




Validation report form for post-registration changes for CDM programme of activities

(version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for post-registration changes for CDM programme of activities" at the end of this form.

VALIDATION REPORT ON POST-REGISTRATION CHANGES (PRCs)

Title and reference number of the programme of activities (PoA)	Title: Thailand Small Scale Livestock Waste Management Program Reference no: 8027
Process track	<input type="checkbox"/> Prior approval <input checked="" type="checkbox"/> Issuance <input type="checkbox"/> Renewal of crediting period
Version number of the validation report on PoA PRCs	1.0 Aa
Completion date of the validation report on PoA PRCs	03/11/2016
Version number of PoA-DD and/or CPA-DD applicable to this validation report	PoA DD version 14.0 CPA 1 DD (8027-0001) version 14.0 CPA 2 DD (8027-0002) version 09.0 CPA 3 DD (8027-0003) version 09.0
Type(s) of PoA PRCs	<input checked="" type="checkbox"/> Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan to a registered PoA <input type="checkbox"/> Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline <input type="checkbox"/> Types of changes specific to afforestation and reforestation activities <input type="checkbox"/> Changes to the programme design of a registered PoA <input checked="" type="checkbox"/> Changes to project design of generic component project activities or specific-case component project activities
Coordinating/managing entity (CME)	Energy Research and Development Institute Nakornping of Chiang Mai University
Host Party(ies)	Thailand
Sectoral scope(s)	13
Selected methodology(ies)	AMS-III.D, version 18 - Methane recovery in animal manure management systems
Selected standardized baseline(s), where	N/A

applicable	
Name of DOE	RINA Services S.p.A. (RINA)
Name, position and signature of the approver of the validation report on PoA PRCs	Laura SEVERINO – Sector Manager Sustainability, Environment & Climate Change 

SECTION A. Executive summary

>>The PoA is developed by Energy Research and Development Institute – Nakornping of Chiang Mai University (ERDI) also the CME of the PoA aims to reduce greenhouse gas emissions from piggeries manure by converting anaerobic lagoons to flow closed anaerobic treatment digesters with biogas capture and power generation in Thailand. The treatment of livestock manure by way of anaerobic digester processes leads to the production of a biogas consisting of 60% methane (CH₄). The project will apply anaerobic digesters which will capture the biogas and use it to generate electricity for on farm consumption or sale to national grid.

The 'CPA 01' covered under this monitoring period involves manure management in three swine farms (Chokchaikansukorn farm- 14°52'25.3"N and 102°10'20.9", Khana Hybrid Co., Ltd (Phanomsarakham Farm 1) -13°46'27.6"N and 101°24'37.4"E and Laemthong Hybrid Co., Ltd (Wang Noi Farm- 14°11'45.3"N and 100°39'28.7"E) to recover biogas, thereby reducing methane emissions and utilization of recovered biogas for electricity generation. Each of the farm installed digester of 3,750 m³ capacity which is equipped to gas generator to generate power and utilize the same for in-house consumption.

The validation scope is to review the PoA DD and CPA-DDs against the UNFCCC criteria for CDM. UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, for SSC project add the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

Validation is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

Validation was conducted using RINA procedures in line with the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The validation consisted of the following three phases:

- Document review;
- Follow-up actions;
- The resolution of outstanding issues and the issuance of the final validation report.

It is RINA's opinion, the changes, as outlined in the revised PoA DD version 14 dated 18/08/2016 and CPA 1 DD version 14 of 18/08/2016, CPA 2 DD version 09 of 18/08/2016 and CPA 3 DD version 09 of 18/08/2016, from the programme of activity as described in the registered PoA DD and CPA-DDs ensure that the level of accuracy and completeness in the monitoring and verification process is not reduces as a result of the revision; the revisions are in accordance with the applied monitoring methodology and the changes to the PoA and CPA comply with the requirements established in the CDM Project Standard. The post registration changes in the project activity is in line with Appendix 1 of CDM project standard and hence does not require prior approval from Executive Board.

Hence, RINA requests that the validation opinion on changes from the programme of activity and CPA as described in the registered PoA and CPA-DDs for the programme of activity "Thailand Small Scale Livestock Waste Management Program" in Thailand to be considered by the Board.

SECTION B. Validation team, technical reviewer and approver**B.1. Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader & Technical Expert (TA 13.1)	IR	Menon	Rekha	RINA India	√	√	√	√
2.	Validator	IR	Buragohain	Champak	RINA India	√	√	√	√

B.2. Technical reviewer and approver of the validation report on PoA PRCs

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Valoroso	Rita	RINA Central Office
2.	Approver	IR	Severino	Laura	RINA Central Office

SECTION C. Means of validation**C.1. Desk review**

>>>The registered PoA DD, version 10 and final revised PoA DD version 14 of 18/08/2016 /01/, registered CPA-DD for CPA 1 version 10 and final revised CPA-DD (8027-0001) version 14 of 18/08/2016, CPA-DD (8027-0002) version 09 of 18/08/2016, CPA-DD (8027-0003) version 09 of 18/08/2016 /02/, in particular the baseline estimations and the monitoring plan and the validation report /03/ for the project were reviewed. In addition, the monitoring report, version 01 of 11/02/2015, version 02 of 13/08/2015, version 03 of 21/01/2016, version 04 of 11/06/2016 and version 05 of 18/08/2016 /04/, the emission reduction calculations provided in the form of a spreadsheet (ERs calculation as Dec 2014.xls) version 01 of 11/02/2015, version 02 (ERs calculation_27AUG2015.xls) of 13/08/2015 and version 03 of (ERs calculation_7Jul2016_TDL10_095.xls) 18/08/2016 /05/ were assessed as part of the validation.

Appendix 3 lists the documentation that was reviewed during the verification.

C.2. On-site inspection

Duration of on-site inspection: 04/03/2015 to 06/03/2016				
No.	Activity performed on-site	Site location	Date	Team member
1.	<p>Assessment of the implementation and operation of the project activity as per the registered PoA framework and registered monitoring plan;</p> <p>Monitoring arrangements and location of monitoring equipments (flow meter, energy meter, weighing scale etc.).</p> <p>Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the registered monitoring plan;</p> <p>Cross check between information provided in the monitoring report and data from plant records such as logbooks, inventories, purchase records, invoices, energy bills, calibration records or similar data sources;</p> <p>A review of calculations and assumptions made in determining the GHG data and emission reductions and QA/QC procedures.</p>	Swine farm of Khana Hybrid Co., Ltd. (Phanomsarakham Farm 1), Thailand.	04/03/2015	Rekha Menon & Champok Buragohain
		Chokchaikansukorn Farm, Thailand.	05/03/2015	
		Laemthong Hybrid Co., Ltd (Wang Noi Farm), Thailand	06/03/2015	

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Seppala	Juha	The World Bank	04/03/2015-06/03/2015	Project implementation and operation, Institutional arrangement and Technical aspects project activity. Preparation of the Monitoring Report (MR), calculation of the ER. Information flows for generating, aggregating and reporting the monitoring parameters	Rekha Menon & Champok Buragohain
2	Ru	Jiang	The World Bank	04/03/2015-06/03/2015		
3	Zhou	Weiguo	The World Bank	04/03/2015-06/03/2015		
4	Siripat	Alongkon	ERDI	04/03/2015-06/03/2015	Information flows for generating, aggregating and reporting the monitoring parameters Cross-check of information in the monitoring report and data source	
5	Suntikunakorn	Amornpun	Phanomsarakham Farm 1	04/03/2015		
6	Chitcharaenthon	Ekkaphoom	Chokchaikan sukorn Farm	05/03/2015		
7	Laodee	Witoon	Laemthong Hybrid Co., Ltd (Wang Noi Farm)	06/03/2015		

					Monitoring plan and monitoring parameters. Technical equipment, calibration and monitoring observation.	
--	--	--	--	--	---------------------------------------------------------------------------------------------------------	--

C.4. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PoA-DD and/or CPA-DD form(s)	-	-	-
Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline	-	1	-
Corrections	-	1	-
Changes to the start date of the crediting period	-	-	-
Inclusion of a monitoring plan in a registered PoA	-	-	-
Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline	-	-	-
Types of changes specific to afforestation and reforestation project activities	-	-	-
Changes to the programme design of a registered PoA	-	-	-
Changes to project design of generic component project activities or specific-case component project activities	-	1	-
Others (please specify)	-	-	-
Total	0	3	0

SECTION D. Validation findings

D.1. Compliance with PoA-DD and/or CPA-DD form(s)

Means of validation	Comparing the PoA-DD and CPA-DD /01/, /02/ with the latest PoA-DD and CPA-DD template form provided by CDM EB listed in UNFCCC website /10/, /11/.
Findings	N/A
Conclusion	The validation team confirms that the revised PoA-DD and CPA-DD completed by the PP is compliance with the latest DD form available at UNFCCC website.

D.2. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

Means of validation	Temporary deviations have been applied for monitoring electricity consumed by the project from grid ($EC_{PJ,y}$) for CPA 1. The CME could not monitor or provide evidence related to monitoring of the parameter for the monitoring period and therefor estimated assuming that the source of the GHG emissions operated at maximum capacity for entire monitoring period. Further, in line with paragraph 3 of Appendix 1 of project standard, 10% addition has been considered as transmission and distribution loss. The MR and emission reduction worksheet have been checked and found to be in line with the requirements /01/, /02/.
Findings	CAR 01 was raised to provide the monitored value for electricity consumed by the project from the grid ($EC_{PJ,y}$) in each farm during the monitoring period in the MR. It was noted during site visit that each farm is connected with grid to receive power supply whenever required and a dedicated energy meter (sealed and controlled by govt. entity) monitors and records total power supply to the farm and there is no separate energy meter to monitor and record power consumed from grid specific to the project activity in each farm under CPA 01. PP has considered temporary deviation for the monitoring parameter and estimated the electricity consumption assuming that the source of the GHG emissions operated at maximum capacity for entire monitoring period. Further, in line with paragraph 3 of Appendix 1 of project standard, 10% addition has been considered as transmission and distribution loss. The equipments connected to the project activity were checked during site visit and PP has considered all connected equipments operated at full load for the entire

	monitoring period which is in line with the project standard. Hence, CAR is closed.
Conclusion	RINA confirms that the temporary deviation from registered monitoring plan applied in the CPA01 conforms to paragraph 3 of Appendix 1 of project standard and hence it does not require prior approval from EB.

D.3. Corrections

Means of validation	Correction is applied to include default values of $B_{o,LT}$ (Maximum methane producing potential of the volatile solid generate for animal type "LT") and $VS_{LT,y}$ (Volatile solids for livestock "LT" entering the animal manure management system in year "y") from tables 10 A-4 to 10 A-9 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 4 Chapter 10 for swine origin either from any of the region included in the above table. This is in line with the applicable methodology (AMS-III.D, version 18).
Findings	CAR 02 was raised to provide supporting document to prove the genetic source of the production operations livestock to which PP has corrected the information of applying $B_{o,LT}$ (Maximum methane producing potential of the volatile solid generate for animal type "LT") and $VS_{LT,y}$ (Volatile solids for livestock "LT" entering the animal manure management system in year "y") from tables 10 A-4 to 10 A-9 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 4 Chapter 10 for swine origin either from any of the region included in the above table. The same is in line with the applicable methodology (AMS-III.D, version 18). Hence, CAR was closed.
Conclusion	RINA confirms that the correction does not affect the design of the PoA and hence do not require prior approval from CDM Executive Board as per Appendix 1 of project standard. Revised PoA-DD, version 14 of 18/08/2016 is submitted highlighting the corrections.

D.4. Changes to the start date of the crediting period

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.5. Inclusion of a monitoring plan in a registered PoA

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.6. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.7. Types of changes specific to afforestation and reforestation activities

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.8. Changes to the programme design of a registered PoA

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.9. Changes to project design of generic component project activities or specific-case component project activities

Means of validation	<p>There has been change in design of the CPA-01 as the installed capacity of biogas electric generator at each farm as the registered CPA-DD was 200 kW, whereas in actual it is different. At Khana Hybrid Co., Ltd (Phanomsarakham Farm 1) the digester is equipped with two gas engine of capacity 150kW each although runs at a load of 130kW /12/, at Chokchaikansukorn Farm the digester is equipped with two gas engine of capacity 200kW each, although runs at a load of 150 kW /12/ and at Laemthong Hybrid Co., Ltd (Wang Noi Farm) the digester is equipped with two gas engine of capacity 150 kW each which runs at a load of 110 kW and 130 kW /12/. With the post registration change in the CPA-DD-01 no adverse impact on the following have been envisaged as explained below:</p> <ul style="list-style-type: none"> a) The applicability of the methodology: The only change is the installed capacity of biogas electric generator which has no impact on the applied methodology. The programme and the component project still animal manure management in livestock farm (swine farm) as described in the registered CPA-DD. Hence, applied methodology AMS-III.D, version 18 is stands applicable. b) The additionality of the project activity: The additionality in the registered CPA-DD was assessed considering cost of biogas electric generation and biogas production and thereby saving in electricity purchase from grid /02/. With the change in installed capacity of biogas electric generation there is impact on biogas generation and saving in electricity purchase from grid which has impact on IRR of the CPA. However in the actual scenario, the operational capacity of gas engines are low as described above resulting less biogas generation and less saving in electricity purchase whereas installing more number of generator results in higher investment. This has been described in the revised CPA-DD /02/. Therefore, there is no adverse impact on additionality of the CPA due to the change in design. c) The scale of the project activity: Due to the change, the scale of the project is not changed as the expected annual emission reduction from the CPA is still less than 60kt CO_{2e}. Hence, there is no impact on project scale.
Findings	<p>CAR 03 was raised for inconsistency in installed capacity of bio-gas electric generator post registration of the CPA to which PP has highlighted the actual installed capacity of biogas electric generator at each farm as design change in the specific CPA and justified in the revised CPA that no adverse impact on additionality of the CPA, applicability of the applied methodology and scale of the CPA. At each farm the actual operational load is less than 200 kW as verified during site visit and from confirmation letter from technology supplier which results less biogas generation of less saving in electricity consumption compared to registered CPA-DD. Hence, the resulted IRR in actual scenario would be lesser than projected during registration of the CPA-DD. Hence, CAR was closed.</p>
Conclusion	<p>RINA confirms that the design change of the registered project activity does not adversely impact a) the applicability of the applied methodology; b) the additionality of the project activity and c) the scale of the project activity; Hence, in line with paragraph 6 of Appendix 1 of project standard /07/ the post registration change does not require prior approval from EB.</p>

SECTION E. Internal quality control

>>The draft final validation opinion before being submitted to the client were subjected to an independent internal technical review to confirm that all validation activities had been completed according to the pertinent RINA instructions.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for CDM validation and verification.

SECTION F. Validation opinion

>>RINA Services Spa (RINA) has performed a validation of post registration changes for the programme of activity "Thailand Small Scale Livestock Waste Management Program" in India, CDM Registration Reference N° 8027. The validation has been based on the information made available to us.

RINA has performed this validation on the basis of the following documents:

- CDM Executive Board: Clean Development Mechanism Project Cycle Procedure, version 09 of 20/02/2015;
- CDM Executive Board: Clean Development Mechanism Project Standard, version 09 of 20/02/2015;
- CDM Executive Board: Clean Development Mechanism Validation and Verification Standard, version 09 of 20/02/2015
- Approved baseline and monitoring methodology "AMS-III.D", "Methane recovery in animal manure management systems", version 18 of 29/09/2011.

It is RINA's opinion, the changes, as outlined in the revised PoA-DD version 14 dated 18/08/2016, CPA-01 version 14 of 18/08/2016, CPA 02 version 09 of 18/08/2016 and CPA 03 version 09 of 18/08/2016, from the project activity as described in the registered PoA-DD and CPA-DDs ensure that the level of accuracy and completeness in the monitoring and verification process is not reduces as a result of the revision; the revisions are in accordance with the applied monitoring methodology and the changes to the project activity comply with the requirements established in the CDM Project Standard. The post registration changes in the project activity is in line with Appendix 1 of CDM project standard and hence does not require prior approval from Executive Board.

Hence RINA requests that the post registration changes from the programme of activity and specific component of activities as described in the registered PoA-DD and CPA-DDs for the programme of activity "Thailand Small Scale Livestock Waste Management Program" in India to be considered by the Board.

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-PCP	Clean Development Mechanism Project Cycle Procedure
CDM-PS	Clean Development Mechanism Project Standard
CDM-VVS	Clean Development Mechanism Validation and Verification Standard
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH ₄	Methane
CL	Clarification Request
CME	Coordinating and Managing Entity
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CP	Certification Program
CPA	Component Project Activity
CPA-DD	Component Project Activity Design Document
DD	Design Document
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reductions
ERDI	Energy Research and Development Institute- Nakornping of Chiang Mai University
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document
PE	Project Emission
PoA	Programme of Activities
PoA-DD	CMD Programme of Activities Design Document
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services Spa
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)

UNFCCC	United Nations Framework Convention on Climate Change
--------	-------------------------------------------------------

Appendix 2. Competence of team members and technical reviewers



RINA

CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Rekha Menon

è qualificato come¹:
is qualified as:

CDM-TEC, -VAL, -VER, -TL

per le seguenti aree tecniche:
for the following technical areas:

1.2, 2.1, 13.1, 13.2, 14.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
2.1	Energy Demand	2
13.1	Solid Waste and wastewater	13
13.2	Manure	13
14.1	Afforestation and reforestation	14

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	06-03-2008	-
10	22-12-2014	Update qualification according to AS ver.6.0

Il Resp. QPT
Head of QPT

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS: Gold Standard
SCS: SocialCarbon Standard
JI: Joint Implementation

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologia Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologia Institute, to carry out Validation and Verification of SCS Reports

GHG_QUAL_CERT_EN_04_12

Page 1 of 1



RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Champak Buragohain

è qualificato come¹:
is qualified as:

CDM –TEC, -VAL, -VER, -TL

per le seguenti aree tecniche:
for the following technical areas:

1.2, 2.1, 13.1, 13.2

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
2.1	Electricity distribution	2
13.1	Solid waste and wastewater	13
13.2	Manure	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	19-01-2011	-
10	22-12-2014	Updated according to AS ver 6.0

Il Resp. QPT
Head of QPT

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS: Gold Standard
SCS: SocialCarbon Standard
JI: Joint Implementation

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologia Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologia Institute, to carry out Validation and Verification of SCS Reports

GHG_QUAL_CERT_EN_04_12

Page 1 of 1


RINA

**CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE**

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Rita Valoroso

è qualificato come/1:
is qualified as:

CDM -TEC, -VAL, -VER, -TL
TECHNICAL REVIEWER

per le seguenti aree tecniche:
for the following technical areas:

1.2, 3.1, 13.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
3.1	Energy demand	3
13.1	Solid Waste and waste water	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	18-01-10	-
10	06/04/2016	Update qualification TA 3.1

Il Resp. QPT
Head of QPT

Rita Valoroso

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS: Gold Standard
SCS: SocialCarbon Standard
JI: Joint Implementation

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

GHG_QUAL_CERT_EN_04_12

Page 1 of 1

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	The World Bank	PoA-DD for project activity "Thailand Small Scale Livestock Waste Management Program"	version 10 of 27/08/2012 and revised DD version 12 of 28/07/2015, version 13 of 02/05/2016 and version 14 of 18/08/2016	CME
2	The World Bank	CPA-DD for project activity "Thailand Small Scale Livestock Waste Management Program CPA 01" in Thailand CPA 02 CPA 03	version 10 of 27/08/2012 and revised PCA-DD version 11.1 of 12/01/2016, version 12 of 02/05/2016, version 13 of 12/06/2016 and version 14 of 18/08/2016 Version 09 of 18/08/2016 Version 09 of 18/08/2016	CME
3	DNV	PoA Validation report (report N° 2010-0125) CPA validation report (report N° 2010-0114)	version 01 issued on 12/10/2012 version 01 issued on 12/10/2012	Others
4	The World Bank	Monitoring report for project activity "Thailand Small Scale Livestock Waste Management Program CPA 01" in Thailand	version 01 of 11/02/2015, version 02 of 13/08/2015, version 03 of 21/01/2016, version 04 of 11/06/2016 and version 05 of 18/08/2016	CME
5	The World Bank	Emission reduction worksheet	version 01 of 11/02/2015, version 02 of 13/08/2015 and version 03 of 18/08/2016	CME
6	CDM Executive Board	Clean Development Mechanism Project Cycle Procedure	version 09 of 20/02/2015	Others
7	CDM Executive Board	Clean Development Mechanism Project Standard	version 09 of 20/02/2015	Others
8	CDM Executive Board	Clean Development Mechanism Validation and Verification Standard	version 09 of 20/02/2015	Others
9	CDM Executive Board	Baseline and monitoring methodology "AMS-III.D", "Methane recovery in animal manure management systems"	version 18 of 29/09/2011	Others
10	CDM Executive Board	Programme design document form for small-scale CDM programmes of activities (CDM-SSC-PoA-DD-FORM)	Version 05 of 15/04/2016	Others
11	CDM Executive Board	Component project activity design document form for small-scale CDM component project activities (CDM-SSC-CPA-DD-FORM)	Version 05 of 15/04/2016	Others
12	ERDI	Operation details of bio-gas engines at each farm (Khana Hybrid Co., Ltd., Chokchaikansukorn Farm and Wang Noi Farm)	Ref. No. MOE dated 6393(27)/2/026 20/04/2015 Ref. No. MOE dated 6393(27)/2/028 20/04/2015 Ref. No. MOE	CME

CDM-PoA-PRCV-FORM

			6393(27)/2/027 dated 20/04/2015	
13	The World Bank	Monitoring report for project activity "Thailand Small Scale Livestock Waste Management Program CPA 01" in Thailand	version 01 of 11/02/2015, version 02 of 13/08/2015, version 03 of 21/01/2016, version 04 of 11/06/2016 and version 05 of 18/08/2016	CME

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	xx	Section no.		Date: DD/MM/YYYY
Description of CL				
CME's response				Date: DD/MM/YYYY
Documentation provided by CME				
DOE assessment				Date: DD/MM/YYYY

Table 2. CAR from this validation

CAR ID	01	Section no.	D.2	Date: 20/03/2015
Description of CAR				
The monitored value for electricity consumed by the project from the grid ($EC_{PJ,y}$) in each farm during the monitoring period is not provided in the MR. It was noted during site visit that each farm is connected with grid to receive power supply whenever required and a dedicated energy meter (sealed and controlled by govt. entity) monitor and records total power supply to the farm and there is no separate energy meter to monitor and record power consumed from grid specific to the project activity in each farm. In that case, PP is requested to clarify how the electricity consumed from grid by the project activity is accounted during the monitoring period.				
CME's response				Date: 18/08/2016
Since the electricity consumed by the project cannot be isolated from the overall farm electricity consumption, $EC_{PJ,y}$ was derived from applying the assumption that electrical appliances are continuously utilized, and a corresponding value applied. This approach was proposed and accepted during the PRC process and included in the revised PoA-DD.				
PP response 2: This deviation from the monitoring plan falls under Appendix 1 of the Project Standard v09.0 paragraph 3, i.e. Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline, given that conservative estimates have been carried out for this period assuming that the source of the GHG emissions (electricity consumption) are operated at maximum capacity for the full period, and given that transmission losses have also been accounted for. These therefore are identified as per the Appendix as changes that do not require prior CDM EB approval. It is to be noted that the intention of the project is for this to be monitored in other periods, that is why this approach is only temporal.				
Documentation provided by CME				
Revised MR, revised ER sheet, revised CPA-DDs and supporting documents.				
DOE assessment				Date: 31/08/2016
Since, project participant have not monitored the grid electricity consumption in the project as per the monitoring plan, PP has accounted project GHG emission considering the source of GHG emissions operated at maximum capacity for the full monitoring period. This approach is conservative. The states deviation is included under temporary deviation which is in line with Appendix 1 of CDM project standard version 09 and don't require prior approval from Board. Hence, CAR is closed.				

CAR ID	02	Section no.	D.3	Date: 20/03/2015
Description of CAR				
PP is requested to provide supporting document to prove the genetic source of the production operations livestock.				
CME's response				Date: 18/08/2016
The PP proposes to use the most conservative IPCC global value for Phanom and Wang Noi farms to resolve the outstanding issue regarding genetic source. This has been revised in the MR.				
Documentation provided by CME				
Revised MR, revised ER sheet, revised CPA-DDs and supporting documents.				
DOE assessment				Date: 31/08/2016
For genetic source of production operations livestock, PP has considered Asian origin swine on conservative side and accordingly considered IPCC default values of VS_{LT} and B_{oLT} . Revised CPA-DD, MR and ER sheet found consistent. Hence, CAR is closed.				

CAR ID	03	Section no.	D.9	Date: 20/03/2015
Description of CAR				
PP is requested to respond the following:				
1. The installed generator capacity at each farm is not correct which was validated in CPA-DD.				
CME's response				Date: 18/08/2016
Confirmed statements of installed and operating generator capacity were provided to the DOE. The change being submitted is not described as a deviation from the project design, as it is not of a temporal nature but rather a permanent one; therefore it is being submitted as a permanent change that does not require prior approval by the CDM EB, as per guidance under Appendix 1 of the CDM Project Standard, v09.0, paragraph 6. As indicated by the Appendix, the changes can be submitted given that they do not adversely impact i) the applicability of the methodology, ii) the addittonality nor the iii) scale of the project. The changes of actual installed capacities in all three CPA 1 farms lead to lower IRR compared with the planned set-up envisioned at the time of registration due to lower actual operating capacity of generators, higher investment cost and fewer actual operating hours. Thus the changes in generator numbers and installed capacities do not need prior approval from the EB, as financial analysis still leads to the projects not achieving the benchmark IRR (in fact, they would achieve lower IRR wirthout CDM). CPA-DD has been revised to include mention of actual capacities and to note that the additionality is not affected.				
Documentation provided by CME				
Revised MR and revised CPA-DDs				
DOE assessment				Date: 31/08/2016
<p>Farm Chokchaikansukorn has installed two biogas electric generator with capacity 200 kW each out of which one is used as standby.</p> <p>Phanomsarakham Farm 1 has installed two biogas electric generator with capacity 150 kW each and operated at 130 kW each.</p> <p>Wang Noi Farm has installed two biogas electric generator with capacity 150 kW each and operated at 130 kW and 100 kW.</p> <p>This is further confirmed from the letter issued by ERDI (the technology provider) and justifies the site visit observation. The revised CPA-DD is also transparently presents this scenario.</p> <p>The digester and gas engine of Chokchaikansukorn farm commissioned by September 2010, for Phanomsarakham Farm in November 2010 and for Wang Noi Farm in July 2011 as confirmed from commissioning report of ERDI (technology supplier).</p> <p>The parameter UF_b (Model correction factor to account for model uncertainties) is now included in the revised MR.</p> <p>For Chokchaikansukorn farm, although two biogas electric generator has been installed (2*200 kW) compared to one (200 kW) during CPA inclusion, one is kept as standby and actual operating capacity is also low for the operational generator (150 kW). This has led to higher investment cost compared to project conceptualization and lower output. Therefore, as presented in revised MR, the actual IRR is lower than envisaged during CPA inclusion stage.</p> <p>For Phanomsarakham farm, although two biogas electric generator has been installed (2*150 kW) compared to one (200 kW) during CPA inclusion stage, one runs at 130 kW cpacity and the other runs only 2 hours per day as verified during site visit. Therefore, in actual scenario, it has led to higher investment cost compared to project conceptualization stage and lower output. Therefore, as presented in revised MR, the actual IRR is lower than envisaged during CPA inclusion stage.</p> <p>For Wang Noi farm, although two biogas electric generator has been installed (2*150 kW) compared to one (200 kW) during CPA inclusion stage, one runs at 130 kW cpacity and the other runs at 100 kW capacity. The actual run hous found to be 12 hours as compared to 24 hours as envisaged. Therefore, in actual scenario, this has led to higher investment cost compared to project conceptualization stage and lower output. Therefore, as presented in revised MR, the actual IRR is lower than envisaged during CPA inclusion stage.</p> <p>Inclusion, response is accepted and CAR is closed.</p>				

Table 3. FAR from this validation

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
CME's response				Date: DD/MM/YYYY
Documentation provided by CME				
DOE assessment				Date: DD/MM/YYYY

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	5 June 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Registration Keywords: post-registration change, programme of activities, validation report		