VALIDATION REPORT

for the CDM Programme of Activities

Biomass Power Development Programme in Thailand

in

Thailand

Report No. 01 997 9105064278

Version No. 01.4, 2012-10-31

TÜV Rheinland (China) Ltd.

I. Programme of Acitivities (PoA) Description:

PoA title: **Biomass Power Development Programme in Thailand**

Host Country: **Thailand**

Methodology: AMS-I.D./ version 17 ☐ Large Scale ☒ Small Scale

Annual average emission reductions (estimate): Not applicable to the PoA

GHG reducing measure/technology: Biomass Power Generation

Party	Project Participants	Party considered a project participant
Thailand	Advance Carbon Securities Ventures (ACSV) Company Limited	No

Generic CPA title: "Biomass Power Development Programme in Thailand" CPA <Insert Number>

Real-case CPA title: "Biomass Power Development Programme in Thailand" CPA 1

Host Country: Thailand

CPA Implementer Advance Clean Power Company

To be project participants No

Annual average emission reductions (estimate): 37,941 tCO_2e

II. Validation:

Contract party: Advance Carbon Securities Ventures (ACSV) Company Limited

Validation Team:

Validation Team			Role									
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Team leader	Acting Team Leader	Local Expert	Team Member (Auditor)	Technicla Expert	Acting Tech. Expert	Trainee Auditor	Technical Reviewer	Expert to TR	Trainee TR
Harold Hai	China	1.2, 6.1, 13.1	X									
Tommy Lo	China	1.2, 5.1, 13.1, 13.2				X						
Libo Ma	China	1.1					X					
Piyaporn Songprasert	Thailand	13.1, 1.2			X							
Lixin LI	China	1.1, 1.2, 2.1, 2.2, 3.1, 4.5								X		

Validation Phases:

☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues

Validation Status:

☐ Corrective Actions / Clarifications Requested
☒ Full Approval and Submission for Registration
☐ Rejected

III. Validation Report:

Report No.:	Current revision No.:	Date of current revision:	Date of first issue:
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Final approval:	Released on:	Designated Operational Entity (DOE):
☒	**2012-11-05** **By: Mr. Praveen N. Urs**	**TÜV Rheinland (China) Ltd.** Unit 707, AVIC Building, No.10B, Central Road, East 3rd Ring Road, Chaoyang District, Beijing, CHINA 100 022 Tel: +86 10 6566 6660-169 E-mail: DOE@chn.tuv.com

Executive Summary – Validation Opinion

The validation team assigned by the DOE (TÜV Rheinland (China) Ltd. [1]) has performed the validation of "Biomass Power Development Programme in Thailand" in Thailand on the basis of UNFCCC criteria for Clean Development Mechanism (CDM) programme of activities according to Article 12 of the Kyoto Protocol and the subsequent decisions by the COP/MOP and CDM Executive Board with regard to the simplified modalities and procedures for small-scale CDM project activities, the procedures for registration of a programme of activities and the application of approved methodologies. The validation findings are summarized in the validation report and the validation protocol.

The review of the Programme design documentations (i.e. PoA-DD, generic CPA-DD and real-case CPA-DD) and the subsequent follow-up interviews have provided the DOE with sufficient evidence to determine the fulfilment of stated criteria.

The validation was executed in the following steps so far:

- Desk review of GSP documents:
  - PoA-DD/ Version 01 dated 12th April 2011
  - Real-case CPA-DD/ Version 01 dated 12th April 2011 (for CPA 1)
  - Generic CPA-DD/ Version 01 without effective date
- Public stakeholder comment process (22nd April 2011 to 21st May 2011)
- On-site visit with stakeholder interviews (21st to 23rd June 2011)
- Issue of checklist with corrective action requests (CARs) and clarification requests (CLs) and the draft validation report & protocol (18th August 2010)
- Desk review of revised PoA-DD, CPA-DD and real-case CPA-DD
  - PoA-DD/ Version 05 dated 4th October 2012
  - Real-case CPA-DD for CPA1/ Version 05 dated 4th October 2012
  - Generic CPA-DD/ without effective version and date
- Review of proposed corrections and clarifications
- Issue of the final validation report & protocol

According to the GSP PoA-DD, the programme is a unilateral PoA. The host country is Thailand. The LoA from the DNA of Thailand – Thailand Greenhouse Gas Management Organization (TGO), has been validated to confirm the voluntary participation and coordination by Advance Carbon Securities Ventures (ACSV) Company Limited, and confirms that the PoA assists Thailand in achieving sustainable development.

The validation team did not reveal any information that indicates that the PoA can be seen as a diversion of ODA funding towards the Thailand.

The validation team has checked that the proposed PoA correctly applies AMS-I.D./Version 17 – "Grid Connected renewable electricity generation".

It is demonstrated that the PoA is not a baseline scenario. The current situation is the supply of power from the national grid which comprised of a large share of fossil fuel based power generation system. There are also no regulations and policies for mandatory biomass power project development. In the absence of the PoA, the baseline

[1] Formerly TUV Rheinland Japan Limited before 1 Nov 2011 as designated in UNFCCC

scenario will remain unchanged. Emission reductions attributable to a programme activity included to the PoA are hence expected to be additional to any that would occur in the absence of the programme activity provided that the PoA meets the requirements for demonstrating additionality established in the PoA-DD.

Monitoring plan and procedures have been presented in the PoA-DD and CPA-DD, and the monitoring requirements from the AMS-I.D./Version 17 are fully complied. The CDM training for CME and CPA1 implementer has been carried out. Continuous training will be provided particularly before the subsequent CPA biomass power plant operation. The CDM training records for PoA and CPA1 are reviewed by the validation team. The validation team considered that CME and the CPA implementer are capable to implement the monitoring plan provided that sufficient training can be arranged to the monitoring team

In summary, the validation team has revealed that the relevance of outlined requirements for PoA is sufficiently followed and evidenced. Thus, it is the validation team's opinion that the proposed PoA, Biomass Power Development Programme in Thailand, as described in the PoA-DD, generic CPA-DD and real-case CPA-DD during GSP, meets all the relevant UNFCCC requirements for the SSC-CDM PoA and relevant host country criteria. The validation team of TÜV Rheinland (China) Ltd. therefore recommends the proposed PoA to be registered as a small-scale CDM Programme of Activities with the UNFCCC.

Abbreviations

ACP	Advance Clean Power Company Limited
ACSV	Advance Carbon Securities Ventures (ACSV) Company Limited
AMS	Approved Methodology Small scale
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CPA	CDM Programme activity
CPA-DD	CDM Programme Activity Design Document
CER	Certified Emission Reduction
CL	Clarification Request
CME	Coordinating/managing entity
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DIW	Department of Industrial Works
DOE	Designated Operational Entity
DNA	Designated National Authority
DR	Document Review
EB	Executive Board
EIA	Environmental Impact Assessment
EPPO	Energy Policy and Planning Office, Ministry of Energy
ER	Emission Reduction
ERPA	Emission Reduction Purchase Agreement
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas
GIZ	German International Cooperation
GTZ	German Technical Cooperation
GWh	Giga Watt Hours
I	Interview
IEE	Initial Environmental Evaluation
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
kW	Kilo Watt
kWh	Kilo Watt Hours
L_y	Leakage
LoA	Letter of Approval
MLR	Minimum Lending Rate
MoV	Means of Verification
MW	Mega Watt
MWh	Mega Watt Hours
NGO	Non Government Organisation
NOx	Nitrogen Oxides
ODA	Official Development Assistance
OSV	On Site Visit
PE	Project Emissions
PEA	Provincial Electricity Authority
PIN	Project Information Note
PoA	Programme of Activities
PoA-DD	Programme of activities design document
PP	Project Participant

SA	Sensitivity Analysis
SO_2	Sulphur Dioxide
SD	Sustainable Development
t	Tonne
TGO	Thailand Greenhouse Gas Management Organization
THB	Thai Baht
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
VSPP	Very Small Power Producers
VVM	Validation and Verification Manual

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1 INTRODUCTION

Advance Carbon Securities Ventures (ACSV) Company Limited has commissioned the DOE TÜV Rheinland (China) Ltd. to perform a validation of the proposed CDM Programme of Activities (PoA) "Biomass Power Development Programme in Thailand" in Thailand (hereafter called "the PoA"). This report summarises the findings of the validation of the PoA identified in the SSC-PoA Design Document (SSC-PoA-DD), the SSC-CDM Programme Activity Design Document (SSC-CPA-DD) template with generic information relevant to all CDM Program Activities (CPAs) to be included in the PoA, and the associated real case SSC-CPA-DD. The validation was performed on the basis of UNFCCC criteria for the PoAs under the CDM, as well as the criteria given to provide for consistent programme operations, monitoring and reporting. The term "UNFCCC criteria" refers to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project /programme activities, the procedures for registration of a programme of activities and the subsequent decisions by the CDM Executive Board.

1.1 Objective

The purpose of a validation is to have an independent third party assess the PoA-DD, CPA-DD template and the associated real case CPA-DD (also known as completed CPA-DD). In particular, the eligibility criteria for inclusion and demonstration of additionality of CPAs, the programme's baseline determination, monitoring plan, and the programme's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the programme design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM PoAs and is seen as necessary to provide assurance to stakeholders of the quality of the programme and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the PoA-DD, CPA-DD template and the completed CPA-DD. The PoA-DD, CPA-DD template and the completed CPA-DD were reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project/ programme activities, the procedures for registration of a programme of activities as a single CDM project activity and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.D. (Version 17). The validation team has, based on the recommendations in the Validation and Verification Manual employed a rules-based approach, focusing on the requirements of the EB's VVM for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the coordinating/managing entity and participants of small-scale CDM-PoA. However, stated requests for clarifications, corrective actions, and/or forward actions may provide input for improvement of the programme design.

2 METHODOLOGY

The validation consists of the following four phases:

I a desk review of the PoA-DD, generic CPA-DD and the real-case CPA-DD;

II global publication of the programme design documents (PoA-DD, generic CPA-DD and real-case CPA-DD) in UNFCCC;

III on-site visit and follow-up interviews with programme stakeholders

IV the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

2.1 Desk Review of the Programme Design Documentation

Table 1: The following table outlines the documentation reviewed during the validation

/1/	/1.1/	PoA-DD/ Version 01 (GSP), 12th April 2011
	/1.2/	PoA-DD/ Version 05, 4th October 2012
/2/	/2.1/	Generic CPA-DD/ Version 01 (GSP, date not specified)
	/2.2/	Generic CPA-DD (date and version to be specified during CPA inclusion)
/3/	/3.1/	Real-case (CPA 1) CPA-DD/ Version 01 (GSP), 12th April 2011
	/3.2/	Real-case CPA-DD (for CPA1)/ Version 05, 4th October 2012
/4/	/4.1/	UNFCCC, Small-Scale CDM Programme of Activities Design Document form (CDM-SSC-PoA-DD), Version 01
	/4.2/	UNFCCC, Small-Scale CDM Programme Activity Design Document form (CDM-SSC-CPA-DD), Version 01
	/4.3/	Guidelines for Completing the Programme Design Document Form For Small-Scale CDM PoA, Version 02.0, EB67
/5/	UNFCCC, Clean Development Mechanism Validation and Verification Manual (Version 01.2), EB 55 Annex 1	
/6/	Glossary of CDM terms http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf	
/7/	/7.1/	UNFCCC, Guidelines on the demonstration of additionality of small-scale project activities, Version 09.0, EB68 Annex 27
	/7.2/	UNFCCC, “Non-binding best practice examples to demonstrate additionality for SSC project activities” (Version 01), EB 35 Annex 34
	/7.3/	UNFCCC, “Guidelines for objective demonstration and assessment of barriers” (Version 01), EB 50 Annex 13
/8/	/8.1/	UNFCCC, “Guideline for determining the occurrence of de-bundling under a programme of activities” (Version 03.0), EB 54 Annex 13
	/8.2/	UNFCCC, “Procedures for registration of a programme of activities as a

		single CDM project activity and issuance of certified emission reductions for a programme of activities" (Version 04.1), EB 55 Annex 38
	/8.3/	UNFCCC, Clarifications regarding the "Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities" (Version 01), EB 60 Annex 26
	/8.4/	UNFCCC, "Procedures for review of erroneous inclusion of a CPA" (Version 03.0), EB 61 Annex 22
	/8.5/	UNFCCC, "Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for PoA" (Version 01.0), EB65 Annex 3
/9/	UNFCCC, "General Guidelines to SSC CDM Methodologies" (version 17), EB 61 Annex 21	
/10/	UNFCCC, AMS-I.D./Version 17 – "Grid Connected renewable electricity generation"	
/11/	UNFCCC, "Guideline on the demonstration and assessment of prior consideration of the CDM" Version 04, EB62	
/12/	UNFCCC, "Tool to calculate the emission factor for an electricity system" version 2.2.1, EB63	
	PoA Documentation	
/13/	Advance Carbon Securities Ventures (ACSV) Company Limited, Business Registration (Ref. no. 0105553083213)	
/14/	Advance Carbon Securities Ventures (ACSV) Company Limited, Organization Chart of CME for PoA operation	
/15/	BTGC Corporation Co., Ltd., PoA-IEE-SD Framework for Biomass Power Development Program in Thailand	
/16/	ACSV, Declaration of Non-use of official development assistance from Annex I parties for the PoA, 1st April 2011	
/17/	TGO (Thai DNA), Acknowledgement of Letter of Intent from ACSV (Ref. no. TGO 02/708), 21st October 2010	
/18/	Collaborative Agreement between GTZ, DIW and ACSV for the development of biomass power plant PoA in Thailand, 21st December 2010	
/19/	German Technical Cooperation (GTZ) and Department of Industrial Works (DIW), Invitation of Development of Biomass Power Plant PoA Workshop on 10th November 2010	
/20/	ACSV, Workshop material for the Development of Biomass Power Plant PoA Workshop on 10th November 2010	
/21/	Site Photos on Local Stakeholder Consultation in November 2010	
/22/	German Technical Cooperation (GTZ), Department of Industrial Works (DIW),	

	United Nations Development Program (UNDP) and ACSV, Invitation of Public Consultation on Development of Biomass Power Plant PoA on 23rd March 2011
/23/	ACSV, Public consultation material for the Development of Biomass Power Plant PoA on 23rd March 2011
/24/	ACSV, PoA Progress Report for August 2010 to April 2011
/25/	ACSV, Newsletter for Carbon Expo 2011
/26/	Training Material for the Development of Biomass Power Plant PoA Workshop on 10th November 2010
/27/	ACSV, Declaration of ACSV will not be the CME for other large scale PoA applying the same technology/measure in Thailand, 1st October 2011
/28/	Thailand Greenhouse Gas Management Organization (TGO, Thai DNA), Letter of Approval of the PoA (Ref. no.: TGO 02/610), 7th October 2011
/29/	Thailand Greenhouse Gas Management Organization (TGO, Thai DNA), "Result of TGO Board Meeting about CDM POA", Page 2, Paragraph 1.2 about the process of subsequent Inclusion of CPAs as per DNA Guide
/30/	Thailand Greenhouse Gas Management Organization (TGO, Thai DNA), Declaration letter (Application PoA Biomass Development/05/0511) for no mandatory IEE-SD for subsequent CPA inclusion
/31/	CME manual for generic plan and schedule guide for CPA implementation (training arrangement for CPA)
/32/	Baker and McKenzie Law Firm's research on investment market in Thailand, http://www.conference.tgo.or.th/download/ppt/Training/210810/Law3.pdf
/33/	ACSV, Letter of Intent to TGO for develop of Small scale biomass power plant below 10MW as PoA in Thailand, 30 September 2010
	CPA1 Documentation
/34/	Advance Clean Power Company Limited (ACP), Business Registration (Ref. no. 0105551090603)
/35/	ACP, Organization Chart for CPA operation
/36/	ACP, Plant Layout Overview for CPA1 biomass power plant
/37/	ACP, Electrical Connection Diagram for CPA1 biomass power plant
/38/	ACP, Minutes of Board of Director Meetings for the CDM development on 12th November 2008, 19th November 2008, 15th June 2010
/39/	Regulation of electricity connection with Provincial Electricity Authority (PEA) 2008
/40/	Provincial Electricity Authority (PEA), Approval of electricity connection for the CPA1 biomass power plant, 2009
/41/	Provincial Electricity Authority (PEA) and ACP, Power Purchase Agreement (PPA, ref. no.: VSPP-PEA 108/2552) 29th July 2009
/42/	Advance Energy Development Co., Ltd., Techno Offer and Quotation on the

	Design, Supply and Installation of the CPA1 biomass power plant with technical specifications, 10th September 2010
/43/	ACP, Proposal for Land Improvement Works for CPA1 biomass power plant
/44/	Advance Asia Engineering, Quotation on the Civil Works of the CPA1 biomass power plant, 22nd September 2010
/45/	Global Woodchip Co., Ltd. (Biomass residues supplier), Quotation of biomass residues, 4th October 2010
/46/	Fahpratan Rungrueng Co., Ltd. (Biomass residues supplier), Quotation of biomass residues, 6th October 2010
/47/	Local Stakeholder Consultation Record with Summary for CPA1, 18th November 2010
/48/	BTGC Corporation Co., Ltd., IEE-SD Framework for Advance Clean Power Biomass Power Generation Project at Phonthong, Roi-Et (CPA1)
/49/	Advance Clean Power Company Limited, Land Purchase Information
/50/	Advance Clean Power Company Limited, Declaration of Non-use of official development assistance from Annex I parties for the PoA, 1st April 2011
/51/	ACSV, CPA Prospect Screening Form for CPA 1 implementer, 21st January 2011
/52/	ACSV and ACP, Non-disclosure Agreement for the development of CPA1 (Ref. no. CPA1/2011), 22nd January 2011
/53/	Emission Reductions calculation spreadsheet for CPA1
/54/	Global Woodchip Co., Ltd. and ACP, biomass supply contract (Ref. no.: ACP-001/2553), 15th November 2010
/55/	Fahpratan Rungrueng Co., Ltd. and ACP, biomass supply contract (Ref. no.: ACP-002/2553) , 15th November 2010
/56/	CPA 1 Biomass survey form for biomass residues supplier 1 (Global Woodchip Co., Ltd.)
/57/	CPA 1 Biomass survey form for biomass residues supplier 2 (Fahpratan Rungrueng Co., Ltd.)
/58/	Advance Energy Development Co., Ltd. (vendor) and Advance Clean Power Company Limited (CPA1 implementer), Contract for Supply and Installation Equipment for CPA1 Biomass Power Plant in Roi Et Province (Ref. no. ACP-02-006-2011), 21st September 2011
/59/	ACSV, Debundling checklist for CPA1 biomass power project
/60/	ACP, Declaration of not debundling component for CPA1 and not applied for other carbon credit, 10th October 2011
/61/	Memorandum of Understanding (MoU) between CPA1 implementer and CME related to CERs ownership and Transaction Procedure in PoA on Biomass Power Development Programme In Thailand

/62/	Advance Asia Engineering and Advance Clean Power Company Limited (CPA1 implementer), Contract for Civil Construction for CPA1 Biomass Power Plant in Roi Et Province, 25th September 2011
/63/	TGO, Study of emission factor for electricity system in Thailand 2009 http://www.tgo.or.th/download/publication/GEFReport_EN.pdf
/64/	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Table 2.5, Page 2.22, Chapter 2, Volume 2
/65/	Monthly Minimum Lending Rate (MLR) published by the Bank of Thailand (BOT), http://www.bot.or.th/English/Statistics/FinancialMarkets/InterestRate/Pages/StatInterestRate.aspx
/66/	Ayudahya Securities Public Company Limited, "Research on energy sector project IRR to reduce due to competition", 2008
/67/	Asian Institute of Technology of Thailand, Publication "Treatment and utilization of agricultural wastes in Thailand"
/68/	National Science and Technology Development Agency and Thailand Environment Institute, research paper "Overview of Biomass Utilization in Thailand"
/69/	Asian Institute of Technology of Thailand and Kasetsart University, publication "Management of Agricultural Wastes and Residues in Thailand: Wastes to Energy Approach"
/70/	IRR calculation spreadsheet for CPA1
/71/	Advance Clean Power Co. Ltd., Minute of Board of Director Meeting on CDM development on the CPA, 12th November 2010
/72/	Metropolitan Electricity Authority (MEA)/ Provincial Electricity Authority (PEA) of Thailand, Regulations for the Purchase of Power from Very Small Power Producers
/73/	Metropolitan Electricity Authority (MEA)/ Provincial Electricity Authority (PEA) of Thailand, Distribution Utilities' Regulations for Synchronization of Generators with Net Output under 10 MW to the Distribution Utility System (max 8MW for connection)
/74/	GPS measurement for geographical coordinates of biomass power plant for CPA1 by validation team using BlackBerry Mobile Tool
/75/	ACSV, CPA Database for the PoA
/76/	Electricity Generating Authority of Thailand (EGAT), Summary of Thailand Power Development Plan 2010-2030, http://www.egat.co.th/en/images/stories/pdf/Report%20PDP2010-Apr2010_English.pdf
/77/	Lertsuridej, P. (2006): Policy on New and Renewable Energy Technology Promotion in Thailand, http://www.energy-based.nrct.go.th/Article/Ts-3%20policy%20on%20new%20and%20renewable%20energy%20technology%

	20promotion%20in%20thailand.pdf. Ministry of Energy, Thailand, Bangkok.
/78/	Amranand, P. (2008): Alternative Energy, Cogeneration and Distributed Generation: Crucial Strategy for Sustainability of Thailand's Energy Sector, http://www.eppo.go.th/doc/Piya-RE-in-Thailand.pdf. Ed. EPPO, Energy Policy & Planning Office, Thailand, Bangkok

2.2 Follow-up Interviews with Programme Stakeholders

Table 2: The following table identifies the personnel who have been interviewed and/or provided additional information to the presented documentation:

	Date	Name and Title	Organization
/i/	2011/06/21 to 2011/06/23	Ivo Besselink (Climate Change Advisor)	United Nations Development Programme
/ii/		Jens Radschinski	CDM consultant
/iii/		Nicole Tan (Chief Executive Officer, Management Representative of the CME)	Advance Carbon Securities Ventures (ACSV) Company Limited
/iv/		Supalerk Kanasook (Project Manager)	German International Cooperation
/v/		Artit Supyangyuenkul (Project Manager)	
/vi/	2011/06/21	Poj Napalert (Chief Executive Officer)	Advance Clean Power Company Limited (CPA 1 Implementer)
/vii/		K. Lanne (Assistant)	
/viii/	2011/06/22	Yonyong Sriburanasorn (Chief Executive Officer)	Fahprathan Ruengrongdo Limited (Woodchip company)
/ix/		Panuwat Hongtong (Chief Executive Officer)	Global Woodchip
/x/		Pang Pakvisit (Village Head)	Kudkuang and Tasangchang Village #4
/xi/		Wanta Hongsa (Village Head)	Kudkuang and Tasangchang Village #11
/xii/	2011/06/23	Chaiwat Muncharoen (Deputy Executive Officer)	Thailand Greenhouse Gas Management Organization (TGO)
/xiii/		Bongkoch Kittisompun	

		(Director of Approval and Monitoring Office)	
/xiv/		Rongphet Bunchuaidee (Assistant Senior Offical Greenhouse Gas Information Center)	
/xv/		Parvcena Panchayaeichet (Officer)	
/xvi/		Akharilt Khuhapinant (Officer)	Department of Industrial Works
/xvii/		Sittichai Ruengrotviriya (Engineer)	
/xviii/		Nuchanat Suphansri (Senior Scientist)	

Table 3: Interview topic

	Date	**Organization**	**Topic**
/a/	2011/06/21 to 2011/06/23	CME: Advance Carbon Securities Ventures (ACSV) Company Limited And CPA1 implementer: Advance Clean Power Company Limited	➢ Programme design ➢ PoA related legal issues ➢ CDM development history ➢ Technical equipment ➢ Sustainable development issues ➢ Additionality ➢ Crediting period ➢ Monitoring plan ➢ Training history ➢ Operation and Management system ➢ Environmental impacts ➢ Stakeholder process ➢ Approval by the host country
/b/	2011/06/22 to 2011/06/23	Bangkok Municipality and Phonthong District (Roi-Et) Local Community	➢ Programme design ➢ Programme related legal issues ➢ Programme status ➢ Sustainable development issues ➢ Environmental impacts ➢ Stakeholder process ➢ Issues affecting the local

			community ➢ Approval by the local governments

2.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to TÜV Rheinland's conclusion on the PoA design. In order to ensure transparency a validation protocol is customised for the programme. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM PoA is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the PoA is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of programme objectives is identified. Corrective action requests (CAR) are issued, where:

i) mistakes have been made with a direct influence on programme results;
ii) CDM and/or methodology specific requirements have not been met; or
iii) there is a risk that the programme would not be accepted as a CDM PoA or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

A forward action request (FAR) may be raised to highlight issues related to the PoA implementation that require review during the first verification.

A revised set of document (PoA-DD, real-case and generic CPA-DD) was submitted to the validation team for final validation. The revision was based on the CARs and CLs in the draft validation report. The major amendments include: programme description, version of methodology, starting date & expected crediting period of the CPA, estimation of the parameters applied in the ER calculation, and monitoring arrangement etc. The following table highlights the major changes:

Subject	Webhosted PDD	Correction to webhosted PDD in the final PDD submission for registration with DOE acceptance
Methodologies	AMS-I.D. Version 16	AMS-I.D. Version 17 (Due to the update of the methodology from

		UNFCCC)
CER calculations	Not applicable to PoA	Not applicable to PoA
Additionality	Barriers due to investment barriers For the CPA1, the benchmark analysis is applied in the investment analysis for the demonatration of additionality by investment barrier, and the project IRR without CDM is 5.32%	Barriers due to investment barriers. The substantiation is supplemented in the final PDD version. For the CPA1, the benchmark analysis is applied in the investment analysis for the demonatration of additionality by investment barrier, and the project IRR without CDM is revised to 5.42% with the correct input of individual finanical data.
Monitoring	AMS-I.D. Version 16	AMS-I.D. Version 17 (Due to the update of the methodology from UNFCCC)
Crediting period	Not applicable to PoA	Not applicable to PoA
Please refer to Appendix A of this report for details of each change between webhosted PoA-DD and the final PoA-DD for submission. The Validation Team has carried out the validation process based on the Webhosted PoA-DD and raised CARs/CLs against the project by issuing the validation protocol. With the updated information and corrections done on final PoA-DD and associated CPA-DD, the PP has addressed all the CARs /CLs that were raised by the Validation Team. It is concluded that the Validation Team has reviewed the project in line with the VVM (version 01.2) and all the evidence, corrections, justifications and updating done on the final PoA-DD and associated CPA-DD with respect to CARs /CLs raised are accepted and closed by the validation Team, issuing the positive validation opinion for project registration.		

Validation Protocol Table 1: Mandatory Requirements for CDM Programme of Activity		
Requirement	***Reference***	***Conclusion***
The requirements the programme must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the programme should meet. The checklist is organised in different sections, following the logic of the small-scale PoA-DD/ CPA-DD templates, version 01. Each section is then further sub-divided.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **corrective action request (CAR)** due to non-compliance with the checklist question (See below). A request for **clarification (CL)** is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests				
CL/CAR No.	***Observations***	***Reference***	***Summary of project owner response***	***Validation team conclusion***
CL/ CAR XX	*If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.*	*Reference to the checklist question number in Table 1and 2 where the CAR or CL is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 1 and 2, under "Final Conclusion".*

Figure 1. Validation protocol tables

2.4 Internal Quality Control

The draft validation report including the validation findings underwent technical review before requesting registration of the PoA. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification.

2.5 Validation Team

Validation Team			Type of Involvement						
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Supervising the work	Desk review	Site Visit + Interview	Report and protocol Writing	Technical Expert Input	Reporting Support	Technical Reviewer
Harold Hai	China	1.2, 6.1, 13.1	X	X	X				
Tommy Lo	China	1.2, 5.1, 13.1, 13.2		X	X	X			
Libo Ma	China	1.1			X		X	X	
Piyaporn Songprasert	Thailand	1.2, 13.1			X			X	
Lixin Li	China	1.1, 1.2, 2.1, 2.2, 3.1, 4.5							X

3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the programme design as documented and described in the revised and resubmitted PoA-DD and generic CPA-DD and real-case CPA-DD.

3.1 Approval and Participation

According to the PoA-DD, the proposed programme is a unilateral CDM PoA which involves a project participant: Advance Carbon Securities Ventures (ACSV) Company Limited from the host party, Thailand.

Advance Carbon Securities Ventures (ACSV) Company Limited is a private entity, and acts as the coordinating/managing entity of the small-scale PoA /13-14/. The host party, i.e. Thailand meets all relevant participation requirements in CDM. The Letter of Approval (LoA) issued by the Thai DNA, i.e. Thailand Greenhouse Gas Management Organization (TGO), has been received for confirming the voluntary participation of ACSV, and the PoA assists to Thailand's sustainable development. The relevant PoA

approval has been announced in TGO's webpage[2], the authenticity of the LoA is therefore confirmed.

According to Section A.4.5 and Annex 2 of the PoA-DD and the on-site interview with the representative from the project participant (CME) /iii/, no public funding was involved in the PoA. The declaration letter dated 1st April 2011 from Advance Carbon Securities Ventures (ACSV) Company Limited was issued and it declared the non-use of official development assistance from any parties included in Annex I for the PoA /16/. This is also confirmed from the representative of the Thai DNA /xii/ during the on-site validation.

Table 4: The below table summarizes the project participant and party involved.

Project participant	Advance Carbon Securities Ventures (ACSV) Company Limited
Parties involved	Thailand (host)
APPROVAL	
LoA received	Yes
Date of LoA	7th October 2011 (date of issuance of LoA, it is also indicated in the LoA that the project was approved by Thai DNA on 21st September 2011)
Reference to document	TGO No.02/610
LoA received from	CME
Validation of authenticity	Document Review and the announcement from TGO's webpage[1]
Validity of LoA	Valid
PARTICIPATION	
Party is party to Kyoto Protocol	Yes. Thailand ratified the Kyoto Protocol on 28th August 2002[3].
Voluntary participation	Yes. Approved by the DNA of Thailand
Diversion of official development aid towards host country	N/A
Programme contribution to SD	Yes. Confirmed by the DNA of Thailand

[2] Project Approval by TGO, http://www.tgo.or.th/english/index.php?option=com_content&view=article&id=3:approved-cdm-poa-projects&catid=32:thailand-cdm-projects&Itemid=46

[3] Information from UNFCCC website: http://unfccc.int/files/kyoto_protocol/status_of_ratification/application/pdf/kp_ratification.pdf

3.2 Programme of Activities Design Documents

The validation team validated that the provided PoA-DD /1/, generic CPA-DD /2/ and real-case CPA-DD /3/ are based on the currently valid SSC-PoA-DD template /4.1/ and SSC-CPA-DD template /4.2/, and are correctly completed in accordance with the applicable guidance document /4.3/.

3.3 Program Description

The "Biomass Power Development Programme in Thailand" involves the development of biomass power projects in Thailand. The CDM programme activities (CPAs) under the PoA will be implemented within the borders of Thailand.

With reference to the PoA-DD Section A.4.2.1. of the PoA-DD, the implementation goal of the PoA is to coordinate and manage the development of small scale (SSC) CPAs for biomass power plant that uses renewable biomass residues from agro related processing mills such as wood barks and wood residues from woodchip mills as raw material to produce and sale the generated electricity. When the supply of biomass residues from processing mills is not stable (such as due to seasonal fluctuations), the SSC-CPA can also use other renewable fuels from other agricultural residues such as rice straw and corn straw. The installed capacity of each biomass power plant will be less than 10MW, and the power generated will be supplied to the national grid. In addition, the CME also expects that the power capacity supply to grid would probably less than 8MW, owing to the limitation of voltage threshold of 22kV for the transmission lines of the national grid. Thus supplying more that 8MW power to the grid is normally capped by the power purchase agreement between the project developer and the national grid of Thailand /72-73/.

According to the Section A.4. of the PoA-DD, the biomass power plant programme contributes to the GHG reductions by using the biomass residues as fuels for electricity generation, and this can displace an equivalent amount of grid power which comprised of a large share of fossil fuel based power generation system. Each SSC-CPA includes boilers, steam turbines, generator sets, transformer station and distribution system for electricity generation. The equipment can be manufactured from foreign countries with foreign technology transfer. The equipment origin is not the inclusion criteria, and the CPA equipment applied will be dependent on individual EPC proposal or technical study report. For CPA1, the boiler and steam turbine will be imported from foreign countries /58/. Thus it involves the technology transfer.

The validation team also considers that the PoA can reduce the possible methane emissions due to natural decay or uncontrolled burning of biomass residues. However, the project participant (CME) does not account this as an additional source of emission reductions, the validation team considers that this is a conservative approach in the estimation of emission reductions from the reduction of fossil fuels consumption only. The estimation of emission reductions will be followed the requirements in the approved methodology AMS-I.D Version 17.

The starting date of the PoA is identified to be on 8th December 2012 or the date of registration. It is only after registration that implementation of CPAs will occur constituting "real action" as defined by the EB guidance. Moreover, the length of the PoA is taken as 28 years, in which it complies with "Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities" version 04.1 in EB 55 /8.2/.

In the CPA-DD Section A.4.3.1, the starting date of fixed 10-year crediting period of the first CPA (CPA1) is selected as 8th December 2012 or date of registration of the PoA, which is in accordance with the requirement stated in the Glossary of CDM Terms /6/ "*the starting date of a crediting period of the CPA shall be the date of its inclusion in the registered PoA or any date thereafter*". The operational lifetime of CPA1 is 25 years, in which this is sourced from the techno-offer provided by the technology supplier of the biomass power generation equipment /42/. The validation team considers that the operation lifetime for the equipment in CPA1 is traceable.

Table 5: The critical programme description milestones from the PoA-DD are tabulated as follows:

Starting date of PoA	**Length of the PoA**
8th December 2012 or the date of registration	28 years

In summary, under the validation by means of document review and on-site interviews with stakeholders, the validation team considers that the programme description in PoA-DD is accurate and complete.

3.4 Eligibility Criteria for CPA Inclusion

The PoA-DD, Section A.4.2.2 states eligibility criteria for inclusion of a CPA under the PoA and validated by the validation team according to the "Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities" (Version 04.1) as below. This also makes reference to the "Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for PoA" version 01.0 in EB65. The validation for the first specific CPA (CPA1) is also included as follows:

Table 6: Validation of the Eligibility Criteria for CPA Inclusion

Eligibility criteria for a SSC-CPA to be included in the PoA	1. "Each SSC-CPA proposed in this PoA must be located within the geographical boundary of Thailand. Thailand stretches from latitude 5° 37' 00" to 20° 27' 00" N and longitude 97° 22' 00" to 105° 37' 00" E".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion. The CME /iii/ confirmed that only new installation of small-scale biomass power plants in Thailand will be included in the PoA. The coordinate of Thailand is correctly indicated in the PDD as 5° 37' 00" to 20° 27' 00" N and 97° 22' 00" to 105° 37' 00" E

	(equivalent to 5.6167° to 20.4500° N and 97.3667° to 105.6167°E). The validation team checked the public online resource from Google map and confirmed the indicated coordinates referring to the geographical boundary of Thailand.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team visited the CPA1 biomass power generation plant, which is located in the Roi-Et Province of Thailand. The geographical coordinates of the power plants correctly indicated in the CPA1-DD as 104°01'12.86" E and 16°27'74.66" N (equivalent to 104.0202° east longitude, 16.4707° north latitude). The project location was verified by crosschecking from public online source (i.e. Google Earth). The geographical coordinates of the proposed power plant and dam are also checked by the validation team via GPS measurement /74/, in which the measurement results are consistent with the values indicated in the CPA1-DD. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	2. "Each SSC-CPA is a standalone biomass based power plant with a power generation capacity of less than 10 MW. Each SSC-CPA employs Biomass combustion system and will have the following major components that meets equipments specifications including compliance with testing/certification or manufacturer's standard (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 (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 (Provincial Authority of Thailand/Metropolitan Electricity of Thailand national grid). The technical specification of the major equipment used for each SSC-CPA must be provided in section A.4.1 of each SSC-CPA-DD".
Validation Opinion on the eligibility criteria	The validation team checked that these criteria also included in the PoA-IEE-SD (Initial Environmental Evaluation-Sustainable Development) framework /15/ for standalone biomass plant with installed capacity less than 10MW. The biomass power generation project mainly comprise of a boiler, a steam turbine, generator, transformer station and distribution system. Thus the validation team considers that this criterion is reasonable and feasible.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team visited the CPA1 biomass power generation plant in the Roi-Et Province of Thailand. The validation team checked also the techno offer provided by the equipment supplier /42/, and confirms that the installed capacity of one set of the biomass power generator will be 9.9MW. The equipment includes a biomass boiler and power generator as major equipment. The technical specifications for major equipment are also indicated in the CPA1-DD Section A.4, as source from the equipment supplier. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for

	inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	3. "Each SSC-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 SSC-CPA proposed in this POA can be uniquely identified to avoid double counting of emissions based on the information recorded in SSC-CPA database under ACSV's record keeping system, including specific geographic information, and specific PPA number. The record keeping database of SSC-CPA must be reported in Section A.4.1 of each SSC-CPA-DD".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion. The CME /iii/ stated that the specific PPA number for CPAs will be used to avoid double counting. All biomass based power plants have unique PPA numbers and are recorded in the SSC-CPA database. Thus the CME can check the specific PPA along with the specific geographical information for each biomass plant, in order to avoid double counting. The validation team considers this is applicable for such purpose. Moreover, the CME has to confirm that the biomass plant is grid connected as required in AMS-I.D. by the confirmation of power connection and purchase agreement with PEA/MEA (Provincial Authority of Thailand/Metropolitan Electricity of Thailand national grid). Thus the validation team considers that this criterion is reasonable and feasible.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team checked the SSC-CPA database for CPA1 /14/. "CPA1" is the specific number assigned to the first CPA of the proposed PoA. Moreover the validation team reviewed the power purchase agreement with the PEA of Thai national grid dated 29th July 2009 /41/. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	4. "The start date of each SSC-CPA proposed into this POA must be justified through documentary evidence for demonstration of earliest real actions or implementation, such as signing date of major equipment contract".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion. This is deemed to be the earliest real action and implementation for a CPA as referred to the CDM glossary. Thus the validation team considers that this criterion is reasonable and feasible.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team checked the EPC contract between the CPA1 implementer, Advance Clean Power Company Limited with the EPC contractor /58/, and confirmed this is the earliest real action for the CPA1. This is correctly identified as the CPA1 starting date. Thus the validation team considers that the CPA01 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	5. "Each SSC-CPA must meets all the criteria in the applied methodology AMS I.D Version 17 as applied in the latest valid POA-DD document".

Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion for the CPA inclusion with same methodology applied in the PoA. The CME /iii/ confirmed that each SSC-CPA is a greenfield plant supplying electricity to the national grid of Thailand. Please also refer to the Section 3.7 for the validation of applicability of the selected methodology for details.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team checked the CPA1, which is a greenfield biomass power generation project with installed capacity of 9.9MW. The power supply will be connected with national grid of Thailand. In addition, the CPA1 does not involve in co-generation activity. Thus it is considered that AMS-I.D. version 17 can be applicable to CPA1. Please refer to Section 3.7 for details. Therefore the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	6. "Each SSC-CPA must demonstrate additionality based on investment barrier analysis by justifying that the financial indicator represented by Project IRR of each SSC-CPA is below the determined applicable benchmark. Each SSC-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."
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion for the CPA inclusion. Please refer to Section 3.8 for the discussion of additionality.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team checked the CPA1 investment analysis, in which the project IRR is lower than the benchmark of local commercial lending rate. Thus investment barrier is demonstrated for CPA1. Please refer to Section 3.7 for details. The validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	7. "Each SSC-CPA must undertake local stakeholder consultation at CPA Level. Each SSC-CPA must describe the process and report the comments of the local stakeholder consultations at CPA level in each CPA-DD. Each subsequent SSC-CPA must provide the C/ME with the justification of passing the environmental impact assessment as accordance to the latest approved version of the POA-IEE-SD framework."
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion for the CPA inclusion. According to the UNFCCC SSC-PoA-DD template, the local stakeholder consultation can be conducted either in PoA or CPA level. The CME considers that the comments from local stakeholders in each SSC-CPA biomass power project cannot be different, thus the local stakeholder consultant will be conducted in CPA level. Please refer to Section 3.13 for the discussion of local stakeholder consultation. According to the DNA of Thailand /xii/, only the Initial Environmental Evaluation-Sustainable Development (IEE-SD) is required for biomass power project under 10MW. In addition, it is required to complete the IEE-SD framework for each SSC-CPA, and

	submitted to Department of Works in order to obtain the operation permit. Please refer to Section 3.12 for the discussion of environmental impact. The validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	For CPA1, the local stakeholder consultation meeting was held at Wang Samukkee Sub-District and Phon Thong District of Roi-Et Province on 18th November 2010. The meeting mainly focused on the social-economic and environment impacts of the CPA1. Please refer to Section 3.13 for details. Meanwhile, the IEE-SD is submitted to the Thai DNA. Please refer to Section 3.12 for details. The validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	8. "Each SSC-CPA must satisfy that the proposed SSC-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 conditions as described in section A4.4.1 of the SSC-POA-DD. The result of the de-bundling should be reported in Section A.4.6 of each SSC-CPA-DD".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion for the CPA inclusion, as this is the requirement for SSC-CPA. Please refer to Section 3.5 for the discussion of de-bundling of CPAs.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team checked the CPA1, in which it is deemed not to be a de-bundled component of another CDM programme activity (CPA) or CDM project activity. The CPA1 is the first biomass power plant of the CPA1 implementer, Advance Clean Power Company Limited. The validation team also checked the UNFCCC webpage, and confirms that all other registered biomass power projects in Thailand are located in other provinces. Furthermore, according to the on-site observation, the validation team confirmed that there is no registered biomass power project within 1km of the CPA1 biomass power plant location. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA. Please refer to Section 3.5 for the discussion of de-bundling of CPAs.
Eligibility criteria for a SSC-CPA to be included in the PoA	9. "A proposed CPA must declare that it is not registered or in the process of registration as a standalone CDM project and also not a registered CPA for other POA. The detail of confirmation must be reported in Section A.4.7 of each SSC-CPA".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion for the CPA inclusion. The CME has established a SSC-PoA database to record all the CPAs included /75/. Each CPA implementer is required to declare the CPA is not registered as individual CDM project or part of another PoA. Please refer to Section 3.5 for the discussion of double-counting of CPAs.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team checked the UNFCCC webpage, and confirms that the CPA1 is not registered as individual CDM project or part of another PoA. The declaration of not applied for other carbon credit issued by the CPA1 implementer is also

	reviewed by the validation team /60/. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	10. "Proposed SSC-CPAs must declare that no ODA has been received for the implementation of the project and purchase of the CERs".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion for the CPA inclusion. The CME shall follow EB's Standard by providing affirmation that the funding will not result in diversion of ODA. In addition, all the CPA implementer is required to provide declaration letter for no ODA received for the implementation of CPA. Therefore it is considered that this criterion is reasonable and feasible.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team checked the declaration of CPA1 implementer for no ODA diversion /50/. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	11. "Each SSC-CPA must demonstrate that it is aware that the project activity has apply to this POA and the initiative is voluntary".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion. The CME has to sign an agreement with all the CPA implementer. The agreement template is checked by the validation team /52/. From the agreement, the CPA implementer has to confirm the voluntary participation in the PoA.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team checked the agreement between the CME and the CPA1 implementer /52/. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	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".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion for the CPA inclusion as this is the requirement for the first paragraph in the applied AMS-I.D. version 17. The CME /iii/ confirmed that only renewable biomass will be applied in the included CPA biomass power plants. The source of renewable biomass for each CPA will be confirmed before inclusion. Thus the validation team considers that this criterion is reasonable and feasible.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	For CPA1, wood residues and wood barks will be used, and these are classified as renewable biomass as defined in EB23 Annex 18. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	13. "Each SSC-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".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion as this is the EB's clarification in similar biomass project as indicated in the "EB answer to SSC_329". This also ensures that the transportation would not be too far away from the project power plant, in order to neglect the impact of project emissions.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	For CPA 1, the validation team checked the biomass survey forms from 2 biomass residues suppliers /45, 46, 56, 57/. The biomass residues suppliers also signed the agreement for the future supply of biomass residues to the biomass power plant with the CPA1 implementer /54, 55/. The suppliers are woodchip processing mill companies, and the distances between the suppliers to the CPA 1 plant location are 1km and 145km respectively. This is also confirmed with the representatives of the two biomass residues suppliers during the on-site validation /viii, ix/, and the validation team can also check the map in order to verify the locations of the woodchip processing mills. The distances between the two biomass residues suppliers are less than 200km radius from the CPA1 project plant /56, 57/. The biomass residues can be categorized as wood bark and wood residues. The two biomass residues suppliers also reported that the biomass residues would not be used as commercial selling, as there is no such demand for the biomass residues. Only some of the farmers would collect a very quantity of wood bark for own use as fertilizer, but the amount is limited since the wood bark is not an effective fertilizer for their agricultural products. Therefore the validation team considers that the quantity of biomass residues available at the region is more than 25% of the total utilized including the proposed CPA1.Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	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.
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion. The fossil fuel consumption for other purposes such as wheel loader operation will be monitored and included as project emissions. The CPA implementer will also check the project design, in order to confirm whether there are other possible emissions sources. If there is no other possible emission more than 1% of the emission reductions, then this emission would be neglected.

	The validation team considers that this is also complied with the requirement in the VVM for the unpredictable project emissions.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team confirmed with the CPA1 implementer (ACP) /vi/ that only a little amount of diesel is required for the boiler start-up purpose. Moreover the diesel consumption for other purposes such as wheel loader operation will be monitored during the implementation of CPA1. The project emissions will be accounted in the calculation of emission reductions. The validation team also checked the project design of CPA1, and considers that there are no other possible project emissions apart from fossil fuel consumption, thus it is considered that there will not be other emissions more than 1% of emission reductions. Therefore other possible emissions can be neglected. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	15. "Each SSC-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 SSC-CPA to support the implementation of each SSC-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.".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion. The CME has to sign a Memorandum of Understanding (MoU) with all the CPA implementer. From the MoU, the CME would confirm to undertake the ownership, management of CERs and related CER revenues.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	The validation team checked the MoU between the CME and the CPA1 implementer /61/. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	16. "Each SSC-CPA must submit the SSC-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".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion. The CPA implementer should provide all the related supporting documents together with the SSC-CPA-DD to CME for request further inclusion from DOE and DNA.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	For CPA1, the SSC-CPA-DD is checked and approved by the CME before the application of inclusion in the PoA. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.
Eligibility criteria for a SSC-CPA to be included in the PoA	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".
Validation Opinion on the eligibility criteria	OK. It is confirmed to be a reasonable criterion. Since the CME requests all the projects to be included must be under VSPP scheme in Thailand, in order to fulfil the requirements for the small-scale biomass power projects implemented under the PoA.
Validation Opinion on the inclusion of CPA1 as indicated in the Section B.2. of CPA-DD	For CPA1, the validation team checked the Power Purchase Agreement under the VSPP scheme, No: VSPP-PEA 108/2552 /41/ signed with Provincial Authority of Thailand and a dedicated legal Thai business registration certificate No: 0105551090603 /34/. So it also demonstrates that the biomass power plant design complies with the related Thai Laws and thus approved by the PEA. Thus the validation team considers that the CPA1 fulfils this eligibility criterion for inclusion in the PoA.

According to the "Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for PoA" (Version 01.0, EB65), the validation team considers that the eligibility criteria are sufficiently objective and comprehensive to permit the assessment of the inclusion of CPAs in the PoA. The real-case CPA-DD for CPA1 is published with the PoA-DD according to the EB's requirements. The eligibility criteria for inclusion of CPA1 are validated. Therefore the validation team considers that the CPA1 is eligible to be included in the proposed PoA.

3.5 Operational and Management Plan

The operational and management arrangement has been established in the PoA-DD Section A.4.4.1. for the implementation of PoA. This is complied with the requirements in clause 6 (i) of the Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities" version 04.1 in EB 55. This also makes reference to the "Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for PoA" version 01.0 in EB65.

According to the PoA-DD Section A.4.4.1., the roles and responsibilities of personnel involved from the PoA level in the process of inclusion of CPAs. The key personnel will be trained to ensure the competence of staff. The record of training will be stored by the CME. For the inclusion of SSC-CPA procedure, it is also indicated in the PoA-DD that the CME will assign competent personnel to evaluate the list of inclusion criteria and the related technical aspects of the proposed CPA. Technical review on the documents such as "Screening Form" will be conducted in order to determine the CPA eligibility of Inclusion into this POA. For CPA1, the validation team also checked the Screening Form /51/, and it is confirmed that technical review on the CPA1 technical aspects has been conducted for the CPA inclusion process.

Meanwhile the CME /iii/ also confirmed that training programs, invitation for training workshops, and provide update about the development and status of POA and CPA will be carried out for continuous improvements of the PoA management system. In addition, the CME is also required to submit annual report for the CPA inclusion to the Thai DNA, and also responsible for the facilitation of the validation of CPA inclusion with DOE. Thus the operational and management system for CPA inclusion can be ensured.

The operation and management procedure can assure to meet the requirement indicated in the relevant section of SSC-PoA-DD form /3.1/.

(i) A record keeping system for each CPA under the PoA

A centralised database will be organized for each of the CPAs under PoA by the ACSV. The development of each of the biomass power plant has to be checked and accepted by the ACSV. The monitoring of each CPA will be carried out by individual CPA implementer, and the ACSV will ensure that each SSC-CPA will have a proper collection and monitoring of data in place. Thus a record keeping system for each CPA under the PoA will be maintained by the ACSV. The CME will also manage the information collected and stored for each SSC-CPA. It is also mentioned that the database includes the essential information (such as identification number, project implementer name, PPA no., GSP coordinates and Commerical Operational Date (COD) etc.) related to CPAs under PoA as indicated in the Section A.4.4.1 of the PoA-DD.

The validation team checked the centralised SSC-CPA database /75/, and only one CPA is included in the database at the moment (CPA1, the first CPA for the PoA). According to the CME, all the mentioned information will be also kept and stored by the CME in the future.

(ii) A system/procedure to avoid double accounting

The SSC-CPA database can be also used to check the CPAs in order to avoid double counting of CPA inclusion. As confirmed by the CME, each SSC-CPA will be assigned with a unique CPA number from the CME. The SSC-CPA implementer is also required to declare that the CPA is not registered as an individual CDM project or is part of another registered PoA. The technical team of the CME will also check the UNFCCC webpage, and other information such as TGO's database if it is available, for the confirmation of no double accounting for the CPA.

The validation team considers that this can avoid double counting of biogas digesters in the same PoA or other CDM PoA. Moreover, there is no double accounting issue at the moment since there is only one CPA (CPA1) implemented for the proposed PoA.

(iii) Procedure to determine each SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity

According to the Guidance for Determining the Occurrence of De-bundling under a PoA EB54 Annex 13, a proposed SSC-CPA of the PoA shall be deemed to be not a de-

bundled component of a large scale activity as (a) the further SSC-CPA has no other PoA coordinating and managing entity apart from ACSV; (b) the further SSC-CPA is not located within 1 km of the boundary of another CPA or registered CDM project activity with the same sectoral scope, at the closest point. The validation team confirms that the further SSC-CPA to be included in the proposed PoA can be therefore considered as being not a de-bundled component of a large scale activity. This will be also verified during the further CPA inclusion, by checking the eligibility criteria. Please refer to Section 3.4.1 accordingly.

As confirmed by the CME /iii/, ACSV will not manage any large scale PoA of same technology in Thailand. The CME also requested all CPA implementer to declare of no other project with same technology within 1 km of the SSC-CPA biomass plant location in the Screening Form /51/. In addition, audit check will be carried out by the technical team of the CME, in which the UNFCCC webpage, and other information such as TGO's database if it is available, for ensuring that the distance between the SSC-CPA project plant and other project implemented by the same project proponent will be above 1km. The validation team considers that these can be effectively used to confirm the SSC-CPA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

During the on-site interview, the CPA1 implementer confirms that the CPA1 is the first batch of biomass project developed by the company. The validation team also checked the UNFCCC webpage, and confirms that all other registered biomass power projects in Thailand are located in other provinces. Furthermore, according to the on-site observation, the validation team confirmed that there is no registered biomass power project within 1km of the CPA1 biomass power plant location. Thus the CPA1 is deemed not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

(iv) The provisions to ensure that those operating the SSC-CPA are aware of and have agreed that their activity is being subscribed to the PoA

From the description of the operation and management arrangement and on-site interviews with the representatives from ASCV /iii/, the ASCV will be the sole coordinating entity of the PoA, and will coordinate and manage information of all CPAs under the PoA including a monitoring database system for all CPAs. In addition, the CME will sign a non-disclosure agreement (NDA) with the CPA implementer for the development of CPA under the PoA. The CPA implementer is required to provide various documents such as Completed Screening Form /51/, Memorandum of Understanding for confirmation of CER ownership, coordination and management role of CME /61/, declaration letter of not registered as other CDM project or part of another PoA /60/ and declaration letter of non-ODA /50/ etc.

Thus ASCV can ensure that all operating CPAs are aware of and have agreed that their activity is being subscribed to the PoA. It is noted that the ASCV has also signed the agreement with the CPA1 implementer, ACP /52/. It is also checked by the validation team that ACP also submitted the aforementioned documents to the CME.

The validation team considers that the operational and management plan established by ASCV for the implementation of the PoA inter alia the issues identified in paragraph 4 (i) of “Procedures for Registration of a PoA as a single CDM project activity and Issuance of CER for a POA”, version 04.1 EB55. In addition, the ASCV will also develop and implement a management system as stipulated in the clause 17 of the “Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for PoA” version 01.0 in EB65”.

3.6 Monitoring Plan

According to the monitoring plan in section A.4.4.2 of PoA-DD, the monitoring parameters for each CPA are addressed in the generic CPA-DD. Each CPA will be monitored separately by the individual CPA implementer (no sampling approach will be used), and the ACSV will verify the monitoring of each CPA. The ACSV will maintain the data of all CPAs in the database in order to avoid double counting.

The monitoring plan is included in generic CPA-DD Section B.6 based on the approved monitoring methodology AMS-I.D./Version 17, and is correctly applied to the proposed PoA. Monitoring of GHG emission reductions is based on measuring the net quantity of electricity supplied by the project activity to grid, electricity exported to the grid, internal plant electricity consumption, electricity imported from the grid, quantity of biomass residue combusted, quantity of diesel combusted and the net calorific value of biomass residue etc., in which there are transparently presented in Section B.6 of the generic CPA-DD.

It is also noted that the moisture content of the biomass is measured ex-ante. According to the PoA-DD, the on-site measurement will be carried out by third party laboratory, and the quantity of biomass consumed will be adjusted according to the ex-ante moisture content as indicated in the PoA-DD in order to cross-check the measurements with an annual energy balance. It is noted that as the quantity of biomass residue consumed (i.e. combusted) in the project plant will be monitored, together with the moisture content data, plus the annual energy balance can be performed in order to cross-check the measurement the biomass residue consumed based on purchased quantities (e.g. with sales/receipts) and stock change. 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. Since the power generation is determined according to the techno offer provided by the equipment designer and supplier, thus it is considered that the power generation should be reliable, as they determined the power generation as per the estimated consumption of biomass amount and quality, and this will be also monitored ex-post with the consistency checking of fossil fuels and biomass used and the efficiency of energy generation. This is also complied with the monitoring requirement of AMS-I.D./Version 17.

3.7 Baseline and Monitoring Methodology

3.7.1 Applicability of the selected methodology

The SSC-CPA included in the PoA applies the simplified baseline and monitoring methodology for small-scale CDM project activity AMS-I.D./ Version 17 ”Grid Connected renewable electricity generation”.

Applicability criteria for the baseline methodology are assessed by the validation team by means of document review and interview. It is agreed in the validation team’s opinion that the SSC-CPA included in the PoA fully met the criteria as described below:

- The SSC-CPA included in the PoA applies renewable energy units such as renewable biomass power plant that supply electricity to the national grid of Thailand. National grid of Thailand mainly comprises fossil fuel-fired power plants which have been supplied by at least one fossil fuel fired generating unit;
- Each SSC-CPA will be a greenfield biomass based power plant, so it does not involve the addition of renewable energy generation at an existing facility, and does not seek to retrofit or modify an existing facility.
- The total installed capacity of the each SSC-CPA included in the PoA will be limited to less than 10MW, which does not exceed the threshold of 15MW as stated in the small-scale methodology;
- Each SSC-CPA included in the PoA only utilizes renewable biomass for power generation only, without non-renewable component. In addition, it does not involve in any co-fired system and biomass cogeneration units, thus the relevant requirement for project unit has both renewable and non-renewable components, co-generation systems in the applicability of methodology is not applicable.

Each SSC-CPA included in the PoA only utilizes renewable biomass for power generation only, thus the relevant requirement for hydro power plants, addition, retrofit or replacement project in the applicability of methodology is not applicable.

Thus the validation team considers that the project participant (CME) has correctly applied the approved methodology for the proposed PoA. As stated from the project participant /iii/ and CPA1 implementer /vi/, auxiliary fuel such as diesel would be used for the start-up of the equipment only. Apart from this, the validation team confirms that there are no other major sources of emission from the PoA and subsequent CPAs. Therefore the validation team considers that the greenhouse gas emissions occurring within the proposed PoA boundary as a result of the implementation of the proposed PoA which are not addressed by the applied methodology, is deemed to contribute less than 1% of the overall expected average annual emission reductions.

3.7.2 PoA Boundary

The project boundary is the physical, geographical site of the biomass power plants of the PoA in Thailand. It is defined as the geographical locations of each biomass power plant participating in the PoA. The exact locations of the biomass power plants will be defined in each SSC-CPA; the biomass power plants will be installed within the

geographical boundary of Thailand. The validation team considers that the physical, geographical site of the digesters producing biogas delineates the project boundary in accordance with AMS-I.D./ Version 17.

Table 6: The CPA boundary is justified transparently and is presented as below.

	Source	GHG involved	Description
Baseline emissions	Grid electricity generation	CO_2	Major emission source
		CH_4 N_2O	Excluded for simplification.
	Uncontrolled burning or decay of surplus biomass residues	CO_2	It is assumed that CO_2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF (Land Use, Land-Use Change and Forestry) sector. In addition, the PoA does not consider the emission reductions induced from the burning or decay of biomass residues. Thus they are excluded for simplification.
		CH_4	
		N_2O	
Project emissions	On-site fossil fuel and electricity consumption due to the project activity (stationary or mobile)	CO_2	Major emission source
		CH_4 N_2O	Excluded for simplification as it is assumed that the emission sources are very small.
	Off-site transportation of biomass residues	CO_2	Excluded for simplification as it is assumed that the emission sources are very small. The CPA implementer is required to demonstrate the distance for the transportation of biomass residues to the power plant is less than 200km as per the eligibility criteria for CPA inclusion. The amount of CO_2 released can be assumed to be very small. Please refer to Section 3.9 for details.
		CH_4 N_2O	Excluded for simplification as it is assumed that the emission sources are very small.
	Combustion of biomass residues for electricity and/or heat generation	CO_2	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.
		CH_4 N_2O	Excluded for simplification as it is assumed that the emission sources are very small.
	Storage of	CO_2	It is assumed that CO_2 emissions from surplus

	biomass residues		biomass residues do not lead to changes of carbon pools in the LULUCF sector. Thus it is excluded.
		CH_4, N_2O	Since biomass residues are stored not more than one year, these are excluded for simplification.
	Waste water from the treatment of biomass residues	CO_2	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.
		CH_4 N_2O	It is confirmed by the CME that there will be no wastewater generated from biomass power generation process. There is also no pre-treatment process before the biomass is utilized for burning in the boiler. Thus the GHG sourced from the wastewater generation can be excluded for simplification.

3.7.3 Baseline Identification

Each SSC-CPA in the PoA is the installation of a new grid-connected renewable biomass power plant. According to the applied methodology AMS-I.D./Version 17 (clause 10 & 11), the baseline scenario is prescribed as:

"The baseline scenario is the electricity delivered to the grid by the CPA that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources. The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor, which can be calculated in a transparent and conservative manner as a combined margin (CM) according to the latest Tool to calculate the emission factor for an electricity system."

According to the interview with the representatives with the Thai DNA /xii, xiv/, the emission factor is only available from the Thai DNA, Thailand Greenhouse Gas Management Organization (TGO). Thus the CME will apply the latest emission factor issued by the TGO at the time of CPA inclusion. The validation team considers that this is a reasonable approach for the determination of emission factor for each individual CPA to be included. The validation of emission factor can be referred to Section 3.9.

The representative from the Thai DNA also stated that there is no policy to regulate the treatment of rural biomass residual. Most of biomass residual will be left for decay. Referring to the Ministry of Environment and Resources /xii/, it is prohibited to burn the biomass residual in open area, but this may not be enforced in the current stage. In addition there is no mandatory requirement for biomass treatment. Moreover, according to the latest information from Ministry of Energy webpage and the interview with Ministry of Environment and Resources, Thai government plans to achieve renewable energy up to 8% of national fuel mix in 2011, but as of 2009, it only achieved 1%. Thus the

validation team considers that biomass power generation is not common in Thailand. Therefore the validation team can confirm that the biomass power generation is not the baseline for the biomass residues treatment.

The baseline determination is considered as transparent and reasonable.

For CPA1, it is validated in Section 3.4 that the CPA1 fulfills the CPA inclusion eligibility criteria no. 5, thus "CPA1 also meets all the criteria in the applied methodology AMS I.D Version 17 as applied in the latest valid POA-DD document". The validation team checked the CPA1, which is a greenfield biomass power generation project with installed capacity of 9.9MW. The power supply will be connected with national grid of Thailand. In addition, the CPA1 does not involve in co-generation activity. Thus it is considered that AMS-I.D. version 17 can be applicable to CPA1. Therefore the baseline for the PoA is also applicable to the CPA1, as defined as "The baseline scenario is the electricity delivered to the grid by the CPA1 that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources".

3.8 Additionality

3.8.1 CDM consideration of the PoA

According to the "Clarifications regarding the Procedures for Registration of a PoA as a single CPA and issuance of CER for a PoA" version 1 in EB60 annex 26, "*Guidelines for the demonstration and assessment of prior consideration of the CDM* do not apply to PoAs, as at present it is expected that no component of the programme will commence prior to the start date of validation". Thus CDM consideration is not applicable to the proposed PoA.

According to the PoA-DD, the PoA will be expected to be started in December 2012, as the expected date of registration. Referring to "Procedures for Registration of a PoA as a single CPA and issuance of CER for a PoA" version 04.1 EB55 clause 7(d), the CME should confirm that the start date of any CPA is not, or will not be, prior to the commencement of validation of the programme of activities, i.e. the date on which the CDM-PoA-DD is first published for global stakeholder consultation. The validation team checked the EPC contract for CPA1 was signed on 21st September 2011 /58/, and the validation team confirmed that this is the earliest real action for CPA1. Thus the start date of the CPA1 is before the commencement of validation of the PoA, i.e. GSP.

Starting date of PoA

According to the Section B.1. of the PoA-DD, the starting date of the PoA is 8th December 2012, or the date of PoA registration.

Table 7: Summary of prior CDM consideration to the starting date of PoA

Starting date of PoA	Justification of and evidences (references) on the starting date	Date of CDM consideration
8th December 2012 or	Not applicable	Not applicable

the date of PoA registration		

3.8.2 Additonality of the PoA

According to the "Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for PoA" version 01.0 EB65, the CME has demonstrated that "in the absence of CDM, none of the implemented CPAs would occur. Referring to the "Guidelines on the demonstration of additionality of small-scale project activities, Version 09.0, EB68 /7.1/, the barrier analysis is applied to demonstrate the additionality of the PoA. Moreover, according to "General Guidelines to SSC CDM Methodologies" (Version 17, EB 61 Annex 21) /9/, the following two documents are used to provide additional guidance or guidelines:

1) "Non-binding best practice examples to demonstrate additionality for SSC project activities" (Version 01, EB 35 Annex 34) /7.2/;
2) "Guidelines for objective demonstration and assessment of barriers" (Version 01, EB 50 Annex 13) /7.3/.

According to the "Guidelines on the demonstration of additionality of small-scale project activities, Version 09.0", the additionality is demonstrated for the investment barrier of the PoA. Benchmark analysis is applied as per the "Tool for the demonstration and assessment of additionality". The benchmark analysis was selected by the CME when conducting the financial assessment of CPA. The selection of "benchmark analysis" is justified in considering that, other than the CDM revenue, the CPA would generate revenue through the sale of electricity to the national grid company. The benchmark approach is considered appropriate, since the baseline scenario does not require investment or is out of the direct control of the CPA developer. This is also complied with the requirement in the paragraph 19 of the Guidelines on the assessment of investment analysis.

Benchmark determination for PoA

As validated in the PoA-DD, an investment analysis is carried out through applying benchmark analysis method, which is mainly based on the comparison between project IRR and the benchmark estimated from 4 options as indicated in the Annex 7 of the PoA-DD depending on the availability of reliable sources, and the benchmark options are validated as follows:

Option (a):

The PP will select benchmark based on the specific benchmark for specific CPA (official letter from financial institution or governmental institutions). The validation team agrees that if there is a specific benchmark for the specific CPA to be included in the future, in which this is issued by reliable financial institution or governmental institution, this can be the most appropriate option, as it is totally CPA specific. The financial institution or governmental institutions would analyse the local market situation in order to justify the project specific financial indicator to the potential CPA implementer. This is deemed to be complied with the requirements of clause 13 of the "Guidelines on the Assessment of

Investment Analysis" version 05 EB62 that the benchmark should be based on the parameters that are standard in the market. For the first CPA1, there is no such benchmark issued by any of institution for such purpose.

Option (b):

The PP will select benchmark based on relevant national authorities for VSPP biomass power project industry such as based on reliable published national information or database for similar small scale biomass power plant projects in Thailand. The validation team agrees that a benchmark for small scale biomass power plant projects in Thailand is deemed to the more reliable than the normal MLR and WACC, as this focus on the SSC biomass projects only but not the overall market activities as applied for MLR. Furthermore, this also complies with the requirements of clause 13 of the "Guidelines on the Assessment of Investment Analysis" version 05 EB62 that the benchmark should be based on the parameters that are standard in the market. Up to the issue of this report, there is still no such national database for similar biomass VSPP in Thailand.

Option (c):

The PP will select the Weighted Average Cost of Capital (WACC) as the benchmark for small scale power producer in Thailand. As confirmed by the PP, there is no policy to regulate the debt financing ratio for the project investment in Thailand. The Thai banks will assess individual project developer's financial status and project condition in order to determine the debt ratio. According to the local legal entity, Baker and McKenzie Law Firm's research /32/, there is no any regulation to control the debt ratio for project investment. Thus no debt-equity ratio can be assured by financial institutions. The debt-equity ratio of 50:50 can be also applied according to the default value in the Guidelines on the Assessment of Investment Analysis. The validation team considers that the WACC approach is also an appropriate benchmark referring to the clause 12 of the aforesaid Guidelines.

Option (d):

The PP will select the local commercial lending rate as the benchmark for small scale power producer in Thailand. The lending rate is based on the 5 local commercial banks in Thailand, and it is governed and published by the Bank of Thailand (BOT) monthly /65/. Thus this refers to the local commercial lending rates in Thailand. This benchmark will be compared with the project IRR of CPA in order to determine whether the CPA is financially attractive.

The validation team considers that the average of Minimum Lending Rate (MLR) and ceiling rate obtained from the Bank of Thailand as the benchmark reference is appropriate, and this also complies with the requirements of clause 12 of the "Guidelines on the Assessment of Investment Analysis" version 05 EB62 by applying the local commercial lending rate as appropriate for a project IRR. In addition, the validation team also considers the MLR and ceiling rate is always available in the local market and be a reliable source.

The validation team checked the PoA-DD and CPA-DD, Annex 7 is included for the procedure to select the appropriate benchmark. The benchmarks listed are all in line

with the Guidelines on the Assessment of Investment Analysis" version 5, and the proposed procedure is deemed to be reasonable as it reflects the appropriateness of the benchmark for specify VSPP biomass power projects to be included in the PoA. The selection of benchmark will be based on the availability of the financial information in Options (a) to (d) at the time of the future CPA inclusion. The validation team considers that the selection options are deemed to be appropriate. Firstly, the most appropriate financial indicator (option (a): similar biomass VSPP power project) will be selected if it is available publicly. If this scenario is not available, then another one will be selected, and vice versa. The final option is the commercial lending rate which is for all kind of projects in Thailand which apply loan from commercial bank. Although this is not directly related to the VSPP biomass power project, this can be also applied according to the Guidelines on the Assessment of Investment Analysis. Therefore the validation team considers the selection procedure in Annex 7 is reasonable and applicable during the individual consideration in the future CPA inclusion.

According to the PoA-DD, and the interview with the representative of TGO /xii/, there are currently no national or regional regulations prescribing the development of biomass power plants. Since there is no existing mandatory policy/regulation, it is demonstrated that in the absence of the CDM, "*(ii) the mandatory policy/regulation would be systemically not enforced and that non-compliance with those requirements is widespread in the country*" and "*(iii) the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation*" are not applicable to the PoA.

3.8.3 Approach for demonstrating additonality of CPA under the PoA

It is noted in the PoA-DD & CPA-DD that the additionality of a CPA is demonstrated using the benchmark analysis. The financial indicator chosen is the project IRR. This will be compared with the benchmark reference, such as MLR applied in the CPA1. The additionality of CPA1 is assessed in accordance with the following criteria:

The validation team checked in the PoA-DD that the demonstration of additionality follows the "Guidelines on the demonstration of additionality of small-scale project activities, Version 09.0". The additionality of the CPA is demonstrated using the investment analysis according to the "Tool for the demonstration and assessment of additionality", with the application of benchmark analysis. This is consistent with the CPA inclusion criteria for the PoA. The additionality of the CPA also refers to the additionality of the PoA.

Tariff Incentive for VSPP in Thailand

The validation team also checked the tariff incentive for VSPP in Thailand. The VSPP scheme was implemented since 2002, this can be considered as one of the E- policy for providing financial incentive to the investor in the development of power plant under 10MW. Although financial support is provided by the Thai government, this factor is also considered in the investment analysis of the CPA to be included. Thus even the CPA under VSPP is financially supported, the project IRR still cannot overcome the investment barrier or the industrial benchmark. The validation team considers that since the demonstration of investment barrier would be validated for each CPA to be included, and this can be further validated case by case. In addition, there is no foreseeable policy

that the financial support to the VSPP would be increased dramatically in the near future, but it is subjected to be validated for the coming CPA to be included.

For the CPA1, the validation team checked all the related tariff information, in which the tariff with VSPP support is already applied in the IRR calculation. However, the IRR is still below the industrial benchmark, thus it is considered that the CPA1 encounters with investment barrier.

Benchmark determination for CPA1

For the real-case CPA1, the benchmark is determined from the MLR. The validation team checked the Annex 7 of PoA-DD for the procedure to determine the benchmark for the selection of suitable financial indicator. The actual value of benchmark shall be determined for each subsequent CPA to be included. For the benchmark analysis in CPA1, the financial indicators in options (a) and (b) were not available at the starting date of CPA1. The validation team also checked the webpage of the Bank of Thailand (BOT) /65/, the average MLR (min) rate was 6.26% and the average ceiling lending rate (min) was 12.08%. Therefore the average commercial lending rate would be 9.17% from January 2010 to August 2011.

According to the CPA1 IRR calculation spreadsheet /70/, the average value of MLR and ceiling rate is applied as 9.17% from the period of January 2010 to August 2011 as sourced from the Bank of Thailand (BOT) /65/. This is also the latest available information for CPA1 before the CPA1 starting date. The validation team checked the webpage of Bank of Thailand, in which the values of MLR and ceiling rates are indicated since January 2010. In Thailand only for the large enterprises in Thailand can apply for MLR with previous good reputation in the financial status. For the new project developer like the CPA1 implementer, it is rarely to obtain the MLR from bank loan. According to the “Guidelines on the Assessment of Investment Analysis”, a default value of ROE can be applied to calculate the WACC. The default ROE in Thailand is 11.2%, and thus the resulted WACC would be resulted as higher than the average commercial lending rate, so the option (c) of WACC is not the most conservative benchmark. Therefore, the validation team considers that it is the most conservative way to apply the average commercial lending rate (option (d)) obtained from averaging the MLR and ceiling lending rate to give the lowest benchmark value for the individual CPA in the proposed PoA. Moreover, it is very unlikely that a CPA developer can raise 100% debts.

It is also analyzed in the CPA1 spreadsheet for the Return of Equity of 4 major power producers and energy companies listed in the Thailand Stock Exchange Market. The 4 companies under studies include “Banpu”, “EGCO”, “Glow” and “Ratchaburi Power Company”. Since the first 3 companies concentrate only on the small power producer projects (>10MW) up to huge coal fired power plants, therefore they are excluded for comparison purpose. The validation team checked the information from the Thailand Stock Exchange Market[4], the rate of return on equity (ROE) of the Ratchaburi Power Company from 2007 to 2009 is averaged at 16.16%. A research analysis from a local Thailand financial entity “Ayudahya Securities Public Company Limited” was conducted

[4] Company Rate of Return from Thailand Stock Exchange Market, http://www.set.or.th/set/companyhighlight.do?symbol=RATCH&language=en&country=US

in 2008, in which it is reported that for energy power projects to be viable in Thailand, the project IRR has to be at least 15% /66/. In addition, according to the "Guidelines on the Assessment of Investment Analysis" version 05 EB62, the expected return on equity for energy industries in Thailand is 11.2%. Therefore the validation team considers that the application of MLR of 9.17% (with assumption of 100% loan) as the benchmark for the CPA1 is transparent and conservative.

Investment Analysis for CPA1

The CPA1 implementer carried out the investment analysis based on the available evidence, and the financial decision was made in the board meeting on 12th November 2010 in accordance to the CPA1 IRR calculation spreadsheet /70/. The validation team also checked that some input values were applied according to the equipment supplier's Techno Offer issued on 10th September 2010. As the period of time between the finalization of Techno Offer and the board meeting was sufficiently short, the validation team is able to confirm that it is unlikely in the context of the underlying project activity that the input values (such as estimation of annual net power to grid, various tax rates etc.) would have materially changed. In addition, the validation team is able to determine the validity of the parameters applied in the investment analysis through cross-checking, reviewing reference sources, on-site observation, and experts' interview. The validation team also confirms that the most recent available data is applied in the investment analysis at the time of investment decision, i.e. project starting date.

According to the real-case CPA-DD for CPA1 /1/, the project IRRs of the CPA are 5.42% and 9.27%, without and with CDM revenues respectively. According to VVM clause 111, the validation team conducts a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator using the available evidence and expertise in relevant accounting practices. The validation team has independently checked the following critical project and financial input values for the IRR calculation as the basis of benchmark analysis. The validation of some critical parameters, based on local and sectoral expertise of the validation team, is tabulated in details as below:

Table 8: Validation of critical parameters in the investment analysis of CPA1

Parameter	*Installed capacity*	Data & Source	9.9MW (Techno offer /42/)
Validation Results:	The validation team checked the techno offer provided by the equipment supplier, and confirms that the installed capacity of the biomass power generator set will be 9.9MW.		
Parameter	*Supply Capacity*	Data & Source	8MW (Power Purchase Agreement, PPA /41/)
Validation Results:	According to the industrial practice in Thailand, the power capacity of a Very Small Power Producers (VSPP) project is capped at 8MW for the connection to the national grid /72, 73/. The validation team checked the PPA for the CPA1 between the Provincial Electricity Authority (PEA) and ACP, the power supply to the grid is also capped at 8MW. According to the PPA, since the CPA1 will be connected to a 22kV national distribution system, thus the maximum capacity for the power transmission is limited to		

	8MW. Thus the validation team considers that it is reasonable to assume maximum supply to the national grid for the CPA1.		
Parameter	*Auxiliary Consumption*	Data & Source	0.99MW (Techno offer /42/)
Validation Results:	This refers to the auxiliary power consumption of the biomass power plant station for CPA1. The validation team checked the techno offer provided by the equipment supplier, and confirms that the station consumption will be 0.99MW as estimated by the biomass power plant designer and supplier. Thus the auxiliary consumption accounts for 10% (0.99MW/9.9MW) for the power generation.		
Parameter	*Capacity for sale to 3rd Party*	Data & Source	0.91MW (Estimated by CPA1 implementer)
Validation Results:	The capacity for sale to 3rd party refers to the power supply to other off-grid consumers, and this is estimated by the CPA1 implementer as: = 9.9MW – 8MW – 0.99MW = 0.91MW The validation team considers that the capacity for sale to 3rd party is reasonable and traceable. It is also noted that this capacity to 3rd party would not be claimed for any emission reductions. This is considered for the energy balance of the power generation from the CPA1. Moreover, the income induced from power sales to 3rd party is also considered in the CPA1 investment analysis. The validation team considers that this is a conservative approach in the ER calculation and IRR estimation.		
Parameter	*Electricity Generation for sale to PEA*	Data & Source	65,280 MWh (Techno offer /42/)
Validation Results:	The validation team checked the techno offer provided by the equipment designer and supplier, and confirms that the estimated average operation days are 340 days. Please note from the excel worksheet the electricity generation for sale to PEA is calculated according to the weekday and weekend basis. The average Saturday and Sunday in a year is about 104 days. The average public holidays in Thailand are about 16 days for the recent average 3 years public holidays Therefore total Sat, Sun and Holiday is estimated to be around 120 days per year. According to EPC technical offer, it is indicated that the total operating days for CPA1 should be 340 days (while the remaining 16 days should refer to annual maintenance period) in a year as indicated in the IRR worksheet. Therefore 340days – 120days = 220 week days refers to the calendar day for Monday to Friday. The total annual operation days are still 340 days as		

	per EPC technical offer. Thus the annual electricity generation for sale to the grid is: = 8MW × 340 days/year × 24 hours/day = 65,280 MWh The load factor = 340 × 24 / 8,760 = 0.93 (8,760 hours in one year) According to the EB48 Annex 11, Guidelines for the reporting and validation of plant load factors, "the plant load factor shall be defined ex-ante in the CPA financial spreadsheet according to the determination by a third party contracted by the project participants". The operation day indicated in the CPA1 IRR calculation spreadsheet is 340 days/yr, which is same as the estimated value in the techno offer /42/. The validation team has validated the calculations for the load factor in the techno offer, which were prepared by the biomass power plant designer and supplier, thus it is considered that the plant load factor has been defined correctly. Thus the estimation of annual generation for sale to PEA is reasonably applied in the investment analysis of CPA1.		
Parameter	*Electricity Tariff (selling to PEA)*	Data & Source	0.002928 THB/MWh for peak tariff; 0.001115 THB/MWh for off-peak tariff; 0.000926 THB/MWh for fuel transfer rate (PEA and EGAT website)
Validation Results:	In Thailand, the electricity tariff for power sold to PEA is fixed by the PEA. The duration of the peak and off-peak hours is also defined by the PEA. Only the fuel transfer rate will be adjusted by the the Electricity Generating Authority of Thailand (EGAT) monthly. However, according to the fuel transfer rate from January 2009 to October 2010, it was remained at 0.000926 THB/MWh. The validation team checked the electricity tariff rate for VSPP projects from the PEA, and confirms the tariff applied is consistent with the official data from the PEA. http://www.pea.or.th/vspp/vspp/vspp_rate.pdf The validation team checked the fuel transfer rate from the EGAT, and confirms the fuel transfer rate applied is consistent with the official data from the EGAT. http://www2.egat.co.th/ft/Web/TAB1.1%20may53_aug53.htm In addition, according to the EGAT, the fuel transfer rate applied by the CPA1 implementer is the highest rate from the period of October 2005 to October 2010. http://www2.egat.co.th/ft/ft-stat5.html		

	Thus the validation team considers that the fuel transfer rate applied is conservative and reasonable. Therefore the validation team considers that the electricity tariff selling to PEA is transparent and traceable as these are sourced from latest available official information in 2010, at the time of investment decision.		
Parameter	*Electricity tariff for other third party consumers*	Data & Source	0.00270 THB/MWh for peak tariff; 0.00119 THB/MWh for off-peak tariff; 0.000926 THB/MWh for fuel transfer rate (PEA and EGAT website)
Validation Results:	The validation team checked the electricity tariff rate from the PEA, and confirms the tariff applied is consistent with the official data from the PEA. http://www.pea.co.th/rates/rates_tou_tod_ft.htm The validation team checked the fuel transfer rate from the Electricity Generating Authority of Thailand (EGAT), and confirms the fuel transfer rate applied is consistent with the official data from the EGAT. http://www2.egat.co.th/ft/Web/TAB1.1%20may53_aug53.htm In addition, according to the EGAT, the fuel transfer rate applied by the CPA1 implementer is the highest rate from the period of October 2005 to October 2010. http://www2.egat.co.th/ft/ft-stat5.html Thus the validation team considers that the fuel transfer rate applied is conservative and reasonable. Therefore the validation team considers that the electricity tariff for other third party consumers is transparent and traceable as these are sourced from latest available official information in 2010, at the time of investment decision.		
Parameter	*Inflation Rate (Escalation Rate)*	Data & Source	3% (Ministry of Commerce of Thailand website)
Validation Results:	The validation team checked the inflation rate from the Ministry of Commerce of Thailand, and confirms the fuel transfer rate applied is consistent with the official data from the Ministry of Commerce of Thailand. http://www.indexpr.moc.go.th Therefore the validation team considers that the inflation rate is transparent and traceable as these are sourced from latest available official information in 2010, at the time of investment decision.		
Parameter	*Peak Capacity Rate*	Data & Source	132.93 THB/kW/month (PEA website)
Validation	The validation team checked the peak capacity rate from the PEA website,		

Results:	and confirms the peak capacity rate applied is consistent with the official data from the PEA. http://www.pea.co.th/rates/rates_tou_tod_ft.htm		
Parameter	*Service Charge*	Data & Source	228.17 THB /month (PEA website)
Validation Results:	The validation team checked the service charge from the PEA website, and confirms the service charge applied is consistent with the official data from the PEA. http://www.pea.co.th/rates/rates_tou_tod_ft.htm		
Parameter	*Incentive from EPPO*	Data & Source	0.0003 THB/MWh (EPPO website)
Validation Results:	The validation team checked the announcement of incentive from EPPO for biomass power projects in 2010 from the Energy Policy and Planning Office, Ministry of Energy (EPPO), and confirms the incentive from EPPO applied is consistent with the official data from the EPPO. http://www.eppo.go.th/power/index.html and http://www.masterpower.co.th/news.htm The tariff policy information has been provided and substantiated via the link to the publically available data from PEA (PDD footnote 12). http://www.pea.co.th/vspp/vspp/Adder19082552.pdf It is clearly stated that for Biomass Power Plant under VSPP scheme, installed capacity > 1MW will receive incentive in the form of adder = 0.3 THB/kWh for a period of 7 years count from COD (date of commercial operation). Thus the EPPO will provide a 7-year subsidy to VSPP for renewable energy projects. The validation team confirms that this incentive from EPPO is also correctly included in the financial analysis of CPA1.		
Parameter	*Project Cost*	Data & Source	832 THB Million (contractor and supplier quotation)
Validation Results:	The validation team checked the project cost indicated in the CPA1 IRR calculation spreadsheet /70/, it mainly consists of civil works, plant and machinery costs, land cost etc. These items contribute to the about 92.9% of the total project cost. The civil works, plant and machinery costs were sourced from the quotation of the civil contractor /44/ and biomass power equipment supplier /42/. The land cost is estimated according to the general land cost in Roi-et at about 300,000 THB per rai (~1,600 m^2). As the project site is about 178 rai, thus the CPA1 land cost is estimated as 53.4 million THB. As most costs of the major items are sourced from the contractor and supplier's quotation, the validation team considers that the estimation of project cost is traceable and reasonable. The validation team also cross-checked the equipment contract in which		

	the cost is same as the quotation /58/. The civil construction contract is also reviewed by the validation team, and the actual civil cost is 7% higher than the estimated cost from quotation /62/. The equipment and civil construction costs have occupied over 86% of the total project capital cost, thus the validation team considers that the estimated project cost from the quotation is reliable and conservative.		
Parameter	*O&M expense and administrative expense*	Data & Source	First year O&M expense: 15.50 million THB First year administrative expense: 16.00 million THB (Estimated by CPA1 implementer)
Validation Results:	For the O&M cost, the estimation can be divided into operational and maintenance expense and administrative expense. According to the estimation by the CPA1 implementer, the O&M expense can be estimated as 2.5% of the total plant and equipment cost, while the administrative expense can be estimated as 2.5% of total plant and equipment cost plus working capital. Moreover, as per the manufacturer's suggestion, overhaul maintenance shall be conducted every 4 years in order to maintain the equipment operation. The overhaul cost is also estimated by the CPA1 implementer as about 7.75 million THB/year (or 31 million THB every 4 years). Thus the total annual O&M and administrative expense is about 39.25 million THB (15.5 + 16 + 7.75), which is about 4.7% of total project cost (39.25/832). This is also indicated consistently in the IRR calculation spreadsheet /70/. For the administrative expense, it mainly includes the yearly labor costs, management fees, consultant fees, renewal of permit fees, transportation, training etc. In addition, it is also expected that the O&M and administrative expenses will increase by 3% every year in accordance to the inflation rate. According to the Department of Industrial Works /xvi/, since there are no such governmental/ technical institutional guidelines in the estimation of O&M and administrative expense available, so biomass power developers can only estimate the O&M expense from their technical knowledge and the understanding to the biomass power market. The validation team checked that the O&M costs from other similar CDM registered biomass power projects in Thailand, the O&M costs were also referred to the estimation from project developers. According to the 4 CDM registered VSPP biomass power generation projects in Thailand, the annual O&M cost is ranged from 3%-4.3% of the project cost. For the CPA1, the O&M and administrate expense is estimated as about 4.7% of the total investment cost based on the CPA1 implementer's technical background and knowledge to the biomass power market. Thus it is considered than the O&M and administrative expense is estimated comparatively with the registered CDM projects. Although the estimation is above the other registered CDM projects for about 10%, it is also validated that the project IRR would reach the benchmark when the O&M and administrative expense are decreased by 53.8%. Please refer to the later part for the validation of sensitivity		

	analysis of various parameters. The validation team considers that the O&M and administrative expenses estimated are generally traceable and reasonable.		
Parameter	*Residual Rate (in the IRR worksheet)*	Data & Source	5% for equipment (Revenue Department of Thailand)
Validation Results:	The validation team checked the regulation of residual rate from the official data of Revenue Department of Thailand, and confirms the residual rate for equipment and building can be 5% and 0% respectively after the lifespan. http://www.rd.go.th/publish/6044.0.html Referring to the Techno-Offer from the supplier, the technical lifespan can be the project equipment lifetime. Thus the CPA1 implementer applies the depreciation at the full technical lifespan. Thus it is deemed to be reasonable to have the financial analysis with the equipment lifetime of 25 years. According to the IRR calculation spreadsheet of CPA1 /70/, the depreciation period applied for equipment and building is 25 year. After 25 years of lifespan, the residual rates for equipment and building are 5% and 0% respectively. Therefore the validation team considers that the residual rates applied in the investment analysis are reasonable and traceable.		
Parameter	*Biomass heating ratio (in the IRR worksheet)*	Data & Source	Wood residues to wood bark: 70% against 30% (Techno offer /42/)
Validation Results:	The validation team checked the techno offer provided by the biomass power plant designer and supplier, and confirms that the estimated biomass ratio for wood residues to wood bark will be 70% against 30%. The estimation is made by the biomass power plant designer according to the current situation of biomass collected by the woodchip processing mills. The CPA1 implementer /vi/ also confirms that the wood residues and wood bark will be basically applied in the biomass power plant.		
Parameter	*Biomass heating values (in the IRR worksheet)*	Data & Source	Wood residues: 8,514 kJ/kg Wood bark: 4,917 kJ/kg (public website and Department of Alternative Energy Development and Efficiency)
Validation Results:	According to the "Green energy network", a research was published for the evaluation of heating value of wood bark as 4,917 kJ/kg[5]. For the wood residues, the CPA1 implementer applied the value provided by the accredited consultant Chulalongkorn University in the webpage of		

[5] Green energy network research study on biomass properties, http://www.greenenergynet.net/tec_Biomass.html

	Department of Alternative Energy Development and Efficiency, Ministry of Energy[6]. The validation team considered that these two heating values applied in the CPA1 financial spreadsheet are traceable. In addition, the heating values will be monitored throughout the operational lifetime of the CPA1 as required in the approved methodology AMS-I.D.		
Parameter	*Biomass Fuel Cost*	Data & Source	88.6 million THB per year (Calculated)
Validation Results:	The validation team checked the techno offer /42/ provided by the biomass power plant designer and supplier, and confirms that the estimated station heat rate for the biomass power plant is about 12,289 kJ/kWh. For the CPA1 biomass power plant with installed capacity of 9.9MW, the total power generation will be = 9.9MW × 340 operation days/year × 24 hours/day = 80,784 MWh/year Annual fuel required for wood residues = 80,784 MWh/year × 12,289 kJ/kWh ÷ 8,514 kJ/kg × 70% = 81,622 tonne/year Annual fuel required for wood barks = 80,784 MWh/year × 12,289 kJ/kWh ÷ 4,917 kJ/kg × 30% = 60,571 tonne/year According to the quotation from the biomass residues suppliers, the costs of wood residues and wood bark will be 900 THB/tonne and 250 THB/tonne respectively /45, 46/. The validation team considers that the biomass cost is thus traceable. Thus the annual biomass fuel cost will be = 81,622 tonne/yr × 900 THB/ton + 60,571 tonne/yr × 250 THB/ton ≅ 88.6 million THB per year The validation team considers that the estimation of annual fuel cost is traceable and transparent. The validation team also reviewed a presentation document on the topic of "Potentials of Biomass in Thailand" by Dr.Pongsak Hengniran, Kasetsart University in Biomass workshop at Germany, March 2012. The findings presented by Dr. Pongsak showed the biomass price in Thailand is on increasing trend. http://www.giz.de/Themen/de/SID-E3A31EE0-8EA03777/dokumente/2012-en-hengniran-pep-informationswork-thailand-biomasse.pdf Thus the validation team considers that the biomass fuel cost in CPA1 is reliable and conservatively applied in the investment analysis. It is also confirmed by the CPA1 implementer, the ash from the burning		

[6] Accredited consultant Chulalongkorn University in the webpage of Department of Alternative Energy Development and Efficiency, http://www2.dede.go.th/Wboard/Question.asp?GID=2832

biomass residue will be disposed or distributed to local farmer for free. During the on-site visit, the local villagers /x, xi/ also considered that ash is not a good agricultural additive, thus the ash should have no market value. Thus the ash is not a valuable by-product from the process. According to the investment analysis, the CPA1 implementer also includes the possible income from sale of ash. The price of ash is appropriately estimated by the CPA implementer, as there is no market value. A very tiny income induced from ash selling is also included in the investment analysis, and the validation team considers that this estimation is also a conservative approach.

Besides, the input values for total capital cost, annual O&M cost rate and plant load factor applied in the investment analysis were compared with other similar VSPP (installed capacity < 10MW) registered biomass CDM projects in Thailand applying small-scale methodology (AMS-I.C. or AMS-I.D.). The parameters are tabulated as follows:

UNFCCC Ref. no.	Location	Project Capacity (MW)	Output (MWh)	Annual Operation hour	Tariff incl. VAT (Baht/k Wh)	Total Investment (million Baht)	Biomass price (Baht/ton)	Annual O&M costs (% of total cost)	Bench mark IRR
2934	Suphan Buri	7.5	51,246	Not indicated in the PDD, Investment barrier is not applied					
2938	Phra Nakhon Sri Ayuthaya	9.9	63,072	7,884	2.44	719	1000	4.3%	15
3945	Surin	9.9	69,379	7,884	2.37	550	600	3.00%	14.6
3585	Buri Ram	9.5	63,630	7,920	2.22	491	300	4.00%	15
3826	Nakhon Ratchasima	7.5	51,998	8,280	2.1	400	600	3.95%	15
CPA1		9.9	65,280	8,160	2.92 for peak hour	832	900 for wood residual, 250 for wood bark	2.5%	9.17

Date Source: a) UNFCCC CDM webpage, as of 1st June 2012
b) CDM Pipeline from CD4CDM, updated to 1st June 2012, http://uneprisoe.org/

The parameters of the CPA1 are estimated and compared with the other similar scale-scale (<10MW VSPP scheme) registered biomass power CDM projects in Thailand. The operational hour for biomass power plants are similar, as they are capped by the limited electricity connection with the PEA. The tariff and total investment for the CPA1 are higher than other similar registered projects, however different investment cost and tariff are resulted in different time period of commissioning and operation. For the biomass price, it is difficult to compare directly, as different projects apply different types of biomass with different prices. For other similar registered projects, they mainly apply rice husk as the biomass source in power generation, which is different from the biomass residuals from woodchip factory in CPA1. For the O&M cost, the CPA1 is estimated as about 2.5% of total investment cost, which is lower than other similar registered projects. The benchmarks from other registered projects are also compared with the project activity. However, it should be noted that the benchmarks are derived from different

sources such as WACC, local bank loan rate, return on equity data etc. in the different conditions of project investment periods. Thus the comparison can be just used as a reference for assessment of the benchmark of the CPA1. Under such circumference, it is found that the benchmark of the CPA1 is much lower than the other similar registered CDM projects in Thailand. Together with the above mentioned discussion, the validation team can further confirm the suitability of the input values as sourced from the Techno-Offer or other official sources.

As reported in the CPA1-DD and verified by the validation team, the project IRR (pre-tax) is 5.42% without CDM revenue, which is lower than the benchmark estimated from local commercial lending rate of 9.17%. The validation team considers that the application of the inflation factor for 3% throughout the CPA1 period in the investment analysis is deemed as appropriate. In addition, for those possible fluctuating parameters such as the tariff, it is considered that it would not encounter dramatic changes in the near future as it is governed by the national policy.

According to the above mentioned document review of various parameters in the financial analysis, the validation team also checked that these parameters are correctly applied in the IRR calculation worksheet /70/. The calculation formulae in the IRR worksheet are reviewed and confirmed to be valid. The cost of financing expenditures (i.e. loan repayments and interest) is not included in the project IRR calculation. In addition, since the benchmark of local commercial lending rate is pre-tax basis, a pre-tax project IRR is calculated without consideration of loan interest and income tax. This also complies with the requirements of clause 9 and 11 of the Guidelines on the Assessment of Investment Analysis". Thus it is concluded that the IRR calculation as presented in the IRR worksheet and the CPA1-DD is correct and traceable. Therefore, the CPA1 cannot be considered as financially attractive in the absence of CDM benefits.

Sensitivity Analysis for CPA1

A sensitivity analysis is carried out and presented in the CPA1-DD which demonstrates that the project activity is unlikely to be financially viable under reasonable variations in the critical assumptions, i.e. fluctuation range of ±10%, four selected financial parameters, including (i) Investment cost, (ii) O&M and Administration cost, (iii) Biomass fuel price and (iv) Electricity tariff. It is also noted that the power supply to the grid cannot be increased as it is limited to the power transmission for VSPP in Thailand. The fluctuation range is in line with the clause 20-21 in "Guidance on the assessment of investment analysis (Version 05)," where the sensitivity analysis should at least cover a range of +10% and -10% and the parameters analysed shall at least include that which contribute more than 20% of either fixed asset project costs or total project revenue. Under such circumstances, the project IRR is still lower than the benchmark, i.e. a project IRR of 9.17%.

The critical variations of each parameter for reaching the benchmark are presented in the CPA1-DD. According to the requirements of the VVM paragraph 111, the sensitivity analysis was verified by the validation team, and the validation findings were discussed in the following paragraphs:

- *If the investment cost decreases by 24.15%, the project IRR can reach to the benchmark.*

The project investment cost is sourced from the contractor and supplier's quotation. The validation team has cross-checked against the actual civil and equipment contract /58, 62/, in which the actual costs are already exceeded 87% of the total investment cost. Thus it is deemed not possible for the investment cost to be decreased by 24.15% in order to reach the benchmark. As the CPA1 is still under construction, other contracts will be signed according to the project progress, this further investment costs will be confirmed in the future. Thus it is considered that the project investment costs estimated in the PDD is reliable and conservative.

Furthermore, according to the World Bank Database on the Consumer Price Index (CPI), http://data.worldbank.org/indicator/FP.CPI.TOTL, there is an increasing trend since 2005 to 2011, thus it is expected that the raw material cost and labour cost would be increased. The project capital costs would be unlikely to be decreased by 24.15% to reach the benchmark.

- *Even the O&M and administration cost decreases by 53.8%, the project IRR still cannot reach to the benchmark.*

Both of the O&M and administrative cost is estimated by the CPA1 implementer at about 2.5% of the total plant and equipment cost. According to the IRR calculation spreadsheet /70/, the O&M expense estimated is lower than the average of market rate at 5%. For the administrative expense, it mainly includes the yearly labor costs, management fees, consultant fees, renewal of permit fees, transportation, training etc. In addition, the O&M and administrative expenses will increase by 3% every year in accordance to the inflation rate.

Furthermore, according to the World Bank Database on the Consumer Price Index (CPI), there is an increasing trend since 2005 to 2011, thus it is expected that the raw material cost and labour cost would be increased. The O&M and administrative cost is would be unlikely to be decreased by 53.8% to reach the benchmark.

- *If the biomass fuel cost decreases by 19.12%, the project IRR can reach to the benchmark.*

There is no historical trend for the biomass fuel cost. However, this also relates to the labour cost and transportation costs for biomass collection. As the CPI in Thailand increases from 2005-2011, it is unlikely that the biomass fuel cost would decrease by 19.12% to reach the benchmark.

- *If the electricity tariff increases by 17.15%, the project IRR can reach to the benchmark.*

The electricity tariff set by Provincial Electricity Authority (PEA) in Thailand, and it is related to the changes in fuel costs and major economic condition determined by the government. As the tariff adjustment is a national policy, it is deemed that the tariff would not experience dramatic changes in the near future. The electricity tariff would be unlikely to be increased by 17.15% to reach the benchmark.

It is also noted that the electricity generation for CPA1 is anticipated to be operated for 24 hours and 340 days/year based on the operating days in page 3 of EPC Technical Offer provided by the technology supplier /42/, as the remaining days should refer to annual maintenance of equipment. It is not sensible to operate more than the design operation time without the proper maintenance work. Please note the power generation is only dependent on the equipment operation time, but not the biomass amount supply. The validation team considers that there is no room for the power generation to increase. Even the operating day is increased to 8,760 days/year, i.e. without any maintenance time, the project IRR is 7.26% which is still lower than the benchmark. However, the validation team does not consider that it is practical to operate a biomass power plant for 8,760 days/year without any maintenance work.

In summary, the steps iterated in the latest "Guidelines on the demonstration of additionality of small-scale project activities" were followed and demonstrated by the project activity within the documentation and the interviews. The CPA1 can be considered as "not the most financially attractive" option. According to the paragraphs 98-121 of the VVM /2/, the CPA1 without any CDM revenue can be proven as additional following the investment analysis and sensitivity analysis.

3.9 GHG Emission Reductions from a typical CPA

The calculations of GHG emission reductions are transparently documented with assumptions regarding the forecast emission reductions.

According to the selected methodology AMS-I.D./Version 17, the emission reductions (ER_y) by the programme activity during the crediting period is the difference between the baseline emissions (BE_y), project emissions (PE_y) and emissions arising from leakage emissions (LE_y), which is expressed as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Regarding to the leakage emissions (LE_y), through document review and on-site interview, the validation team does not notice any equipment transfer from any other project activity to the proposed PoA and CPA1, or existing equipment of the CPA to another programme activity. Thus there is no leakage in the CPA according to the applied AMS-I.D./ Version 17.

According to the AMS-I.D. Version 17, for most renewable energy project activities, the project emissions are zero. Only the project emissions from geothermal power plants and hydropower plants might be considered. Thus it is deemed that it is not necessary to consider the project activity for the transportation of biomass.

The validation team also checked the SSC WG 22, F-CDM-SSCwg ver 01 SSC_329 for the similar SSC methodology AMS-I.D., the project emissions due to transport of biomass is to be considered if the transportation distance is more than 200 kilometers.

Moreover, the CPA implementer is required to conduct survey to check whether the biomass supply is within 200km radius from the project power plant, and investigate whether the biomass availability is more than 25% of the total utilized biomass including the proposed CPA. These have been specified in the CPA inclusion criteria. Thus it is presumed that no biomass plant will be included if the biomass supply is more than 200km. The validation team considers that it is reasonable to check the transportation distance for the biomass supply in order to neglect the project emissions. Therefore the project emissions can be considered as zero ex-ante.

The project emissions due to combustion of fossil fuels, $PE_{FC,y}$, will be monitored by measuring the fossil fuels consumption. The project emissions can be correctly calculated from

$$PE_{FC,y} = \sum FC_{i,j,y} * COEF_{i,y}$$

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

$COEF_{i,y}$ = Carbon Dioxide Emission Coefficient of fossil fuel (based on "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" EB 41)

The project emissions from fossil fuel consumption such as wheel loader operation are also related to eligibility criteria no. 14. The validation team also checked the fossil fuel (such as diesel) consumption for other purposes will be monitored during the implementation of CPA1. The fossil fuel consumption such as wheel loader operation is also estimated for CPA1. This will be also accounted in the emission reductions. For simplification, as the fossil fuel consumption for wheel loader is expected to be in very small amount, this is not determined ex-ante and thus project emissions can be considered as zero. However, this fossil fuel consumption will be monitored and included as project emissions ex-post as per AMS-I.D./Version 17.

The validation team checked the project design and technology applied in the CPA1, and considers that there are no other possible project emissions apart from fossil fuel consumption, thus it is considered that there will not be other emissions more than 1% of emission reductions. Therefore other possible emissions can be neglected.

According to AMS-I.D. version 17 while the project emissions & leakage emissions are zero, baseline emissions (BE_y) are equal to the emission reductions (ER_y) due to the CPA1 and have been estimated to be 37,941 tCO_2e per year in the real-case CPA-DD, based on an ex-ante fixed baseline emission factor of 0.5812 tCO_2e/MWh.

$$ER_y = BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$$

Where:

BE_y = Baseline emissions in year y (tCO_2/yr)

$EG_{BL,y}$ = Quantity of net electricity generation supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{CO2,grid,y}$ = CO_2 emission factor of the grid in year y (tCO_2/MWh/yr)

The baseline emission factor ($EF_{CO2,grid,y}$) for the CPA, using the combined margin (CM) approach, is fixed ex-ante during the first crediting period. According to AMS-I.D./Version 17 and the Tool to calculate EF for an electricity system, the default weights for the proposed CPA1 are 50% for OM and 50% for BM for the first crediting period, and 25% for OM and 75% for BM for the second and third crediting period.

The validation team has crosschecked the data and calculation listed in Section B.6 and Annex 3 of the real-case CPA-DD. It is found that the OM and BM data are directly provided by the Thailand Greenhouse Gas Management Organization (TGO, Thai DNA) in the document "The Study of emission factor for an electricity system in Thailand 2009", and it is also available on line from the TGO's official webpage /63/. It is stated in the above mentioned document that:

- *Data used in the calculation is taken from the information provided by the Electricity Generating Authority of Thailand (EGAT), Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA);*
- *The calculated Emission Factor can be used for the calculation of emission reductions of CDM projects that produce electricity and export to the Thailand national grid in 2009;*
- *The OM and BM are 0.6147 tCO_2/kWh and 0.5477 tCO_2/kWh respectively, thus the CM is resulted as 0.5812 tCO_2/kWh in the first crediting period.*

The validation team has carried out an interview with the Thai DNA /viii-xiv/ on 23rd June 2011, and checked the calculation procedures of the emission factors. The Thai DNA confirmed that the calculation of emission factors also followed the "Tool to calculate the emission factor for an electricity system". The TGO stated that the fuel consumption information is obtained from the Electricity Generating Authority of Thailand. Throughout the on-site confirmation with the TGO's officials, the validation team can conclude the emission factors are reliable and plausible. The TGO official also confirmed that this is the latest available information from the Thai official statistical data, thus the validation team considers that this is the latest available information at the time of submission of the PoA-DD to the DOE for validation.

The data used in the PoA-DD is consistent with the data source /63/ to give the baseline emission factor ($EF_{CO,grid,CM,y}$) of the CPA1. The emission reductions due to the CPA1 were estimated ex-ante to be 37,941 tCO_2e per year. The ex-ante estimation of emission reductions is based on the most recent data available at the time of submission of the PoA-DD, real-case CPA-DD & generic CPA-DD to the DOE for validation (i.e. GSP, 22nd April 2011 to 21st May 2011), for the relevant baseline emissions and project emissions of the CPA, which is reasonably and transparently carried out.

Table 9: The summary of GHG emission reduction (as per VVM clause 92)

All assumptions made for estimating	☒ Yes ☐ No	As per PoA-DD Section E.6, assumptions were made for ex-ante

GHG are listed in the PoA-DD		GHG emission reductions
All data used by project participants are listed in the PoA-DD	☒ Yes ☐ No	As per PoA-DD Annex 3 Baseline Information & Section E.6
Their references and sources are also listed in the PoA-DD	☒ Yes ☐ No	As per PoA-DD Annex 3 Baseline Information & Section E.6
Formulas, parameters, values are complete, accurate, transparent and conservative	☒ Yes ☐ No	The formulas, parameters and values in the calculations applied in the PoA-DD are complete, accurate, transparent and conservative.
All the references and documents used are correctly quoted and conservatively interpreted in the PoA-DD	☒ Yes ☐ No	The references and document used in the calculations applied in the PoA-DD are correctly quoted and conservatively interpreted.
Methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and emission reductions	☒ Yes ☐ No	The calculations of emission reductions applied in the PoA-DD follow the requirements in the approved methodology.
All the emissions of baseline emissions can be replicated using information provided in the PoA-DD	☒ Yes ☐ No	The calculations of baseline emissions applied in the PoA-DD can be replicated, and also follow the requirements in the approved methodology.

3.10 Monitoring Plan for a typical CPA

The monitoring plan is included in the PoA-DD Section E.7. and CPA-DD Section B.6. based on the approved monitoring methodology AMS-I.D./Version 17 titled “Grid connected renewable electricity generation”, and was correctly applied to the proposed PoA. Monitoring of GHG emission reductions is mainly based on measuring the net quantity of electricity supplied to the Thai power grid which is transparently presented in the PoA-DD and CPA-DD.

3.10.1 Parameters determined ex-ante

The ex-ante parameters for determining the GHG emission reductions are described in section E.6.3 of the PoA-DD and Section B.5.1 of the real-case CPA-DD for CPA1. According to AMS-I.D./Version 17, IPCC default values shall be used for calculating the emission factor when the country specific data are not available. The validation team checked that the net calorific value of fossil fuel is obtained from the Ministry of energy of Thailand, while the emission factor for fossil fuel is also consistent with the data source of 2006 IPCC Guidelines /64/. The validation team considers that the application of ex-ante parameters complies with the requirements for AMS-I.D./Version 17. Please refer to Section 3.9 for detailed discussion.

3.10.2 Parameters monitored ex-post

The parameters for determining the GHG emissions reductions are described in section E.7.1 of the PoA-DD and section B.5 of CPA-DD. Totally 6 nos. of major parameters are required to be monitored and they are namely:

(i) Quantity of net electricity supplied by the project activity to grid during the year y, $EG_{actual,y}$ (equals to $EG_{export,y} – EC_{import,y}$);
(ii) Quantity of electricity exported to the grid in year y, $EG_{export,y}$;
(iii) Quantity of electricity imported from the grid in year y, $EC_{PJ,y}$;
(iv) Quantity of biomass residue type k combusted in the project plant during year y ($FF_{k,y}$);
(v) Quantity of diesel combusted during year y, $FC_{diesel,y}$;
(vi) Net calorific value of biomass residue type k ($NCV_{biomass,k}$).

These parameters have been described in the monitoring plan, in which the parameter (i) (ii) and (iii) will be directly measured by the meter systems at the connection point continuously and recorded at least monthly, in which this fulfills the methodology requirement. These meters are selected by PEA (Provincial Authority of Thailand) according to PEA standard. The current accuracy of PEA Export and PEA Import meter is 0.5s, in which this should be in accordance with the current Thai national standard as the meters are selected by the national authority of PEA. In addition, QA/QC for parameters (i) to (iii) will be conducted by cross-checking against the import invoice billed by the PEA. For parameters (iv), this will be monitored continuously and recorded in the logbook on daily basis. For parameters (v), the diesel combusted from wheel loader will be measured continuously. QA/QC for parameters (iv) will be conducted by cross-checking against the fuel purchase receipts. For parameters (vii), this will be determined once in the first year of crediting period in laboratory according to national/international standards. The NCV will be measured quarterly by taking at least three biomass samples for each measurement.

Since the power supply to 3rd party will not be used to claim any emission reductions, thus this is not monitored by the CPA implementer. The validation team checked that the monitoring procedures are all complied with the requirements stipulated in the AMS-I.D. Version 17.

3.10.3 Management system and quality assurance

The monitoring plan for a SSC-CPA is described in section E.7.2 of the PoA-DD, in which this is matched with the monitoring plan for the PoA in section A.4.4.2 of the same document. A database will be organized for all CPAs under PoA managed by the ACSV.

Steps undertaken to assess the monitoring plan

According to document review in the PoA-DD, on-site interviews with the representatives from the CME /iii/, the monitoring arrangements described in the monitoring plan were assessed. The responsibilities for and institutional arrangements for data collection and archiving have been developed according to the PoA Operational and management plan and the implementation of these will enable subsequent verification of the project's emission reductions. The CDM training for CME and CPA1 implementer has been

carried out. Continuous training will be provided particularly before the subsequent CPA biomass power plant operation. The CDM monitoring training materials are checked by the validation team /26/, in which the training will be provided by the CME. For the technical training, the training of individual CPA will be conducted before the plant operation. The project operation and maintenance manuals will be prepared by the equipment supplier before the CPA project operation. The generic training plan for the implementation of monitoring plan for each of CPA is also reviewed by the validation team /31/. The validation team considers that the CME is capable to coordinate and manage the implementation of the monitoring plan as the relevant training programs will be arranged for the monitoring team.

3.11 Sustainable Development

According to the PoA-DD, the proposed PoA is considered to be contributing to sustainable development (SD) of Thailand in the following ways:

(i) Social well being: the PoA contributes to the creation of jobs from construction of biomass power plants and supply chain of biomass etc.;

(ii) Economic well being: the PoA shall bring additional investment. In addition, the reduction in Thailand's dependency on imported fossil fuels from biomass residues can contribute to savings in foreign exchange;

(iii) Environmental well being: the PoA results in utilization of surplus biomass residues thus reduce the emissions arisen from burning or nature decay of biomass residues, and it also reduces the CO_2 emissions from the electricity generation through fossil fuels consumptions;

(iv) Technological well being: the PoA contributes to Thailand's objective of renewable energy targets by using the biomass residues for power generation.

Thus, the sustainable development in social, environmental and economic aspects could be achieved by implementation of the PoA /76-78/. Moreover, the validation team has checked the LoA /28/ issued by the Thai DNA for the confirmation of the contribution of the PoA to the sustainable development of Thailand.

3.12 Environmental Impacts (at both PoA and CPA level)

Referring to the PoA-DD form /4.1/, it is allowed the environmental analysis to be done at PoA level or CPA level. For this proposed PoA, it is indicated in PoA-DD that the environmental analysis will be done at both the PoA and CPA level.

As confirmed by the TGO officials /xii-xiii/, it is not necessary to carry out an environmental impact assessment for a project with a power plant capacity below 10MW. As the CPAs of the proposed PoA will be implemented under VSPP (<10MW), environmental impact assessment is therefore not required for the PoA and CPAs. It is also confirmed that only the Initial Environmental Evaluation-Sustainable Development (IEE-SD) is required. In addition, it is required to complete the IEE-SD framework for each SSC-CPA, and submitted to Department of Works in order to obtain the operation permit. The IEE-SD framework is also included in the Annex 6 of the PoA-DD.

The environmental impacts of the project were sufficiently assessed by means of IEE-SD according to Thai laws & regulations. The IEE-SD framework for the PoA was prepared by BTGC Corporation Co., Ltd, and this has been submitted to the Department of Works and TGO /15/. The IEE-SD framework for the CPA1 at Phonthong, Roi-Et was also prepared by BTGC Corporation Co., Ltd, and this has been submitted to the Department of Works and TGO /48/. According to the TGO official /xii-xiii/, only the IEE framework for the first CPA is required to be submitted to TGO, for the subsequent CPAs, the IEE-SD framework can be only submitted to Department of Works.

In addition, it is analyzed in the IEE-SD framework that the PoA does not result in negative environmental impacts. The validation team also checked the operation of biomass boiler, the flue gas can be legally released to the atmosphere as per the latest Thai Environmental Law as indicated in the webpage of Ministry of Natural Resources and Environment Pollution Control Department:

http://www.pcd.go.th/info_serv/en_reg_std_airsnd03.html

The PoA and CPAs can contribute environmental development by substituting fossil fuels and reducing the emissions of greenhouse gases.

According to the TGO /xii/, there is no mandatory requirement for individual CPA to provide assessment of IEE-SD criteria to TGO. However, the CME also requires each subsequent SSC-CPA to provide the justification of passing the environmental analysis assessment as accordance to the latest approved version of the POA-IEE-SD framework as indicated in the eligibility criteria. The validation team considers that it shows an additional requirement from the CME in order to assess the IEE-SD situation in each CPA to be included. Moreover, the CME would also submit a report to the Thai DNA every year for confirmation the number of new CPAs that have been included in the POA, and a justification docuemnt of any negative impact to the environment of new SSC-CPAs. Therefore, the validation team considers that the CME's eligibility criteria no. 7 for IEE-SD assessment already complies with the national requirement in environmental analysis.

3.13 Local Stakeholder Consultation (at CPA level)

Referring to the PoA-DD form /4.1/, it is allowed the local stakeholder consultation to be done at PoA level or CPA level. For this proposed PoA, it is indicated in PoA-DD that the local stakeholder consultation will be done at CPA level.

The stakeholder consultation was done prior to the publication of the PoA-DD on the UNFCCC website (i.e. 22nd April 2011). The stakeholder consultation was carried out in form of workshop activities with aims of promotion. For the PoA workshops, these were presented by the ACSV, together with Department of Works and German Technical Cooperation (currently renamed as German International Corporation). According to the PoA-DD, the first local stakeholder consultation workshop was carried out in Bangkok on 10th November 2010 /19-20/. Another public consultation workshop was also held in Bangkok on 23rd March 2011, with the cooperation of United Nations Development Program (UNDP) /22/. During the consultation, the comments from government officers,

potential biomass power plant investors and biomass technology suppliers etc. were received and discussed. The stakeholder consultation records were reviewed by the validation team /21, 24/. According to the representative from the Department of Works (DIW) /xviii/, apart from these workshops, DIW also assists the PoA for promotion in various media or seminar.

For the CPA1, the local stakeholder consultation meeting was held at Wang Samukkee Sub-District and Phon Thong District of Roi-Et Province on 18th November 2010. The meeting mainly focused on the social-economic and environment impacts of the CPA1. There were totally 64 participants in the meeting, and 56 of them returned the questionnaire feedback forms. The summary of the questionnaire feedback forms is reviewed by the validation team /40/. The participants included the head of village, representatives from local NGO, and local government officials.

It is indicated that the local villagers agreed with the CPA1 that would contribute to sustainable development and environmental protection in the region. They also expected that the CPA1 could create employment opportunities for local people during the construction and operation phases. In general, the stakeholders expressed their support to the implementation of the CPA1.

During the on-site visit, the representatives from the local villages (Kudkuang and Tasangchang Village #4 and #11 /x-xi/) in Roi-et Province were interviewed. In general, the interviewees showed adequate understanding of the nature of the biomass power plant project developed by the CPA1 implementer. They consider that the project implementation would not cause adverse impact to their daily life. The plant construction would not affect their farming works since the plant location is about 2km from their living environment. In addition, the validation team also interviewed with the woodchip mill owners /viii-ix/, in which they will be the biomass residues suppliers for the CPA1 biomass power plant. They confirmed that the biomass residues will be solely sold to the CPA1 implementer at this moment, the biomass residues amount from the woodchip mills can fulfill the demand of the CPA1 implementer. The interviewees' overall response was supportive to the CPA1.

The stakeholder's comments are indicated in the Section D of the real-case CPA-DD for CPA1. However, please summarize in the CPA-DD for the background information of the local stakeholder meeting, and clarify whether the comments received could reflect the general attitudes towards the CPA.

3.14 Comments by Parties, Stakeholders and NGOs

The PoA-DD/ Version 01 and real-case CPA-DD/ Version 01 (for CPA1) dated 12th April 2011 respectively, and CPA-DD/ Version 01 without effective date were made publicly available on UNFCCC's website (http://cdm.unfccc.int/ProgrammeOfActivities/Validation/DB/I06DE6UCRK368XWLQWEYH35LWQMDAF/view.html) and parties, stakeholders and NGOs were through the CDM

website invited to provide comments during a 30 days period from 22nd April 2011 to 21st May 2011, where no comment was received.

Appendix A

THE VALIDATION PROTOCOL FOR CDM PROGRAMME OF ACTIVITIES

based on CDM Validation and Verification Manual

Biomass Power Development Programme in Thailand

in Thailand

Report No. 01 997 9105064278

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Programme of Activities (PoA)

Requirement	Reference	Conclusion
About Parties		
1. The programme shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art.	Kyoto Protocol Art.12.2	N/A/. No Annex I party is involved.
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	The ultimate objective of the UNFCCC is to achieve "...stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The programme aims in reduction of fossil fuel consumption with biomass power plant in Thailand. GHG emission reductions can be achieved by the reduction of fossil fuel consumption for power generation.
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	The LoA is issued from the DNA of host country, Thailand.
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	The LoA /28/ issued by the DNA of Thailand confirms the proposed programme in contributing to sustainable development of Thailand.
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	No diversion of ODA can be found for the PoA.
6. Parties participating in the CDM shall designate a national authority for the	CDM Modalities and Procedures §29	The designated national authority

Requirement	Reference	Conclusion
CDM.		(DNA) of Thailand is Thailand Greenhouse Gas Management Organization (TGO)
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	Thailand ratified the Kyoto Protocol on 28th August 2002
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	N/A/. No Annex I party is involved.
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	N/A/. No Annex I party is involved.
About Design of Programme		
10. The CDM-POA-DD sets a framework for the implementation of the PoA and defines unambiguously a CPA under the PoA.	PoA Procedures § 2	Yes. The implementation of the PoA is described in the PoA-DD. Moreover, detailed descriptions of criteria for CPA inclusion are provided in section A.4.2.2 of the PoA-DD.
11. The coordinating/managing entity shall be identified.	PoA Procedures § 2 (a)	The Advance Carbon Securities Ventures (ACSV) Company Limited is identified as the coordinating / managing entity (CME) of the PoA, which is also confirmed in the LoA /28/ issued by the DNA of Thailand.
12. The boundary for the PoA in terms of a geographical area (e.g., municipality, region within a country, country or several countries) within which all CPAs included in the PoA will be implemented is defined.	PoA Procedures § 2 (b)	The boundary for the PoA for all CPAs to be included and implemented is defined as in the whole country of Thailand.
13. Eligibility criteria are defined for inclusion of a project activity as a CPA under the PoA, which shall include criteria for demonstration of additionality, and the type and/or extent of information (e.g. criteria, indicators, variables, parameters or measurements) that shall be provided by	PoA Procedures § 2 (g)	OK. The detailed descriptions of eligibility criteria for CPA inclusion are provided in section A.4.2.2 of the PoA-DD, which include criteria for

Requirement	Reference	Conclusion
		demonstration of additionality, and the type and/or extent of information (e.g. criteria, indicators, variables, parameters or measurements) that shall be provided by each CPA in order to ensure its eligibility.
14. The length of the PoA is not exceeding 28 years.	PoA Procedures § 2 (h)	The length of the PoA is taken as 28 years.
15. The operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA is described, including a description of a record keeping system for each CPA under the PoA, a system/procedure to avoid double accounting e.g. to avoid the case o including a new CPA that has been already registered either as CDM project activity or as a CPA of another PoA, the provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	PoA Procedures § 2 (i)	The operational and management arrangement has been established in the PoA-DD Section A.4.4.1 for the implementation of PoA. The operation Management System can assure to meet the requirement indicated in the relevant section of SSC-PoA-DD form: 1) Record keeping system for each CPA under the PoA; 2) Procedure to avoid double counting; 3) Procedure to check for debundling; 4) Awareness and agreement of those operating a CPA on PoA subscription.
16. The proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of emission reductions achieved by CPAs under the PoA is described. In case the coordinating/managing entity opts for a verification method that does not use sampling but verifies each CPA there is a transparent system defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA.	PoA Procedures § 2 (k)	N/A No sampling is used for the PoA.
About small-scale programmes of activities (if applicable)		
17. The CPAs shall meet the eligibility criteria for small scale CDM project	Simplified Modalities and	The assessment for CPA as small

Requirement	Reference	Conclusion
activities set out in § 6 (c) of the Marrakech Accords.	Procedures for Small Scale CDM Project Activities §12a,c	scale CDM CPA is included in eligibility criteria for CPA inclusion.
About additionality		
18. Additionality of the programme as a whole is demonstrated because in the absence of the CDM (i) the proposed voluntary measure would not be implemented, or (ii) the mandatory policy/regulation would be systematically not enforced and that non- compliance with those requirements is widespread in the country/region, or (iii) that the PoA will lead to a greater level of enforcement of the existing mandatory policy/ regulation.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43 PoA Procedures § 2 (e)	As per the applied baseline and monitoring methodology, the SSC additionality guideline "Guidelines on the demonstration of additionality of small-scale project activities, Version 09.0" for the Simplified modalities and procedures for small-scale CDM project activities, the additionality of the PoA is demonstrated. It is confirmed that the proposed PoA is a voluntarily coordinated action and it would not be implemented in the absence of the CDM, due to the investment barrier.
19. Additionality of a typical CPA is demonstrated by using the procedure provided in the baseline and monitoring methodology applied.	PoA Procedures § 2 (f)	The additionality of CPAs is included in the eligibility criteria for inclusion of a SSC-CPA in the PoA in section 4.2.2 of the PoA-DD and section B.2 of the real-case CPA-DD, which is in accordance with the requirement of EB 55 Annex 38. As per the applied baseline and monitoring methodology, the SSC additionality guideline "Guidelines on the demonstration of additionality of small-scale project activities, Version 09.0" for the Simplified modalities and procedures for small-scale CDM project activities" is applied to demonstrate

Requirement	Reference	Conclusion
		additionality.
About application of baseline and monitoring methodology		
20. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	The applied AMS-ID version 17 is approved by the CDM EB.
21. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	As the per PoA-DD section E.4, the baseline scenario is prescribed according to the applied methodology AMS-I.D./Version 17, the baseline is identified as the the electricity delivered to the grid by the project activity that otherwise would have been otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.
22. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	The applied methodology AMS-I.D./Version 17 excludes to earn CERs for decreases in activity levels outside the project activity or due to force majeure.
23. The monitoring plan for a typical CPA is developed in accordance with the approved monitoring methodology, and identification of the monitoring provisions and data parameters a CPA has is to apply/monitor	PoA Procedures § 2 (j)	The applied methodology AMS-I.D./Version 17 excludes to earn CERs for decreases in activity levels outside the project activity or due to force majeure.
24. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	The validation team confirms that the provisions for monitoring, verification and reporting are in accordance with the modalities described in the Marrakech Accords and relevant

Requirement	Reference	Conclusion
		decisions of the COP/MOP.
About forecast emission reductions		
25. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	The environmental impacts of the project were sufficiently assessed by means of IEE-SD according to Thai laws & regulations. The IEE-SD framework for the PoA was prepared by BTGC Corporation Co., Ltd, and this has been submitted to the Department of Works and TGO /15/. The IEE-SD framework for the CPA1 at Phonthong, Roi-Et was also prepared by BTGC Corporation Co., Ltd, and this has been submitted to the Department of Works and TGO /41/. According to the TGO official /xii-xiii/, only the IEE framework for the first CPA is required to be submitted to TGO, for the subsequent CPAs, the IEE-SD framework can be only submitted to Department of Works.
About stakeholder comments		
26. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	The stakeholder consultation was done prior to the publication of the PoA-DD on the UNFCCC website (i.e. 22nd April 2011). The stakeholder consultation was carried out in form of workshop activities with aims of promotion. For the PoA workshops, these were conducted by the ACSV, together with Department of Works and German Technical Cooperation

Requirement	Reference	Conclusion
		(currently renamed as German International Corporation). According to the PoA-DD, the first local stakeholder consultation workshop was carried out in Bangkok on 10th November 2010 /19-20/. Another public consultation workshop was also held in Bangkok on 23rd March 2011, with the cooperation of United Nations Development Program (UNDP) /22/. During the consultation, the comments from government officers, potential biomass power plant investors and biomass technology suppliers etc. were received and discussed. The stakeholder consultation records and summary were reviewed by the validation team.
27. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	The PoA-DD/ Version 01, generic CPA-DD/ Version 01 and a real-case CPA-DD/ Version 01 were made publicly available on UNFCCC's website and parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 22 April 2011 to 21 May 2011. Until the end of publication period, no comment was received.
Other		
28. The project design document shall be in conformance with the UNFCCC CDM-SSC-PoA-DD format.	CDM Modalities and Procedures Appendix B, EB Decision	Yes. All the project design documents, i.e. PoA-DD and CPA-DD are in conformance with the UNFCCC CDM-SSC-PoA-DD format.

Table 2: Requirement Checklist
(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual)
(MoV = Means of Verification, DR= Document Review, I= Interview)

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
A. General Description of Programme Activity **The project design is assessed.**					
A.1 Programme Boundaries *Project/Programme Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the programme's spatial boundaries (geographical) clearly defined?	/1/	DR	Yes. As per the PoA-DD /1/, the geographical boundary of the PoA is clearly defined as the whole country of Thailand.	OK	OK
A.1.2. Are the programme's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	Yes. The programme's system boundaries are defined as biomass power plants.	OK	OK
A.1.3. Can each CPA under the PoA be clearly identified individually including spatial boundaries (geographical) clearly defined	/1/	DR	Yes. All CPA will be clearly identified individually including the spatial geographical boundaries of different regions in Thailand.	OK	OK
A.2 Participation Requirements *Referring to Part A, Annex 1 and 2 of the PoA-DD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.*					

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
A.2.1 Which Parties and programme participants are participating in the project?	/1/, /28/	DR	According to the PoA-DD and LoA, the proposed programme is a unilateral CDM PoA which involves one project participant: Advance Carbon Securities Ventures (ACSV) Company Limited from Thailand. **CAR01** Please provide the LoA for the project participant (CME) for validation.	~~CAR01~~	OK (Refer to Table 3)
A.2.2 Has the coordinating/managing entity of the programme been identified?	/1/	DR	Yes. The project participant, Advance Carbon Securities Ventures (ACSV) Company Limited, is the coordinating / managing entity (CME) of the PoA. **CL04** For the CPA eligibility criteria, the implementer of a CPA will be the individual project proponent. Please clarify whether different CPAs would be implemented by same project proponent.	~~CL04~~	OK (Refer to Table 3)
A.2.3 Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/, /28/	DR	Yes. The Letter of Approval (LoA) /28/ issued by the DNA of Thailand has been validated for confirming the voluntary participation of MARD and its coordination role on the PoA.	OK	OK
A.2.4 Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/	DR	Yes. The host party, i.e. Thailand meets all relevant participation requirements in CDM. Thailand ratified the Kyoto Protocol on 28th August 2002. Thailand Greenhouse Gas Management Organization is the designated national authority (DNA) of Thailand.	OK	OK
A.2.5 Has it been checked that if there is public funding	/1/,	DR	Yes. According to Section A.4.5 and Annex 2 of	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
for the programme from Parties in Annex I, this funding shall not be a diversion of official development assistance.	/16/, /51/		the PoA-DD and on-site interview with the representative from ACSV, there is no ODA for the PoA. All the CPA has also declared of no ODA for inclusion.		
A.3 Technology to be employed *Validation of project technology focuses on the programme engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A..3.1 Does the programme design engineering reflect current good practices?	/1/, /43/	I DR	Yes. The programme applies biomass power technology for power generation, in which this can reflect good engineering practices.	OK	OK
A.3.2 Does the programme use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/, /43/	I DR	Yes. The biomass power technology results in a significantly better performance than the commonly used technology of traditional fossil fuel consumption for power generation in Thailand. **CL03** Please clarify whether there will be technology transfer in the equipment applied in each SSC-CPA. **CL19** Please clarify why this is deemed to be more conservative for the equipment lifetime of 25 years.	~~CL03~~ ~~CL19~~	OK (Refer to Table 3)
A.3.3 Does the programme make provisions for meeting training and maintenance needs?	/1/, /31	I DR	As per on-site interview with the ACSV, technical trainings and monitoring trainings will be provided to the operational staff. The training	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
			records will be checked for future CPA accordingly.		
A.4 Contribution to Sustainable Development *The programme's contribution to sustainable development is assessed.*					
A.4.1 Has the host country confirmed that the programme assists it in achieving sustainable development?	/1/, /28/	DR	The Letter of Approval (LoA) issued by the DNA of Thailand has been validated for confirming the proposed programme in contributing to sustainable development of Thailand.	OK	OK
A.4.2 Will the programme create other environmental or social benefits than GHG emission reductions?	/1/	I DR	Environmental benefits: the PoA results in utilization of surplus biomass residues thus reduce the emissions arisen from burning or nature decay of biomass residues, and it also reduces the CO_2 emissions from the electricity generation through fossil fuels consumptions Social benefits: the PoA contributes to the creation of jobs from construction of biomass power plants and supply chain of biomass etc. The validation team interviewed local stakeholders during OSV and got the above positive feedbacks from the villagers to national government representatives. Thus, the sustainable development in social, environmental and economic aspects could be achieved by implementation of the PoA.	OK	OK
A.5 Small scale programme activity *Is this assessed whether the project qualifies as small-scale CDM project activity*					

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
A.5.1. Do CPAs under the programme qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	Yes. The CPAs under the programme qualify as small scale CDM project activities as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM.	OK	OK
A.5.2. Is the small scale project activity not a de-bundled component of a larger project activity?	/1/ /8/	DR	According to the Guidance for Determining the Occurrence of De-bundling under a PoA version 03 EB54 Annex 13, each CPA has to demonstrate that there is no similar biomass power plant implemented by the same CPA implementer within 1km of another large scale CDm project. This is also one of the eligibility criteria for the CPA inclusion. Thus this can confirm the CPA is not being a de-bundled component of a large scale activity. **CL06** Please clarify how the CME will ensure the CPA is not a de-bundling component from a large-scale project, and whether this would be one of the inclusion eligibility criteria.	~~CL06~~	OK (Refer to Table 3)
A.6 Operational, management and monitoring plan for the programme					
A.6.1. Do the operational and management arrangements established by the coordinating entity include a record keeping system for each CPA under the programme?	/1/	DR	Yes. The operational and management arrangements established by the coordinating entity include a record keeping system for each CPA under the programme. **CL09** Please provide if any centralised database organized for each of the CPAs under PoA by ACSV for validation.	~~CL09~~	OK (Refer to Table 3)
A.6.2. Do the operational and management arrangements established by the coordinating entity	/1/, /14/	DR	Yes. The operation and management arrangements established by ACSV include a	~~CL07~~	OK (Refer to

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
include a system/procedure to avoid including CPAs that have already been registered either as CDM project activity or as a CPA of another PoA?			system/procedure to avoid including CPAs that have already been registered either as CDM project activity or as a CPA of another PoA. The ACSV will check the PoA database and UNFCCC information for such management arrangement. **CL07** Please clarify how the CME avoid the double accounting for new CPA inclusion in the PoA.		Table 3)
A.6.3. Do the operational and management arrangements established by the coordinating entity include provisions to ensure that CPA implementers are aware and have agreed that their activity is being subscribed to the PoA?	/1/	/DR	Yes. This is one of the eligibility criteria for the CPA o sign MoU with CME of the PoA. Thus this ensure that CPA implementers are aware and have agreed that their activity is being subscribed to the PoA. **CL08** As the GHG emission reductions will be resulted in the CPA biomass power plants, please clarify how the CME manage the CER ownership with the CPA implementers for each CPA.	~~CL08~~	OK (Refer to Table 3)
A.6.4. Does the monitoring plan include a description of a proposed statistically sound sampling method and procedure to be used by designated operational entities for verification of GHG emission reductions by CPAs under the programme? OR If the programme does not use verification method that applies a statistical method for sampling, has a system been defined to avoid double counting of CERs, and is the system transparent?	/1/	/DR	N/A. The PoA does not involves in the sampling plan.	OK	OK
B. Duration of the Programme of Activities, Crediting Period					
B.1.1. Is the programme starting date and length of the	/1/,	DR	According to the PoA-DD Section B.1, the	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
programme clearly defined and evidenced?	/59/		starting date of the CPA01 is defined as 21st September 2011. It is defined as the confirmation date of EPC contact. The PoA will be started on 8th December 2012, or date of registration whichever is later. Meanwhile, the length of the PoA is 28 years.		
B.1.2. Does the PoA design documentation confirm that the length of the PoA does not exceed 28 years?	/1/	DR	Yes. As per the PoA-DD, the length of the PoA is 28 years.	OK	OK
C. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
C.1.1. Has an analysis of the environmental impacts of the programme been sufficiently described?	/1/, /15/, /49/	DR I	Not applicable. As per on-site interview with representative of the TGO, it is confirmed that there is no requirement to conduct an environmental impact assessment for implementing a PoA and its CPA for biomass power plant under 10MW.	OK	OK
C.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)?	/1/, /15/, /49/	DR I	Not applicable. As per on-site interview with representative of the TGO, it is confirmed that there is no requirement to conduct an environmental impact assessment for implementing a PoA and its CPA for biomass power plant under 10MW. **CL05** Please clarify whether the CME will prepare the IEE-SD report and submit to the DNA for further authorization of subsequent CPAs, as it is stated by the DNA that only the PoA and first CPA are	~~CL05~~ ~~CL25~~	OK (Refer to Table 3)

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
			required to do so. **CL25** Please clarify whether there is any official approval procedure from government for the IEE-SD assessment of PoA and CPAs.		
C.1.3. Will the programme create any adverse environmental effects?	/1/, /15/, /49/	I DR	No. As per on-site interview with representative of the TGO, no negative impact is expected on the local environment induced by the PoA.	OK	OK
C.1.4. Are transboundary environmental impacts considered in the analysis?	/1/, /15/, /49/	DR	No. There are no transboundary environmental impacts.	OK	OK
C.1.5. Have identified environmental impacts been addressed in the programme design?	/1/, /15/, /49/	DR	Yes. Environmental impacts are identified in the programme design.	OK	OK
C.1.6. Does the programme comply with environmental legislation in the host country?	/1/, /15/, /49/	DR	Yes. According to the TGO, the programme complies with environmental legislation in Thailand.	OK	OK
D. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received*					
D.1.1. Have relevant stakeholders been consulted?	/1/, /20-23/	DR	Yes. As per section D.2 of the PoA-DD, the first local stakeholder consultation workshop was carried out in Bangkok on 10th November 2010. Another public consultation workshop was also held in Bangkok on 23rd March 2011, with the cooperation of United Nations Development Program (UNDP). During the consultation, the comments from government officers, potential	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
			biomass power plant investors and biomass technology suppliers etc. were received and discussed.		
D.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/, /20-23/	DR	For the PoA workshops, these were conducted by the ACSV, together with Department of Works and German Technical Cooperation (currently renamed as German International Corporation). The notification of the stakeholder consultation meetings was published on a local newspaper, and public media before the meetings and workshops.	OK	OK
D.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/, /20-23/	I DR	Not applicable. There is no regulation/law regarding the stakeholder consultation process in the host country.	OK	OK
D.1.4. Is a summary of the stakeholder comments received provided?	/1/, /20-23/	DR	PP summarized the comments including the feedbacks from stakeholders' comments and described in section D.3 of PoA-DD /1.1/.	OK	OK
D.1.5. Has due account been taken of any stakeholder comments received?	/1/, /20-23/	DR	No applicable. The general comments are positive.	OK	OK
E. Programme Baseline *The validation of the project/programme baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline*					
E.1. Baseline Methodology *It is assessed whether the project/programme applies an appropriate baseline methodology.*					

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
E.1.1. Does the project/programme apply an approved methodology and the correct version thereof?	/1/	DR	The PoA and its CPAs applies the approved baseline and monitoring methodology AMS-I.D./Version 17 " Grid connected renewable electricity generation", which is approved by the EB and also be a valid applicable version. **CAR02** For the CPA eligibility criteria, further CPA inclusion should follow the methodology applied in the latest valid PoA-DD instead of the latest version of methodology, please revise accordingly.	~~CAR02~~	OK (Refer to Table 3)
E.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/	DR	Yes. The applicability criteria for the baseline methodology in section E.2 of the PoA-DD are assessed by the validation team by means of document review and interview, and confirmed to be fulfilled with the AMS-I.D.	OK	OK
E.2. Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.*					
E.2.1. What is the baseline scenario?	/1/, /10/	DR	As the per PoA-DD section E.4, the baseline scenario is prescribed according to the applied methodology AMS-I.D./Version 17, "the baseline is identified as the electricity delivered to the grid by the CPA that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources.	OK	OK
E.2.2. What other alternative scenarios have been	/1/	DR	Not applicable. It is prescribed in the applied	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
considered and why is the selected scenario the most likely one?			methodology AMS-I.D./Version 17.		
E.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	Not applicable. It is prescribed in the applied methodology AMS-I.D./Version 17.	OK	OK
E.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Not applicable. It is prescribed in the applied methodology AMS-I.D./Version 17.	OK	OK
E.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Not applicable. It is prescribed in the applied methodology AMS-I.D./Version 17. Moreover, there are no laws and regulations for the mandatory sectoral policies for biomass power generation.	OK	OK
E.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Not applicable. It is prescribed in the applied methodology AMS-I.D./Version 17.	OK	OK
E.2.7. Have the major risks to the baseline been identified?	/1/	DR	Not applicable. It is prescribed in the applied methodology AMS-I.D./Version 17.	OK	OK
E.3. Additionality of the Programme of Activities *The assessment of additionality will be validated with focus on whether the programme itself is not a likely baseline scenario.*					
E.3.1. Has it been demonstrated that the programme is a voluntary coordinated action that would not be implemented in the absence of CDM?	/1/	DR I	According to the PoA-DD Section A.4.3, the ACSV stated that “there is no mandatory programme in Thailand to promote the biomass power plant”. As per on-site interview with representative of the TGO, there is no mandatory law/regulation or other governmental campaign to enforce the application of biomass power generation. Thus the proposed PoA is confirmed	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
			to be a voluntarily coordinated action.		
E.3.2. If the programme is implementing a mandatory policy/regulation, has it been demonstrated whether the policy/regulation is being enforced? If it is enforced, has it been demonstrated that the programme will lead to a higher level of enforcement?	/1/	DR	According to the PoA-DD Section A.4.3, the ACSV stated that "there is no mandatory programme in Thailand to promote the biomass power plant". As per on-site interview with representative of the TGO, there is no mandatory law/regulation or other governmental campaign to enforce the application of biomass power generation. Thus the proposed PoA is confirmed to be a voluntarily coordinated action. **CL02** Please clarify whether the agricultural biomass residues will be treated or managed according to any laws and regulations, in order to confirm the biomass residues would not be used for other purposes.	~~CL02~~	OK (Refer to Table 3)
E.3.3. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Yes. All assumptions are stated in a transparent and conservative manner.	OK	OK
E.3.4. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Yes. Sufficient evidence is provided to support the relevance of the arguments. Investment barrier is demonstrated for the additionality of the proposed programme and CPA1.	OK	OK
E.3.5. If the starting date of the project/programme activities is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the programme?	/1/	DR	N/A. As per EB60 Annex 26 Clarifications regarding the Procedures for Registration of a PoA as a single CDM project activity and Issuance of CER for PoA, "Guidelines for the demonstration and assessment of prior consideration of the CDM" do not apply to PoAs, as at present it is expected that no component of the programme will commence prior to the start date of validation. For this PoA,	~~CL01~~ ~~CL12~~	OK (Refer to Table 3)

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			the CPA1 was started after the start date of validation, i.e. GSP. Thus the "Guidelines for the demonstration and assessment of prior consideration of the CDM" is not applicable. **CL01** Please clarify the starting date of PoA according to Glossary of CDM term, in which this was the earliest date at which implementation or construction or real action of the PoA began. **CL12** Please clarify with supporting information for the signing date of the major equipment contact for the justification of the starting date of CPA1.		
E.4. Additionality of CPAs					
E.4.1. Is the approach described for demonstrating additionality of a CPA in accordance with the using the procedure provided in the baseline and monitoring methodology applied?	/1/, /10/	DR	Yes. As per AMS-I.D./Version 17, the approach of investment barrier is described for demonstrating additionality of a CPA. **CAR03** Please revise with consistency of the appropriate Tool applied for the demonstration and assessment of additionality for the CPAs.	~~CAR03~~	OK (Refer to Table 3)
E.4.2. Are specific criteria for demonstrating the additionality of a specific CPA included to the PoA?	/1/, /10/	DR	The criteria for demonstrating the additionality of a specific CPA basically follow the approch of addtionality of PoA as per " Guidelines on the demonstration of additionality of small-scale project activities, Version 09.0.	OK	OK
E.4.3. Is the additionality of a typical CPA demonstrated?	/1/, /10/	DR	Yes. As per the real-case CPA-DD Section B.3, the assessment of additionally of the CPA refers	~~CL13~~ ~~CL14~~	OK (Refer to

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
			to discussion of eligibility criteria in section B.2. As per AMS-I.D./Version 17, for the CPA with installed capacity under 10MW, the additionality will be demonstrated by the CPA implementer by investment barrier and benchmark analysis. **CL13** For the determination of MLR, please clarify whether there is any regulation for the limitation of debt financing ratio for the project investment in Thailand. **CL14** Please clarify the current situation (such as availability, creditability) of the “published journal or database”, “indicative offer(s)” and “national database” for similar small scale biomass power plant projects in Thailand respectively. **CL15** Please clarify the tariff incentive provided by the VSPP compared with normal tariff, and why this is not considered as E- policy to the CPAs. **CL16** For the determination of MLR as the benchmark of CPA1, please clarify why an average from 2010 to project starting date is applied. Please also clarify the reasons for applying zero equity in the project IRR calculation for the benchmark analysis. **CL17**	~~CL15~~ ~~CL16~~ ~~CL17~~ ~~CL18~~	Table 3)

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
			Please provide the relevant translated minutes of board meeting held on 12th November 2010 for the financial decision making of CPA1 for validation. **CL18** Please provide if any supporting information for the market rate or general engineering budget guidelines for the O&M costs of similar power plants.		
E.5. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
E.5.1. Has the procedure to calculate project emissions of an individual CPA been documented according to the approved methodology and in a complete and transparent manner?	/1/, /71/	DR	Yes. The procedure to calculate emission reductions of an individual CPA is documented according to the approved methodology and in a complete and transparent manner.	OK	OK
E.5.2. Have conservative assumptions been used when calculating the project emissions?	/1/, /71/	DR	Yes. The calculation of emission reductions is conservative. The estimation of project emissions is carried out with most conservative assumptions in the fossil fuel consumption.	OK	OK
E.5.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Yes. The uncertainties in project emission estimation are properly addressed.	OK	OK
E.6. Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the procedure for calculating baseline emissions is according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified*					

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
E.6.1. Has the procedure to calculate baseline emissions of an individual CPA been documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes. The procedure to calculate emission reductions of an individual CPA is documented according to the approved methodology and in a complete and transparent manner.	OK	OK
E.6.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Yes. The calculation of emission reductions is basically considered conservative. Only the reduction of fossil fuel consumption is considered for the estimation of baseline emissions.	OK	OK
E.6.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Yes. The uncertainties in baseline emission estimation are properly addressed. **CL10** Please demonstrate the amount of CO_2 released due to transportation of biomass residues to the power plant can be assumed to be very small. **CL11** Please clarify whether the wastewater from the treatment of biomass residues will be generated in each of the CPA biomass power plant, and whether the wastewater can be the one of the sources included in the SSC-CPA boundary.	~~CL10~~ ~~CL11~~	OK (Refer to Table 3)
E.7. Calculation of GHG Emission Reductions – Leakage *It is assessed whether the procedure for calculating leakage is according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
E.7.1. Has the procedure to calculate leakage emissions of an individual CPA been documented according	/1/	DR	Referring to AMS-I.D. version 17, there will be no energy generating equipment transferred from	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
to the approved methodology and in a complete and transparent manner?			another activity for the PoA, thus the leakage can be neglected.		
E.7.2. Have conservative assumptions been used when determining the procedure to be used to calculate the leakage emissions? E.7.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	As described above, the assumptions have been used for the leakage emissions, and leakage emissions are not required to be considered and are assumed as zero.	OK	OK
E.8. Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
E.8.1. Does the PoA-DD provide a clear and correct way of calculating the emission reductions from each CPA?	/1/, /54/	DR	Yes. The procedure to calculate emission reductions of an individual CPA is documented according to the approved methodology AMS-I.D and in a complete and transparent manner.	OK	OK
E.9. Monitoring Methodology *It is assessed whether the project applies an appropriate monitoring methodology.*					
E.9.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/, /10/	DR	Yes. The monitoring plan is based on the monitoring methodology AMS-I.D./Version 17 in a complete and transparent manner.	OK	OK
E.9.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/, /10/	DR	Yes. As indicated in the monitoring operation and management plan, all the monitored data will be kept for two years after the end of the crediting period.	OK	OK
E.10. Monitoring of Plan *It is established whether the monitoring plan provides for*					

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
reliable and complete project emission data over time.					
E.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the programme boundary during the crediting period?	/1/, /54/	DR	Yes. Electronic databases for PoA and individual CPA will be operated and maintained by the CME, which include all relevant data necessary for estimation and measuring the GHG emissions during crediting period. **CL21** Please clarify whether the emission reductions will be accounted from the net quantity of electricity supplied to the third party in CPA1.	~~CL21~~	OK (Refer to Table 3)
E.10.2. Are the choices of project GHG indicators reasonable and conservative?	/1/, /54/	DR	Yes. The choices of project GHG indicators are reasonable and conservative, as per AMS-I.D.	OK	OK
E.10.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/, /54/	DR	Yes. The measurement method is clearly stated for each GHG value to be monitored as per AMS-I.D.	OK	OK
E.10.4. Is the measurement equipment described and deemed appropriate?	/1/, /54/	DR	Yes. The measurement equipment is clearly described and deemed to be appropriate monitored as per the monitoring requirements of AMS-I.D.	OK	OK
E.10.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/, /54/	DR	Yes. The measurement is based on the survey carried out during monitoring by trained personnel, and is deemed to be appropriate. **CL20** Please clarify if any emergency plan for metering arrangement in case of malfunction of monitoring meters.	~~CL20~~	OK (Refer to Table 3)
E.10.6. Is the measurement interval identified	/1/,	DR	Yes. The measurement interval is based on the	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
And deemed appropriate?	/54/		requirements from AMS-I.D., and is deemed to be appropriate.		
E.10.7. Is the registration, monitoring, measurement and reporting procedure defined?	/1/, /54/	DR	Yes. The CME is responsible for preparing the monitoring report and relevant procedures in order to fulfill the EB's requirements in registration, monitoring, measurement and reporting. **CL22** Please clarify if any QA/QC procedures for the on-site measurement of moisture content of biomass residues. **CL23** Please provide a generic training plan and schedule for the implementation of monitoring plan for each of CPA.	~~CL22~~ ~~CL23~~	OK (Refer to Table 3)
E.10.8. Are procedures identified for maintenance of monitoring equipment and installations? Are the calibration intervals being observed?	/1/, /54/	DR	N/A. No monitoring equipment is required as the monitoring will be conducted mainly through survey and interview, as per the requirements in AMS-I.D.	OK	OK
E.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/, /54/	DR	Yes. The procedures identified for regular record handling including the keeping, storage of monitoring documentation.	OK	OK
E.11. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
E.11.1. Is the monitoring of sustainable development	/1/	I	No. According to TGO, it is not required in host	~~CL24~~	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
indicators/ environmental impacts warranted by legislation in the host country?		DR	country of Thailand. **CL24** Please provide the relevant document from the Thai DNA for the confirmation of PoA contributing to sustainable development.		(Refer to Table 3)
E.11.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	N/A. Data concerning environmental, social and economic impacts are not included in the monitoring plan.	OK	OK
E.11.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/, /28/	DR	The validation team interviewed stakeholders during OSV and got the positive feedbacks from the villagers and local government representatives. It is considered that the sustainable development in social, environmental and economic aspects could be achieved by implementation of the PoA. Moreover, The Letter of Approval (LoA) issued by the DNA of Thailand has been received to confirm the PoA in assisting to achieve sustainable development in Thailand.	OK	OK
E.12. Management System and Quality Assurance for Monitoring and Reporting *It is checked that programme implementation is properly prepared for and that critical arrangements are addressed*					
E.12.1 Is the authority and responsibility of overall project management clearly described?	/1/	DR I	Yes. During the on-site interview with the ACSV, the monitoring of each CPA will be in charge and responsible by the ACSV. The organization chart of the ACSV as the CME was checked for confirming its management structure.	OK	OK
E.12.2 Are procedures identified for training of monitoring	/1/	DR	The monitoring training to relevant monitoring	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	Findings, comments, references, data sources	Draft Concl.	Final Concl.
personnel?		I	staff and technicians will be provided before each CPA operation. The validation team has checked the Monitoring Plan for the monitoring procedures.		
E.12.3 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	N/A. There are no unintended emissions induced by the PoA. The validation team has checked the monitoring plan for the identification of monitoring procedures, in which it includes the procedures to handle monitoring errors.	OK	OK
E.12.4 Are procedures identified for review of reported results/data?	/1/	DR I	Yes. The validation team has checked the monitoring plan for the identification of monitoring procedures for review of reported results/data.	OK	OK
E.12.5 Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR I	Yes. The validation team has checked the monitoring plan for the identification of procedures for accurate monitoring.	OK	OK

Table 3: List of Requests for Corrective Action (CAR) and Clarification (CL)						
No.	**CAR/CL**		**Observation (CAR/CL)**	**Reference**	**Summary of project owner response**	**Validation team conclusion**
1.	√		**CAR01** Please provide the LoA for the project participant (CME) for validation.	A.2.1	LOA is attached for Validation	The validation team checked the Thai LoA issued by the Thai DNA, and confirmed to be valid. OK. The CAR is therefore closed.
2.	√		**CAR02** For the CPA eligibility criteria, further CPA inclusion should follow the methodology applied in the latest valid PoA-DD instead of the latest version of methodology, please revise accordingly.	E.1.1	Updated in Section E.4.2.2: • Each SSC-CPA must meets all the criteria in the applied methodology AMS I.D as applied in the latest valid POA-DD document	The validation team checked the revised Section A.4.2.2. of PoA-DD, the CPA eligibility is updated to follow the methodology applied in the latest valid PoA-DD. OK. The CAR is therefore closed.
3.	√		**CAR03** Please revise with consistency of the appropriate Tool applied for the demonstration and assessment of additionality for the CPAs.	E.4.1	The appropriate tool applied for demonstration and assessment of additonality of each SSC-CPA is in line with "Guidelines on the demonstration of additionality of small-scale project activities" for the simplified modalities and procedures for small scale CDM project activities".	The validation team checked the revised PoA-DD, the latest "Guidelines on the demonstration of additionality of small-scale project activities" for the simplified modalities and procedures for small scale CDM project activities is applied to demonstrate the additionality of the SSC PoA. This also fulfills the "Standard for Demonstration

						of Additionality, Development of Eligibiligy Criteria and Application of Multiple Methodoloies for PoA" version 01.0. OK. The CAR is therefore closed.
4.		√	**CL01** Please clarify the starting date of PoA according to Glossary of CDM term, in which this was the earliest date at which implementation or construction or real action of the PoA began.	E.3.5	The starting date for this POA is 1st December 2012 or the date of POA registration whichever is later, referring to the date of which the CDM-POA DD was first published for global stakeholder consultation. The above has been updated in the SSC-POA-DD, Section B.1.	The CME identified the starting date of PoA to be 8th December 2012, or the date of PoA registration, whichever is later. The validation team also checked the EPC contract for the first CPA (CPA1), which was signed on 21 September 2011. This is the first major contract confirmed for CPA1, thus the validation team considers that it can be identified as the starting date of CPA1 as the earliest real action and implementation for the CPA. In addition, since the CPA1 was started after the GSP of proposed PoA, CPA1 can be included in the proposed PoA. OK. The CL is therefore closed.

5.		√	**CL02** Please clarify whether the agricultural biomass residues will be treated or managed according to any laws and regulations, in order to confirm the biomass residues would not be used for other purposes.	E.3.2	1. Published Journal The following published journal and documents provide the evidence that there is no law and regulation enforcing the treatment of Agricultural Biomass Residuals in Thailand. Both documents has been attached. Treatment and utilization of agricultural wastes in Thailand www.faculty.ait.ac.th/visu/Data/Methsiri/Paper.doc Overview of Biomass Utilization in Thailand http://www.aistriss.jp/old/lca/ci/activity/project/biomass/report/041028_paper/thailand_paper.pdf 2. Interview with relevant organizations in Thailand According to Ministry of Natural Resource and Environment, they have expressed that biomass residues are not required by Thai laws for treatment, all interviewees also expressed that wood branches, wood barks from woodchip processing mills does not need to go through any treatment according to any laws and regulations in Thailand.	The validation team checked the published reference from several sources: 1) publication from Asian Institute of Technology of Thailand titled “Treatment and utilization of agricultural wastes in Thailand”; 2) research paper from National Science and Technology Development Agency and Thailand Environment Institute titled “Overview of Biomass Utilization in Thailand”; 3) publication from Asian Institute of Technology of Thailand and Kasetsart University titled “Management of Agricultural Wastes and Residues in Thailand: Wastes to Energy Approach”. It is mentioned in these reference that Thailand is a nation rich in agricultural and forestry resources, thus with enough supply of biomass. The biomass residual are mainly used for cooking and process heating. There is potential to develop biomass power generation. There is research study for the development of synthetic diesel from biomass. In

					3. Additional Information There is a law issued under Ministry of Environment and Resources (MoNRE) Thailand that prohibits open burning of crop residues (biomass) but none related to treatment of biomass residues. http://www.environnet.in.th/index.php?option=com_content&view=article&id=959&catid=104&Itemid=221	addition, there are no laws and regulations for the treatment of biomass residual in Thailand. During the onsite visit, the validation team also interviewed with the representative from the Thai DNA, Thailand Greenhouse Gas Management Organization. He also stated that there is no such policy to regulate the treatment of rural biomass residual. Most of biomass residual will be left for decay. Referring to the Ministry of Environment and Resources, it is prohibited to burn the biomass residual in open area, but this may not be enforced in the current stage. In addition there is no mandatory requirement for biomass treatment. In conclusion, it is evidenced that there is no policy to regulate the treatment of biomass residues and the biomass waste is dumped for natural decay or burning.

						OK. The CL is therefore closed.
6.		√	**CL03** Please clarify whether there will be technology transfer in the equipment applied in each SSC-CPA.	A.3.2	Technology transfer for each SSC-CPA is not a mandatory requirement for inclusion of subsequent SSC-CPA to POA on Biomass Power Development Programme in Thailand. SSC-CPA can view of technology transfer based on knowledge transfer and/or equipment transfer. Justification of the proposed equipment list can be obtained from the feasibility study report, or EPC proposal or technical study report or individual proposals justifying the technology or knowledge transfer of each SSC-CPA. Real Case Application: CPA 1 There will technology transfer for CPA1 involving import of equipments as evidenced in CPA1's Techno-commercial Proposal, page 66 and 67, as attached. In page 66 and 67 of the Techno-Commercial Proposal, it tabulated a list of equipments that has been proposed by the EPC Contractor,	According to the CME, technology transfer is not a CPA inclusion criteria. The CPA equipment applied will be dependent on individual EPC proposal or technical study report. For the CPA1 in Roi Et Province, the validation team checked the Techno-Commercial Proposal issued by the vendor "Advance Energy Development Co., Ltd." the major equipment for the CPA1 biomass power plant, i.e. boiler and steam turbine will be imported from foreign countries. Thus it involves the technology transfer. OK. The CL is therefore closed.

					Advance Energy Development Co., Ltd to CPA 1. The list of equipments proposed is from manufacturers located at countries such as Germany, USA and Sweden	
7.		√	**CL04** For the CPA eligibility criteria, the implementer of a CPA will be the individual project proponent. Please clarify whether different CPAs would be implemented by same project proponent.	A.2.2	The implementer of each SSC-CPA will be the individual project proponent. Each project proponent refers to a legally registered business entity in Thailand, owns the assets of the project and also the beneficiary of the Power Purchase Agreement of the project. A project proponent may develop more than 1 biomass power plant projects in Thailand and therefore the project proponent must apply for inclusion of each individual project separately to join this POA. Each power plant project is consider as an individual CPA and identified uniquely in CPA database. In Thailand, a legal registered Company is allowed to bid, own and operate for more than 1 PPAs in different locations. Therefore, it is fair that this POA recognize the inclusion by project basis and not by project proponent only. However CME must ensure no double counting or de-bundling occurred in the scenario of more than 1 CPA is	It is confirmed by the CME that each CPA implementer will be individual project proponent with legally registered business license. Since it is also legal for project proponent to develop different biomass power plants in Thailand, thus the PoA will also accept same eligible project proponent to apply different CPA. The debundling check will be carried out by the CME as one of the inclusion criteria. The CME will also check the proposed biomass power plant from the PoA database in order to avoid double-counting. Thus different CPAs can be also implemented by same project proponent with legal license. For CPA1 implementer, both plants have been applied for

					submitted for inclusion by same project proponent. REAL CASE APPLICATION: CPA 1 It was found that Advance Clean Power Co., Ltd (ACP), a legally registered Thai company, owning the assets of CPA1, and beneficiary to the PPA for CPA 1 has received other approved PPAs, for VSPP Biomass Power Plant Projects. Further interview with the CEO of ACP, K. Poj confirms that only 2 have been decided by the Board to go ahead with the implementation as of November 2010. The projects are: Project 1: ACP1, Banbueng, Chonburi, 9.9MW Biomass Power Plant, VSPP No: VSPP-PEA-184/2552. Decision to go ahead with the project happened in October 2009 during 3rd Board Meeting and as a result of to the benefits of carbon credits revenue. Information about project implementer must be reported in each SSC-CPA-DD. Information about the project implementer for real case CPA1 is	CDM, currently in the stage of validation. According to the UNFCCC information, the validation team confirms that another biomass power generation power is located at over 500km far way from the CPA1 biomass power plant. Thus there is not deemed to be a debundled from a large-scale project. OK. The CL is therefore closed.

					available in section A.3. and further recorded in the record keeping database of CPA1	
8.		√	**CL05** Please clarify whether the CME will prepare the IEE-SD report and submit to the DNA for further authorization of subsequent CPAs, as it is stated by the DNA that only the PoA and first CPA are required to do so.	C.1.2	DNA of Thailand, the Thailand Greenhouse Gas Management Organization known as TGO has approved the LOA for Advance Carbon Securities Ventures Co., Ltd, as the Coordinating/Managing Entity for the proposed POA on Biomass Power Development Programme in Thailand on the 22nd September 2011, further substantiated through a letter by TGO, attached for validation. The DNA of Thailand do not request for the specific IEE-SD report of each CPAs. Letter of Acknowledgement will be issued by DNA within 12 months after the CPA is registered into the POA. Letter of Acknowledgement is not the same as Letter of Approval and is not an inclusion criterion of a subsequent CPA into the POA. Conclusion is that C/ME would not need to prepare IEE-SD report for subsequent CPAs.	According to the declaration letter (Application PoA Biomass Development/05/0511) from TGO, since there is no mandatory requirement in Thailand for the preparation of IEE-SD report for subsequent CPAs currently, the CME is only required to report the newly registered CPA to TGO. Therefore IEE-SD report for subsequent CPAs will not be prepared. In addition, the CME will notify the TGO for the CPA inclusion, in order to obtain a Letter of Acknowledgement for each CPA. OK. The CL is therefore closed.
9.		√	**CL06** Please clarify how the CME will ensure the CPA is not a de-bundling component from a	A.5.2	Statement from C/ME confirming that it does not manages or will not manages any large scale POA of	According to the CME, there will be different criteria to ensure the CPA is not a de-

			large-scale project, and whether this would be one of the inclusion eligibility criteria.		the same technology/measure in Thailand during the entire of this POA crediting period. The status of C/ME can be cross checked from DNA website for the list of LOA approved for CDM-POA in Thailand.Declaration from each SSC-CPA that the project proponent is aware of de-bundling conditions and it has never been included or applied to another C/ME managing similar POA in Thailand. The information of CPA under review will also be compared to UNFCCC website 5. Should the same project proponent/implementer name appeared to be in any of the above databases and matches with the CPA under review, C/ME will check against the location coordinates of the project sites compared to the CPA under review, to ensure that the distance between the project sites implemented by the same project proponent is above 1km, and not considered as a de-bundled component of a large scale activity. C/ME will also check the type of technology used as per the AMS I.D, to cross check the technology/measure used under AMS I.D if the distance of project sites is below 1km.	bundling component of a large scale project. According to CME's declaration letter, the ACSV will not mange other large scale PoA in Thailand during the whole PoA crediting period. The CME will require individual CPA to declare of not included or applied to another CDM or similar PoA in Thailand. Apart from the CPA declaration, the CME will check from the UNFCCC webpage to ensure the CPA is not from another CDM project or PoA. Finally, the CME will check the location of the proposed CPA, in order to ensure it is located at least 1 km apart from other biomass power plant implemented by the same CPA implementer applying the same technology. The validation team reviewed a checklist prepared by the CME for the assessment of CPA1. It is shown that CPA1 is not a de-bundled component of a large-scale project activity. The closest point to the biomass power plant with same CPA implementer is

					C/ME has established a database for each of its SSC-CPA. Please refer to real case CPA1 database for demonstration of de-bundling audit process. Subsequent CPAs must provide the following information to the C/ME to allow C/ME to perform audit check to confirm that the project site is not a de-bundled component of a larger scale of activity:CPA Specific Identification No. Given by CME or recorded in the Design Document, Project Proponent/ Implementer, Business registration No., PPA No., Company in PPA, Location, GPS coordinates and Type of technology/measure The above data will be compared to other CPAs in UNFCCC website De-bundling is an inclusion criterion as per POA-DD, Section A.4.2.2. The process for de-bundling check, is available in section A.4.4.1, POA-DD. The audit result will be presented in each SSC-CPA-DD.	far away from the CPA1 by over 500km. In addition, the validation team also checked a declaration letter from CPA1 implementer for declaring not a debundling component of any CDM project activity. The debundling assessment will be also checked before the CPA inclusion. Thus this will be one of the inclusion criteria. OK. The CL is therefore closed.
10.		√	**CL07** Please clarify how the CME avoid the double accounting for new CPA inclusion in the PoA.	A.6.2	The procedure to avoid double counting is available in section A.4.1, POA-DD. The procedure is described as:	According to the CME, ACSV will set up specific SSC-CPA database to record all the CPA to be

					ACSV setup specific SSC-CPA database as shown that provides record of unique information of each proposed SSC-CPA. All the SSC-CPAs can be uniquely defined based on the information in the specific SSC-CPA record keeping database to avoid double counting. On top of that, each SSC-CPA will provide a declaration letter to ACSV that the project activity to be included into the POA is not registered as an individual CDM project or is part of another Registered PoA. ACSV will further confirm this through auditing it with the UNFCCC CDM and CDM POA database. Real Case application CPA1: The record keeping database for CPA1 is recorded in Section A.4.1 of CPA1-DD, while the confirmaton of project activity is not registered CDM project or part of another registered POA is available in section A.4.7 ACSV will also cross check the information from Host Country i.e. TGO database, if such database is made available to C/ME in the future. As of December 2011, there is no specific database in the TGO database that allows C/ME to	included in the proposed PoA. All CPA implementers are required to declare that they are not part of another UNFCCC CPA or CDM projects. The CME will also check from the UNFCCC project database to avoid the double-counting of subsequent inclusion of CPA. The validation team considers that these checking procedures and regulations to CPA implementers can fully monitor the status of double-counting of CPA inclusion for the captured PoA. Moreover, if there is double-counting of the include CPA, this might be rejected within the first 12 months of registration of a CPA and within the first 6months of Issuance of CERs according to TGO's "Result of TGO Board Meeting about CDM POA". Moreover, the CME will check the letter of acknowledgement (similar function of letter of approval for specific CPA inclusion),

					perform further cross checking.	as this seems to be another reliable database for CPA or CDM project information from TGO if it is available. OK. The CL is therefore closed.
11.		√	**CL08** As the GHG emission reductions will be resulted in the CPA biomass power plants, please clarify how the CME manage the CER ownership with the CPA implementers for each CPA.	A.6.3	C/ME Manual: CERs Management and Revenue Distribution CPA Inclusion Agreement will be signed with C/ME once DOE confirmed the registration of the CPA and prior to payment of CPA registration fees to UNFCCC or immediately after the CPA chooses the selling arrangement options. Prior to the Inclusion Agreement, during the intention stage, subsequent CPA will be made aware by the C/ME of the CERs management and distribution condition, subsequent CPA will sign the Memorandum of Understanding (MOU) with C/ME to indicate their awareness of this condition. In the MOU it will states the terms for transferring of exclusive rights by CPA to C/ME for managing the transaction of the CERs and Distribution of Revenue on behalf during the entire crediting period. Project Proponent owning the	The validation team reviewed the CME manual regarding the CER management and revenue distribution. The CME has the exclusive right to manage the selling of CER and distribute the revenue to each CPA. It is mentioned that an Inclusion Agreement will be signed between the CME and CPA implementer before a positive validation team is obtained from DOE regarding the CPA inclusion. Before the Inclusion Agreement, a Memorandum of Understanding (MoU) will be signed between the CME and CPA implementer for aware of CER management and distribution by CME. Thus the CPA implementer should be aware of the CER ownership and the

					underlying asset of the project and beneficiary of the Power Purchase Agreement remain as the legal owner of the CERs until it is transacted but is made aware during the intention stage that under the POA on Biomass Power Development Programme in Thailand the C/ME requires the CPA to acknowledge the awareness of their participation in this POA and the status of CERs ownership and provision of mandate for assignment of rights to C/ME to communicate, coordinate and manage the CERs transaction on behalf during the entire crediting period.	subsequent distribution of CER revenue. The validation team checked the MOU for the CPA1 signed by the CPA1 implementer, and it shows that the CPA1 implementer understand and agree with the CER management and distribution arranged by the CME during the subsequent crediting period. OK. The CL is therefore closed.
12.		√	**CL09** Please provide if any centralised database organized for each of the CPAs under PoA by ACSV for validation.	A.6.1	CPA1 database is included for validation.	The validation team checked the “Overview of UNFCCC status of AMS-I.D. PoA and Projects” Worksheet “Sample CPA database” as the centralized database for each of the CPAs under PoA by ACSV. The details of the CPA1 are included as the example, and further CPA will be also included in the database. OK. The CL is therefore closed.

13.		√	**CL10** Please demonstrate the amount of CO_2 released due to transportation of biomass residues to the power plant can be assumed to be very small.	E.6.3	The amount of CO2 released due to transportation of biomass residues to the power plant is excluded not because it is assumed to be very small, actually it was excluded because according to the answer by EB through SSC WG 22, F-CDM-SSCwg ver 01 SSC_329, project emissions due to transport of biomass is to be considered if these are transported over a distance of more than 200 kilometers. One of the eligibility criteria of inclusion of CPA into this POA is that each SSC-CPA must conduct surveys with potential suppliers of biomass residuals within or less than 200km radius from the project site and demonstrate that the quantity of biomass available using biomass availability study report is more than 25% of the total utilized including the proposed CPA. The project emissions due to transport of biomass for each SSC-CPA can be excluded if the result from the surveys and surplus availability study within 200 km of the project site demonstrated that the biomass residues availability is above 25% of the total utilized including the proposed CPA.	According to AMS-I.D. version 17, the project emissions can be neglected and only the PE from geothermal power plants and hydropower plants might be considered. Thus it is deemed that it is not necessary to consider the PE for the transportation of biomass. The validation team also checked the SSC WG 22, F-CDM-SSCwg ver 01 SSC_329 for the similar SSC methodology AMS-I.D., the project emissions due to transport of biomass is to be considered if the transportation distance is more than 200 kilometers. Moreover, the CPA implementer is required to conduct survey to check whether the biomass supply is within 200km radius from the project power plant, and investigate whether the biomass availability is more than 25% of the total utilized biomass including the proposed CPA. These have been specified in the CPA

						inclusion criteria. Thus it is presumed that no biomass plant will be included if the biomass supply is more than 200km. The validation team considers that it is reasonable to check the transportation distance for the biomass supply in order to neglect the project emissions. Ok. The CL is therefore closed.
14.		√	**CL11** Please clarify whether the wastewater from the treatment of biomass residues will be generated in each of the CPA biomass power plant, and whether the wastewater can be the one of the sources included in the SSC-CPA boundary.	E.6.3	There will be no wastewater generated from the biomass residues in a biomass power plant. The biomass residues after being transported to the power plant will be stored in a warehouse or goes directly to the combustion system, there will be no wastewater generated from handling up to combustion of biomass residues. The by products of biomass power plant is ash. The wastewater source is therefore excluded for simplification.	It is confirmed by the CME that there will be no wastewater generated from biomass power generation process. There is also no pre-treatment process before the biomass is utilized for burning in the boiler. Thus the GHG sourced from the wastewater generation can be excluded for simplification. This is also presented in the POA-DD Section E.3. for clear presentation. OK. Therefore the CL is closed.

15.		√	**CL12** Please clarify with supporting information for the signing date of the major equipment contact for the justification of the starting date of CPA1.	E.3.5	The start date of any CPA cannot be prior to the starting date of validation of the programme of activities, i.e. the date on which the CDM-POA-DD was first published for global stakeholder consultation. This POA was web hosted in the UNFCCC website on the 22nd April 2011. Therefore the starting date of each SSC-CPA must be after 22nd April 2011. CPA must provide evidence that the major equipment contract normally represented through an EPC contract's signing date is after 22nd April 2011. The signing date for CPA1 is on 21st September 2011 and is after the web-hosting date, a copy of the signed EPC contract is attached for validation.	The validation team checked the EPC contract for the first CPA (CPA1), which was signed on 21 September 2011. This is the first major contract confirmed for CPA1, thus the validation team considers that it can be identified as the starting date of CPA1 as the earliest real action and implementation for the CPA. In addition, since the CPA1 was started after the GSP of proposed PoA, CPA1 can be included in the proposed PoA. OK. Therefore the CL is closed.
16.		√	**CL13** For the determination of MLR, please clarify whether there is any regulation for the limitation of debt financing ratio for the project investment in Thailand.	E.4.3	There is no limitation of debt financing ratio for project investment in Thailand. The following is the published documents providing the overview of the financing structure in Thailand for Renewable Projects. The following publication documented that there is no limitation of debt financing ratio. Information collected is from reputable legal organization, The Baker and McKenzie Law Firm: • http://www.conference.tgo.or.th/download/ppt/Training/210810/La	As confirmed by the PP, there is no policy to regulate the debt financing ratio for the project investment in Thailand. The Thai banks will assess individual project developer's financial status and project condition in order to determine the debt ratio. According to the Baker and McKenzie Law Firm's research, the debt to equity ratio for renewable energy is ranged from 1:1 to 3:1.

					w3.pdf	There is no any regulation to control the debt ratio for project investment. For the CPA1, it applies the maximum debt ratio with 100% debt in order to obtain a MLR. This is deemed to be the most conservative approach. In addition, the MLR obtained from the Bank of Thailand as the benchmark reference is appropriate, and this also complies with the requirements of clause 12 of the "Guidelines on the Assessment of Investment Analysis" version 05 by applying the local commercial lending rate as appropriate for a project IRR. OK. Therefore the CL is closed.
17.		√	**CL14** Please clarify the current situation (such as availability, creditability) of the "published journal or database", "indicative offer(s)" and "national database" for similar small scale biomass power plant projects in Thailand respectively.	E.4.3	The earlier benchmark suggested in SSC-POA Version 1 such as published journal, indicative offers and national database for similar small scale power plant projects in Thailand is not relevant to this POA and will be excluded. The demonstration of appropriate benchmark in PDD Version 01 was not properly analyzed based on the	The validation team checked the revised PoA-DD Section 5.2 for the demonstration of additionality by using benchmark analysis. The determination of benchmark is based on the paragraph 12 of the "Guideline on the Assessment of Investment Analysis" version 5.

					relevant EB guides. The demonstration of appropriate benchmark of each SSC-CPA is reassessed again in the revised PDD Version 02 to be in line with ”Attachment A to Appendix B of the simplified modalities and procedures for small scale CDM project activities”,”EB35, Annex 34, Non-binding best practice examples to demonstrate additionality for SSC project activities” and “EB62, Annex 5, Guidelines on the assessment of investment analysis”. As per paragraph 12, EB62, Annex 5, there are three types of appropriate benchmark for Project IRR: (a) Local commercial lending rates or (b) Weighted average costs of capital (WACC) or (c) Benchmark supplied by relevant national authorities are also appropriate if can be substantiated that it is applicable to the project activity and Project IRR calculated. In this POA, benchmark shall be determined based on sources that are standard in the market, publicly available, and credible to use. The demonstration of the availability and creditability of the appropriate benchmark has been updated in	The benchmark shall be determined from three sources: (a) Local commercial lending rates or (b) Weighted average costs of capital (WACC) or (c) Benchmark supplied by relevant national authorities or (d) Specific benchmark for the CPA The standards of four benchmarks are identified as publicly available information such as from government, national bank, financial institute etc. The actual value of benchmark shall be determined for each subsequent CPA to be included. The validation team considers that this can be the appropriate approach, if the determination of benchmark fulfills the requirements of the “Guideline on the Assessment of Investment Analysis”. In addition, the demonstration of additionality in terms of investment analysis is also included as the CPA inclusion criteria as indicated

					SSC-POA version 2. The demonstration with supporting documents for Real Case CPA1 is submitted for validation. The guide for SSC-CPA to determine the appropriate applicable benchmark option to be selected for use for investment analysis is appended in Annex 7 of this POA-DD. The Determination of applicable benchmark is updated in CPA-DD Generic, Section B3. The study for determination of the benchmark option to be applied by CPA1 is available in Annex 6 of the CPA1-DD.	in the PoA-DD Section A.4.2.2. The validation team checked the revised PoA-DD and CPA-DD, a new Annex is included for the procedure to select the appropriate benchmark. The benchmarks listed are all in line with the Guidelines on the Assessment of Investment Analysis" version 5, and the proposed procedure is deemed to be reasonable as it reflects the appropriateness of the benchmark for specify VSPP biomass power projects to be included in the PoA. OK. Therefore the CL is closed.
18.		√	**CL15** Please clarify the tariff incentive provided by the VSPP compared with normal tariff, and why this is not considered as E- policy to the CPAs.	E.4.3	There is E- policy in Thailand that mandates the development of renewable energy projects. The following has been updated in the section A.4.3 in the SSC-POA-DD. The E+/E- policy as per EB53 Annex 32, provides guidance for the suitability of tariffs applied in the investment analysis of CPAs. The VSPP scheme in Thailand was	The validation team checked the revised PoA-DD Section A.4.3 for the discussion of tariff incentive for VSPP. The VSPP scheme was implemented since 2002, for providing financial incentive to the investor in the development of power plant under 10MW. Although financial support is provided

					implemented after the year 2002 and is part of the Thai Feed-in-tariff policy. The feed-in-tariff is considered as E- policy in Thailand and is a voluntary incentive scheme to promote the development of renewable energy project of less than 10MW in Thailand to encourage the supply of green electricity to the Thailand electricity grid. Under the VSPP scheme, incentive in the form of adder on top of the normal tariff is offered to project developer for a period of 7 years. The participation of each SSC-CPA under this POA into this policy is voluntarily.	by the Thai government, this factor is also considered in the investment analysis of the CPA to be included. Thus even the CPA under VSPP is financially supported, the project IRR still cannot overcome the investment barrier or the industrial benchmark. The validation team considers that since the demonstration of investment barrier would be validated for each CPA to be included, and this can be further validated case by case. In addition, there is no foreseeable policy that the financial support to the VSPP would be increased dramatically in the near future, but it is subjected to be validated for the coming CPA to be included. For the CPA1, the validation team checked all the related tariff information, in which the tariff with VSPP support is already applied in the IRR calculation. However, the IRR is still below the industrial benchmark, thus it is considered that the CPA1 encounters with investment barrier.

						OK. Therefore the CL is closed.
19.		√	**CL16** For the determination of MLR as the benchmark of CPA1, please clarify why a 5-year average is applied. Please also clarify the reasons for applying zero equity in the project IRR calculation for the benchmark analysis.	E.4.3	The information for local commercial lending rates is sourced from the Bank of Thailand (BOT) website, which is updated by monthly. Data since January 2010 are publicly available prior to decision making of CPA1 on the 12th November 2010. CPA1 demonstrated that the benchmark is based on local commercial lending rate and in line with this; it is assumed the cost of financing is raised only from the debts market and zero equity were assumed. The benchmark of Local Commercial Rates of CPA1 has been reassessed based on the guidance for demonstration of appropriate benchmark in Section E.5.1 of the revised SSC-POA. Commercial lending rates in Thailand have increased since Nov 10 up to Aug 11. The average lending rate has increased to 9.17% based on the period from Jan 10 to Aug 11. Information has been updated in the IRR Spreadsheed and in section B.3 of CPA1-DD.	According to the "Guidelines on the Assessment of Investment Analysis" version 05 EB62 by applying the local commercial lending rate as appropriate for a project IRR. For the MLR applied as the benchmark, 100% of debt gives the most conservative value of the MLR. The MLR is sourced from the Bank of Thailand, in which this is also considered to be a reliable source of information. It is also noticed that the CPA1 implementer might not probably obtain the MLR for the actual loan. In Thailand, it is indicated that only for the large enterprises, these can apply for MLR with previous good reputation in the financial status. For the new project developer, it is rarely to obtain the MLR from bank loan. Moreover, it is very unlikely that a CPA developer can raise 100% debts, if the project IRR is

						still below MLR. Thus it is even more conservative as the actual higher loan rate could reduce the CPA revenue. According to the local commercial lending rate, it is assumed that all the cost comes from debt with zero equity. According to the “Guidelines on the Assessment of Investment Analysis”, a default value of ROE can be applied to calculate the WACC. The default ROE in Thailand is 11.2%, and thus the resulted WACC would be resulted as higher than the average commercial lending rate. Therefore, it is the most conservative way to apply the average commercial lending rate obtained from averaging the MLR and ceiling lending rate to give the lowest benchmark value for the individual CPA in the proposed PoA. The validation team checked the revised CPA1 worksheet, the MLR and ceiling lending

						rate are updated as the average value from Jan 2011 to August 2011, and thus the average commercial lending rate is revised. The validation team the MLR and ceiling lending rate applied are the latest available information at the starting date of the CPA1, thus the benchmark determination is considered as reasonable and reliable. The IRR with CDM income is therefore changed and to be indicated in the revised real-case CPA-DD. OK. Therefore the CL is closed.
20.		√	**CL17** Please provide the relevant translated minutes of board meeting held on 12th November 2010 for the financial decision making of CPA1 for validation.	E.4.3	Minutes of Board Meetng held on 12th November 2010 both Thai Version and Translated Version is attach for validation	The validation team reviewed the translated minutes of board meeting held on 12th November 2010 for the financial decision making of CPA1 (ref. no. 6/2010), and confirmed to be valid OK. Therefore the CL is closed.
21.		√	**CL18** Please provide if any supporting information	E.4.3	To cross reference the assumption used for O&M cost for biomass power plant in Thailand, against	The validation team checked that the O&M cost estimated is referenced from the similar

			for the market rate or general engineering budget guidelines for the O&M costs of similar power plants.		general budget guidelines for O&M cost of biomass power plants in Thailand, the following sourced have been used: 1. Assumption used for similar power plant projects in Thailand that successfully registered in the UNFCCC database • http://cdm.unfccc.int/Projects/DB/SGS-UKL1175071990.26/view • http://cdm.unfccc.int/Projects/DB/RWTUV1251209528.4/view • http://cdm.unfccc.int/Projects/DB/SGS-UKL1283245686.53/view • http://cdm.unfccc.int/Projects/DB/JQA1251422347.9/view The above source of information in Thailand is consider creditable and available for reference in view that it has been validated and registered under UNFCCC	biomass power plants in Thailand. According to the 4 CDM registered biomass power generation projects in Thailand, the annual O&M cost is ranged from 4%-5% of the project cost. For the CPA1, the O&M cost is estimated as about 2% of the total investment cost. Moreover there are no such governmental/ technical institutional guidelines in the estimation of O&M costs available. Thus it is considered than the O&M cost is estimated conservatively compared with the registered CDM projects. OK. Therefore the CL is closed.
22.		√	**CL19** Please clarify why this is deemed to be more conservative for the equipment lifetime of 25 years.	A.3.2	. Please refer to Techno-commercial offer for information about technical lifespan. The technical lifespan of this project activity (CPA1) is 25 years as proposed in the Techno-Offer and the project IRR has also taken into account the net cash flow of the operation of the power plant for 25 years, therefore, the residual value should be depreciated up to the end of the technical lifespan.	According to the "Guidelines on the Assessment of Investment Analysis" version 05 EB62, "both project IRR and equity IRR calculations shall as a preference reflect the period of expected operation of the underlying project activity (technical lifetime)". According to the Revenue Department of Thailand http://www.rd.go.th/publish/6

					The description of the residual value has been updated to follow: The existing accounting standard in Thailand practice depreciation rate of 5%. CPA 1 has calculated the Project IRR for decision making based on cash flow analysis for 25 years technical lifespan. The residual value is therefore correspondence to the 25 years financial projection.	044.0.html, the power plant building can be depreciated to 0%, while the equipment residual value can be 5%. Referring to the Techno-Offer from the supplier, the technical lifespan can be the project equipment lifetime. Thus the CPA1 implementer applies the depreciation at the full technical lifespan. Thus it is deemed to be reasonable to have the financial analysis with the equipment lifetime of 25 years. OK. Therefore the CL is closed.
23.		√	**CL20** Please clarify if any emergency plan for metering arrangement in case of malfunction of monitoring meters.	E.10.5	As per provision in table1 of AMS-I.D parameter(s), measurement will be cross-check with records for sold/purchase electricity. This information will in the case of obvious malfunction of the monitoring meters be used to calculate emission reductions. Furthermore section E.7.2 of POA-DD has been revised to include procedures for reconstruction of data in the case of monitoring failure. There is an internal back-up meter	The validation team checked the revised PoA-DD Section E.7.2 for the emergency plan when there is malfunction of monitoring meter. The validation team realizes that the electricity invoice from PEA can be considered as a cross-check tool for the finalized net power supply to the grid. According to the single-line diagram of power connection for CPA1, there will be a backup meter located in the

					belonging to the power plant located around approx 400meter from the main PEA energy meters. The internal back-up meter is a bi-directional meter that will record the net electricity consumption. Transmission lost is considered negligible. The CME clarifies on the energy meters at the connection to the national grid. PEA requested that the power plant is required to install 2 separate energy meters, one to record only export, and one to record only import. Both meters are property of PEA and follow the calibration standard set by PEA. The CME have updated the parameters for EGactual (measuring net consumption) as per AMS 1D Version 17, added EGexport parameter to record quantity electricity exported to grid. EC import recording electricity import from grid remain but the calibration detail has been updated as per PEA standard requirement. Calibration of PEA meters are out of control of the power plant company.	power plant. When the main PEA meters (both export and import) are malfunction, the backup meter can be used to record the power export and import. Since the distance of the meter in the power plant is just 400m from the PEA meters, it is considered that the transmission loss can be very small, and it is reasonable to be neglected. It is also confirmed in the PoA-DD Section E.7.1. that 2 separate energy meters from PEA will be used instead of a bi-directional meter. In addition, one internal plant's back-up energy meter will be used when the 2 PEA meters are out of order. However, all the arrangement will be further confirmed by the PEA when the CPA is inlcuded in the future. OK. Therefore the CL is closed.
24.		√	**CL21** Please clarify whether the emission reductions will be accounted from the net quantity of electricity supplied to the third	E.10.1	There is no intention to account for emission reductions from electricity supplied to the third party in CPA1 and future CPAs to be included	The CME confirms that there is no intention to supply power to third party, and all the power from CPAs will be

			party in CPA1.		under the PoA. The project activity consists of electricity supplied to a national grid.	supplied to national grid. Thus the validation team considers that the CME has correctly applies the methodology, in which only grid-connected power generation is allowed for the proposed PoA. Ok. Therefore the CL is closed.
25.		√	**CL22** Please clarify if any QA/QC procedures for the on-site measurement of moisture content of biomass residues.	E.10.7	No particular QA/QC procedure has been defined for the measurement of moisture content of biomass residues. In the case of project activities under the PoA the determination of moisture content is considered an uncritical parameter, because only biomass is used in each CPA as described under section A.4.2 of the PoA-DD; co-combustion of fossil fuel and biomass is not part of the project activities. In the case of co-combustion, the exact determination of biomass combusted is critical to calculate emission reductions. In the case of biomass-only combustion, the amount of biomass is monitored for cross-check against the electricity supplied to the grid, and is therefore not directly used for emission reduction calculation. Therefore the PP has made no special provisions for QA/QC procedures of this parameter.	The validation team considers that since the proposed CPAs are all biomass power plants, but not co-fired power plants. Therefore all the biomass consumed will then be converted into electricity from power generator. In addition, the proposed PoA does not claim for any ER from methane avoidance from biomass disposal. According to the AMS-I.D., the estimation of ER is not determined by the quantity of biomass consumed, but only the actual power output measured by power meter. As the CME is already proposed to measure the moisture content at least once a month, this also fulfills the requirement of AMS-I.D version 16. Thus

					Please notice that the parameter is monitored monthly, but weighted average is being calculated per monitoring period, which will to a certain extend level inaccuracies. Please also notice that version 17 of AMS-I.D has changed the parameter to be ex-ante determined instead of monitored, for the simple reason explained above (parameter is uncritical).	the validation team considers that it is not mandatory to include QA/QC procedures for the on-site measurement of moisture content of biomass residues. OK. Therefore the CL is closed.
26.		√	**CL23** Please provide a generic training plan and schedule for the implementation of monitoring plan for each of CPA.	E.10.7	Annex 4: Monitoring Plan – Generic CPA-DD and real case CPA1-DD 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 validation team checked the “CME manual for generic plan and schedule guide for CPA implementation”, in which it includes the schedule for the training arrangement for the CPA. The training includes the briefing by CME and CPA implementer for monitoring and technical operation etc. Moreover, the CME will arrange at least 1briefing and training session per year for each CPA to ensure that internal team is aware of the monitoring activities and continue the practice for implementation of monitoring systems. OK. Therefore the CL is closed.

27.		√	**CL24** Please provide the relevant document from the Thai DNA for the confirmation of PoA contributing to sustainable development.	E11.1	Approved LOA from Thai DNA for confirmation of POA contributing to sustainable development is attach for validation	The validation team checked the Thai LoA issued by the Thai DNA for the confirmation of PoA contributing to sustainable development. OK. The CL is therefore closed.
28.		√	**CL25** Please clarify whether there is any official approval procedure from government for the IEE-SD assessment of PoA and CPAs.	C.1.2	There is official procedure and the clarification is appended below: Environmental Impact Assessment Report is required to obtain the Approval for an Operation Permit for a Power Plant to operate the business in Thailand. The approval and governing agency for Operation Permit is Department of Industrial Works (DIW) under the Ministry of Industry Thailand. If the Power Plant Capacity is above 10MW, a complete EIA must be submitted for approval; however for power plant with capacity of less than 10MW especially power plant under VSPP Scheme, the assessment of environmental impact is submitted in the report format commonly known as Initial Environmental Assessment (IEE) Report or Environmental and Safety (ESA) Report. IEE report is acceptable but the project developer must also submit the safety assessment as additional chapter to the IEE report. In another word, IEE report would be prepared anyway	According to the TGO during the interview, EIA (with comprehensive analysis of SD assessment) is required for the LoA application of the proposed PoA. The Thai LoA is validated by the validation team, thus the EIA is therefore accepted by the TGO. According to the declaration letter (Application PoA Biomass Development/05/0511) from TGO, since there is no mandatory requirement in Thailand for the preparation of IEE-SD report for subsequent CPAs currently, the CME is only required to report the newly registered CPA to TGO. Therefore IEE-SD report for subsequent CPAs will not be prepared.

					and is required as part of the approval for power plant to operate in Thailand. LOA at POA Level A C/ME must obtain Letter of Approval (LOA) from the Host Country of Thailand to perform the duty as a voluntary Coordinating/Managing Entity of an approved POA in Thailand. To obtain the LOA, a C/ME is required to prepare a POA IEE-SD Framework and submit together with a real case IEE-SD-CPA report to DNA Thailand to seek for approval and obtain the LOA. The objective of the LOA is to state the approval of Host Country to C/ME that the proposed POA meets the objective of sustainable development in Thailand and that the participation is voluntary initiative by C/ME. Subsequent Inclusion of CPAs DNA of Thailand, the Thailand Greenhouse Gas Management Organization known as TGO has approved the LOA for Advance Carbon Securities Ventures Co., Ltd, as the Coordinating/Managing Entity for the proposed POA on Biomass Power Development Programme in Thailand on the 22nd September 2011, further substantiated through a letter by	In addition, the CME will notify the TGO for the CPA inclusion, in order to obtain a Letter of Acknowledgement for each CPA. OK. The CL is therefore closed.

					TGO, attached for validation. In the letter it states a C/ME must submit to TGO every 12 months post registration of the POA the following documents: (a) CDM-CPA-DD/CDM-SSC-CPA-DD for each newly registered CPAs within the assessment year (b) Justification summary from C/ME that each newly registered CPAs meets the POA-IEE-SD framework within the assessment year The DNA of Thailand do not request for the specific IEE-SD report of each CPAs. Letter of Acknowledgement will be issued by DNA within 12 months after the CPA is registered into the POA.	
29.		√	**CL26** Please summarize in the CPA-DD for the background information of the local stakeholder meeting, and clarify whether the comments received could reflect the general attitudes towards the CPA.		The summary for the background information of the local stakeholder meeting is updated in the CPA1-DD. Advance Clean Power Co. Ltd being the project proponent and implementer of CPA1 has conducted local stakeholder consultation at PhonThong, RoiET. Questionnaire was circulated to project participants, follow-up by introduction of project information by power plant team and then presentation of CDM benefits by GIZ, discussion were open to the floor at the end of the session. The total number of registered participants was 64 people and 56	According to the PoA-DD, the local stakeholder consultation will be conducted at CPA level. The validation team checked the updated CPA-DD for the CPA1, the background information for the local stakeholder consultation meeting dated 18 Nov 2011 is included. The validation team also checked the attendance list, meeting minutes, photos, and considers that the comments received from the

					of them have completed and returned the questionnaire. The overall response was good and the participants foresee that there will be an increase of land values surrounding the power plant, foresee improvement of local infrastructure facilities, and most importantly foresee that the project will provide a better management system of the agricultural residues and thereby may increase the income of local farmers. Total participants registered for the stakeholder consultation is 64 people, 56 of them completed and returned the questionnaire which constitute to 87.5% of responsive rate. Therefore the overall comments received from the participants do reflect the general attitudes of the local community towards the implementation of CPA1. No negative comments were received during the stakeholder consultation process.	participants can reflect the general attitudes towards the CPA1. OK. Therefore the CL is closed.

Appendix B

CERTIFICATES OF COMPETENCE

Qualification

Hai, Harold /

Emission Trading
United Nations Framework Convention on Climate Change

Auditor No.:
(AuditorenRegNr)

Appointed: (Zugelassen)	☒ ja	Qualification Level: (Qualifikationsstufe)	Lead Auditor
External: (Externer)	☐ ja	Add. reviewer: (Zusätzlicher Prüfer)	☐ yes
EAC Scopes: (EAC Branchen)	CDM 13 - Waste handling and disposal CDM 01 - Energy industries (renewable - / non-renewable sources) CDM 06 - Construction		
Add. qualification: (zus. Qualifikation)			
First Appointment: (Erstberufung)	12/19/2007	Valid to: (Gültig bis)	09/24/2015

Remarks:	TA1.2 - Renewable Energies TA 13.1- Waste handling & disposal TA 6.1 - Construction
Languages:	Chinese English Mandarin Chinese simplified Chinese traditional

Experience Exchange

Date	Location	Remarks	Accreditation(s)
2010-12-21	Beijing	GC CDM Auditor Experience Exchange, Beijing, 2010-12-21to23 United Nations Framework Convention on Climate Change	

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next Monitoring:
(nächste Beurteilung)

Remarks:

View / Edit Monitoring

History of scope allocation

Date:	2012-06-29
Change:	EAC CDM added
By:	Praveen Urs
Reason:	

Date:	2011-01-04
Change:	EAC CDM added; Non-EAC CDM 01 Energy Industries removed
By:	Manfred Brinkmann
Reason:	

Date:	2010-04-15
Change:	CDM 01 Energy Industries added
By:	Manfred Brinkmann
Reason:	Scope 1: limited to renewable energies except biomass power generation / geothermal

Date:	2007-12-20
Change:	EAC CDM added
By:	Manfred Brinkmann
Reason:	

History

Created:	12/19/2007 02:32:34 PM	Harold Hai/Hk/Chn/TUV
Modified:	09/26/2012 06:21:49 PM	Harold Hai/Hk/Chn/TUV
	09/24/2012 11:49:37 AM	Harold Hai/Hk/Chn/TUV
	06/29/2012 03:42:54 PM	Praveen Urs/Chn/TUV
	03/19/2012 07:31:44 PM	
	01/31/2011 09:25:37 AM	
	01/04/2011 03:16:31 PM	
	ZE9	
	01/04/2011 03:16:11 PM	
	ZE9	
	01/04/2011 03:15:12 PM	
	ZE9	
	09/13/2010 02:53:26 PM	
	ZE9	

Export to ICMS

Last Export:

Qualification

Lo, Tommy /

Emission Trading
United Nations Framework Convention on Climate Change

Auditor No.: (AuditorenRegNr)			
Appointed: (Zugelassen)	☒ ja	Qualification Level: (Qualifikationsstufe)	Lead Auditor
External: (Externer)	☐ ja	Add. reviewer: (Zusätzlicher Prüfer)	☐ yes
EAC Scopes: (EAC Branchen)	CDM 13 - Waste handling and disposal CDM 01 - Energy industries (renewable - / non-renewable sources) CDM 05 - Chemical industry		
Add. qualification: (zus. Qualifikation)			
First Appointment: (Erstberufung)	2008-04-28	Valid to: (Gültig bis)	2015-10-11

Remarks:	CDM 01 limited to TA1.2 - Renewable Energies CDM 13 limited to TA13.1 / 13.2 - Waste handling and disposal (as GHG auditor from 2009-10-14)
Languages:	Chinese English Mandarin Chinese simplified Chinese traditional

Experience Exchange

Date	Location	Remarks	Accreditation(s)
2010-12-21	Beijing	GC CDM Auditor Experience Exchange, Beijing, 2010-12-21to23	United Nations Framework Convention on Climate Change

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next Monitoring:
(nächste Beurteilung)

Remarks:

View / Edit Monitoring

History of scope allocation

Date:	2012-03-17
Change:	EAC CDM added
By:	Praveen Urs
Reason:	

Date:	
Change:	
By:	
Reason:	

Date:	2011-01-13
Change:	EAC CDM removed
By:	Manfred Brinkmann
Reason:	CDM 01 limited to TA1.2 - Renewable Energies

Date:	
Change:	
By:	
Reason:	

Date:	2010-05-25
Change:	EAC CDM added
By:	Manfred Brinkmann
Reason:	First appointment as expert: 2008/04/29

Date:	2008-04-29
Change:	EAC CDM, CDM added
By:	Manfred Brinkmann
Reason:	

History

Created:	2008-04-27 03:19:00 PM ZE9	Manfred Brinkmann/Jpn/TUV
Modified:	2012-10-10 07:47:39 PM	Praveen Urs/Chn/TUV
	2012-03-17 08:18:09 PM	Praveen Urs/Chn/TUV
	2011-01-13 03:13:56 PM ZE9	Manfred Brinkmann/Jpn/TUV
	2011-01-13 03:12:34 PM ZE9	
	2011-01-13 03:12:05 PM ZE9	
	2010-09-13 11:37:26 PM ZE9	

Qualification

Ma, Libo /

Emission Trading
United Nations Framework Convention on Climate Change

Auditor No.:
(AuditorenRegNr)

Appointed: (Zugelassen)	☒ ja	Qualification Level: (Qualifikationsstufe)	Lead Auditor
External: (Externer)	☐ ja	Add. reviewer: (Zusätzlicher Prüfer)	☐ yes
EAC Scopes: (EAC Branchen)	CDM 01 - Energy industries (renewable - / non-renewable sources) CDM 04 - Manufacturing industries		
Add. qualification: (zus. Qualifikation)			
First Appointment: (Erstberufung)	2009-06-01	Valid to: (Gültig bis)	2015-05-30

Remarks:	CDM 01: valid for TA 1.1, 1.2 CDM 04: valid for TA 4.5 - Other WHR and Fuel Switch
Languages:	Chinese English

Experience Exchange

Date	Location	Remarks	Accreditation(s)
2010-12-21	Beijing	GC CDM Auditor Experience Exchange, Beijing, 2010-12-21to23	United Nations Framework Convention on Climate Change

Monitoring

Latest Monitoring: (letzte Beurteilung)	Next Monitoring: (nächste Beurteilung)

Remarks:

History of scope allocation

Date:	2009-06-02
Change:	EAC CDM added
By:	Manfred Brinkmann
Reason:	

History

Created:	2008-03-20 03:44:05 PM	Daxun Li/Bj/Chn/TUV
Modified:	2012-05-03 09:38:44 PM	Praveen Urs/Chn/TUV
	2011-01-17 02:43:10 PM	Manfred Brinkmann/Jpn/TUV
	ZE9	Manfred Brinkmann/Jpn/TUV
	2011-01-17 02:42:56 PM	
	ZE9	
	2008-03-20 03:44:19 PM	

Export to ICMS

Last Export:

Qualification

Songprasert, Piyaporn /

Emission Trading
United Nations Framework Convention on Climate Change

Auditor No.:
(AuditorenRegNr)

Appointed: (Zugelassen)	☒ ja	Qualification Level: (Qualifikationsstufe)	Auditor
External: (Externer)	☐ ja	Add. reviewer: (Zusätzlicher Prüfer)	☐ yes
EAC Scopes: (EAC Branchen)	CDM 01 - Energy industries (renewable - / non-renewable sources) CDM 13 - Waste handling and disposal		
Add. qualification: (zus. Qualifikation)			
First Appointment: (Erstberufung)		Valid to: (Gültig bis)	2015-03-16

Remarks:	TA 13.1 , TA 1.2
Languages:	Thai English

Experience Exchange

Date	Location	Remarks	Accreditation(s)

Monitoring

Latest Monitoring: (letzte Beurteilung)	Next Monitoring: (nächste Beurteilung)

Remarks:

History of scope allocation

Date:	2012-03-29
Change:	EAC CDM, CDM added
By:	Praveen Urs
Reason:	

History

Created:	2011-02-02 10:20:42 AM ZE7	Chaipot Maksuk/Tha/TUV
Modified:	2012-03-29 08:12:24 PM	Praveen Urs/Chn/TUV
	2011-02-02 10:21:00 AM ZE7	

Export to ICMS

Last Export:

Qualification

Li, Lixin /

Emission Trading
United Nations Framework Convention on Climate Change

Auditor No.:
(AuditorenRegNr)

Appointed: (Zugelassen)	☒ ja	Qualification Level: (Qualifikationsstufe)	Lead Auditor
External: (Externer)	☐ ja	Add. reviewer: (Zusätzlicher Prüfer)	☒ yes
EAC Scopes: (EAC Branchen)	CDM 01 - Energy industries (renewable - / non-renewable sources) CDM 03 - Energy demand CDM 02 - Energy distribution CDM 04 - Manufacturing industries		
Add. qualification: (zus. Qualifikation)			
First Appointment: (Erstberufung)	2010-09-06	Valid to: (Gültig bis)	2013-09-05

Remarks: Appointed as Technical Reviewer for TA 1.1, 1.2, 2.1, 2.2, 3.1
TA 4.5

Languages:

Experience Exchange

Date	Location	Remarks	Accreditation(s)
2010-12-21	Beijing	GC CDM Auditor Experience Exchange, Beijing, 2010-12-21to23	United Nations Framework Convention on Climate Change

Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next Monitoring:
(nächste

Beurteilung)

Remarks:

History of scope allocation

Date: 2012-03-10
Change: EAC CDM, CDM added
By: Praveen Urs
Reason:

Date:
Change:
By:
Reason:

Date:
Change:
By:
Reason:

Date: 2010-11-08
Change: EAC CDM, CDM added
By: Manfred Brinkmann
Reason: Appointed as Technical Reviewer for

History

Created:	2010-08-13 11:09:24 AM	Lixin Li/Bj/Chn/TUV
Modified:	2012-07-06 04:55:01 PM	Praveen Urs/Chn/TUV
	2012-03-10 08:33:44 PM	Praveen Urs/Chn/TUV
	2012-02-12 06:12:39 PM	Praveen Urs/Chn/TUV
	2010-11-15 04:02:03 PM	
	2010-11-15 04:01:56 PM	
	2010-11-08 09:36:09 AM	
	ZE9	
	2010-11-08 09:28:17 AM	
	ZE9	
	2010-11-08 09:28:07 AM	
	ZE9	
	2010-11-08 09:27:39 AM	
	ZE9	
	2010-08-13 11:09:41 AM	

Export to ICMS

Last Export: