that the PEA meter malfunction, additional cross checking of the net electricity supplied to the grid as gross energy generation in the project activity power plant minus the auxiliary electricity consumption, power loss, any off grid supply and electricity import from the grid to the project power plant measured at the grid connection used for billing purposes.
QA/QC procedures to be applied (if any):	Calibration of PEA energy meters both export and import will be done as per the calibration requirement and standard set by the PEA or every three years once whichever is applicable.
Any comment:	The data will be kept in the plant for the crediting period + 2 years after it. The data will be maintained in both soft copy and hard copy format. In view that the PEA energy meters belong to PEA, therefore the calibration procedure would be most likely depending on the calibration requirement and standard of the PEA. If meter is in kWh conversion to MWh is required.

Parameter:	EG_{export}
Unit:	MWh/y
Description:	Quantity of electricity exported to the grid in year y
Source of data:	Plant records from the PEA export meter
Value of data:	-
Brief description of measurement methods and procedures to be applied:	Continuous monitoring, hourly measurement and at least monthly recording. PEA energy meter to measure export of electricity will be installed and the accumulative measurements will be recorded on a log sheet once per day. The PEA export meter measure the electricity supplied at the point of sale to the grid. The PEA export meter will be located at the purchasing point specified by PEA. The data can be cross checked against the data recorded from the internal plant's main energy meter, it is a bilateral meter that records export, import and net supply. The data can be further cross checked against the export invoice billed to PEA.
QA/QC procedures to be applied (if any):	The calibration of PEA energy meters will be done as per the standard and requirement set by PEA. The calibration of internal plant's main energy meter will be based on the recommendation of the manufacturer or at least three years once whichever is applicable.
Any comment:	The data will be kept in the plant for the crediting period + 2 years after it. The data will be maintained in both soft copy and hard copy format. KWh will be converted to MWh.

Parameter:	$EC_{import,y}$
Unit:	MWh/y
Description:	Quantity of electricity imported from the grid in year y
Source of data:	Plant records from the PEA import meter
Value of data:	-
Brief description of measurement methods and procedures to be applied:	Continuous monitoring, hourly measurement and at least monthly recording. A unit of PEA energy meter to measure import of electricity from the grid will be installed and the accumulative measurements will be recorded on a log sheet once per day. The import data measured from PEA energy meter can be cross checked against the data recorded from the internal plant's main energy meter, it is a bilateral meter measuring the import, export, and net quantity in the same meter. In case of PEA's energy meter is malfunction, the data from the internal plant's main energy meter will be use. The data can be further cross checked against the import invoice billed by PEA.
QA/QC procedures to be applied (if any):	The calibration of PEA energy meters will be done as per the standard and requirement set by PEA. The calibration of internal plant's main energy meter will be based on the recommendation of the manufacturer or at least three years once whichever is applicable.
Any comment:	The data will be kept in the plant for the crediting period + 2 years after it. The data will be maintained in both soft copy and hard copy format. The import meter is a property of PEA and therefore the calibration requirement should follow the requirement set by PEA. Conversion to MWh if the energy meter is in kWh.

Parameter:	$FF_{k,y}$
Unit:	Tonne/y
Description:	Quantity of biomass residue type *k* consumed in the project plant during year *y*.
Source of data:	Plant records / on-site measurements
Value of data:	-
Brief description of measurement methods and procedures to be applied:	Measured continuously or in batches and estimate using annual energy/mass balance. Quantity of biomass used will be measured using weigh scales and recorded in log book on daily basis. The data will be adjusted for the moisture content in order to determine the quantity of dry biomass. The biomass will be stored in a covered warehouse to ensure that it is protected from rain before sending it to the combustion system. If more than one type of biomass is consumed each shall be monitored separately. An annual energy balance will be performed in order to cross check the measurement of quantity of biomass residue consumed based on purchased quantities (e.g. with sales/receipts) and stock changes. The information of quantity of biomass consumed from sales/receipts and stock changes will be used to calculate the energy amount for annual energy balance. Consistency check of measurement ex-post with annual data on energy generation, fossil fuels and biomass used and the efficiency of energy generation as determined ex ante.

QA/QC procedures to be applied (if any):	The weighbridge will be calibrated as per the manufacturer's specification or at least three years once whichever is applicable. The data recorded at weighbridge in log books will be crosschecked against the purchase receipts and inventory data.
Any comment:	The data will be kept in the plant for the crediting period + 2 years after it. The data will be maintained in both soft copy and hard copy format. Each biomass fuel consumed shall be monitored separately.

Parameter:	$FC_{diesel,y}$
Unit:	litres/year
Description:	Quantity of diesel combusted in e.g. wheel loader and/or diesel gen-set during year y
Source of data:	Plant records/on-site measurement
Value of data:	-
Brief description of measurement methods and procedures to be applied:	Quantity of diesel should be continuously measured by volumetric flow meters. In cases where fuel is supplied from small daily tanks, rulers will be used to determine volume of fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated as per the manufacturer's specification and have a book of control for recording the measurements.
QA/QC procedures to be applied (if any):	The data recorded can be cross checked against the fuel purchase receipts.
Any comment:	The data will be kept in the plant for the crediting period + 2 years after it. The data will be maintained in both soft copy and hard copy format. Quantity of diesel combusted is excluding any that will be used by the boiler system. No diesel is anticipated to be combusted in the boiler system. Diesel generation set for emergency back-up is only in planning stage and is not included as part of the design of the power plant during feasibility study.

Parameter:	$NCV_{biomass,k}$
Unit:	kJ/kg (by mass)
Description:	Net calorific value of biomass residue type *k*
Source of data:	Measurement in laboratories according to relevant national/international standards
Value of data:	All the individual fuels used in a CPA will be reported at the CPA level
Brief description of measurement methods and procedures to be applied:	Determine once in the first year of the crediting period. Measure quarterly, taking at least three sample for each measurement. The average value can be used for the rest of the crediting period. Measure the NCV based on dry basis. Check the consistency of the measurement results with, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default value by IPCC).
QA/QC procedures to be applied (if any):	Measurement on dry basis will be conducted in laboratories according to relevant national/international standards. Consistency of the Measurement results will be checked by comparing with relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by

	the IPCC. If the measurement results are found to differ significantly from other relevant data sources, then additional measurements will be conducted. e.g. the measurement result will be rejected if found differ significantly, the back-up set of samples collected during the same time as test samples will be used to measure again, and if the data is still significantly differ from other relevant data sources, the measurement data from the second set of samples will be used to calculate the average.
Any comment:	The data will be kept in the plant for the crediting period + 2 years after it. The data will be maintained in both soft copy and hard copy format.

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

The environmental analysis is undertaken at the CPA level. <CPANumber> is not required to submit a specific IEE-SD report to Thai DNA to obtain Host Country Approval. Moreover, since <CPA Number> is <insert the installed capacity and should be less than 10MW> as VSPP, there is no requirements from Thai government for Thai environmental impact assessment for VSPP. The CME will continuously check if there is any new requirements in the future from Thai government for any requirement of EIA for VSPP.

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

Not Applicable

C.3. Please state whether an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA), in accordance with the host Party laws/regulations:

This information is provided at the PoA level. Not Applicable here.

SECTION D. Stakeholders' comments

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D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

☑ This information is provided at the PoA level as well as CPA level. However, must follow the criteria as stated under the section D.1, D.2, D.3 and D.4 of SSC-PoA-DD as needed and applicable for CPA.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

Each proposed project must conduct stakeholder consultation process prior to inclusion as a CPA.

<CPA number> indicates the following process on how comments by stakeholder have been invited and compiled.

Invitation Process

a) Means of invitation
- ☐ Personal Invitation
- ☐ Open notice posted on public places
- ☐ Newspaper advertisements
- ☐ Invitation letter

b) Types of Stakeholders
- ☐ Local community leaders
- ☐ Equipment manufacturer
- ☐ Government officials
- ☐ NGO organizations
- ☐ Compliance Buyers
- ☐ Plant staff employees
- ☐ Biomass suppliers
- ☐ Local residents
- ☐ Media

Consultation Process

During consultation process at site, the following agenda must be presented:
- ✓ Circulations and consultations of questionnaires to local community
- ✓ Introduction speech
- ✓ Explanation of the purpose of the stakeholder consultation
- ✓ Introduction of the CDM PoA
- ✓ Explanation of CDM benefits towards economic, and social and environmental improvement for the community
- ✓ Addressing comments from the questionnaires
- ✓ Closure of consultation with thanks

Supporting documents for justification of stakeholder consultation process

- ☐ Means of invitation
- ☐ Questionnaires
- ☐ Photos

D.3. Summary of the comments received:

The comments are received in the form of filled questionnaires. If questions were raised during the consultation process, the questions will be recorded by the CPA and filed as summary of comments.

☐ Completed Questionnaires
☐ Summary of comments

D.4. Report on how due account was taken of any comments received:

Is there any negative Comments?

☐ No
☐ Yes

If negative comments are received, CPA will need to complete the following table:

NEGATIVE COMMENTS	RESPONSES/EXPLANATIONS **OR** MITIGATION PLAN

Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE SMALL-SCALE CPA

Organization:	Advance Carbon Securities Ventures (ACSV) Company Limited
Street/P.O.Box:	122, North Sathorn Road, Silom
Building:	N/A
City:	Bangkok
State/Region:	Bangkok
Postfix/ZIP:	10500
Country:	Thailand
Telephone:	+66 084 360 1333
FAX:	+66 2 637 9754
E-Mail:	nicole.t@advance-securities.com
URL:	N/A
Represented by:	Mrs. Nicole Tan
Title:	Director
Salutation:	Mrs.
Last Name:	Tan
Middle Name:	N/A
First Name:	Nicole
Department:	N/A
Mobile:	+66 084 360 1333
Direct FAX:	+66 2 637 9754
Direct tel:	+66 084 360 1333
Personal E-Mail:	nicole.t@advance-securities.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The CPA does not receive any public funding.

Annex 3

BASELINE INFORMATION

For this CPA, small-scale CDM methodology AMS-I.D i.e. "Grid connected renewable electricity generation" Version -17, reference EB 54, is applicable. According to AMS-I.D, "For all other systems, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2e/kWh) calculated in a transparent and conservative manner as:

A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system'

OR

(b) The weighted average emissions (in kg CO_2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used."

At the PoA level, for Biomass Power Development Programme in Thailand, it was selected to follow option (a) i.e. combined margin emission factor for all the CPA baseline calculations. The ex-ante approach is selected and the emission factor is fixed for the whole crediting period of a CPA.

Thus CPA <number> has selected option (a) i.e. combined margin emission factor is applied for the project baseline calculations. The ex-ante approach is selected and the emission factor is fixed for the whole crediting period. The ex-ante approach is considered conservative since the grid system in future is expected to become more carbon intensive as the projects planned to be established in the region are mostly thermal energy based.

The national grid emission factor is available online at Thailand Greenhouse Gas Management Organization (TGO) website. TGO is functioning as Designated National Authority (DNA) of Thailand. The summary report on the study of emission factor for an electricity system in Thailand 2009 is available online at http://www.tgo.or.th/english/download/publication/GEF/2009/GEFReport_EN.pdf. The emission factor is calculated as per Annex 19 Methodological Tool (Version 02.2.1) "Tool to calculate the emission factor for an electricity system, which had been approved by the CDM Executive Board (EB 63)". The procedures for calculation the national grid emission factor has been transparently documented and justified as follows:

Step 1: Identify the relevant electricity systems:
The electricity transmission system of Thailand is considered as a single system since the transmission lines are networked throughout the country and owned by the Electricity Generating Authority of Thailand (EGAT). EGAT is the authority that controls electricity generation and distribution in Thailand, whereas the Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA) are the authorities that supply the electricity to the users in Bangkok and provinces, respectively. Therefore, the geographical extent of the project electricity system is the geographical extent of the Kingdom of Thailand; imports from other countries are valued with 0 tCO2/MWh.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

Under this step Option I is chosen to calculate the operating margin and build margin emission factor, which means that only grid power plants are included in the calculation.
Option II aims to reflect that in some countries off-grid power generation is significant and can partially be displaced by CDM project activities, e.g. if off-grid power plants are operated due to an unreliable and unstable electricity grid. Since this is not the case in Thailand and the data required to calculate with option II are not easily available, this option is not applied.

Step 3: Select a method to determine the operating margin (OM)
The calculation of the operating margin emission factor ($_{EFgrid,OM,y}$) is based on one of the following methods:

a) Simple OM
b) Simple Adjusted OM
c) Dispatch Data Analysis OM
d) Average OM

According to Thailand's data, the simple OM method (Ex ante Option) is the most appropriate method. This method requires the latest 3 years data including quantity of electricity generated, fuel types used and fuel consumption of each fuel type. This study used data obtained in the years 2007 – 2009 due to the following reasons:

1. In Thailand, the generated electricity that is transferred to the national grid is the only available data. Thus, it is not possible to obtain off-grid electricity generation data.
2. Low-cost/must-run (LC/MR) power plants include hydro and renewable power plants[3]. The quantity of electricity generated by these power plants is not included in the calculation because it is less than 50% of total grid generation.

Step 4: Calculate the operating margin emission factor according to the selected method
(a) Simple OM
The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

The simple OM may be calculated:

Option A: Based on the net electricity generation and a CO_2 emission factor of each power unit;[4] or
Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

The requirements to use option B:

a) The necessary data for option A are not available; and
b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and

[3] Low-cost/must-run resources are defined as power plants with low marginal generation costs or power plants that are dispatched independently of the daily or seasonal load of the grid. They typically include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation.

[4] Power units should be considered if some of the power units at the site of the power plant are low-cost/must-run units and some are not. Power plants can be considered if all power units at the site of the power plant belong to the group of low-cost/must-run units or if all power units at the site of the power plant do not belong to the group of low-cost/must-run units.

c) Off-grid power plants are not included in the calculation

Option B is used in accordance with the tool, as publicly available information is not complete and available on details for using option A. Generation and fuel use per plant is not available only net generation but not specified the fuel amount used.
Option B is chosen for the gross balance on the country generation and total fuel used. These data are available. The requirements to use option B are fulfilled.

Option B - Calculation based on total fuel consumption and electricity generation of the system
Under this option, the simple OM emission factor is calculated based on the net electricity supplied to the gid by all power plants serving the system, not including low-cost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i (FC_{i,y} \bullet NCV_{i,y} \bullet EF_{CO2,i,y})}{EG_y} \quad (1)$$

where:

$EF_{grid, OM simple,y}$	=	Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$FC_{i,y}$	=	Amount of fossil fuel type i consumed in the project electricity system in year y (mass or volume unit)
$NCV_{i,y}$	=	Net Calorific value (energy content) of fossil fuel type i in year y (GJ/mass or volume unit)
$EF_{CO2,i,y}$	=	CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)
EGy	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must run power plants/units, in year y (MWh)
i	=	All fossil fuel types combusted in power sources in the project electricity system in year y
y	=	The relevant year as per the data vintage chosen

The values of CO_2 emission from combustion of fossil fuel (per unit of fossil fuel) are shown in Table 1. Net Calorific Value (NCV) is obtained from data provided by the Department of Alternative Energy Development and Efficiency, Ministry of Energy. The CO_2 Emission Factor of fossil fuel follows IPCC default values as specified in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Table 1: Net Calorific Value and CO_2 emission per unit of each type of fossil fuel

Fuel type A)	Unit	Net Calorific Value 1) (MJ/Unit)	CO_2 Emission 2) (tCO_2/TJ)	CO_2 Emission ($kgCO_2$/Unit)
Natural gas	scf.	1.02	54.30	0.0554
Lignite	ton	10,470.00	90.90	951.7230
Bituminous	ton	26,370.00	89.50	2,360.1150
Bunker	liter	39.77	75.50	3.0026
Diesel	liter	36.42	72.60	2.6441

1) Electric Power in Thailand 2008/ Department of Alternative Energy Development and Efficiency,

Ministry of Energy
2) IPCC default values at the lower limit as provide in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
A) See Table: Comparison of name of fuel type

The quantity of electricity generated and delivered to the national grid can be obtained from the Electricity Report 2007 – 2009 published by the Electricity Generating Authority of Thailand as shown in Table 2. Data are categorized by electricity generation system, type of power plant and quantity of electricity generated by LC/MR and Non LC/MR power plants. Type of power plant includes the power plant of the Electricity Generating Authority of Thailand, Independent Power Producers (IPPs) and Small Power Producers (SPPs).

Quantity and type of fossil fuel consumed in electricity generation are also obtained from the Electricity Report 2007 – 2009 published by the Electricity Generating Authority of Thailand as shown in Table 3.

VSPP power plants use renewable energy including biogas, biomass, hydro, wind and solar energy and are considered as low-cost/must-run power plants. However, a VSPP power plant is non-firm and can supply only a small quantity of electricity to the grid compared to other power plants. In 2009, the amount of electricity that VSPP power plants sold to the Provincial electricity Authority was 974.47 GWh [3)] (0.67% of the total electricity generated in 2009). Thus, this study does not include electricity generated by VSPP in the calculation of total electricity in the national grid. The total amount of electricity exported to the national grid (only Non LC/MR) in the years 2007 – 2009 was 406,291.70 GWh.

Table 2: Quantity of electricity generated and delivered to the national grid [4)]

Generation System	Grid Generation (GWh)				
	EGAT	**IPP**	**SPP**	**Total**	**%**
2009					
Total	66,488.10	64,840.72	13,971.37	145,300.19	100.00
Non LC/MR	59,541.66	64,840.72	11,811.42	136,193.80	93.73
LC/MR [5)]	6,946.44	0.00	2,159.95	9,106.39	6.27
Thermal	23,463.69	12,388.03	2,225.63	38,077.35	
Combined-Cycle	33,164.46	52,452.69	8,752.19	94,369.35	
Gas Turbine	309.63	0.00	833.60	1,143.23	
Diesel Engine	1.44	0.00	0.00	1.44	
Hydropower	6,941.74	0.00	23.97	6,965.71	
Renewable Energy	4.70	0.00	2,135.98	2,140.68	
Electricity Import	2,602.43	0.00	0.00	2,602.43	
2008					
Total	63,719.02	67,420.14	14,092.83	145,232.00	100.00
Non LC/MR	56,791.19	67,420.14	11,904.81	136,116.14	93.72
LC/MR [5)]	6,927.83	0.00	2,188.03	9,115.86	6.28
Thermal	26,778.89	14,398.34	1,996.83	43,174.06	
Combined-Cycle	26,449.20	53,021.80	9,029.90	88,500.90	
Gas Turbine	659.33	0.00	878.07	1,537.41	
Diesel Engine	2.30	0.00	0.00	2.30	

Hydropower	6,926.02	0.00	28.77	6,954.79	
Renewable Energy	1.81	0.00	2,159.26	2,161.07	
Electricity Import	2,901.47	0.00	0.00	2,901.47	
2007					
Total	67,704.95	62,233.44	14,426.00	144,364.39	100.00
Non LC/MR	59,765.33	62,233.44	11,982.99	133,981.76	92.81
LC/MR [5)]	7,939.62	0.00	2,443.02	10,382.64	7.19
Thermal	30,265.00	17,453.59	2,168.76	49,887.35	
Combined-Cycle	24,124.09	44,779.85	8,935.60	77,839.54	
Gas Turbine	884.20	0.00	878.63	1,762.83	
Diesel Engine	1.17	0.00	0.00	1.17	
Hydropower	7,937.20	0.00	21.70	7,958.90	
Renewable Energy	2.42	0.00	2,421.32	2,423.73	
Electricity Import	4,490.87	0.00	0.00	4,490.87	

3) Provincial Electricity Authority: PEA
4) Electricity report 2007 – 2009/ Electricity Generating Authority of Thailand
5) LC/MR power plants include hydropower and renewable energy (including biomass, solar and geothermal power)

Table 3: Amount of fossil fuel consumed by power plants [6)]

Fuel type	Unit	Fuel Consumption			
		EGAT	IPP	SPP	Total
2009					
Natural Gas	scf.	369,146,214,392	459,228,417,361	140,550,086,056	968,924,717,809
Lignite	ton	15,818,265	0.00	0.00	15,818,265
Bituminous	ton	0.00	3,645,721	1,840,527	5,486,248
Bunker	liter	111,039,065	38,180,874	8,797,506	158,017,445
Diesel	liter	12,140,891	0.00	1,685,046	13,825,937
2008					
Natural Gas	scf.	340,739,529,461	490,866,999,785	145,410,364,035	977,016,893,281
Lignite	ton	16,407,465	0.00	0.00	16,407,465
Bituminous	ton	0.00	3,711,791	1,866,776	5,578,567
Bunker	liter	247,441,682	93,212,260	9,555,452	350,209,394
Diesel	liter	6,792,039	43,698,832	1,451,087	51,941,958
2007					
Natural Gas	scf.	342,335,310,261	454,590,745,280	145,512,075,117	942,438,130,658
Lignite	ton	16,060,766	0.00	0.00	16,060,766
Bituminous	ton	0.00	3,692,979	1,889,868	5,582,847
Bunker	liter	785,979,152	144,198,973	6,042,880	936,221,005
Diesel	liter	7,381,996	2,688,851	1,266,337	11,337,184

6) Electricity report 2007 – 2009/ Electricity Generating Authority of Thailand

Table 4 shows the calculated CO_2 emission from electricity generation in the years 2007 - 2009 categorized by fuel types. The total emissions during the 3-years period (2007-2009) were 249,762,588 tCO_2.

The Operating Margin Emission Factor (Ex ante option) calculated by using equation 1 is shown in Table 5. The value is 0.6147 tCO_2/MWh (614.70 gCO_2/kWh)

Table 4: CO_2 emission from electricity generation in the years 2007 - 2009

Fuel type	Fuel consumption		CO_2 Emission ($kgCO_2$/Unit)	CO_2 Emission ($kgCO_2$)
	Unit	Volume		
2009				
Total				82,178,673
Natural Gas	scf.	968,924,717,809	0.0554	53,664,864
Lignite	ton	15,818,265	951.7230	15,054,607
Bituminous	ton	5,486,248	2,360.1150	12,948,176
Bunker	liter	158,017,445	3.0026	474,469
Diesel	liter	13,825,937	2.6441	36,557
2008				
Total				84,083,369
Natural Gas	scf.	977,016,893,281	0.0554	54,113,058
Lignite	ton	16,407,465	951.7230	15,615,362
Bituminous	ton	5,578,567	2,360.1150	13,166,060
Bunker	liter	350,209,394	3.0026	1,051,551
Diesel	liter	51,941,958	2.6441	137,339
2007				
Total				83,500,546
Natural Gas	scf.	942,438,130,658	0.0554	52,197,878
Lignite	ton	16,060,766	951.7230	15,285,400
Bituminous	ton	5,582,847	2,360.1150	13,176,161
Bunker	liter	936,221,005	3.0026	2,811,130
Diesel	liter	11,337,184	2.6441	29,977

Table 5 Operating Margin Emission Factor (Ex ante option)

Year	CO_2 Emission (tCO_2)	Grid Consumption (GWh)	OM Emission Factor	
			(tCO_2/MWh)	(gCO_2/kWh)
2009	82,178,673	136,193.80	0.6034	603.40
2008	84,083,369	136,116.14	0.6177	617.70
2007	83,500,546	133,981.76	0.6232	623.20
Summary	249,762,588	406,291.70	0.6147	614.70

Step 5: Identify the group of power units to be included in the build margin

Group of power units that are included in the build margin must be identified. The sample group of power units used to calculate the build margin consists of either:

1) The set of five power units that have been built most recently; or

2) The set of power capacity additions in the electricity system that comprise 20% of the system generation and that have been built most recently sorted by Commercial Operation Date (COD) which is the date when the power plant starts to supply electricity to the grid.

The set of power units that comprises the larger annual generation must be used. According to Thailand's data, the first option can generate less electricity than the second option, thus this study uses the quantity of electricity generation of the second option as listed in Table 6. Fuel consumptions of these power plants are shown in Table 7.

Table 6: Electricity generation by the most recently built power plants [7)]

Power unit	Grid Generation [7)] (GWh)	COD
1. Bangpakong Power Plant (Unit 05)	1,918.11	16-Sep-09
2. South Bangkok Power Plant (Unit 03)	4,745.32	1-Mar-09
3. Chana Power Plant (Unit 01)	4,150.26	15-Jul-08
4. Ratchaburi Power Company Limited (RPCL) (Unit 1&2)	8,153.26	1-Jul-08
5. Gulf Power Generation Co., Ltd. (Unit 1&2)	9,338.68	1-Mar-08
6. BLCP Power Co., Ltd. (Unit 1&2)	10,018.13	1-Feb-07
Summary	38,323.76	
Percentage as of 2009 Grid Generation (145,300.19 GWh)	26.38	

7) Electricity report 2009/ Electricity Generating Authority of Thailand

Table 7: Fuel consumptions of the most recently built power plants as listed in Table 6 [8)]

Fuel type	Fuel consumption		CO_2 Emission ($kgCO_2$/Unit)	CO_2 Emission (tCO_2)
	Unit	Volume		
Total				20,991,690
Natural Gas	scf.	223,467,679,056	0.0554	12,376,981
Lignite	ton	–	951.7230	–
Bituminous	ton	3,645,721	2,360.1150	8,604,321
Bunker	liter	–	3.0026	–
Diesel	liter	3,929,038	2.6441	10,389

8) Electricity report 2009/ Electricity Generating Authority of Thailand

As shown in Table 6, electricity generated by the most recently built power plants is 38,323.76 GWh 26.38% of the total electricity generated in 2009 which is 145,300.19 GWh. Fuel consumptions of the most recently built power plants as listed in Table 7 emit CO_2 20,991,690 ton. The Build Margin Emission Factor calculated by using equation 1 is shown in Table 8. The value is 0.5477 tCO2/MWh (547.70 gCO_2/kWh).

Step 6: Calculate the build margin emission factor

Table 8 Calculation of Build Margin Emission Factor

Year	CO_2 Emission	Grid Consumption	BM Emission Factor

	(tCO_2)	(GWh)	(tCO_2/MWh)	(gCO_2/kWh)
2009	20,991,690	38,323.76	0.5477	547.70

Step 7: Calculate the combined margin emissions factor
The Combined Margin Emission Factor can be calculated by using equation 2

$$EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM} \quad (2)$$

where:

$EF_{grid,CM,y}$	=	Combined margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$	=	Operating margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year y (tCO_2/MWh)
W_{OM}	=	Weighting of operating margin emission factor
W_{BM}	=	Weighting of build margin emission factor

The following default value should be used for W_{OM} and W_{OM}:

Table 9: Weighting of operating and build margin emissions factor for general CDM projects and wind and solar power generation CDM projects

CDM project type	W_{OM}	W_{OM}
General project	0.50	0.50
Wind and solar power generation project	0.75	0.25

For this project activity, which is not a wind or solar power generation project activity, the following weights are chosen: W_{OM} = 0.5 and W_{BM} = 0.5.

Table 10: Calculated Combined Margin Emission Factor

CDM project type	Emission Factor (tCO2/MWh)		
	$EF_{grid,OM}$	$EF_{grid,BM}$	$EF_{grid,CM}$
General project	0.6147	0.5477	0.5812

Therefore, the baseline emission factor $EF_{CO2} = EF_{grid,CM,y}$ = 0.5812 tCO_2/MWh.

Reference Table Comparison of name of fuel type from different reports

Report [9)]	DEDE [10)] (Thailand)	IPCC [11)]
Natural Gas	Natural Gas (Dry)	Natural Gas
Lignite	Lignite (Mae Moh)	Lignite
Bituminous	Coal Import	Other Bituminous Coal
Bunker	Fuel Oil	Residual Fuel Oil
Diesel	Diesel	Diesel

9) The Study of emission factor for an electricity system in Thailand 2009
10) Electric Power in Thailand 2008/ Department of Alternative Energy Development and Efficiency, Ministry of Energy
11) 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Annex 4

MONITORING INFORMATION

The monitoring plan will be undertaken by CPA1 as described in Section A.4.2 of the latest valid POA-DD based on individual verification and implemented according to the following process and procedure as described in section E.7.2 of latest POA-DD:

All data will be archived electronically and backed up regularly at each CPA level. The data will be kept for the full crediting period of CPA, plus two years after the end of the crediting period, or the last issuance of CERs for a CPA, whichever occurs later. The monitoring plan for this PoA has been developed to ensure that from the start, the CPAs are well organised in terms of the collection and archiving of complete and reliable data.

Data to be monitored:

The team responsible for monitoring will monitor,

The main parameter for baseline emissions calculation is net electricity supplied by the power plant to the Thai national grid (**$EG_{actual,y}$**). The quantity of biomass fuels used in the power plant is monitored but this information is not used in the baseline emissions calculation.

Calibration:
All the measurement devises, energy meters, weighing machines etc will be taken care as per the technology supplier's maintenance protocol.

Data and records management:

All data collected during the verification period will be stored in an electronic format that will be easily accessible to the verifier for independent checking i.e. DOE. In the event that a series of measurements are truncated, a remediation of conservative interpolations with recorded data will be applied to restore the data integrity. In order to make it easy for the verifier to retrieve the documentation and information in relation to the project emission reduction verification, a document register will be maintained and continually updated. The document register will ensure adequate document control for CDM purposes.

This is under taken by the team responsible for monitoring as per requirements and a dedicated QA/QC Manager will be responsible for checking the data (according to a formal procedure) and will be responsible for managing the collection, storage and archiving of all data and records.

Quality Assurance and Quality Control procedures:
QA/QC procedures will ensure accuracy and reliability of the collected data through measurement control, document control and management review.

All monitoring instruments/ meters will undergo a proper and timely calibration by the qualified agency according to the standard procedures for calibration and equipment supplier's schedule.

To ensure the quality of the recorded data, all relevant personnel will received the extensive on-the-job trainings which will include training on plant operations, data monitoring and report generation.

In addition, a proper maintenance of the power plant will be conducted according to the equipment suppliers' recommendations and the established operation and maintenance procedures and plan to ensure the efficiency of the power plant.

Uncertainties and Emergency Preparedness:

Uncertainties:

Any uncertainty like inconsistency/discrepancy of data parameters will be dealt with various corrective actions. These will be reported along with its time of occurrence, possible reasons and duration Uncertainty with metering (if any difference between recording of Main electricity meter and Check meter) will be dealt jointly both by CPA1 and PEA representative. Corrective actions will be undertaken after identification of reason for such uncertainty.

Emergency:

The plant will be equipped with Automatic Alarming System to detect any emergency. This will help the authority to take immediate preventive measures.

Emergency preparedness plans will be laid out to cope up with and control situations which can lead to unintended emissions like fire in the fuel yard and fuel spoilage due to water. Fire protection system will be adopted as per statutory requirements. These emergency situations will be taken care by putting up a fire safety system and a water drainage system in the fuel yard.

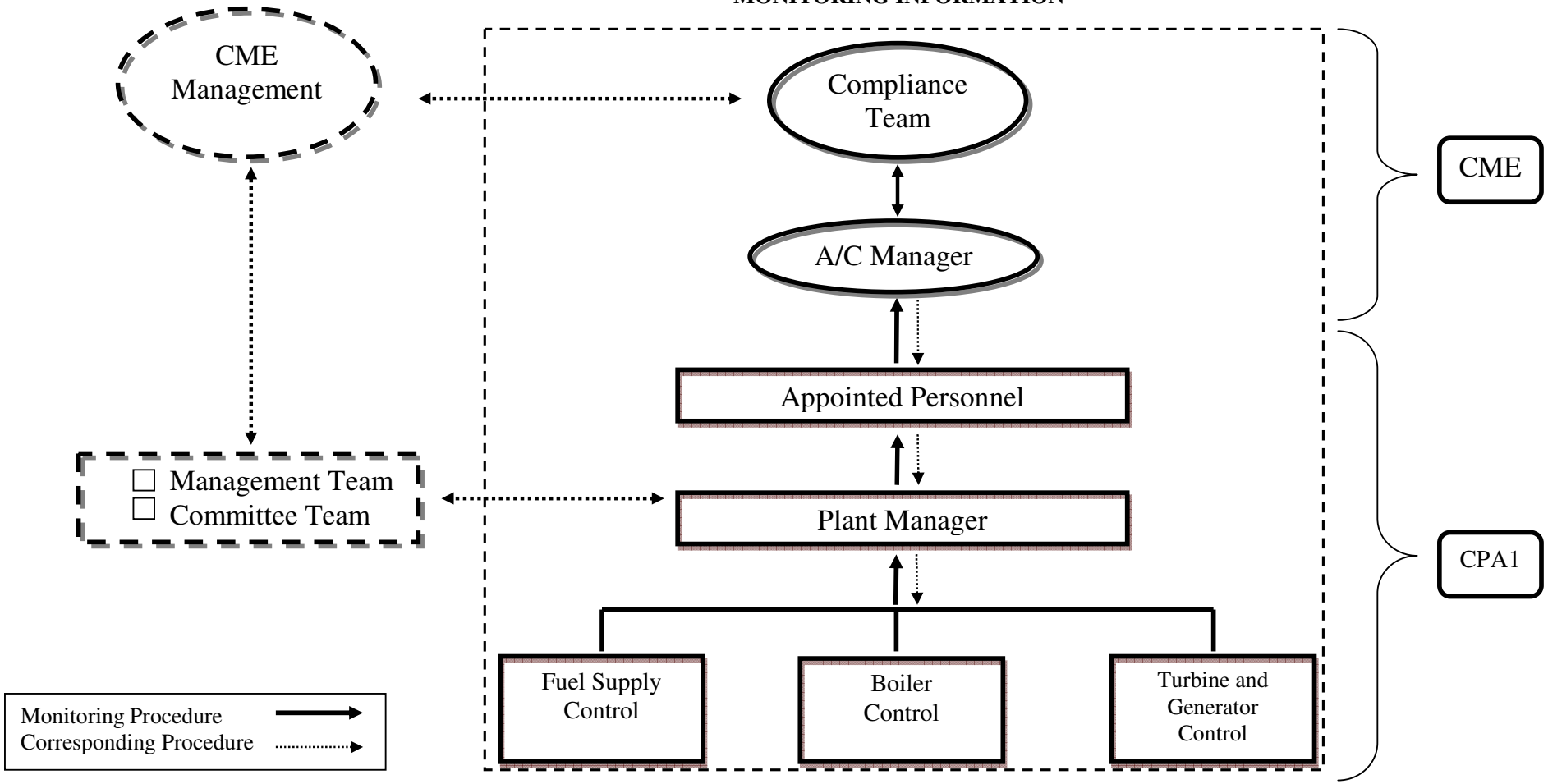
Expertise & Training:

The power plant will be managed and operated by a team of highly skilled professionals with prior knowledge and experience of power plant operation. All the personnel will receive an extensive on-the-job training which will include training on plant operations, data monitoring and report generation. An annual assessment of the training needs of all the plant personnel will be done and if required an extensive training program will be conducted on annual basis.

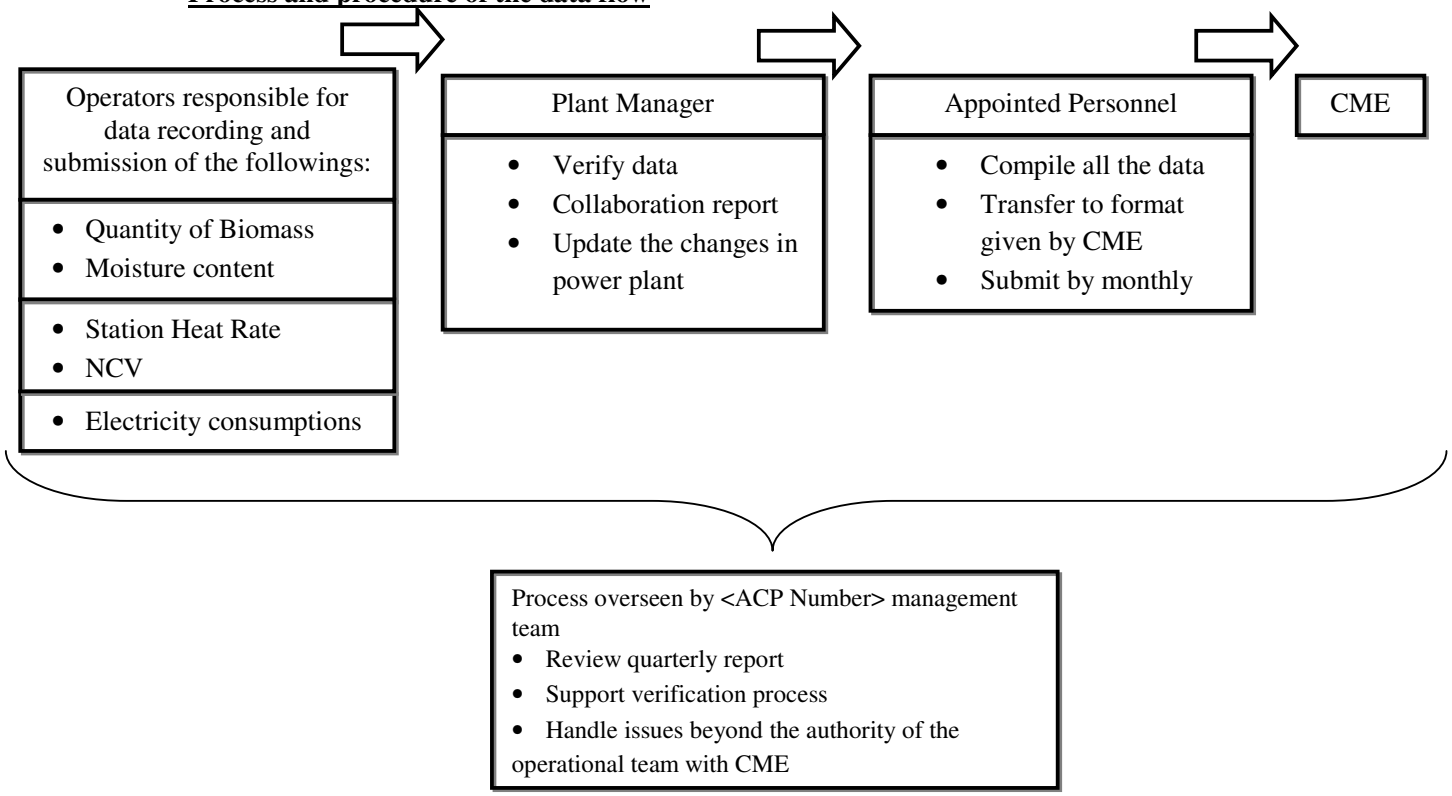
The monitoring team will undertake all the activities to ensure provision of accurate information for verification and certification in accordance with the above monitoring plan.

Annex 4

MONITORING INFORMATION

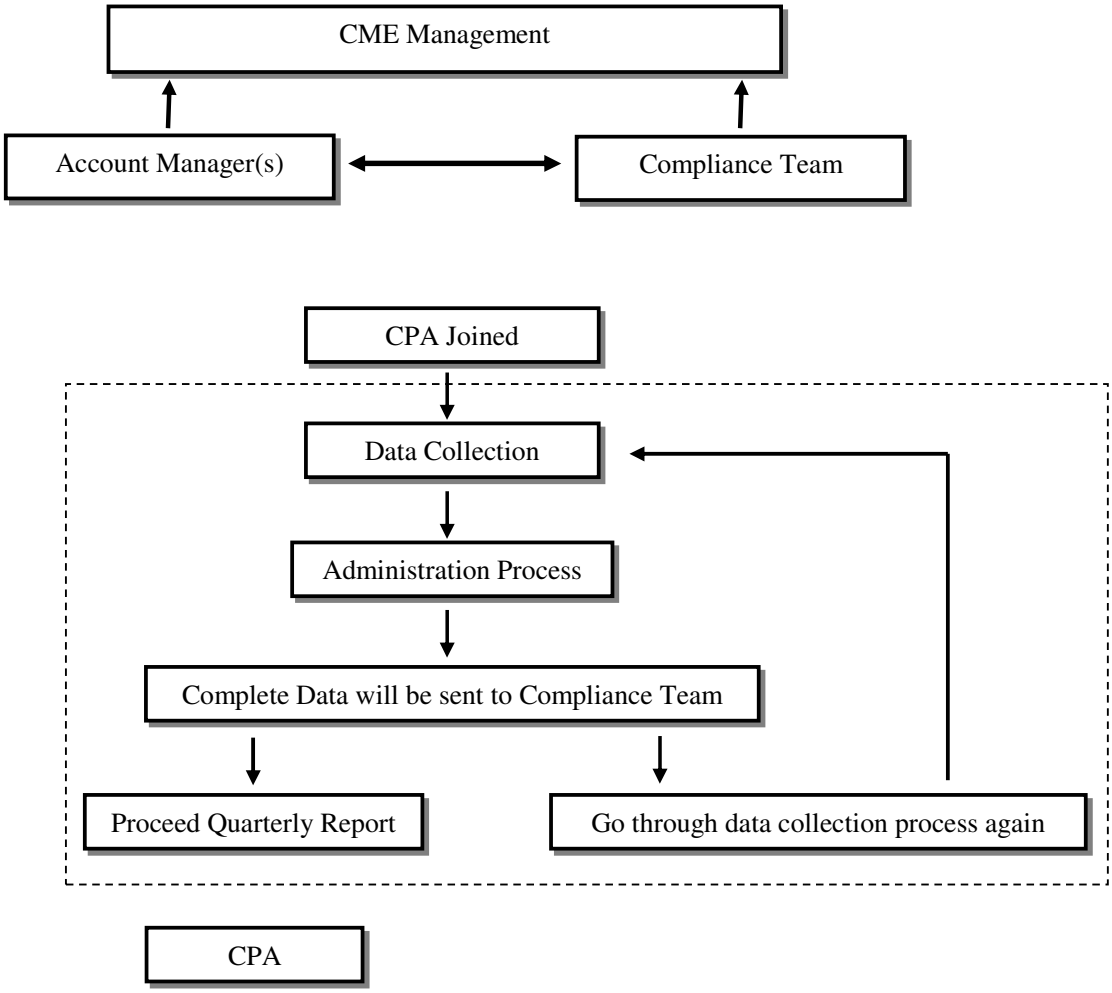


Process and procedure of the data flow



Role	Responsibilities
Operators: Fuel Supply Control	Data reading, recording, of quantity of biomass and moisture content based on procedure
Operators: Boiler Control	Data reading, recording, of station heat rate and NCV
Operators: Turbine and Generator Control	Data reading, recording, of all energy consumption data
Plant Manager	The plant manager will verify all the data collected by monthly from the operators. The plant manager is responsible for calibration schedule and report The plant manager will ensure all major issues and changes to the power plant related to CDM POA to be recorded To review and support the appointed personnel of <CPA number> to perform its duty
Appointed Personnel	Compiled all the required data from plant manager, Transfer all data to format given by CME And file all relevant documents Focal coordinating point between CME and <CPA Number>

Overview of CME Operational and Management Chart



Every CPA will be coordinated by 1 appointed account manager from CME, dedicated account manager will handle all matters since the first day the CPA agree to participate to the PoA. The main role including on-time collection of data, these data needs to be transfer to internal monitoring system and account manager ensure accurate calculation of emission reductions, the quarterly monitoring report will be sent to compliance team for audit of data and if all data is in compliance of internal QC, the compliance team will communicate back to the account manager to proceed with formal quarterly report issued to CPA personnel.

CME is overseen by an appointed management any issues beyond the authority of the personnel, will be handle directly by the management.

Annex 5

Justification of methodology choice of <CPA Number> based on AMS-1.D, Version 17 as applied in the latest valid POA-DD

Criterion	Conditions	Applicability
Criterion 1	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that: (a) Supplying electricity to a national or a regional grid; (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling	<CPA Number> installs renewable biomass based power plant that supply electricity to the national grid of Thailand.
Criterion 2	Illustration of respective situations under which each of the methodology (i.e. AMS-1.D, AMS-1.F, and AMS-1.A) applies is included in Table 2 of AMS-I.D version 17	<CPA number> will supply electricity to the Thai national grid. <CPA number> may supply electricity to an identified consumer facility that is currently using electricity from the national/regional grid through a contractual agreement.
Criterion 3	This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition[5]; (c) involve a retrofit[6] of (an) existing plant(s); or (d) involve a replacement[7] of (an) existing plant(s).	<CPA Number> is a Greenfield plant.
Criterion 4	Hydro power plants with reservoirs that	Not applicable

[5] A capacity addition is an increase in the installed power generation capacity of an existing power plant through: (i) the installation of a new power plant besides the existing power plant/units, or (ii) the installation of new power units, additional to the existing power plant/units. The existing power plant/units continue to operate after the implementation of the project activity.

[6] Retrofit (or Rehabilitation or Refurbishment). It involves an investment to repair or modify an existing power plant/unit, with the purpose to increase the efficiency, performance or power generation capacity of the plant, without adding new power plants or units, or to resume the operation of closed (mothballed) power plants. A retrofit restores the installed power generation capacity to or above its original level. Retrofits shall only include measures that involve capital investments and not regular maintenance or housekeeping measures.

[7] Replacement: it involves investment in a new power plant or unit that replaces one or several existing unit(s) at the existing power plant. The installed capacity of the new plant or unit is equal to or higher than the plant or unit that was replaced.

	satisfy at least one of the following conditions are eligible to apply this methodology: • The project activity is implemented in an existing reservoir with no change in the volume of reservoir; • The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.	
Criterion 5	If the unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added fossil fuel[8], the capacity of the entire unit shall not exceed the limit of 15 MW.	<CPA Number> installs a biomass based power plant and the project does not have any non-renewable component in the project boundary. The installed capacity of the biomass power plant is <Insert the power plant capacity> MW.
Criterion 6	Combined heat and power (co-generation) systems are not eligible under this category.	<CPA Number> doesn't include co-generation activity.
Criterion 7	In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct[9] from the existing units	Not applicable to the SSC-CPA

[8] Co-fired system uses both fossil and renewable fuels.

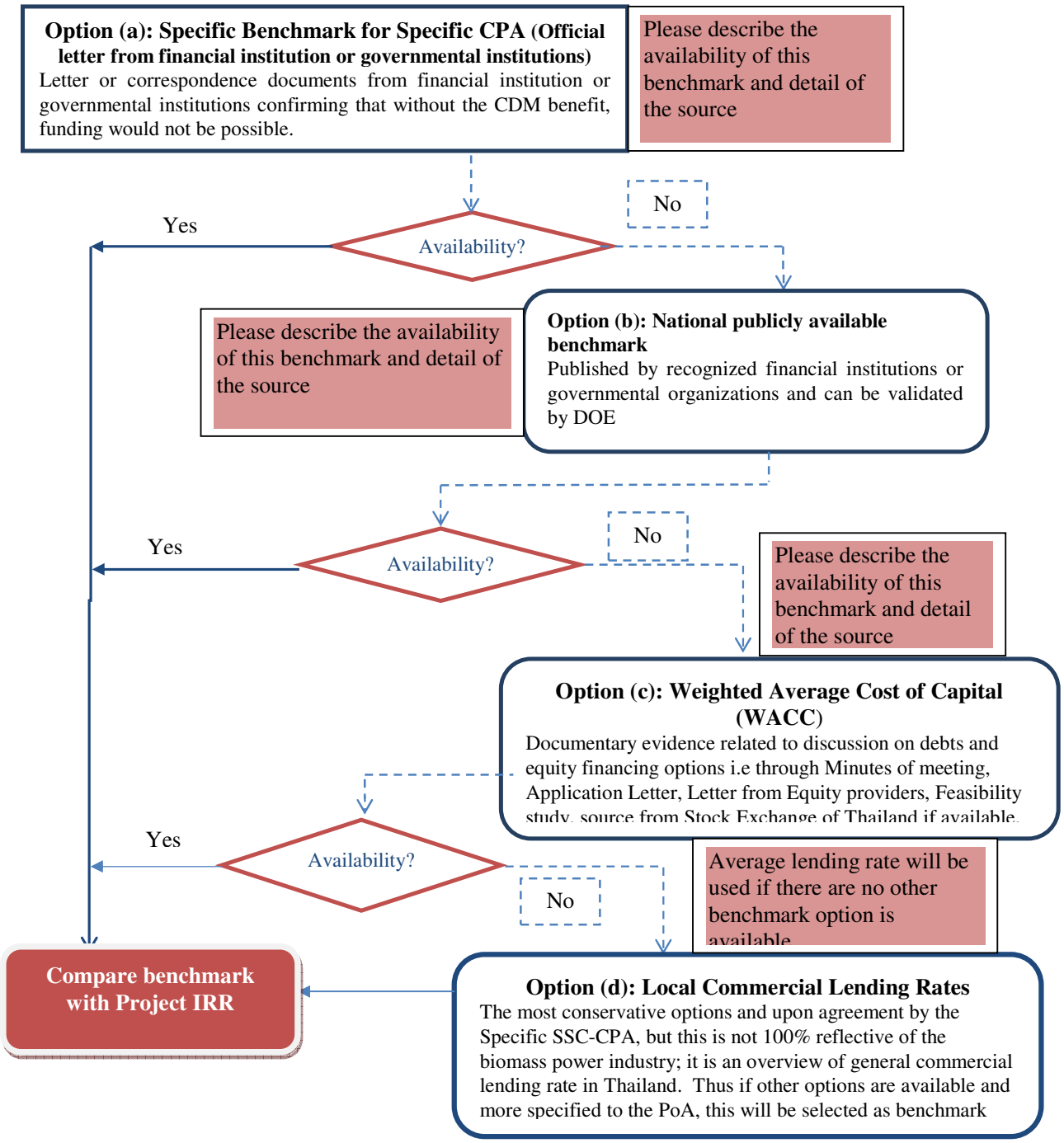
[9] Physically distinct units are those that are capable of generating electricity without the operation of existing units, and that do not directly affect the mechanical, thermal, or electrical characteristics of the existing facility. For example, the addition of a steam turbine to an existing combustion turbine to create a combined cycle unit would not be considered "physically distinct".

Criterion 8	In the case of retrofit or replacement,to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	Not applicable to the SSC-CPA

Annex 6

Procedure for determining appropriate applicable benchmark

<CPA NUMBER>'S STUDY FOR DETERMINING THE APPROPRIATE APPLICABLE BENCHMARK



Please use Red line indicate the flow of the study of each options from top preferences