PoA Validation Report

"Anaerobic Digestion and Renewable Energy Generation in South Africa"

Report No. 2012-9506

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Det Norske Veritas

POA VALIDATION REPORT

Date of first issue: 7 November 2011	ConCert Project No.: PRJC-316037-2011-CCS-ITA
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Summary:

Title of PoA: Anaerobic Digestion and Renewable Energy Generation in South Africa
Country: South Africa
Methodology: AMS-III.D and/or AMS-I.C **Version:** 18.0 and 19.0
GHG reducing Measure/Technology: Anaerobic treatment of animal manure and electricity generation from renewable biogas resource
ER estimate of PoA: 400 000 tCO_2e per year (average)

Size

☐ Large Scale ☒ Small Scale

Validation Phases:

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

Validation Status

☐ Corrective Actions Requested ☐ Clarifications Requested
☒ Approval and submission for registration ☐ Rejected

In summary, it is DNV's opinion that the programme of activity "Anaerobic Digestion and Renewable Energy Generation in South Africa", as described in the PoA-DD, version 4 of 10 June 2013, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AMS-III.D and/or AMS-I.C, version 18.0 and 19.0. Hence DNV requests the registration of the project as a CDM project activity.

Report No.: 2012-9506	Subject Group: Environment
Report title: "Anaerobic Digestion and Renewable Energy Generation in South Africa"	
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Work verified by: Simon Wong Yon-Sing	
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Table of Content *Page*

1 EXECUTIVE SUMMARY – VALIDATION OPINION 1

2 INTRODUCTION 3
2.1 Objective 3
2.2 Scope 3

3 METHODOLOGY 4
3.1 Document review 4
3.2 Follow-up actions 7
3.3 Closing out of validation findings 9
3.4 Internal quality control 13
3.5 Validation team 13

4 VALIDATION FINDINGS 14
4.1 Comments by Parties, stakeholders and NGOs 14
4.2 Approval, authorization and contribution to sustainable development 14
4.3 Modalities of communications 14
4.4 PoA design and description of each generic CPA 14
4.5 Demonstration of additionality for PoA 17
4.6 Demonstration of additionality of each generic CPA 17
4.7 Eligibility criteria for including CPAs to the PoA 23
4.8 Application of methodologies 26
4.9 Management system of the PoA 27
4.10 Environmental impacts 27
4.11 Local stakeholder consultation 27
4.12 Application of selected baseline and monitoring methodology(ies) by each generic CPA 28
4.13 Project boundary of each generic CPA 33
4.14 Baseline scenario identification and description for each generic CPA 35
4.15 Algorithms and/or formulae used to determine emission reductions of each generic CPA 35
4.16 Monitoring plan 44

Appendix A PoA and generic CPA validation protocol
Appendix B Protocol for assessing compliance of specific CPA with PoA requirements
Appendix C Curricula vitae of the validation team members

Abbreviations

AWMS	Animal Waste Management System
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CPA-DD	CDM component project activity design document
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CME	Coordinating and Managing Entity
CPA	Component project activity
CSTR	Continuously Stirred Tank Reactor
DNV	Det Norske Veritas
DNA	Designated National Authority
FAR	Forward Action Request
FFR	Formulated Feed Ratio
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer(s)
IRR	Internal Rate of Return
kt	Kilo ton
LDC	Least Developed Country
LoA	Letter of approval
N_2O	Nitrous oxide
NERSA	National Energy Regulator of South Africa
NGO	Non-governmental Organisation
MCF	Methane Conversion Factor (capacity of facility to produce methane)
MoC	Modalities of communication
MP	Monitoring Plan
MW	MegaWatt
NPV	Net Present Value
ODA	Official Development Assistance
PoA	Programme of activities
PoA-DD	CDM programme of activities design document
PS	Clean Development Mechanism Project Standard
SUZ	Special Underdeveloped Zone
SWDS	Solid Waste Disposal System
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change
VS	Volatile Solids produced daily per cattle head
VVM	Clean Development Mechanism Validation and Verification Manual
VVS	Clean Development Mechanism Validation and Verification Standard
WACC	Weighted Average Cost of Capital

WWTS	Waste Water Treatment System
ZAR	South African Rand (currency)

1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the programme of activity (PoA) "Anaerobic Digestion and Renewable Energy Generation in South Africa including generic information relevant to all component project activities (CPAs) to be included in this PoA. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is South Africa, which fulfils the participation criteria and has approved the PoA and authorized the project participants Farmsecure Carbon (Pty) Ltd. The DNA from South Africa confirmed that the project assists in achieving sustainable development.

The PoA correctly applies the baseline and monitoring methodologies "AMS-III.D.: Methane recovery in animal manure management systems" version 18.0 and/or "AMS-I.C.: Thermal energy production with or without electricity" version 19.0.

The programme will involve renewable energy generation through anaerobic digestion and biogas-based energy generation. As a result, the PoA results in reductions of CO_2 and CH_4 emissions those are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the PoA and typical component project activities (CPAs) are not a likely baseline scenario. Emission reductions attributable to the PoA are hence additional to any that would occur in the absence of the project activity.

The total emission reductions of the first CPAs expected to be included to the PoA are estimated to be on the average 400 000 tCO_2e per year.

The monitoring plan provides for the monitoring of the PoA's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the PoA design and it is DNV's opinion that the project participants are able to implement the monitoring plan.

In summary, it is DNV's opinion that the PoA "Anaerobic Digestion and Renewable Energy Generation in South Africa", as described in the PoA-DD, version 4 dated 10 June 2013 *meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodologies AMS-III.D and/or AMS-I.C, version 18.0 and 19.0, respectively. Hence, DNV requests the registration of the PoA as a CDM PoA.*

Rio de Janeiro and Oslo, 12 August 2013

Felipe Antunes	Ole A. Flagstad
Validator	*Approver,*
DNV Rio de Janeiro, Brazil	DNV Climate Change Services AS

2 INTRODUCTION

Farmsecure Carbon (Pty) Ltd has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the proposed small-scale CDM Programme of Activities (PoA) "Anaerobic Digestion and Renewable Energy Generation in South Africa" (hereafter called "project"). This report summarises the findings of the validation of the PoA including generic information relevant to all component project activities (CPAs) to be included in this PoA, performed on the basis of UNFCCC criteria for CDM PoAs, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the small-scale PoA design document (PoA-DD) including the description of the generic component project activity (CPA) with generic information relevant to all CPAs to be included in this PoA. 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).

2.2 Scope

The validation scope is defined as an independent and objective review of the PoA-DD including the description of the generic component project activity (CPA) with generic information relevant to all CPAs to be included in this PoA. The PoA-DD was 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 activities, Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities /23/ and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodologies AMS-III.D and/or AMS-I.C (version 18.0 and 19.0, respectively).

The validation of the programme has also considered the completed CPA-DD for the CPA with the title FSCAD001 – Under the PoA "Anaerobic Digestion and Renewable Generation Energy in South Africa" submitted together with the PoA-DD

The validation was carried out in accordance with the principles and the requirements for validation contained in the Validation and Verification Standard /21/.

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

3 METHODOLOGY

The validation consisted of the following three phases:

I document review

II follow-up actions (e.g. on-site visit and telephone or email interviews)

III the closing out of validation findings and the issuance of the final validation report and opinion

The following sections outline each step in more detail.

3.1 Document review

The following tables list the documentation that was reviewed during the validation.

3.1.1 Documentation provided by the project participants

/1/ Farmsecure Carbon (Pty) Ltd: *CDM-SSC-PoA-DD for project activity "Anaerobic Digestion and Renewable Energy Generation in South Africa"* in South Africa, Version 1 dated 22 August 2011, version 2 dated 7 October 2011, version 3 dated 6 August 2012 and version 4 dated 10 June 2013

/2/ Farmsecure Carbon (Pty) Ltd: *Generic CDM-SSC-CPA-DD for PoA titled "*Anaerobic Digestion and Renewable Energy Generation in South Africa*"*, Version 1 dated 22 August 2011

/3/ Farmsecure Carbon (Pty) Ltd: *CDM-SSC-CPA-DD for CPA titled "CPA FSCAD001 – Under the PoA "Anaerobic Digestion and Renewable energy in South Africa""*, Version 1 dated 22 August 2011, version 2 dated 7 October 2011, version 3 dated 6 August 2012 and version 4 dated 10 June 2013

/4/ Milk Producers' Organisation, Letter from the dairy industry regarding the common practise of waste management, 4 July 2011

/5/ SA Pork Producers' Organisation, Letter from the pork industry regarding the common practise of waste management, 24 June 2011

/6/ South African feedlot Association, Letter from the feedlot industry regarding the common practise of waste management, 4 August 2011

/7/ South African Poultry Association, Letter from the poultry industry regarding the common practise of waste management, 20 February 2012

/8/ Farmsecure Carbon (Pty) Ltd: Basic Engineering Design of an Aerobic Digestion Plant at Manjoh Ranch, rev.0 28 July 2010

/9/ Farmsecure Carbon (Pty) Ltd: CME Quality Manual, version 2, 10 June 2013

/10/ Farmsecure Carbon (Pty) Ltd: CER calculation spreadsheet, version 1, version 1, dated 18 October 2011, version 2, dated 3 August 2012 and version 3, dated 9 May 2013

/11/ Farmsecure Carbon (Pty) Ltd: Board Resolution - MoC, 13 June 2012

/12/ Farmsecure Carbon (Pty) Ltd: Signing authority for Rudi Kriese - MoC, 25 November 2011

/13/ Farmsecure Carbon (Pty) Ltd: Modalities of Communication Statement, 16 October 2012

/14/ Farmsecure Carbon (Pty) Ltd: Grid Emission factor calculation spreadsheet, version 1, 4 November 2011, version 2, 29 June 2012

/15/ Farmsecure Carbon (Pty) Ltd: Confirmation letter regarding CPA participant confirmation at Manjoh Ranch (Pty) Ltd, dated 3 May 2012

/16/ Farmsecure Carbon (Pty) Ltd (Jaco Drost): Feasibility Study for Renewable Energy from Waste project at Manjoh Ranch Feedlot dated February 2012

/17/ Gauteng Department of Agriculture and Rural Development (GDARD): Granting of a Waste Management Licence in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 19200898), for the biogas production from biodegradable substances on Portion 2 of the farm Holgatfontein 326 IR, Nigel, 28 February 2012

/18/ Farmsecure Carbon (Pty) Ltd: Confirmation letter regarding CDM project activity at Manjoh Ranch (Pty) Ltd, dated 23 January 2012

/19/ Farmsecure Carbon (Pty) Ltd: Generic benchmark analysis spreadsheet, dated 6 November 2012

3.1.2 Letters of approval

/20/ Department of Energy Republic of South Africa (DNA of South Africa): *Letter of approval* dated 8 February 2012

3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

/21/ CDM Executive Board: *Clean Development Mechanism Validation and Verification Standard*, version 04.0

/22/ CDM Executive Board: *Clean Development Mechanism Project Standard*, version 04.0

/23/ CDM Executive Board: *Standard for the demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities*, version 03.0

/24/ CDM Executive Board: *Baseline and monitoring methodology AMS-III.D*, Methane recovery in animal manure management systems --- Version 18.0

/25/ CDM Executive Board: *Baseline and monitoring methodology AMS-I.C*, Thermal energy production with or without electricity --- Version 19.0

/26/ CDM Executive Board: *Baseline and monitoring methodology AMS-III.H*, version 16

/27/ CDM Executive Board: *Appendix B of the simplified modalities and procedures for small-scale CDM project activities – Attachment A to Appendix B – General guidance on additionality*, version 09.

/28/ CDM Executive Board: *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories - General Guidelines to SSC CDM methodologies*, Version 17, Annex 21, EB61.

/29/ CDM Executive Board: *Standard for sampling and surveys for CDM project activities and programme of activities*, version 04, EB74

/30/ CDM Executive Board: *Guidelines on assessment of de-bundling for SSC project activities*, version 03, Annex 13, EB54.

/31/ CDM Executive Board: *Non-binding best practice examples to demonstrate additionality for SSC project activities*, Annex 34, EB35.

/32/ CDM Executive Board: *Guidelines for completing the simplified project design document (CDM-SSC-PDD) and the form for proposed new small scale methodologies*

(CDM-SSC-NM), version 05, Annex 34, EB35.

/33/ CDM Executive Board: *Appendix C of the simplified modalities and procedures for small-scale CDM project activities – Determining the occurrence of debundling.*

/34/ CDM CDM Executive Board: *Procedures for approval of the application of multiple methodologies to a programme of activities,* version 01, Annex 31, EB47.

/35/ CDM Executive Board: *CDM Glossary of Terms,* version 6

/36/ CDM Executive Board: *"Standard for the development of the eligibility criteria for the inclusion of a project activity as a CPA under PoA"* version 01, Annex 3, EB63.

/37/ CDM Executive Board: *"Standard for demonstration of additionality of GHG emission reductions achieved by a Programme of Activities"* version 01, Annex 2, EB63.

/38/ CDM Executive Board: "*General guidelines for SSC CDM methodologies"* version 18, Annex 23, EB66

/39/ CDM Executive Board: *"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"* version 02, Annex 11, EB41.

/40/ CDM Executive Board: *"Tool to determine the baseline efficiency of thermal or electric energy generation systems"* version 01, Annex 12, EB48

/41/ CDM Executive Board: *"Tool to determine the remaining lifetime of equipment"* version 01, Annex 15, EB50

/42/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system*, Version 2.2.1 Annex 19, EB63

/43/ CDM Executive Board: *"Emissions from solid waste disposal sites"* version 06.0.1, Annex 46, EB66

/44/ CDM Executive Board: *"Tool to determine project emissions from flaring gases containing methane"* version 01, Annex 13, EB28

/45/ CDM Executive Board: *"Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities"* version 01, Annex 15, EB41

/46/ CDM Executive Board: *"Guidelines on the assessment of investment analysis"* version 05, Annex 5, EB62

/47/ CDM Executive Board: *"Tool for the demonstration and assessment of additionality"* version 7.0.0, Annex 08, EB70

/48/ CDM Executive Board: *"Clarifications on the consideration of national and/or sectoral policies and circumstances in baseline scenarios"* version 2, Annex 3, EB22

/49/ CDM Executive Board: *'Guidelines for demonstrating additionality of microscale project activities'* version 4.0, Annex 26, EB68

/50/ CDM Executive Board: '*Guidelines for objective demonstration and assessment of barriers*' version 1.0, Annex 13, EB50

/51/ CDM Executive Board: '*Guidelines on additionality of first-of-its-kind project activities*' version 2.0, Annex 7, EB69

/52/ CDM Executive Board: SSC_173 Clarification on use of AMS-I.C and AMS-I.D for a project using biogas from gas water: 19 February 2008

/53/ CDM Executive Board: SSC_485 Clarification on the applicability of AMS-III.D to a dry cattle feedlot baseline treatment system: 13 October 2010

3.1.4 Documents used by DNV to validate / cross-check the information provided by the project participants

/54/ Ministry of Energy Republic of South Africa, White Paper on Renewable Energy, November 2003, available at: http://www.energy.gov.za/files/policies_frame.html

/55/ Ministry of Energy Republic of South Africa, Department of energy; Sustainable development criteria for approval of clean development mechanism projects by the designated national authority of the CDM, 2004, available at: http://www.dme.gov.za/dna/pdfs/sustainable_criteria.pdf

/56/ Government Notice R.543; Republic of South Africa's Environmental Impact Assessment EIA Regulations, 18 June 2010

/57/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10

/58/ National Electricity Regulator of South Africa (NERSA), Integrated resource plan for electricity, available under: http://www.doeirp.co.za/content/IRP2010_2030_Final_Report_20110325.pdf)

/59/ Eskom Holdings Limited, 2010, *CDM Calculations, General Information, http://www.eskom.co.za/live/content.php?Item_ID=4226&Revision=en/0 accessed 21 May 2012*

/60/ Eskom, *Facts and Figure Sheet http://recruitment.eskom.co.za/live/content.php?Category_ID=60 accessed 2 August 2012*

/61/ Spalding-Fecher, R, *What is the carbon emission factor for the South African electricity grid?*, Journal of Energy in Southern Africa • Vol 22 No 4 • November 2011

/62/ South African DNA (Chauke Lindiwe Olga), *Email regarding SD criteria monitoring* • 1 February 2012

/63/ WelTec BioPower: A Sustainable Power Solution, 8 October 2009

/64/ Agricultural Research Council – Institute for Agricultural Engineering; Mishanteringshandleiding vir intensiewe diereproduksie-eenhede in SA (Manure Management guidelines for intensive Animal production units in SA); 2011 published by Agricultural Research Council

3.2 Follow-up actions

On 17 October 2011, DNV visited the Farmsecure Offices in Sasolburg, 18 October 2011 DNV visited the Manjoh Ranch near Nigel, 19 October 2011 DNV visited the South African DNA in Pretoria and Eskom Head Office in Megawatt Park, Rivonia and performed interviews with project stakeholders.

	Date / Type of interview	Name / Organization	Topic
/65/	17&18 October 2011 ☒ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	Isabelle Barnard / Farmsecure Carbon (Pty) Ltd	PoA Baseline CPA Eligibility Criteria & Additionality in the PoA PoA Emission Reduction Calculation

			PoA Monitoring Plan
/66/	17&18 October 2011 ☒ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	Werner van Wyk / Farmsecure Carbon (Pty) Ltd	CPA Feasibility Study CPA Basic Design CPA Baseline CPA Monitoring Plan
/67/	17&18 October 2011 ☒ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	Jaco Orost / Farmsecure Carbon (Pty) Ltd	CPA Feasibility Study CPA Basic Design CPA Baseline CPA Monitoring Plan
/68/	17&18 October 2011 ☒ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	Eugene Muller / Farmsecure Carbon (Pty) Ltd	CPA Feasibility Study CPA Basic Design CPA Baseline CPA Monitoring Plan
/69/	17 October 2011 ☒ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	AB van der Merwe / Promethium Carbon	Grid Emission Factor
/70/	18 October 2011 ☒ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	Tony Da Costa / Manjoh Ranch	CPA Baseline CPA Additionality
/71/	19 October 2011 ☐ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	Lufumo Mukwevho / Department of Energy. South Africa DNA	LoA Approval Procedure Barriers faced by Independent Electricity Producers
/72/	19 October 2011 ☐ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	Patrick Tuwani / Department of Energy. South Africa DNA	LoA Approval Procedure Barriers faced by Independent Electricity Producers
/73/	19 October 2011 ☐ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	Ivan Radebe / Eskom – Main Grid Operator in South Africa	Barriers faced by Independent Electricity Producers
/74/	19 October 2011 ☐ On-site ☒ Face-to-face at office ☐ Telephone ☐ E-mail	Enoch Liphoto / Eskom – Main Grid Operator in South Africa	Grid Emission Factor

3.3 Closing out of validation findings

The objective of this phase of the validation was to resolve any issues which needed to be clarified prior to DNV's conclusion on the PoA's compliance with applicable CDM requirements. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the 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 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 four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the project activity "Anaerobic Digestion and Renewable Energy Generation in South Africa" is enclosed in Appendix A to this report.

Table 2 of the validation protocol documents the findings of the desk review of the project design documentation and follow-up interviews with project stakeholders. Any findings raised in Table 2 are listed in Table 3 of the protocol, and changes to the description of the project design as a result of these findings are addressed in Table 3. Table 2 thus may not reflect all aspects of the project as described in the final PoA-DD submitted for registration.

A corrective action request (CAR) is raised if one of the following occurs:

(a) The project participants have made mistakes that will influence the ability of the PoA to achieve real, measurable additional emission reductions;

(b) Applicable CDM requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of CPAs of the PoA. FARs shall not relate to the CDM requirements for registration.

The validation identified seven CARs, fourteen CLs and no FARs. The CARs and CLs were satisfactorily addressed by the project participants by among other revising the PoA-DD (please refer to Table 3 in Appendix A for further details). In addition to the changes made to the PoA-DD as a result of the validation findings, the following changes to the PoA-DD (version 4 of 10 June 2013) were made compared to the version of the PoA-DD published for stakeholder comments (version 1 of 22 August 2011):

- Apart from changes made due to CL/CAR requests identified during the on-site validation, the changes were raised between version 2 and version 3 of the documented were related to changing from the VVM format of the documentation, to the VVS format in order to meet the new guidelines issued by the UNFCCC, including the incorporation of the generic CPA-DD documentation /2/ into the POA-DD /1/.

On 7 May 2013, the UNFCCC secretariat informed that the request for registration of the proposed programme of activities "Anaerobic Digestion and Renewable Energy Generation in South Africa" (9219) was incomplete for the following reason(s):

Issue 1)
The PoA-DD, pages 8-9 indicates that the PoA will cover multiple technologies/measures and/or multiple methodologies (i.e. scenario A: AMS.III-D and AMS.I-C; scenario B: AMS.III-D, scenario C: AMS.I-C; and energy scenarios 1, 2, and 3). However, the PP/DOE have not submitted generic CPAs (Part II. Generic component project activity) for each of the combinations of technologies/measures and/or methodologies, in accordance with the Guidelines for completing the programme design document form for small-scale CDM programmes of activities (version 01.0). Please also refer the CDM Project Standard, version 02.1, paragraph 143.

Issue 2)
Scope: The DOE is requested to describe how it has validated the suitability of the input values used in the financial calculations as per VVS version 2 paragraphs 120 and 123 (a).
Issue: The validation report of the first CPA, pages A-41, 42 indicates that the values for total Capex and total Opex were "obtained from the probable equipment supplier, WELtec."
However, the DOE has not provided information on how:
a) it has determined the suitability of the financial indicator selected by the project participants and conducted a thorough assessment of all parameters and assumptions used in calculating such financial indicators, and determined the accuracy and suitability of these parameters using available evidence and applying its expertise in relevant accounting practices, as per VVS version 03.0 paragraph 120 (a);
b) it has crosschecked the parameters against third party or publicly available sources, such as invoices or price indices, as per VVS version 03.0 paragraph 120 (b).

Issue 3)
Scope: The coordinating/managing entity shall define in the proposed CDM PoA the eligibility criteria for inclusion of a CPA under the PoA, in accordance with the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities."
Issue: The eligibility criteria for inclusion of a CPAs listed in section B.2 of the PoA-DD, does not describe the specifications of technology(ies)/measure(s) including the level and type of service, performance specifications, in accordance with the Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities, version 02.1 paragraph 3.2.1 (c).

As a result of an incompleteness message received from the UNFCCC Secretariat, in order to address Issue 1), DNV raised CAR 7 in the PoA validation report and the CME included the description of 3 generic CPAs within the revised PoA-DD, as required by paragraph 143 of the PS /22/.
The first generic CPA corresponds to scenario A:

- Project activities that digest animal manure where the manure would otherwise have been treated in an anaerobic treatment system without biogas recovery.

- Recovered biogas will be utilized for thermal energy production with or without electricity.

The second generic CPA corresponds to scenario B:

- Project activities that digest animal manure where the manure would otherwise have been treated in an anaerobic treatment system without biogas recovery.
- Technical measures shall be used to ensure that all biogas captured from the digester is flared.

The third generic CPA corresponds to scenario C:

- Project activities that recover and utilize biogas for power/heat production without claiming methane emission avoidance from manure.
- Recovered biogas will be utilized for thermal energy production with or without electricity.

As a result of an incompleteness message received from the UNFCCC Secretariat, in order to address Issue 2), DNV provided further information (CAR 4 of CPA) on how:

a) it has determined the suitability of the financial indicator selected by the project participants and conducted a thorough assessment of all parameters and assumptions used in calculating such financial indicators, and determined the accuracy and suitability of these parameters using available evidence and applying its expertise in relevant accounting practices, as per VVS version 03.0 paragraph 120 (a);

b) it has crosschecked the parameters against third party or publicly available sources, such as invoices or price indices, as per VVS version 03.0 paragraph 120 (b).

Moreover, in response to Issue 3) of the abovementioned incompleteness message, DNV raised CAR 6 in the PoA validation report and the CME revised the third eligibility criterion for inclusion of a CPA under the PoA in order to further describe the specifications of technology(ies)/measure(s) including the level and type of service, performance specifications, in accordance with the Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities, version 02.1 paragraph 3.2.1 (c).

Validation Protocol Table 1: Mandatory Requirements for CDM programme of activities (PoA)		
Requirement	***Reference***	***Conclusion***
The requirements the PoA must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**) or a **corrective action request (CAR)** if a requirement is not met.*

Validation Protocol Table 2: Requirement Checklist				
Checklist question	***Reference***	***Means of verification (MoV)***	***Assessment by DNV***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the PoA should meet. The checklist is organised in different sections, following the logic of the PoA-DD	*Gives reference to documents where the answer to the checklist question or item is found.*	*Means of verification (MoV) are **document review (DR)**, **interview (I)** or any other follow-up actions (e.g., on site visit and telephone or email interviews) and **cross-checking (CC)** with available information relating to projects or technologies similar to the proposed CDM PoA under validation.*	*The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.*	*OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A **corrective action request (CAR)** is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A **clarification request (CL)** is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A **forward action request (FAR)** during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Corrective action and/ or clarification requests	***Ref. to checklist question in table 2***	***Response by project participants***	***Validation conclusion***
*The **CARs** and/ or **CLs** raised in Table 2 are repeated here.*	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants to address the CARs and/or CLs.*	*The validation team's assessment and final conclusions of the CARs and/or CLs.*

Validation Protocol Table 4: Forward Action Requests		
Forward action request	***Ref. to checklist question in table 2***	***Response by project participants***
The FARs raised in Table 2 are repeated here.	*Reference to the checklist question number in Table 2 where the FAR is explained.*	*Response by project participants on how forward action request will be addressed prior to first verification.*

Figure 1: Validation protocol tables

3.4 Internal quality control

The validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation team

				Type of involvement								
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 1.2 competence	TA 13.1 competence	TA 15.1 competence	Financial expertise
Team leader (Validator)	Antunes	Felipe	Brazil	✓		✓	✓		✓	✓	✓	
Validator under Observation	Zamarron	Francisco	Italy	✓	✓	✓			✓			✓
Observer	Grant	Little	South Africa	✓	✓	✓						✓
Expert	Goorden	Geert	Belgium	✓	✓	✓				✓	✓	
Technical reviewer	Wong	Simon Yon-Sing	Malaysia					✓	✓	✓	✓	

The qualification of each individual validation team member is detailed in Appendix C to this report.

4 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 PoA design as documented and described in the PoA-DD, version 4 dated 10 June 2013.

4.1 Comments by Parties, stakeholders and NGOs

The PoA-DD, version 1 dated 22 August 2011, was made publicly available on the CDM website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 9 September 2011 to 8 October 2011.

No comments were received during this period.

4.2 Approval, authorization and contribution to sustainable development

The coordinating/managing entity of the PoA is Farmsecure Carbon (Pty) Ltd, which is the entity that communicates with the Board.

The project participants are Farmsecure Carbon (Pty) Ltd of South Africa. The host Party (South Africa) meet all relevant participation requirements. A letter of approval (LoA) /20/ was issued by DNA of South Africa on 8 February 2012, authorizing Farmsecure Carbon (Pty) Ltd of South Africa as project participant and confirming that the project assists in achieving sustainable development. This was also confirmed by cross checking the sustainable development criteria for approval of clean development mechanism projects by the designated national authority of the CDM /55/. The coordinating/managing entity has obtained a letter of authorization of its coordination of the proposed CDM PoA from the host Party.

The letter of approval dated 8 February 2012 /20/ was received from the CME. This was confirmed in a discussion with the DNA of South Africa /72/ and in a meeting in March 2012 in Pretoria.

The letter is accordance with paragraphs 39-42 of the VVS and it was validated that the letter was acceptable and fulfils the requirements of the UNFCCC.

4.3 Modalities of communications

DNV has performed due diligence on the Modalities of Communications (MoC) statement /13/ submitted by the project participants in accordance with applicable requirements in the VVS as documented in section A.5 of Table 2 in the validation protocol in Appendix A to this report. DNV was able to confirm the information contained in the MoC and that the MoC complies with all relevant forms and requirements and CME board resolutions /11/ and signing authorities /12/.

4.4 PoA design and description of each generic CPA

DNV considers the project description of the project contained in the PoA-DD to be complete and accurate. The PoA-DD complies with the relevant forms and guidance for completing the CDM-SSC-PoA-DD. The PoA has identified only manure from piggeries and dairies, in

addition to renewable biomassas being applicable for inclusion in the scope of application. Three different scenarios corresponding to three different generic CPAs are allowable under the program. These are:

- Generic CPA corresponding to scenario (A): generation of thermal and/or electrical energy from manure and other renewable biomass where only manure from piggeries and dairies are applicable for inclusion in the scope of methane avoidance application;
- Generic CPA corresponding to scenario (B): methane avoidance from AWMS with the recovered methane being destroyed where only manure from piggeries and dairies are applicable for inclusion in the scope of methane avoidance application; and
- Generic CPA corresponding to scenario (C): generation of thermal and/or electrical energy with no claimed methane avoidance where only biomass that complies with the renewable biomass applicability conditions are applicable for inclusion in the scope of renewable energy generation application.

Scenario (A) is a combination of the approved methodologies applied in the program, AMS-III.D /24/ and AMS-I.C /25/ and is allowable in terms of paragraph 11 (a) of the General guidelines to SSC CDM methodologies /38/, scenario (B) is the application of methodology AMS-III.D /24/ alone and scenario (C) is the application of methodology AMS-I.C /25/. This was also checked in terms of the Executive Board clarifications SSC_173 /52/ and SSC_485 /53/ regarding the use of these methodologies and the application for cattle feedlots.

In the generic CPAs corresponding to scenarios A and C, the recovered biogas biogas will be utilized for thermal energy production with or without electricity, adopting one of the following energy scenarios:

1. Project activities that install biogas thermal energy plants that produce renewable thermal energy for on-site consumption or for consumption by other facilities and displace fossil fuel use.
2. Project activities that install biogas cogeneration plants that produce renewable electricity for supply to the grid and/or for captive use and renewable thermal energy for on-site consumption or for consumption by other facilities and displace fossil fuel use.
3. Project activities that involve the addition of renewable energy units (thermal or cogeneration units) at an existing renewable energy production facility.

Biomass under this PoA can be divided under the following two categories:

1. Manure from different livestock types (LT): Manure from AWMS that would otherwise have been left to decay anaerobically.
2. Other biomass types (BT): Other renewable biomass that does not involve methane emission avoidance. This biomass should comply with renewable biomass applicability conditions.

The first category (LT) is applicable for all 3 scenarios (A, B and C), while the second category (BT) is applicable for scenarios A and C only.

The geographic boundary for the Program is the Republic of South Africa. This was validated by DNV and accepted as it covers the geographic extent of the entire country. All relevant

national and sectoral policies have been taken into account by the project proponent in the program design this was checked during an interview with the South African DNA /72/ who confirmed that the program complied with policies that were currently in place. The installation or alteration of power plants (<15MW electrical and equivalent thermal of <45 $MW_{thermal}$) are to be installed, using biogas as a fuel source.

A document review was undertaken by the DNV validation team of the project documentation before a team conducted an on-site validation of the CME offices and the proposed location of FSCAD001 in South Africa. It was confirmed that CPAs under the PoA would involve methane emission avoidance at anaerobic AWMS sites through controlled anaerobic digestion and/or biogas-based renewable energy generation. The treatment would involve an anaerobic digestion system with the captured biogas being either flared (in the case of scenario (B) being implemented) or fed into an energy generator (for scenarios (A) and (C)). No equipment supplier was stipulated in the program, but all equipment would need to comply with the eligibility and inclusion of the POA and would be one of the following four technology options, (i) a covered lagoon system; (ii) a mixed reactor system; (iii) a plug flow reactor system or (iv) a dry fermentation reactor system.

The applicability of the methodology choices were confirmed.

Energy generators would need to have a maximum of 15MW electrical and an equivalent thermal maximum of 45 $MW_{thermal}$. The energy will be from the combustion of methane in a biogas internal combustion engine or micro gas turbines/8/. The biogas internal combustion engine produce thermal energy by decoupling the engine jacket water cooling circuit and circulating the engine block cooling water to heat the digester. Hot exhaust gas at ~400°C can also be used for additional heating. The thermal energy will be carried over to heat water and this water will also be circulated along with the block cooling water to heat the digester. In the case of gas turbine systems, thermal energy can be utilized from the hot exhaust gases as a single point source of energy /1/. The CME had developed a CME Quality Manual /9/ which included the roles and responsibilities for various positions within the CME (including naming people responsible). The roles addressed in the CME Quality Manual /9/ are Business Manager (Rudi Kriese), CDM Manager (Isabelle Barnard); Financial Manager (Elrina Kruger); Marketing Manager (Johan van Biljon); CMD Consultant (Vincent Donato); Technology Manager (Werner van Wyk); Monitoring Manager (Werner van Wyk); QC Manager (TC Botha) and HR Manager (Suzelle de Plessis). The Technical Manager will be responsible for all technical aspects of the CPA equipment, including ensuring that operating and maintenance is in accordance with the program. Other aspects included in the CME Quality manual include: Training and capacity development for personnel, record and document control processes for the CPAs, avoidance of double counting, technical review and measures for continual improvement /9/.The program was validated against the relevant tools and guidelines required for a PoA and according to the methodologies chosen to be applied by the CME. The validation team considered the project description to be an accurate and complete representation of the programme and proposed components.

It was confirmed that the PoA meets the eligibility criteria for a small scale project activity and falls within the thresholds as outlined in paragraph 3 of the general guidelines for small scale projects /28/. Each component activity will not exceed 15 MW electrical and an equivalent thermal maximum of 45 $MW_{thermal}$ and for the methane emissions will not go beyond the limits of 60 $ktCO_2e$/year. This was checked in the basic engineering package /8/ and POA-DD /1/. The start date of the program is 9 September 2011, which is the date of

publication of the PoA-DD for global stakeholder consultation. The lifetime of the program is 28 years, while the first CPA will only have a lifespan of 20 years as confirmed by the feasibility study /16/ and from the likely equipment supplier (WelTec) /63/.

It was validated that the PoA is not a debundled project, with no other CDM project activity occurring in the vicinity of the first CPA, namely Manjoh Ranch. This was checked with the guidelines on debundling /30/ and in interviews with the South African DNA /72/.

4.5 Demonstration of additionality for PoA

Additionality for each CPA will be determined at CPA level and not at PoA level. All CPAs will be voluntary measures that would not have been implemented except by being part of the Program. This is in accordance with Article 12.5.c of the Kyoto Protocol and was checked through each CPA signing an agreement letter /18/ between CPA participants and the CME which includes their voluntary participation in the POA. It was further confirmed during the interview with the DNA that there is no policy or regulation within South Africa that requires the proposed program or its components to be implemented /72/.

Additionality for CPAs within the program will be determined using one of two approaches. Project activities up to five megawatts that employ renewable energy technology are additional if any one of the conditions in the 'Guidelines for demonstrating additionality of microscale project activities' /49/ is satisfied. For components smaller than 15 MW additionality will be demonstrated according to "Attachment A of Appendix B" and the "Non-binding best practice examples to demonstrate additionality for SSC project activities" /31/.

4.6 Demonstration of additionality of each generic CPA

In terms of the PoA-DD the CPA participants are required to provide an explanation to show that the project activity would either meet a micro-scale threshold (Approach 1) or would not have occurred anyway due to at least one of the following barriers (Approach 2):

a) Investment barrier
b) Barrier due to prevailing practice

As far as Approach 1 is concerned, micro scale components need to apply at least one of the following two methods (a and b), as per 'Guidelines for demonstrating additionality of microscale project activities' /49/ in order to demonstrate additionality.

a) Project activities up to 5 MW that employ renewable energy technology are additional if any one of the conditions in paragraph 2 in the "Guidelines for demonstrating additionality of microscale project activities" /49/.

   I. The geographic location of the project activity is in one of the least developed countries or the small island developing States (LDCs/SIDS) or in a special underdeveloped zone (SUZ) of the host country. It was confirmed that the program will only occur within the geographic boundary of South Africa (which is not a LDC) /1/ and at the time of the validation there were no SUZ identified by the DNA /72/, so no CPA would fulfil this requirement;

   II. The project activity is an off-grid activity supplying energy to households/communities (less than 12 hours grid availability per 24 hrs is

also considered "off-grid" for this assessment). In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level;

III. The project activity is designed for distributed energy generation (not connected to a national or regional grid) with both conditions (i) and (ii) satisfied;

i. Each of the independent subsystems/measures in the project activity is smaller than or equal to 1500 kW electrical installed capacity. In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level;

ii. End users of the subsystems or measures are households/communities/small and medium enterprises (SMEs). In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level.

IV. The project activity employs specific renewable energy technologies/measures recommended by the host country designated national authority (DNA) and approved by the Board to be additional in the host country. The following conditions shall apply for DNA recommendations:

i. "Specific renewable energy technologies/measures" refers to grid connected renewable energy technologies of installed capacity equal to or smaller than 5 MW. In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level;

ii. The ratio of installed capacity of the specific grid connected renewable energy technology in the total installed grid connected power generation capacity in the host country shall be equal to or less than 3 per cent. In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level;

iii. Most recent available data on the percentage of contributions of specific renewable energy technologies shall be provided to demonstrate compliance with the 3 per cent threshold. In no case shall data older than three years from the date of submission be used. In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level;

iv. Technologies/measures recommended by DNAs and approved by the Board to be additional in the host country remain valid for three years from the date of approval. However, additionality of eligible project activities applying the guidelines remains valid for the entire crediting period. In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level;

v. DNA submissions shall include the specific grid connected renewable electricity generation technologies that are being recommended and

provide the required data as indicated above (e.g. wind power, biomass power, geothermal power, hydropower). In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level.

b) Type III project activities that aim to achieve emission reductions at a scale of no more than 20 ktCO_2e per year, are additional if any one of the conditions in paragraph 4 in the "Guidelines for demonstrating additionality of microscale project activities" /49/.

I. The geographic location of the project activity is an LDC/SIDS or special underdeveloped zone of the host country as identified by the government in accordance with the paragraph 2 (a) (i) above. It was confirmed that the program will only occur within the geographic boundary of South Africa (which is not a LDC) /1/ and at the time of the validation there were no SUZ identified by the DNA /72/, so no CPA would fulfil this requirement;

II. The project activity is an emission reduction activity with both conditions (i) and (ii) below satisfied:

i. Each of the independent subsystems/measures in the project activity achieves an estimated annual emission reduction equal to or less than 600 tCO_2e per year. In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level; and

ii. End users of the subsystems or measures are households/communities/SMEs. In accordance with the design of the program /1/ it is possible that a CPA would fulfil this requirement, and would be assessed at CPA level.

It is important to note that for specific CPAs corresponding to scenario A, in case Approach 1 is selected, either method a or b can be adopted. For specific CPAs corresponding to scenario B, in case Approach 1 is selected, only method b can be adopted. For specific CPAs corresponding to scenario C, in case Approach 1 is selected, only method a can be adopted.

Approach 2 can be used to demonstrate the additionality of project activities with an installed capacity less than 15 MW and it will be further analized in paragraph 4.6.2and 4.6.3 here below.

There are no regulations or legislation in South Africa that require the implementation of methane recovery projects from agricultural or livestock waste. There are also no requirements to implement Renewable Energy projects in South Africa. This was confirmed by the DNV validation team during interviews with the South African DNA /72/ and the national utility company, ESKOM /73/ and cross checked against the national integrated resource plan for electricity issued by NERSA /58/ and the government White Paper on Renewable Energy /54/.

4.6.1 Identification of alternatives to each generic CPAs

In addition to the proposed 3 generic component activities – corresponding to scenarios A, B and C – being included in the program, two additional alternatives were considered by the participants. These were the project activity is implemented, but not included as a CPA (i.e. carbon finance and revenue is not considered) and a continuation of the current energy baseline scenario already identified at the site /1/. Only AWMS where manure is left to decay in an anaerobic treatment system will be applicable under this PoA for the methane emission avoidance. In South Africa, manure in piggeries and dairies are commonly left to decay in anaerobic treatment systems /64/ and therefore only these livestock will be applicable under this PoA. However, the current manure management practice for each CPA will be assessed and will form the baseline AWMS for the specific CPA. DNV considers the listed activities presented in the PoA-DD to be credible and complete.

None of the alternatives presented was found to be in contravention of any regulations or legislation in South Africa. This was confirmed by the DNV validation team during interviews with the South African DNA /72/ and checked in the report from the Agricultural Research Council – Institute for Agricultural Engineering /64/ which makes reference to common animal waste handling guidelines in South Africa.

According to methodology AMS-III.D – which is applicable for CPAs corresponding to scenarios A and B – the baseline scenario is the situation where, in the absence of the project activity, organic matter (including manure where applicable) are left to decay within the project boundary and methane is emitted to the atmosphere. Therefore, the current waste and/or manure management practice at each CPA will be the baseline scenario for that CPA.

For methodology AMS-I.C – which is applicable for CPAs corresponding to scenarios A and C – three scenarios were documented, viz. the fuel consumption of the technologies that would have been used in the absence of the project activity; Electricity is imported from a grid and thermal energy (steam/heat) is produced using fossil fuel; Electricity is imported from a grid and thermal energy (steam/heat) is produced from biomass; the electricity displaced from the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and the fuel consumption of the technologies that would have been used in the absence of the project activity.

4.6.2 Investment analysis

As anticipated above, within Approach 2, CPA participants are required to provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

a) Investment barrier
b) Barrier due to prevailing practice

This paragraph concerns the assessment of the Investment barrier.

The CPA applying the investment analysis needs to demonstrate that a financially more viable alternative to the project activity would have led to higher emissions using a benchmark analysis (as per the guidance of the *Tool for the demonstration and assessment of additionality* /47/). The specific CPA corresponding to scenario B, which applies only methodology AMS-III.D and only involve flaring of the captured biogas as per POA-DD /1/, will apply only barrier analysis due to prevailing practice and not investment analysis.

Investment analysis is conducted solely at CPA level.

Choice of approach

Where a financial analysis is conducted to demonstrate additionality, it is done completely at the CPA level and no analysis or parameters were set at the PoA level. All aspects of the analysis will be conducted at CPA level where relevant.

The financial analysis is proposed for the CPA using a benchmark analysis in accordance with the tool /47/.

Benchmark selection

The alternatives include the proposed project activity in the CPA undertaken without being registered as a CDM activity (CPA). The chosen benchmark needs to be appropriate to the type of IRR (equity or debt) calculated. Both local lending rates of the Weighted Average Cost of Capital (WACC) are considered. Benchmark determination would be calculated on a pre-taxation basis.

Input parameters

No input parameters were developed or postulated at PoA level. All parameters will be demonstrated at CPA level.

A generic table of 14 parameters for each CPA implementer to complete in order to demonstrate additionality is given in the generic CPA approach. The parameters are included in a generic spreadsheet /19/ that will be used as a basis for the benchmark analysis of all component activities that require a benchmark analysis to demonstrate additionality.

Parameter	Unit	Value
1. Investment decision date	Date	
2. Project lifetime	Years	
3. Total Capex	ZAR	
4. Opex	ZAR	
5. Cost of sales	ZAR	
6. Net electricity generation	kWh	
7. Net thermal energy gen.	TJ/yr	
8. Electricity price	ZAR/kWh	
9. Thermal energy price	ZAR/TJ	
10. CER price	EUR/ton	
11. Exchange Rate	ZAR:EUR	
12. Inflation rate	%	
13. Depreciation	%	
14. Salvage value	%	

Calculation and conclusion

It was concluded by the validation team that the approach taken by the CME to determine additionality through investment analysis fulfils the requirements of the tool /47/, however no

conclusion could be made on the actual additionality presented in the PoA or generic CPA as additionality will be conducted and demonstrated completely at the CPA level.

Sensitivity analysis

Financial analysis is conducted completely at the CPA level and no parameters for sensitivity analysis were set at the PoA level. All aspects of the sensitivity analysis will be conducted at CPA level where relevant.

The approach is that variables that constitute more than 20% of either the total project cost or total project revenues should be subjected to reasonable variation. The sensitivity analysis provides a valid argument in favour of additionality only if it consistently supports the conclusion that the project activity is unlikely to be financially attractive. In cases where a scenario will result in the project activity passing the benchmark the CPA implementer shall provide an assessment of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity.

4.6.3 Barrier analysis

As anticipated above, within Approach 2, CPA participants are required to provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

a) Investment barrier
b) Barrier due to prevailing practice

This paragraph is assessing the Barrier due to prevailing practice, which can be adopted for all specific CPAs – corresponding to scenarios A, B and C – that are selecting Approach 2 to demonstrate their additionality.

Additionality, including barrier analysis is to be demonstrated at CPA level alone.

The only barriers considered in the PoA are:

- Barrier due to prevailing practice
  - Demonstrating that the prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions
  - Best practice includes (but is not limited to the demonstration that the project is among the first of its kind in terms of technology, geography, sector, type of investment and investor, market etc.).
  - Satisfies the 'Guidelines for objective demonstration and assessment of barriers' /50/ and '*Guidelines on additionality of first-of-its-kind project activities*' /51/ with the assessment being included in the CPA-DD.

It was not possible to evaluate whether these barriers were real or would have prevented the proposed project activity being implemented at a PoA level as the program was designed to evaluate these at the CPA level. It was the assessment of DNV that the PoA is designed adequately to ensure that the barriers are assessed at CPA level as outlined in the PoA-DD /1/ and the assessment was conducted at CPA level and included in the associated CPA1 validation report.

4.6.4 Common practice analysis

Common Practice Analysis was not considered for the program. This was acceptable as additionality would be demonstrated by one of the other analyses in accordance with the tool /47/.

4.6.5 Additionality - Conclusion

The demonstration of additionality of typical CPAs to be included to the PoA is in accordance with section A of the "Standard for demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities" /23/, and it is demonstrated that in the absence of CDM, none of the CPAs would occur.

The following eligibility criteria (refer to section 4.7 for the complete list of eligibility criteria) ensure that a CPA meets the conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality as described above.

4.7 Eligibility criteria for including CPAs to the PoA

The eligibility criteria for including CPAs are in accordance with section B of the "Standard for demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities" /23/.

The PoA has documented 12 eligibility criteria for inclusion of a CPA into the PoA.

a) The proposed CPA must be located in the geographical boundary of South Africa. This was confirmed that all CPAs would be in the boundary of South Africa /1/.

b) The CME must implement precaution measures to avoid double counting of emission reductions. This was checked by the validators by examining the agreement between the CME and CPA Implementer /15/ which includes the CPA implementer confirming that the proposed component is not part of any other CDM or POA activity and the CME Quality Manual /9/ which ensures that the CME checks with the DNA and the UNFCCC to see that the proposed CPA is not included in any other CDM or POA activity and includes checking for other PoAs in the region and CDM activities with the South African DNA. These were checked during validation by the DNV team.

c) The proposed CPA must comply with performance specifications including compliance with certification. The CPA must involve the implementation of one of the technologies/measures described in section A.6, Part I in the PoA-DD. The CPA implementer shall demonstrate that the performance of the equipment used in the proposed CPA comply with national or international standards. If this evidence is not available at the time of validation, it will be submitted during verification. The technology eligibility criteria mentioned in section A.6 were validated as follows:

   i. The national standard for the performance of the equipment type (project participants shall identify the standard used). Each CPA will specify the national standard to be used depending on the equipment that is employed, this was checked with the Engineering Manager of the CME /66/, and any specific requirements will be included into the operating, maintenance and monitoring plans for the CPA.

   ii. An international standard for the performance of the equipment type, such as International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) standards (CPA implementer shall identify

the standard used) if the value specified in subparagraph (a) is not available. Each CPA will specify the standard to be used depending on the equipment that is employed, this was checked with the Engineering Manager of the CME /66/, and any specific requirements will be included into the operating, maintenance and monitoring plans for the CPA.;

iii. The manufacturer's specifications, provided that they are tested and certified by national or international certifiers, if the value specified in subparagraph (b) is not available. Each CPA will specify the manufacturer's specifications to be used depending on the equipment that is employed, this was checked with the Engineering Manager of the CME /66/, and any specific requirements will be included into the operating, maintenance and monitoring plans for the CPA.;

iv. Performance data from test results conducted by an independent entity for equipment installed under the project activity if the value specified in subparagraph (c) is not available. Each CPA will ensure performance tests are performed by recognised independent engineering and testing entities depending on the equipment that is employed and is none of the previous specifications are available, this was checked with the Engineering Manager of the CME /66/, and any specific requirements will be included into the operating, maintenance and monitoring plans for the CPA. It is unlikely that this will be the scenario, as it is expected that as a minimum the equipment manufacturer will supply specifications as leading equipment suppliers are planned for all CPA installations. This was confirmed with the CME management during interviews /66/ /68/.

d) The starting date of the project activity must not be before the date of commencement of validation of the PoA. The start date of the program is 9 Semptember 2011, which is the date of publication of the PoA-DD for global stakeholder consultation and was checked on the UNFCCC project cycle website and in the POA-DD /1/. Each CPA will confirm that the starting date is after the commencement date of the POA using evidence such as a purchase order, payment or evidence related to the construction of the component activity /1/.

e) The proposed CPA must implement one of the eligible methodologies or methodology combinations for the PoA. Also, the proposed CPA must comply with the applicability conditions of the applicable methodology. These are described in section 4.8 and 4.12 of this report. It was checked that the POA will only apply the two approved methodologies either separately or in combination, namely AMS-III.D and/or AMS-I.C /24/ /25/. This was specified in section B.2 of the POA-DD /1/.

f) The CPA must demonstrate additionality as per eligibility criteria. The eligibility criteria state that additionality is needed to be demonstrated in terms of "*Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities*" /23/. These criteria will be in accordance with the methodology/ies applied for the CPA – viz. AMS-III.D and/or AMS-I.C. The additionality requirements are clearly stated in the POA-DD and in Part II of the POA-DD which covers the requirements for the generic CPA /1/. The demonstration of additionality was validated and reported above in section 4.5 of this report.

g) The CPA must comply with PoA conditions related to undertaking local stakeholder consultations and environmental impact analysis. It was validated that both the local stakeholder consultation and the environmental impact analysis will be conducted at the CPA level and will be validated for each CPA during the inclusion thereof /1/.

h) The CPA must confirm that there is no diversion of Official Development Aid. The source of finance will be included in a Financial Analysis at CPA level (for non micro scale) components, and the sources of finance will be validated to ensure no ODA was diverted. For micro scale components, it will be validated at CPA level that there is no diversion of ODA. Any source of public funding from any Annex I country would need to provide evidence at the CPA level that it was not from the diversion of ODA /1/. This was confirmed in an interview with the CME management /65/.

i) The PoA has no specific target group or distribution mechanism, therefore there is no eligibility criterion for target groups or distribution mechanisms, therefore this is not applicable as there is no specific target group for this program.

j) All relevant parameters will be monitored for each CPA. However, only a statistically acceptable sample will be verified by the DOE. Sampling of the monitored parameters would need to comply with "*General guidelines for sampling and surveys for small-scale CDM project activities*" /29/ which require a confidence/precision limit of 90/10. All CPAs included in the program will be available for verification in the future. The verifying entity will ensure that the statistically acceptable sample is used for the verification. It was envisaged by the CME that all CPAs will be verified until a statistically acceptable threshold was met, this will be determined by the verifying DOE /65/.

k) CPA in aggregate must meet the small-scale or micro-scale threshold criteria. The micro and small scale threshold limits are defined in section B.2 and are defined in accordance with the CDM glossary of terms /35/.

l) The proposed CPA must pass the de-bundling check. The CME will ensure debundling checks are done by following the requirements in paragraph 8 of the "*Guidelines on assessment of debundling for SSC project activities*" /30/. These checks include:

   i. Confirmation from the CPA implementer that they have not already implemented an activity within 1 km of the boundary of the proposed CPA, at the closest point. This was validated by checking a copy of a signed agreement between the CME and the CPA implementer /15/.

      Confirmation from the CME that they do not manage a large scale PoA of the same technology/measure within 1 km of the boundary of the proposed CPA, at the closest point. This was validated by checking a copy of a signed agreement between the CME and the CPA implementer /15/.

Furthermore, the program and its components need to demonstrate compliance of the baseline system and project activity to the mandatory applicable legal and regulatory requirements/legislation that will be confirmed through the Environmental authorization process of the republic South Africa /1/. South African environmental legislation includes waste management for both solid and liquid streams and is a pre-requisite for any activity of this type to start operation. The DNA confirmed that the Environmental authorities will

ensure that appropriate authorisations are in place before operations of this type of activity will begin operation /72/.

These eligibility criteria fulfil the requirements of paragraph 14 of the *Standard for the development of the eligibility criteria for the inclusion of a project activity as a CPA under PoA* /36/ and the Project Standard /22/.

In addition to these eligibility criteria, paragraph 12 of "*Standard for the demonstration of , development of eligibility criteria, and application of multiple methodologies for programme of activities*" /23/ requires eligibility criteria relative to each combination of technology/measure and/or methodology to be proposed to demonstrate additionality. The following eligibility criteria are given for the three scenarios corresponding to the three generic CPAs available in the program:

A. For the combination of the two approved methodologies, AMS-III.D & AMS-I.C, additionality may be based on either confirming the component activity fulfil the requirements of a micro scale project in terms of the guidelines /49/, or a barrier analysis in terms of the guidelines /50/. Where the micro scale approach is used, demonstration of both the Type I and Type III sub-components need to be demonstrated. Where a barrier analysis is used, either an investment analysis /46/ or a barrier due to prevailing practice /31/ need to be demonstrated.
B. When only Type III (methane recovery) is applied in component activity using methodology AMS-III.D, additionality may be based on either confirming the component activity fulfil the requirements of a micro scale project in terms of the guidelines /49/, or a barrier analysis in terms of the guidelines /50/. Where the micro scale approach is used, demonstration of only the Type III components need to be demonstrated. Where a barrier analysis is used a barrier due to prevailing practice /31/ needs to be demonstrated.
C. When only Type I (energy generation) is applied in component activity using methodology AMS-I.C, additionality may be based on either confirming the component activity fulfil the requirements of a micro scale project in terms of the guidelines /49/, or a barrier analysis in terms of the guidelines /50/. Where the micro scale approach is used, demonstration of only the Type I components need to be demonstrated. Where a barrier analysis is used, either an investment analysis /46/ or a barrier due to prevailing practice /31/ need to be demonstrated.

It was concluded that the eligibility criteria are sufficiently objective and comprehensive to permit the assessment of the inclusion of CPAs of the three possible combinations of activities at any time during the crediting period of the PoA.

4.8 Application of methodologies

The combination of methodologies proposed in the generic CPA corresponding to scenario A, i.e. AMS-III.D and/or AMS-I.C – "Methane recovery through controlled anaerobic digestion"or "Thermal energy production with or without electricity" versions 18.0 and 19.0 respectively, meets the requirements of the "Standard for the demonstration of additionality,

development of eligibility criteria, and application of multiple methodologies for programme of activities" /23/ and paragraph 11 (a) of the General guidelines to SSC CDM methodologies /38/ which allows for a combination of one type III methodology where activities lead to methane generation and a type I methodology utilising the methane to generate renewable energy.

It was concluded that the application of the multiple methodologies and methodology combinations was acceptable in terms of the guidelines and standards.

4.9 Management system of the PoA

The management system of the proposed PoA is in accordance with the "Standard for demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities" /23/.

The CME has developed a CME Quality Manual /9/ in accordance to the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities" /23/ that includes the following.

a) A clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies
b) Records of arrangements for training and capacity development for personnel
c) Procedures for technical review of inclusion of CPAs
d) A procedure to avoid double counting
e) Records and documentation control process for each CPA under the PoA
f) Measures for continuous improvements of the PoA management system

It was concluded that the management system of the PoA was acceptable and complied with the requirements of the guidelines.

4.10 Environmental impacts

Environmental impacts are to be assessed at the CPA level for all CPAs in the program.

For the first component project activity (FSCAD001) an Environmental Impact Assessment (EIA) in the form of the Basic Assessment Report for the project activity was completed by company PTERSA. The EIA assessed potential environmental impacts, such as odour, water pollution, soil contamination, land use, socio-economic impacts, cultural/historic impacts and ground water.

The EIA was approved by Gauteng Department of Agriculture and Rural Development on 28 February 2012 /17/.

DNV could determine that no significant environmental impacts are expected from the project activity and that possible impacts were adequately mitigated.

4.11 Local stakeholder consultation

Local stakeholder consultation is a requirement of South African Environmental regulations /56/ and will be conducted for every CPA and not at the PoA level.

DNV considers the local stakeholder consultation carried out adequately for FSCAD001 as part of the EIA regulations. It is also the opinion of the validation team that environmental approval will not be granted in South Africa without adequate local stakeholder consultation.

4.12 Application of selected baseline and monitoring methodology(ies) by each generic CPA

The assessment of the generic CPA's compliance with the applicability criteria of AMS-III.D and/or AMS-I.C (version 18.0 and 19.0 respectively) are documented in detail in section B.2 of Table 2 in the validation protocol in Appendix A to this report.

The following eligibility criteria were applied to ensure that a CPA meets the conditions that ensure that CPAs meet the requirements pertaining to the demonstration of the application of selected baseline and monitoring methodology. As each component activity can differ from other components, the assessment of these applicability criteria is assessed individually for each included CPA:

For methodology AMS-III.D (which is applied in scenarios A and B):

- *This methodology covers project activities involving the replacement or modification of anaerobic animal manure management systems in livestock farms to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane. It also covers treatment of manure collected from several farms in a centralized plant. This methodology is only applicable under the following conditions:*

  (a) The livestock population in the farm is managed under confined conditions;

  (b) Manure or the streams obtained after treatment are not discharged into natural water resources (e.g. river or estuaries), otherwise AMS-III.H "Methane recovery in wastewater treatment" shall be applied;

  (c) The annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5°C;

  (d) In the baseline scenario the retention time of manure waste in the anaerobic treatment system is greater than one month, and in case of anaerobic lagoons in the baseline, their depths are at least 1 m;

  (e) No methane recovery and destruction by flaring, combustion or gainful use takes place in the baseline scenario. It was included in the Project documentation that any CPA would need to comply with the above five conditions /1/.

CPAs that apply methodology AMS-III.D shall involve the replacement or modification of anaerobic AWMS in livestock farms to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane. It also covers treatment of manure collected from several farms in a centralized plant. No greenfield AWMS will be permissible, but all activities will occur on or associated with an existing AWMS activity. The methane capture may be a new component to the AWMS, however this is not a greenfield installation in terms of the CDM glossary of terms /35/. The components were discussed with the management team, specifically the technical manager /66/, the CDM manager /65/ and the senior manager /68/ to ensure there was an acceptable understanding of the requirements and the implementation thereof, this was also checked in the initial proposed component activity in the engineering package /8/.

- *The project activity shall satisfy the following conditions:*

  (a) The residual waste from the animal manure management system shall be handled aerobically, otherwise the related emissions shall be taken into

account as per relevant procedures of AMS-III.AO "Methane recovery through controlled anaerobic digestion". In case of soil application, proper conditions and procedures (not resulting in methane emissions) must be ensured. The components were discussed with the management team, specifically the technical manager /66/, the CDM manager /65/ and the senior manager /68/ to ensure there was an acceptable understanding of the requirements and the implementation thereof, this was also checked in the initial proposed component activity in the engineering package /8/.;

(*b) Technical measures shall be used (including a flare for exigencies) to ensure that all biogas produced by the digester is used or flared*. In accordance with the programme documentation (and emission reduction calculations) & the basic engineering package take into account the need for a flare on the system /1//8/. The components were discussed with the management team, specifically the technical manager /66/, the CDM manager /65/ and the senior manager /68/ to ensure there was an acceptable understanding of the requirements and the implementation thereof, this was also checked in the initial proposed component activity in the engineering package /8/.;

(c) The storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester. If the project proponent can demonstrate that the dry matter content of the manure when removed from the animal barns is larger than 20%, this time constraint will not apply. Storage time will be recorded to ensure compliance to this criteria /1/. The components were discussed with the management team, specifically the technical manager /66/, the CDM manager /65/ and the senior manager /68/ to ensure there was an acceptable understanding of the requirements and the implementation thereof, this was also checked in the initial proposed component activity in the engineering package /8/.

- *Projects that recover methane from landfills shall use AMS-III.G "Landfill methane recovery" and projects for wastewater treatment shall use AMS-III.H. Project for composting of animal manure shall use AMS-III.F "Avoidance of methane emissions through composting". Project activities involving co-digestion of animal manure and other organic matters shall use the methodology AMS-III.AO "Methane recovery through controlled anaerobic digestion*. This will not be applicable in this programme as no landfill recovery is used in the program /1/;
- *Different options to utilise the recovered biogas as detailed in paragraph 3 of AMS-III.H are also eligible for use under this methodology. The respective procedures in AMS-III.H shall be followed in this regard*. Only direct thermal or electrical energy generation systems (as per paragraph 3a of the methodology /26/) will be applicable under this programme /1/;
- *New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the "General Guidelines to SSC CDM methodologies".* Any component activity applying methodology AMS-III.D shall involve the replacement or modification of anaerobic AWMS in livestock farms to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane. No

greenfield AWMS will be permissible, but all activities will occur on or associated with an existing AWMS activity. The methane capture may be a new component to the AWMS /1/. It was confirmed with interviews with Farmsecure management /68/ that any capacity additions are to be of a small scale with increases being typically less than 500 kW electrical equivalent due to the large volume of livestock required and this being unlikely to be available due to the lack of prevailing practice in South Africa /6/;

- *The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the "General Guidelines to SSC CDM methodologies".* This is not applicable as no anaerobic digesters are to be replaced in this programme /1/;
- *Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO_2 equivalent annually from all Type III components of the project activity* – the CPAs are limited to those that fulfil the SSC threshold of 60kt CO_2 equivalent annually /1/,

For methodology AMS-I.C (which is applied in scenarios A and C):

- *This methodology comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.* It was confirmed that the renewable energy technologies will be from renewable biomass from anaerobic digestion by checking the POA-DD /1/ and the basic engineering package for the initial component activity /8/;
- *Biomass-based cogeneration systems are included in this category. For the purpose of this methodology "cogeneration" shall mean the simultaneous generation of thermal energy and electrical energy in one process. Project activities that produce heat and power in separate element processes (for example heat from a boiler and electricity from a biogas engine) do not fit under the definition of cogeneration project*. It was validated by checking that the equipment for the POA /8/ and the initial component activity /16/ were for the co-generation of energy;
- *Emission reductions from a biomass cogeneration system can accrue from one of the following activities:*

  (a) Electricity supply to a grid;

  (b) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for consumption by other facilities;

  (c) Combination of (a) and (b). This will be confirmed for each individual component activity. The initial component activity was checked and discussed with the management team, specifically the technical manager /66/, the CDM manager /65/ and the senior manager /68/ to ensure there was an acceptable understanding of the requirements and the implementation thereof, this was also checked in the initial proposed component activity in the engineering package /8/ and feasibility study /16/.

- *The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities)* – the CPAs are limited to those that fulfil the SSC threshold of 45 MW thermal annually /1/,
- *For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities).* This criteria is not applicable for this programme as no co-firing is to be utilised /1/, and equipment design is for gas fired engines only /8/.
- *The following capacity limits apply for biomass cogeneration units:*
    - *If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant)* – the CPAs are limited to those that fulfil the SSC threshold of 45 MW thermal annually /1/;
    - *If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal* – the CPAs are limited to those that fulfil the SSC threshold of 45 MW thermal annually /1/;
    - *If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW* – the CPAs are limited to those that fulfil the SSC threshold of 15 MW electrical annually /1/;
- *The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6, and should be physically distinct from the existing units*. This was confirmed in the basic engineering package /8/ and feasibility study /16/,
- *Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category* – no retrofits to existing facilities will be allowed in the programme, so this is not applicable /1/;
- *New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the "General Guidelines to SSC CDM methodologies".* The "General guidelines for SSC CDM methodologies" /38/ stipulate the condition that Type II and III greenfield projects and project activities involving capacity additions

may use Type II and Type III small-scale methodologies provided that they can demonstrate that the most plausible baseline scenario for the project activity or PoA is the baseline provided in the respective Type II an Type III small-scale methodology. The "General guidelines for SSC CDM methodologies" does not stipulate this conditions for Type I greenfield projects or for Type I project activities involving capacity addition. For CPAs that apply methodology AMS-III.D /24/ compliance with this condition should be demonstrated, however no greenfield AWMS will be permissible, but all activities will occur on or associated with an existing AWMS activity. For CPAs that only apply methodology AMS-I.C /25/ (Type I small scale methodology), this condition is not applicable,

- *If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation*. Solid biomass fuel will not be used as a feedstock in this program, so it is not applicable /1/;
- *Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions*. Solid biomass fuel will not be used as a feedstock in this program, so it is not applicable /1/;
- *If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions*. In the case where a CPA activity produces both thermal and electrical energy for third party consumption, a contract will be developed to ensure no double counting /9//1/;
- *If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand-alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions*. FSCAD001 is an example of the application of a project activity with no type III methodology /3/ and incremental emissions were accounted for;
- *Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided.* Charcoal biomass fuel will not be used as a feedstock in this program, so it is not applicable /1/;
- Project activity under a Programme of Activities must comply with stipulated conditions – this activity is part of a POA and all required conditions listed were applied with /1/.

4.13 Project boundary of each generic CPA

The identified boundary and selected sources and gases are justified for the generic CPA. Three different project boundary scenarios were presented in the generic CPA. The validation of the generic CPA did not reveal other greenhouse gas emissions occurring within the proposed CPA boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by AMS-III.D and/or AMS-I.C (version 18.0 and 19.0, respectively).

As far as the scenario A is concerned, emissions and sources included in the project boundary are described in the table here below:

	GHGs involved	***Description***
Baseline emissions	CO_2	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity and thermal energy generation from the combustion of fossil fuels.
	CH_4	Emissions from decomposition of manure in AWMS
Project emissions	CO_2	CO_2 emissions from the use of electricity for the operation of the facilities and from the use of fossil fuel for the operation of the facilities.
	CO_2	CO_2 emissions from the incremental transportation of manure to the component project activity.
	CO_2	Emissions from the use of fossil fuel for the operation of the facilities
	CH_4	Emissions from the storage of manure before being fed into the anaerobic digester.
	CH_4	Emissions due to physical leakage of biogas
	CH_4	Emissions from biogas flaring.
	CH_4	Emissions from the disposal/ storage/treatment of residual waste
Leakage	CO_2	CO_2 emissions from emissions from incremental transportation.

As far as the scenario B is concerned, emissions and sources included in the project boundary are described in the table here below:

	GHGs involved	***Description***
Baseline emissions	CH_4	Emissions from decomposition of manure in AWMS
Project emissions	CO_2	CO_2 emissions from the use of electricity for the operation of the facilities and from the use of fossil fuel for the operation of the facilities.
	CO_2	CO_2 emissions from the incremental transportation of manure to the component project activity.
	CO_2	Emissions from the use of fossil fuel for the operation of the facilities
	CH_4	Emissions from the storage of manure before being fed into the anaerobic digester.
	CH_4	Emissions due to physical leakage of biogas
	CH_4	Emissions from biogas flaring.
	CH_4	Emissions from the disposal/ storage/treatment of residual waste
Leakage	CO_2	CO_2 emissions from emissions from incremental transportation.

As far as the scenario C is concerned, emissions and sources included in the project boundary are described in the table here below:

	GHGs involved	***Description***
Baseline emissions	CO_2	CO_2 emissions from electricity consumption.
	CO_2	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity and thermal energy generation from the combustion of fossil fuels.
Project emissions	CO_2	CO_2 emissions from the use of electricity for the operation of the facilities and from the use of fossil fuel for the operation of the facilities.
	CO_2	Emissions from the use of fossil fuel for the operation of the facilities

	CH_4	Emissions from the storage of manure before being fed into the anaerobic digester.
	CH_4	Emissions due to physical leakage of biogas
	CH_4	Emissions from biogas flaring.
	CH_4	Emissions from the disposal/ storage/treatment of residual waste
Leakage	CO_2	CO_2 emissions from emissions from incremental transportation.

4.14 Baseline scenario identification and description for each generic CPA

According to methodology AMS-III.D, the baseline scenario is the situation where, in the absence of the project activity, biomass and other organic matter (including manure where applicable) are left to decay within the project boundary and methane is emitted to the atmosphere. Therefore, the current waste and or manure management practice at each specific CPA corresponding to scenario A and B will be the baseline scenario for that CPA. For methodology AMS-I.C, which is applicable to scenarios A and C, three scenarios were documented, i.e. the fuel consumption of the technologies that would have been used in the absence of the project activity; Electricity is imported from a grid and thermal energy (steam/heat) is produced using fossil fuel; Electricity is imported from a grid and thermal energy (steam/heat) is produced from biomass; the electricity displaced from the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and the fuel consumption of the technologies that would have been used in the absence of the project activity.

The approved baseline methodology has been correctly applied to identify a complete list of realistic and credible baseline scenarios, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

All the assumption and data used by the project participants are listed in the PoA-DD and/or supporting documents. All documentation relevant for establishing the baseline scenario and correctly quoted and interpreted in the PoA-DD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PoA-DD.

4.15 Algorithms and/or formulae used to determine emission reductions of each generic CPA

4.15.1 Explanation of methodological choices

In terms of the two methodologies, baseline emissions are determined as follows:

For methodology AMS-III.D (which is applied in scenarios A and B):

Baseline emissions shall be calculated by using one of the following two options. Once an approach has been chosen for a component activity, it will be consistently applied for the duration of the crediting period:

a) Based on the most recent IPCC tier 2 approach, using equation 1 from methodology AMS-III.D:

$$BE_y = GWP_{CH4} \times D_{CH4} \times UF_b \times \sum_{j,LT} MCF_j \times B_{0,LT} \times N_{LT,y} \times VS_{LT,y} \times MS\%_{Bl,j}$$

b) Based on direct measurement of the quantity of manure treated together with its specific volatile solids (*SVS*) content, using equation 4 from methodology AMS-III.D:

$$BE_y = GWP_{CH4} \times D_{CH4} * UF_b \times \sum_{j,LT} MCF_j \times B_{0,LT} \times Q_{manure,j,LT,y} \times SVS_{j,LT,y}$$

For methodology AMS-I.C (which is applied in scenarios A and C):

Baseline emissions shall be calculated by using one of the following three options, corresponding to three energy scenarios:

a) Project activities that install biogas thermal energy plants that produce renewable thermal energy for on-site consumption or for consumption by other facilities and displace fossil fuel use. These project activities will use equation (2) from methodology AMS-I.C:

$$BE_{thermal,CO2,y} = (EG_{thermal,y}/\eta_{BL,thermal}) \times EF_{FF,CO2}$$

b) Project activities that install biogas cogeneration plants that produce renewable electricity for supply to the grid and/or for captive use and/or renewable thermal energy for on-site consumption or for consumption by other facilities and displace fossil fuel use. These project activities will use the equation (1) from methodology AMS-I.D for electricity baseline emission calculations and equation (2) from methodology AMS-I.C for thermal energy baseline emission calculations.

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

$$BE_{thermal,CO2,y} = (EG_{thermal,y}/\eta_{BL,thermal}) \times EF_{FF,CO2}$$

c) Project activities that involve the addition of renewable energy units (thermal or cogeneration units) at an existing renewable energy production facility. Project activities that involve the addition of renewable thermal energy units will use equations (5), (6) and (7) from methodology AMS-I.C:

$$EG_{thermal,add,y} = EG_{thermal,PJ,y} - EG_{thermal,old,y}$$

$$EG_{thermal,old,y} = MAX(EG_{thermal,actual,y}, EG_{thermal,estimated,y})$$

$$EG_{thermal,old,y} = MAX(EG_{HY,thermal,retrofit,y}, EG_{estimated,thermal,y}) \text{ until } DATE_{BaselineRetrofit}$$

Emission reductions

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y	Emission reductions in year y (tCO_2e/yr)
BE_y	Baseline emissions in year y (tCO_2e/yr)
PE_y	Project emissions in year y (tCO_2e/yr)
LE_y	Leakage emissions in year y (tCO_2e/yr)

Baseline emissions

$$BE_y = (BE_{AMS\text{-}III.D,y}) + BE_{AMS\text{-}I.C,y} \quad \text{(Scenario A)}$$

$$BE_y = BE_{AMS\text{-}III.D,y} \quad \text{(Scenario B)}$$

$$BE_y = BE_{AMS\text{-}I.C,y} \quad \text{(Scenario C)}$$

Where:

$BE_{AMS\text{-}III.D,y}$	Baseline emissions from AWMS (tCO_2e/yr), calculated in section "Baseline emissions – AMS-III.D"
$BE_{AMS\text{-}I.C,y}$	Baseline emissions from renewable thermal energy with or without electricity (tCO_2e/yr), calculated in section "Baseline emissions – AMS-I.C".

The various options involved for the alternative methodological choices and permutations are expounded in the PoA-DD.

Project emissions

Project activity emissions consist of:

$$PE_y = PE_{PL,y} + PE_{flare,y} + PE_{transp,y} + PE_{storage,y} + PE_{reswaste,y} + PE_{FC,i,j,y} + PE_{elec,y}$$

Where:

$PE_{,y}$	Project emissions in year y (tCO_2e/yr)
$PE_{PL,y}$	Emissions due to physical leakage of biogas in year y (tCO_2e/yr)
$PE_{flare,y}$	Emissions from biogas flaring the year y (tCO_2e/yr)
$PE_{transp,y}$	Emissions from incremental transportation in the year y (tCO_2e/yr)
$PE_{storage,y}$	Emissions from the storage of manure before being fed into the anaerobic digester (tCO_2e/yr)

$PE_{reswaste,y}$ In case residual wastes are subjected to anaerobic storage, or disposed in a landfill, methane emissions from storage/disposal of waste (tCO_2e/yr)

$PE_{FF,y}$ Emissions from the use of fossil fuel for the operation of the facilities in the year *y* (tCO_2e/yr)

$PE_{elec,y}$ Emissions from the use of electricity for the operation of the facilities in the year *y* (tCO_2e/yr)

The various options involved for the alternative methodological choices and permutations are expounded in the PoA-DD.

Leakage emissions

Leakage emissions from the renewable energy project activity consist of:

$$LE_y = LE_{FC,j,y} + LE_{transp,y} + LE_{renewable\ biomass,y}$$

Where:

$LE_{FC,j,y}$ Leakage emissions from collection/processing of biomass outside the project boundary during year *y* (tCO_2e/yr).

$LE_{transp,y}$ Leakage emissions from transportation of biomass outside the project boundary during year *y* (tCO_2e/yr).

$LE_{renewable\ biomass,y}$ Leakage emissions from project activities involving renewable biomass during year *y* (tCO_2e/yr).

The various options involved for the alternative methodological choices and permutations are expounded in the PoA-DD

The parameters and algorithms are described completely and accurately in the PoA-DD. They use a conservative approach and fulfill the requirements of the various methodologies applied. There is no evidence of cross effects causing any adverse effects on the emission reductions from the project activity. All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

4.15.2 Parameters determined ex-ante

The following parameters are fixed ex ante in the generic CPAs corresponding to scenario A and B. The following list is exhaustive for scenario B, while for scenario A there are additional parameters that are mentioned separately herebelow:

- Global Warming Potential (GWP) of methane – obtained from IPCC /57/ default value of 21 used
- Maximum methane producing potential of the volatile solid generated for animal type "*LT*" – obtained from IPCC /57/ default values – dependent on the animal type, a table of values is presented in the POA-DD /1/

- Annual methane conversion factor for the baseline animal waste management system *j*, stage 1 — obtained from IPCC /57/ default values – tabulated and determined in accordance with the specific AWMS
- Annual methane conversion factor for the baseline animal waste management system *j*, stage 2 — obtained from IPCC /57/ default values – tabulated and determined in accordance with the specific AWMS
- Fraction of manure handled in stage 1 of the baseline manure management system *j* – *obtained from AWMS baseline information, specific to the system* – tabulated and determined in accordance with the specific AWMS
- Fraction of manure handled in stage 2 of the baseline manure management system *j* – *obtained from AWMS baseline information, specific to the system* – tabulated and determined in accordance with the specific AWMS
- Density of the methane – obtained from IPCC /57/ default value of 0.00067 is applied
- Model correction factor to account for model uncertainties – obtained from and cross checked in the IPCC guidelines, specifically for methodology AMS-III.D /57/ default value of 0.94 is applied
- Default average animal weight of a defined population – obtained from IPCC /57/ default values – tabulated and determined in accordance with the specific AWMS
- Volatile solids for livestock "LT" entering the animal manure management system in year *y* (on a dry matter weight basis, kg dm/animal/year) – obtained from IPCC /57/ default values – tabulated and determined in accordance with the specific AWMSCO_2 emission factor of the grid in year – calculated using the Tool to calculate emission factor for an electricity system /42/ and South African grid specific information in the spreadsheet /14/ - 0.9 tCO_2e/MWh appliedDegradation rate constant – obtained from IPCC specifically for methodology AMS-III.D /57/ default value of 0.069 applied
- Annual methane conversion factor for the project manure storage device *l* – obtained from IPCC /57/ default values
- Model correction factor to account for model uncertainties when residual waste is removed from digesters for placement in landfill – obtained from IPCC /57/ default value of 0.9 applied from "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site"
- Oxidation factor of the project SWDS (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) – obtained from IPCC /57/ default values
- Fraction of methane in the SWDS gas (volume fraction) – obtained from IPCC /57/ default value of 0.5 applied
- Fraction of degradable organic carbon (DOC) that can decompose – obtained from IPCC /57/ default value of 0.5 applied
- Methane correction factor of the project SWDS – obtained from IPCC /57/ default values
- Fraction of degradable organic carbon (by weight) in the residual waste – obtained from IPCC /57/ default values
- Decay rate for residual waste – obtained from IPCC /57/ default values

Additionally to the above parameres, the following parameters are fixed ex ante in the generic CPA corresponding to scenario A only:

- Installed capacity of the power plant – Obtained from CPA specific design data such as basic engineering package for FSCAD001 /8/
- Captive power – Obtained from CPA specific design data such as basic engineering package for FSCAD001 /8/
- Installed capacity of the thermal plant – Obtained from CPA specific design data such as basic engineering package for FSCAD001 /8/
- Plant availability – Obtained from CPA specific design data such as basic engineering package for FSCAD001 /8/
- Estimated net electrical energy that would have been produced by the existing units under the observed availability of the renewable resource in year *y – this is estimated from the manufacturers specifications*
- Date at which the existing generation facility is likely to be replaced or retrofitted in the absence of the CDM project activity – determined from the Tool to determine the remaining lifetime of equipment /41/
- The estimated thermal energy that would have been produced by the existing units under the observed availability of the renewable resource for year *y – this is estimated from the manufacturers specifications*
- Average of historical thermal energy levels delivered by the existing facility, spanning all data from the most recent available year (or month, week or other time period) to the time at which the facility was constructed, retrofitted, or modified in a manner that significantly affected output (i.e. by 5% or more) – obtained as an estimate from historical plant records
- Estimated thermal energy that would have been produced by the existing units under the observed availability of renewable resources in year *y – estimated for each CPA*
- Efficiency of the plant using fossil fuel that would have been used in the absence of the project activity – calculated in accordance with methodology AMS-I.C /25/ using plant specific design
- The CO_2 emission factor of the fossil fuel that would have been used in the baseline plant – as per the methodology, and if not available, then the IPCC default is used /57/
- Global Warming Potential for N_2O – obtained from IPCC /57/ default value of 310 applied
- Emission Factor for emissions from N inputs – obtained from IPCC /57/ default value of 1% applied
- ton N_2O/ton N – obtained from molecular weight ratio (44/28) is value applied
- Fraction that volatilises as NH_3 and NO_x for synthetic fertilizers – obtained from IPCC /57/ default value (10% volatilises as NO_x and 20% as NH_3) applied
- Fraction that volatilises as NH_3 and NO_x for organic fertilizers – obtained from IPCC /57/ default value (10% volatilises as NO_x and 20% as NH_3) applied

- Demonstration that the biomass residue type k from a specific source would continue not to be collected or utilized, e.g. by an assessment whether a market has emerged for that type of biomass residue (if yes, leakage is assumed not be ruled out) or by showing that it would still not be feasible to utilize the biomass residues for any purposes – obtained from the site where the biomass is generated and applicable if approach L_1 is used to rule out leakage.
- Quantity of available biomass residues of type *k* or *m* in the region – obtained from surveys or statistics from the defined geographical region. Monitoring of this parameter is applicable if approach L_2 is used to rule out leakage or if approach L_4 is used in combination with approach L_2 to rule out leakage for the substituted biomass residue type *m*.
- Quantity of available biomass residues of type *k* or *m* that are utilized in the defined geographical region – obtained from surveys or statistics from the defined geographical region. Monitoring of this parameter is applicable if approach L_2 is used to rule out leakage or if approach L_4 is used in combination with approach L_2 to rule out leakage for the substituted biomass residue type *m*.
- CO_2 emission factor of the most carbon intensive fuel used in the country. Identify the most carbon intensive fuel type from the national communication, other literature sources (e.g. IEA). Possibly consult with the national agency responsible for the national communication / GHG inventory. If available, use national default values for the CO_2 emission factor. Otherwise, IPCC default values may be used /57/.

The following parameters are fixed ex ante in the generic CPA corresponding to scenario C:

- Installed capacity of the power plant – Obtained from CPA specific design data such as basic engineering package for FSCAD001 /8/
- Captive power – Obtained from CPA specific design data such as basic engineering package for FSCAD001 /8/
- Installed capacity of the thermal plant – Obtained from CPA specific design data such as basic engineering package for FSCAD001 /8/
- Plant availability – Obtained from CPA specific design data such as basic engineering package for FSCAD001 /8/
- CO_2 emission factor of the grid in year – calculated using the Tool to calculate emission factor for an electricity system /42/ and South African grid specific information in the spreadsheet /14/ - 0.9 tCO_2e/MWh applied
- Estimated net electrical energy that would have been produced by the existing units under the observed availability of the renewable resource in year *y* – *this is estimated from the manufacturers specifications*
- Date at which the existing generation facility is likely to be replaced or retrofitted in the absence of the CDM project activity – determined from the Tool to determine the remaining lifetime of equipment /41/
- The estimated thermal energy that would have been produced by the existing units under the observed availability of the renewable resource for year *y* – *this is estimated from the manufacturers specifications*

- Average of historical thermal energy levels delivered by the existing facility, spanning all data from the most recent available year (or month, week or other time period) to the time at which the facility was constructed, retrofitted, or modified in a manner that significantly affected output (i.e. by 5% or more) – obtained as an estimate from historical plant records
- Estimated thermal energy that would have been produced by the existing units under the observed availability of renewable resources in year *y – estimated for each CPA*
- Efficiency of the plant using fossil fuel that would have been used in the absence of the project activity – calculated in accordance with methodology AMS-I.C /25/ using plant specific design
- The CO_2 emission factor of the fossil fuel that would have been used in the baseline plant – as per the methodology, and if not available, then the IPCC default is used /57/
- Degradation rate constant – obtained from IPCC specifically for methodology AMS-III.D /57/ default value of 0.069 applied
- Annual methane conversion factor for the project manure storage device *l* – obtained from IPCC /57/ default values
- Model correction factor to account for model uncertainties when residual waste is removed from digesters for placement in landfill – obtained from IPCC /57/ default value of 0.9 applied from "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site"
- The following parameters have been determined *ex-ante* and verified by DNV.Global Warming Potential (GWP) of methane – obtained from IPCC /57/ default value of 21 used
- Oxidation factor of the project SWDS (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) – obtained from IPCC /57/ default values
- Fraction of methane in the SWDS gas (volume fraction) – obtained from IPCC /57/ default value of 0.5 applied
- Fraction of degradable organic carbon (DOC) that can decompose – obtained from IPCC /57/ default value of 0.5 applied
- Methane correction factor of the project SWDS – obtained from IPCC /57/ default values
- Fraction of degradable organic carbon (by weight) in the residual waste – obtained from IPCC /57/ default values
- Decay rate for residual waste – obtained from IPCC /57/ default values
- Global Warming Potential for N_2O – obtained from IPCC /57/ default value of 310 applied
- Emission Factor for emissions from N inputs – obtained from IPCC /57/ default value of 1% applied
- ton N_2O/ton N – obtained from molecular weight ratio (44/28) is value applied
- Fraction that volatilises as NH_3 and NO_x for synthetic fertilizers – obtained from IPCC /57/ default value (10% volatilises as NO_x and 20% as NH_3) applied

- Fraction that volatilises as NH_3 and NO_x for organic fertilizers – obtained from IPCC /57/ default value (10% volatilises as NO_x and 20% as NH_3) applied
- Demonstration that the biomass residue type k from a specific source would continue not to be collected or utilized, e.g. by an assessment whether a market has emerged for that type of biomass residue (if yes, leakage is assumed not be ruled out) or by showing that it would still not be feasible to utilize the biomass residues for any purposes – obtained from the site where the biomass is generated and applicable if approach L_1 is used to rule out leakage.
- Quantity of available biomass residues of type *k* or *m* in the region – obtained from surveys or statistics from the defined geographical region. Monitoring of this parameter is applicable if approach L_2 is used to rule out leakage or if approach L_4 is used in combination with approach L_2 to rule out leakage for the substituted biomass residue type *m*.
- Quantity of available biomass residues of type *k* or *m* that are utilized in the defined geographical region – obtained from surveys or statistics from the defined geographical region. Monitoring of this parameter is applicable if approach L_2 is used to rule out leakage or if approach L_4 is used in combination with approach L_2 to rule out leakage for the substituted biomass residue type *m*.
- CO_2 emission factor of the most carbon intensive fuel used in the country. Identify the most carbon intensive fuel type from the national communication, other literature sources (e.g. IEA). Possibly consult with the national agency responsible for the national communication / GHG inventory. If available, use national default values for the CO_2 emission factor. Otherwise, IPCC default values may be used /57/.

The baseline emission factor is determined *ex ante* according to the methodological tool "Tool to calculate emission factor for an electricity system" Version 02.2.1 /42/ as the weighted average of OM and BM. The weights of OM and BM are selected for the crediting period as 0.5 and 0.5 respectively and as required by the methodological tool.

The OM was determined using the simple OM calculation (option a) approach. Its applicability as per the "Tool to calculate emission factor for an electricity system" /42/ was confirmed as the power generation by low-cost/must-run power plants in the period 2008-2011 account for 0% of the total power generation. Option (a) of the "Tool to calculate emission factor for an electricity system" /42/ was chosen for the calculation of the OM. The data used in OM calculations are for the 3 year period of 1 April 2008 – 31 March 2011. The fuel used for coal power stations is other bituminous coal. In *"Eskom Fact Sheet – Formation of Coal" /*60*/* it is stated that coal in South Africa is "mostly classified as 'bituminous' coals". Spalding-Fecher /61/ also specifies the use of "other bituminous coal" as the fuel used in the Eskom power stations. The NCV and EF values for the various fuel types were sourced from the IPCC guidelines /57/ and it was checked that the Lower limits of the 95% confidence intervals were used as per the tool /42/. These tables were included in the spreadsheet for the calculation of the grid emission factor /14/.

The BM was determined considering the Option 1 of the "Tool to calculate emission factor for an electricity system" /42/. The only two power stations that are included in the build margin are Majuba (1996) and Kendal (1988). There is no power generation data available for power units registered in the CDM, therefore these could not be included. Majuba and Kendal

comprises 23% of generation. The sample group of power units m used to calculate the build margin is the resulting set **SETsample-CDM->10yrs**.

For the determination of the OM and BM the project participant has used the latest 3 years of data; this is a vintage of 2008/2009, 2009/2010, 2010/2011 which DNV confirmed to be the latest available data at the time of the publication of the PDD for stakeholder comments (6 March 2012) through publicly available date from ESKOM /59/.

Using the above references the OM equals 0.92 tCO_2e/MWh while the BM equals to 0.87 tCO_2e/MWh. Therefore, the CM would be equal to 0.9 tCO_2e/MWh.

DNV confirms that the data used are acceptable and the combined margin grid emission factor of the South African national grid has been calculated in an accurate manner.

4.16 Monitoring plan

The monitoring plan is in compliance with the monitoring methodology AMS-III.D and/or AMS-I.C (version 18.0 and 19.0, respectively). The monitoring plan will give opportunity for real measurements of achieved emission reductions. The application of the monitoring methodology is transparent and DNV considers the project participants able to implement the monitoring plan.

It is DNV's opinion, that the project participants are able to implement the monitoring plan.

4.16.1 Parameters monitored ex-post by each generic CPA

The following data and parameters need to be monitored in the generic CPAs corresponding to scenario A and B; these are considered appropriate.

- Number of days in year *y* that the treatment plant was operational – from farm operational records. It was checked by DNV during interviews with the CME management both from a technological /66/ and CDM /65/ perspective whether the monitoring would be possible.
- Annual average number of animals of type "*LT*" in year *y* – from farm operational records. It was checked by DNV during interviews with the CME management both from a technological /66/ and CDM /65/ perspective whether the monitoring would be possible.
- Number of days animals are alive in the farm in the year – from farm operational records. It was checked by DNV during interviews with the CME management both from a technological /66/ and CDM /65/ perspective whether the monitoring would be possible.
- Number of animals produced/bought annually of type *LT* for the year *y* – from farm operational records. It was checked by DNV during interviews with the CME management both from a technological /66/ and CDM /65/ perspective whether the monitoring would be possible.
- Average animal weight of a defined livestock population at the project site – from farm operational records. It was checked by DNV during interviews with the CME management both from a technological /66/ and CDM /65/ perspective whether the monitoring would be possible.
- Daily average gross energy intake – from farm operational records. It was checked by DNV during interviews with the CME management both from a technological /66/ and CDM /65/ perspective whether the monitoring would be possible.

- Digestible energy of the feed in present – from IPCC default value /57/ or from the feed supplier.
- Fraction of GE – specific to each CPA and obtained from the urinary energy which is expressed as a fraction of the gross energy intake.
- Fraction of the dry matter feed intake – from IPCC default value /57/, this will vary depending on the specifics of the component activity, but is covered in volume 4, Chapter 10 of the IPCC documentation /57/.
- Energy density of the feed in MJ/kg fed to livestock type LT – from IPCC default value /57/, IPCC notes the energy density of feed, ED, is typically 18.45 MJ/kg DM, which is relatively constant across a wide variety of grain-based feeds. The project proponent will record the composition of the feed to enable the DOE to verify the energy density of the feed.
- Quantity of manure treated from livestock type *LT* and animal manure management system *j* – measured as part of operational management using either mass or volume based measurements depending on the component activity. This will be specified in the specific CPA monitoring plan as confirmed by the CME Technology Manager /66/.
- Specific volatile solids content of animal manure from livestock type *LT* and animal manure management system *j* in year *y* – measured at accredited laboratories annually as confirmed by the CME Technology Manager /66/.
- *Genetic source* – *r*ecorded as part of operational management for CPA farm records /66/.
- Formulated feed rations (*FFR*) which are optimized for the various animal(s), stage of growth, category, weight gain/productivity and/or genetics – measured as part of operational management
- *Soil application* – recorded as part of operational management, if applicable, to confirm that there would be no resultant methane emission from residual waste. This will be an exception in component project activity and will be monitored by the CME Technology Manager /66/.
- *Site inspections* – recorded as part of operational management by the CME management /66/ to ensure the project boundary for each component activity is checked and recorded.
- Biogas flow to the flare, the electricity generation system or the thermal energy generation system – measured continuously by flow meters, this will be normalised with the temperature and pressure measurements for the conditions under which the gas is combusted.
- Temperature of the biogas at the flow measurement site – measured continuously by instrumentation in order to normalise the flow rate of the biogas.
- Biogas pressure – measured continuously by pressure gauge in order to normalise the flow rate of the biogas.
- Fraction of Methane in the biogas in year *y* – measured continuously by gas analyser. The methodology /25/ also allows for the use of a default value of 60% if the gas

analysers were not operational. Continuous monitoring, integrated hourly and at least monthly recording.

- Temperature in the exhaust gas of the flare – measured continuously by temperature gauge and dependent on flare type employed in the component activity. This is measured to ensure that 90% of the biogas is combusted in an enclosed flare system.
- Volumetric flow rate of the residual gas in dry basis at normal conditions in hour h – measured using flow meters as confirmed by the CME Technology Manager /66/.
- Flare efficiency in hour *h* – default values from the tool /44/ of 50% for open flares and 90% for enclosed flares (or 0% if the temperature is below 500°C for more than 20 minutes on the temperature gauge) are applied
- Quantity of raw manure or digester residual waste transported in the year y – use mass or volume based measurements consistently applied in CPA and will be recorded as part of the specific component activity monitoring plan as confirmed by the CME Technology Manager /66/.
- Average truck capacity for manure or digester waste transportation– as per operational records for each truck which will be aggregated on a monthly basis.
- Incremental distance for manure or digester residual waste transportation – as per operational records for each truck
- Vehicle fuel consumption in litres per kilometre – as per operational records for each truck or from the IPCC default values /57/ if these are not available.
- Fuel density – from fuel supplier or oil company depending on the fuel type used
- Net calorific value of the fuel used for transport inside the project boundary in year *y* – *from fuel supplier, otherwise a default value*
- Emission factor of the fuel for transport inside the project boundary – from fuel supplier, otherwise a default value /57/ if these are not available.
- Fraction of volatile solids handled by storage device *l* – measured on site using either volume or mass based measurements depending on the component activity and configuration from Operational records
- Annual average interval between manure collection and delivery for treatment at a given storage – recorded in days from Operational records
- Fraction of methane captured at the project SWDS and flared, combusted or used in another manner – from Operational records at CPA and SWDS, this is for the component activity when the residual digester waste is sent to landfill.
- Total amount of residual disposed of in SWDS in year x – from Operational records at CPA and SWDS, this is for the component activity when the residual digester waste is sent to landfill.
- Quantity of fossil fuel type *i* combusted in process *j* inside the project boundary in year *y* – as part of methodology AMS-III.D /24/, values from onsite operational measurements using either mass meters or volume meters and operational records aggregated monthly
- Weighted average net calorific value of the fossil fuel type *i* combusted inside the project boundary in year *y* – as part of methodology AMS-III.D /24/, values from fuel supplier, otherwise a default value /57/ if these are not available.

- CO_2 emission factor of fossil fuel type *i* combusted inside the project boundary – as part of methodology AMS-III.D /24/, values from fuel supplier, otherwise a default value/57/ if these are not available.
- Quantity of electricity consumed in the project boundary in year *y* – measured by an electricity gauge on the electrical generating equipment This will be specified in the specific CPA monitoring plan as confirmed by the CME Technology Manager /66/.

The following data and parameters need to be monitored in the generic CPA corresponding to scenario A only:

- Net quantity of thermal energy supplied by the project activity during the year *y* – calculated as per AMS-I.C /25/. Continuous monitoring, aggregated annually.
- Total actual thermal energy produced in year *y* by all units, existing and new project units – calculated as per AMS-I.C /25/. Continuous monitoring, aggregated annually.
- The actual, measured thermal energy production of the existing units in year *y* – calculated as per AMS-I.C /25/. Continuous monitoring, aggregated annually.
- Quantity of hot air – measured continuously by flow meter in m^3/yr
- Quantity of steam – measured continuously by flow meter in m^3/yr
- Temperature of the steam or hot fluid and/or gases generated by the heat generation equipment – measured by a temperature gauge in the case of a thermal energy component activity
- Pressure of the steam or hot fluid and/or gases generated by the heat generation equipment – measured by a pressure gauge in the case of a thermal energy component activity
- The amount of net renewable electricity supplied to the grid or displaced from the grid as a result of the implementation of the CDM project activity in year *y* – measured by an electricity gauge on the electrical generating equipment. This will be specified in the specific CPA monitoring plan as confirmed by the CME Technology Manager /66/.
- The total net electrical energy supplied to a grid or displaced from the grid in year *y* by all units, existing and new project units – measured by an electricity gauge on the electrical generating equipment. This will be specified in the specific CPA monitoring plan as confirmed by the CME Technology Manager /66/.
- The actual, measured net electrical energy supplied to the grid or displaced from the grid by the existing units in year *y* – measured by an electricity gauge on the electrical generating equipment. This will be specified in the specific CPA monitoring plan as confirmed by the CME Technology Manager /66/.
- Quantity of biomass type k consumed in year y – this will be measured as part of the component activity monitoring plan as confirmed by the CME Technology Manager /66/ using either mass or volume based measurements on site.
- Moisture content of the biomass type *k* – measured as percentage water by taking samples and testing to relevant standards using calibrated equipment as confirmed by the CME Technology Manager /66/.

- Volatile solid content of the biomass type k consumed in year y – Measured quarterly at accredited laboratories as confirmed by the CME Technology Manager /66/.
- Quantity of fossil fuel type *c* combusted in process *j* outside the project boundary in year *y* – as part of methodology AMS-III.D /24/, values from using either mass meters or volume meters and operational records aggregated monthly
- Weighted average net calorific value of the fossil fuel type *c* combusted outside the project boundary in year *y* – as part of methodology AMS-III.D /24/, values from fuel supplier, otherwise a default value /57/ if these are not available.
- CO_2 emission factor of fossil fuel type *c* combusted outside the project boundary – as part of methodology AMS-III.D /24/, values from fuel supplier, otherwise a default value /57/ if these are not available.
- Quantity of biomass transported outside the project boundary in the year *y* – as part of methodology AMS-I.C /25/ using either mass meters or volume meters and operational records aggregated monthly Average truck capacity for transportation outside the project boundary– as part of methodology AMS-I.C /25/ to determine leakage as per operational records for each truck
- Average truck capacity for transportation outside the project boundary in year *y* – as part of methodology AMS-I.C /25/ to determine leakage as per operational records for each truck
- Average incremental distance for biomass transportation outside the project boundary – as part of methodology AMS-I.C /25/ to determine leakage as per operational records for each truck
- Vehicle fuel consumption in litres per kilometre – as part of methodology AMS-I.C /25/ to determine leakage as per operational records for each truck
- Fuel density – as part of methodology AMS-I.C /25/ to determine leakage from fuel supplier
- Net calorific value of the fuel used for transport outside the project boundary in year *y* – as part of methodology AMS-I.C /25/ to determine leakage from fuel supplier, otherwise a default value
- CO_2 emission factor of the fuel for transport outside the project boundary – as part of methodology AMS-I.C /25/ to determine leakage, values obtained from fuel supplier, otherwise a default value
- Mass of synthetic fertilizer type i applied – Operational records
- Mass of organic fertilizer type j applied – Operational records
- Nitrogen content of synthetic fertilizer type i applied – supplier information
- Nitrogen content of organic fertilizer type j applied – supplier information

The following data and parameters need to be monitored in the generic CPA corresponding to scenario C:

- Biogas flow to the flare, the electricity generation system or the thermal energy generation system – measured continuously by flow meters, this will be normalised

with the temperature and pressure measurements for the conditions under which the gas is combusted.

- Temperature of the biogas at the flow measurement site – measured continuously by instrumentation in order to normalise the flow rate of the biogas.
- Biogas pressure – measured continuously by pressure gauge in order to normalise the flow rate of the biogas.
- Fraction of Methane in the biogas in year *y* – measured continuously by gas analyser. The methodology /25/ also allows for the use of a default value of 60% if the gas analysers were not operational. Continuous monitoring, integrated hourly and at least monthly recording.
- Net quantity of thermal energy supplied by the project activity during the year *y* – calculated as per AMS-I.C /25/. Continuous monitoring, aggregated annually.
- Total actual thermal energy produced in year *y* by all units, existing and new project units – calculated as per AMS-I.C /25/. Continuous monitoring, aggregated annually.
- The actual, measured thermal energy production of the existing units in year *y* – calculated as per AMS-I.C /25/. Continuous monitoring, aggregated annually.
- Quantity of hot air – measured continuously by flow meter in m^3/yr
- Quantity of steam – measured continuously by flow meter in m^3/yr
- Temperature of the steam or hot fluid and/or gases generated by the heat generation equipment – measured by a temperature gauge in the case of a thermal energy component activity
- Pressure of the steam or hot fluid and/or gases generated by the heat generation equipment – measured by a pressure gauge in the case of a thermal energy component activity
- The amount of net renewable electricity supplied to the grid or displaced from the grid as a result of the implementation of the CDM project activity in year *y* – measured by an electricity gauge on the electrical generating equipment. This will be specified in the specific CPA monitoring plan as confirmed by the CME Technology Manager /66/.
- The total net electrical energy supplied to a grid or displaced from the grid in year *y* by all units, existing and new project units – measured by an electricity gauge on the electrical generating equipment. This will be specified in the specific CPA monitoring plan as confirmed by the CME Technology Manager /66/.
- The actual, measured net electrical energy supplied to the grid or displaced from the grid by the existing units in year *y* – measured by an electricity gauge on the electrical generating equipment. This will be specified in the specific CPA monitoring plan as confirmed by the CME Technology Manager /66/.
- Quantity of electricity consumed in the project boundary in year *y* – measured by an electricity gauge on the electrical generating equipment This will be specified in the specific CPA monitoring plan as confirmed by the CME Technology Manager /66/.
- Quantity of biomass type k consumed in year y – this will be measured as part of the component activity monitoring plan as confirmed by the CME Technology Manager /66/ using either mass or volume based measurements on site.

- Moisture content of the biomass type *k* – measured as percentage water by taking samples and testing to relevant standards using calibrated equipment as confirmed by the CME Technology Manager /66/.
- Volatile solid content of the biomass type k consumed in year y – Measured quarterly at accredited laboratories as confirmed by the CME Technology Manager /66/.
- Temperature in the exhaust gas of the flare – measured continuously by temperature gauge and dependent on flare type employed in the component activity. This is measured to ensure that 90% of the biogas is combusted in an enclosed flare system.
- Volumetric flow rate of the residual gas in dry basis at normal conditions in hour h – measured using flow meters as confirmed by the CME Technology Manager /66/.
- Flare efficiency in hour *h* – default values from the tool /44/ of 50% for open flares and 90% for enclosed flares (or 0% if the temperature is below 500°C for more than 20 minutes on the temperature gauge) are applied
- Fraction of volatile solids handled by storage device *l* – measured on site using either volume or mass based measurements depending on the component activity and configuration from Operational records
- Annual average interval between manure collection and delivery for treatment at a given storage – recorded in days from Operational records
- Fraction of methane captured at the project SWDS and flared, combusted or used in another manner – from Operational records at CPA and SWDS, this is for the component activity when the residual digester waste is sent to landfill.
- Total amount of residual disposed of in SWDS in year x – from Operational records at CPA and SWDS, this is for the component activity when the residual digester waste is sent to landfill.
- *Soil application* – recorded as part of operational management, if applicable, to confirm that there would be no resultant methane emission from residual waste. This will be an exception in component project activity and will be monitored by the CME Technology Manager /66/.
- Quantity of fossil fuel type *i* combusted in process *j* inside the project boundary in year *y* – as part of methodology AMS-III.D /24/, values from onsite operational measurements using either mass meters or volume meters and operational records aggregated monthly
- Weighted average net calorific value of the fossil fuel type *i* combusted inside the project boundary in year *y* – as part of methodology AMS-III.D /24/, values from fuel supplier, otherwise a default value/57/ if these are not available.
- CO_2 emission factor of fossil fuel type *i* combusted inside the project boundary – as part of methodology AMS-III.D /24/, values from fuel supplier, otherwise a default value/57/ if these are not available.
- Quantity of fossil fuel type *c* combusted in process *j* outside the project boundary in year *y* – as part of methodology AMS-III.D /24/, values from using either mass meters or volume meters and operational records aggregated monthly

- Weighted average net calorific value of the fossil fuel type *c* combusted outside the project boundary in year *y* – as part of methodology AMS-III.D /24/, values from fuel supplier, otherwise a default value/57/ if these are not available.
- CO_2 emission factor of fossil fuel type *c* combusted outside the project boundary – as part of methodology AMS-III.D /24/, values from fuel supplier, otherwise a default value/57/ if these are not available.
- Quantity of biomass transported outside the project boundary in the year *y* – as part of methodology AMS-I.C /25/ using either mass meters or volume meters and operational records aggregated monthly Average truck capacity for transportation outside the project boundary– as part of methodology AMS-I.C /25/ to determine leakage as per operational records for each truck
- Average truck capacity for transportation outside the project boundary in year *y* – as part of methodology AMS-I.C /25/ to determine leakage as per operational records for each truck
- Average incremental distance for biomass transportation outside the project boundary – as part of methodology AMS-I.C /25/ to determine leakage as per operational records for each truck
- Vehicle fuel consumption in litres per kilometre – as part of methodology AMS-I.C /25/ to determine leakage as per operational records for each truck
- Fuel density – as part of methodology AMS-I.C /25/ to determine leakage from fuel supplier
- Net calorific value of the fuel used for transport outside the project boundary in year *y* – as part of methodology AMS-I.C /25/ to determine leakage from fuel supplier, otherwise a default value
- CO_2 emission factor of the fuel for transport outside the project boundary – as part of methodology AMS-I.C /25/ to determine leakage, values obtained from fuel supplier, otherwise a default value
- Mass of synthetic fertilizer type i applied – Operational records
- Mass of organic fertilizer type j applied – Operational records
- Nitrogen content of synthetic fertilizer type i applied – supplier information
- Nitrogen content of organic fertilizer type j applied – supplier information

4.16.2 Management system and quality assurance

The monitoring parameters proposed are consistent to the approved methodology AMS-III.D and/or AMS-I.C, version 18.0 and 19.0 /24/ /25/ respectively, and details data to be collected, the recording frequency, proportion and control forms are described and deemed appropriate.

A senior manager from the CME has been assigned to be responsible for the monitoring of all component activities in the CME Quality Manual /9/. The manager is also the Technology Manager who is responsible for the operational and maintenance management of the component activities under the program. A CDM Manager will oversee the monitoring data and preparation of any reports on the monitoring as a check. Interviews were held with the management team, including the CME business manager who is ultimately responsible for the CME and the personnel involved in the CME and its implementation /65//66//68/.

The electric power generated by the project will be measured with energy meters (Facility Metering configuration owned by Project owner).

A CME Quality Manual /9/ has been documented and covers all relevant sections of the management system for monitoring, including training, quality assurance (which also encompassed calibrations). The CME Quality Manual /9/ includes a corrective and preventative action system to monitor any non-conformances and suggestions for improvement that will be fed to the CME Business Manager and the management team through a management review system to ensure continuous improvement. All data recorded and collected will be archived electronically for a period of at least two years after the crediting period is over in accordance with paragraph 56 (b) of the Project Standard /22/.

A monitoring system will be implemented in order to ensure that the real, measurable and long-term GHG emission reductions for the proposed project activity are monitored and reported.

The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions. The application of the monitoring methodology is transparent and DNV considers the project participants able to implement the monitoring plan.

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APPENDIX A

POA AND GENERIC CPA VALIDATION PROTOCOL

Table 1 Mandatory requirements for 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. 3.	Kyoto Protocol Art.12.2	OK
2. The programme shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The programme 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	OK
4. The programme 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	OK
5. In case public funding from Parties included in Annex I is used for the programme, 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	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
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	OK
About Design of Programme		

Requirement	Reference	Conclusion
10. The CDM-PoA-DD sets a framework for the implementation of the PoA and defines unambiguously a CPA under the PoA.	PoA Procedures § 6	OK
11. The coordinating/managing entity shall be identified.	PoA Procedures § 6 (a)	OK
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 § 6 (b)	OK
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 each CPA in order to ensure its eligibility.	PoA Procedures § 6 (g)	OK
14. The length of the PoA is not exceeding 28 years.	PoA Procedures § 6 (h)	OK
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 of 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 § 6 (i)	OK
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 § 6 (k)	OK
About small-scale project activities		
17. The proposed project activity shall meet the eligibility criteria for small scale	Simplified Modalities and Procedures	OK

Requirement	Reference	Conclusion
CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity.	for Small Scale CDM Project Activities §12a,c	
18. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK
19. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK
About additionality		
20. 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 § 6 (e)	OK
21. It is demonstrated for the PoA and generic CPA that in the absence of CDM, none of the implemented CPAs would occur	PoA Standard § 7	OK
22. Additionality of a typical CPA is demonstrated through eligibility criteria for inclusion in the PoA.	PoA Procedures § 7 (g)	OK
About application of baseline and monitoring methodology		
23. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
24. 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	OK
25. The baseline methodology shall exclude to earn CERs for decreases in activity	CDM Modalities and Procedures §47	OK

Requirement	Reference	Conclusion
levels outside the project activity or due to force majeure.		
26. 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 § 6 (j)	OK
27. 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	OK
About forecast emission reductions		
28. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
About environmental impacts		
29. Documentation on the analysis of the environmental impacts of the programme activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the programme 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	☐ Analysis at PoA level ☒ Analysis at CPA level
About stakeholder comments		
30. 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	☐ Analysis at PoA level ☒ Analysis at CPA level
31. 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	OK

Requirement	Reference	Conclusion
Other		
32. The project design document shall be in conformance with the CDM-PoA-DD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK

Table 2 Requirements checklist

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
PART I. Programme of activities (PoA)					
A General description of project activity					
A.1 Title of the PoA (PS § 31, VVS § 62-63)					
A.1.1 Does section A.1 of the PoA-DD include a clearly identifiable project title, version number of the PoA-DD and date of the PoA-DD?	/1/	DR	☒ Clearly identifiable title of the project activity ☒ Version number of the PoA-DD is included ☒ Date of the PoA-DD is included.		OK
A.1.2 Is the PoA-DD is in accordance with the applicable requirements for completing PoA-DD?	/1/	DR	☒ Yes If no, list where the PoA-DD is not in accordance:		OK
A.2 Description of the PoA (VVS § 64-69, (PS § 138, VVS § 189 and VVS § 150-157 for small-scale project activities, as applicable)					
A.2.1 How was the design of the PoA assessed?	/1/	DR	What type is the project? ☐ Project in existing facility or utilizing existing equipment(s) ☐ Project is either a large scale project or a small scale project with emission reductions exceeding 15 000 tCO_2e per year. In this case, a site visit must be performed. ☐ Project is a bundled small scale project, with each project in the bundle with emission reductions not exceeding 15,000 tCO_2e per year. In such case the number of physical site visits may be based on sampling, if the sampling size is appropriately justified through statistical		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				analysis. ☒ The project is an individual small scale project activity with emission reductions not exceeding 15 000 tCO_2e per year. In this case, DOE may not conduct a physical site visit as appropriate. ☒ Greenfield project How was the design of the project assessed? ☒ Physical site inspection ☒ Reviewing available designs and feasibility studies If a physical site inspection is not undertaken, justify why no site visit was undertaken: A site inspection was undertaken of the CME offices and the site of FSCAD001, Manjoh Ranch, to confirm that there were existing feedlot activities and that no AD AWMS was in place.		
A.2.2	If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/	DR	The proposed project activity was still at Engineering Design stage during the site inspection with a engineering design document and probable equipment supplier.		OK
A.2.3	If physical site visits were performed based on sampling (only applicable for bundled small scale projects, each with emission reductions not exceeding 15 000 tCO2e per year), justify the sampling through a statistical analysis:	/1/	DR	Not applicable as this was a SSC PoA and the only CPA was visited.		OK
A.2.4	Does the PoA-DD and generic CPA-DD describe the framework for the implementation of the proposed CDM PoA and inclusion of CPAs under the PoA?	/1/	DR	The PoA-DD and generic CPA-DD documents describe the framework for the implementation of the PoA and how CPAs will be included into the programme under the PoA. The first CPA (FSCAD001) was also described and presented to		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				the validation team.		
A.2.5	Does the PoA involve alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PoA-DD?	/1/	DR	No, the proposed project activity will occur at an existing feedlot farm, and there is no current AD system for the treatment of the animal and vegetable waste.		OK
A.2.6	Does the PoA design engineering reflect current good practices?	/1/ /8/	DR	The implementation of an Anaerobic digestion system for the AWMS of the feedlot is considered practice. The basic engineering package /8/ for the first CPA reflected good practice in the view of the validation team.		OK
A.2.7	Would the technology result in a significantly better performance than any commonly used technologies in the host country? Is any transfer of technology from any Annex-I Party involved?	/1/ /4/ /5/ /6/ /72/	DR	Letters from the Milk Producers Organisation /4/, Pork Producers Organisation /5/ and the South African Feedlot Association /6/ and interviews with the South African DNA /72/ confirmed that the current practice does not involve the treatment of animal waste, and the proposed project activity would result in significantly better performance. Technology transfer would be likely as a number of the potential equipment suppliers were either European or Asian.		OK
A.2.8	Does the PoA 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	The PoA qualifies as a small scale as the energy generation is less than 15MW (type I) and less than 60,000 tCO_2e (type III) which meets the requirements of the UNFCCC /21/. CAR 1 The eligibility criteria does not take into consideration relevant SSC CDM criteria such as the "General Guidelines to SSC CDM Methodologies"	~~CAR 1~~	OK
A.2.9	Is the small scale project activity a debundled component of a larger project activity in accordance with the rules defined in appendix C of the simplified modalities and procedures	/1/ /30/ /33/	DR	The project activity is not considered a debundled project as the project participant has no other registered CDM projects and there is no other		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
for small-scale CDM project activities?			project activity within 1km of the proposed FSCAD001 or any other CPA /30/, /33/.		
A.3 Programme Boundaries (VVS § 191-192) *Programme Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.3.1 Are the programme's spatial boundaries (geographical) clearly defined?	/1/	DR	Yes, the PoA-DD states that all CPAs will be implemented within the boundary of the Republic of South Africa		OK
A.3.2 Are the programme's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	The system boundaries of the programme and various possible components that could be utilised are defined and described in A.4.2.1 of the PoA-DD		OK
A.3.3 Do the programme boundaries take into consideration all applicable national and/or sectoral policies and regulations within the chosen boundary?	/1/ /73/ /72/	DR	During the interview with the South Africa Energy Utility /73/ and the DNA/72/ it has been checked that the baseline scenarios take into consideration the relevant national policies, trends and political aspirations		OK
A.3.4 Can each CPA under the PoA be clearly identified individually including spatial boundaries (geographical) clearly defined?	/1/	DR	The PoA-DD contains the eligibility criteria for the inclusion of a CPA in the Programme. Each individual CPA will be identified including its geographical boundaries in the CPA-DD CL 1 It is not described in the PoA-DD whether the anaerobic treatment and/or the power plant in the CPA could be centralized serving to different solid waste / animal manure installations.	~~CL 1~~	OK
A.4 Participation and authorization (VVS § 38-52) *Referring to Part A.3 and A.4, Appendix 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.*					
A.4.1 Do all participating Parties fulfil the participation requirements as follows:	/1/ /20/	DR	South Africa is a signatory to the Kyoto Protocol as a non-Annex I country.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
		South Africa (host)				
	a) Party has ratified the Kyoto Protocol	☒ Yes ☐ No				
	b) Party has designated a Designated National Authority	☒ Yes ☐ No				
	c) The assigned amount has been determined	☒ Yes ☐ No				
A.4.2	Do the letters of approval meet the following requirements?	/1/ /20/	DR	A Letter of Approval was issued by the DNA of South Africa on 8 February 2012 /20/.		OK
		South Africa (host)			~~CAR 2~~	OK
	a) LoA confirms that Party has ratified the Kyoto Protocol	☒ Yes ☐ No				
	b) LoA confirms that participation is voluntary	☒ Yes ☐ No				
	c) The LoA confirms that the project contributes to the sustainable development of the host country?	☒ Yes ☐ No				
	d) The LoA refers to the precise project activity title	☒ Yes ☐ No				
	e) The LoA is unconditional with respect to (a) to (d) above	☒ Yes ☐ No				
	f) The LoA is issued by the respective Party's DNA	☒ Yes ☐ No				
	g) The LoA was received directly by the DNA or the PP	☒ DNA ☐ PP				
	h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic	CAR 2 Letters of Approval and Authorisation from the Host Country have not been issued yet				
A.4.3	Have all private/public project participants been authorized by an involved Party?	/1/ /20/	DR	Yes, Farmsecure Carbon (Pty) Ltd has been authorised ion the LoA /20/.		OK
A.4.4	Has the coordinating/managing entity of the programme been identified?	/1/	DR	Farmsecure Carbon will serve as the CME and have been identified as such in the PoA-DD.		OK
A.4.5	Has the coordinating/managing entity provided letters of authorization of its coordination of the PoA from each host Party?	/1/ /15/ /68/	DR I	A letter between the CME and the CPA implementer was seen for FSCAD001 /15/. This was confirmed by the CME management /68/ as being the template for all CPAs.		OK
A.5	**Modalities of communications (VVS § 53-61)**					
A.5.1	How has the corporate identity of all project participants and focal points included in the MoC, as well as the personal	/1/ /11/	DR I	☒ Directly checking evidence for corporate, personal identity and other relevant		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
identities, including specimen signatures and employment status, of their authorized signatories, been validated?	/12/ /13/ /68/ /65/		documentation; ☒ Notarized documentation; ☒ Written confirmation from the project participant or the coordinating/managing entity that submits to it the MoC statement that all corporate and personal details, including specimen signatures, are valid and accurate. If this case was selected, DNV has confirmed that: ☒ the MoC statement was received from a project participant with whom DNV has a contractual relationship. ☒ the official who submits the MoC statement to the DOE and the official who signed the written confirmation (if a different person) is/are duly authorized to do so on behalf of the respective project participant The modalities of communication statement /13/ was seen along with the authority giving Mr Rudi Kriese power to sign company documents /12/ and the board resolution appointing Mrs Isabelle Barnard as the point of contact for the PoA /11/. This was also confirmed during the site validation with interviews with management (Eugene Muller) /68/ anf Isabelle Barnard /65/.		

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.5.2 Has the MoC statement been correctly completed and duly authorized? Check that all three requirements listed in the next column are complied with.	/1/ /13/	DR	☒ The latest version of the form F-CDM-MOC has been used; ☒ The information required as per the F-CDM-MOC, including its annex 1, is correctly completed; ☒ The project participant is authorized signatories signing the F-CDM-MOC correspond to the project participant is authorized signatories included in F-CDM-MOC, annex 1.		OK
A.6 Public funding of the project activity (CDM Modalities and Procedures Appendix B § 2)					
A.6.1 In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided 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?	/1/ /3/	DR	The funding for each CPA is included in section A.4.2.2. of the PoA-DD /1/ and will be included in each CPA. This was done for FSCAD001 /3/.		OK
A.7 Verification of CPAs (PoA procedure § 6 k)					
A.7.1 If case the coordinating /managing entity does not wish to have all CPAs verified, is there a description of the proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of reductions of anthropogenic emissions by sources or removals by sinks of greenhouse gases achieved by CPAs under the PoA?	/1/ /29/	DR	The sampling needs to meet a 90/10 requirement as stipulated by the General guidelines for sampling and surveys for small-scale CDM project activities /29/. CL 2 It is not described and motivated in the PoA-DD the rationale behind the proposed sampling criteria and that make the verification risks acceptable	~~CL 2~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B Demonstration of additionality and development of eligibility criteria					
B.1 Additionality of the Programme of Activities (VVS § 195) *Assessment of the additionality of the PoA as a whole in accordance with the PoA standard*					
B.1.1 Has it been demonstrated that the programme is a voluntary coordinated action that would not be implemented in the absence of CDM?	/1/	DR	A.2 (3) of the PoA-DD /1/ confirms that all key players are voluntary participants. A.4.4.1 (iv) also confirms that CPA operators are bound to the PoA via a signed agreement		OK
B.1.2 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	CL 3 The PoA additionality elements described in section A.4.3 of the PDD need to be substantiated with objective evidence.	~~CL 3~~	OK
B.2 Additionality determination of each generic CPA (VVS § 101-129 and VVS § 158-161 for small-scale project activities, as applicable)					
B.2.1 What approach/tool does the PoA use to demonstrate additionality of each generic CPA? Is this in line with the methodology? In case of small-scale CDM project activities, is Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities applied considering also the "Non-binding best practice examples to demonstrate additionality for SSC project activities".	/1/	DR	Additionally is demonstrated through barrier and financial analysis which is in accordance with the tool used to demonstrate additionality.		OK
B.2.2 Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR	Regulatory requirements have been considered, and an EIA has been conducted for the proposed project activity and FSCAD001.		OK
B.2.3 Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Only the Integrated Resource Plan for electricity in South Africa and letters from industry	~~CL 3~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				organisations were referenced, more sources need to be supplied for the assumptions and statements.		
B.2.4	What is the additionality of each generic CPA mainly based on (Investment analysis or barrier analysis)?	/1/	DR	Additionally is demonstrated through barrier and financial analysis which is in accordance with the tool used to demonstrate additionality. CL 4 The additionality criteria reported in the PoA-DD repeat elements already considered at PoA level (identification of alternatives, compliance with mandatory regulations, common practice analysis, etc.) and not CPA specific (i.e. check that the CPA specific baseline treatment stages satisfy all the applicability criteria of the chosen methodologies, check that the financial parameters fixed at PoA are applicable to the specific CPA, etc.). In addition it has not been provided a letter from the poultry association in order to substantiate that anaerobic digesters are not common practice in the poultry sector	~~CL 4~~	OK
	Investment analysis (VVS § 117-123) *The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation. All input parameters need to be assessed.*					
B.2.5	Does each generic CPA or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PoA-DD?	/1/	DR	Yes, there will be the potential for the sale of electricity to an electricity buyer. This is reflected in the project documentation. The generic CPA also allows for the potential to sell thermal energy if the component activity has a willing buyer in close proximity.		OK
B.2.6	Do any of the alternatives to each generic CPA involve investment? Is this reflected in the PoA-DD?	/1/	DR	Yes, this is reflected in the CPA-DD.		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2.7	Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/1/ /46/	DR	A benchmark analysis is used in this additionality determination in accordance with the VVS /21/ and the "Guidelines on the assessment of the investment analysis" /46.		OK
B.2.8	Is the benchmark/discount rate the latest available at the time of decision?	/1/	DR	The benchmark for this PoA is based on parameters that are standard in the market, internal company benchmarks are not applicable		OK
B.2.9	What is the financial indicator? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/1/	DR	The indicator will be determined as either debt or equity by each CPA. The benchmark will also be determined as being pre or post tax at CPA level.		OK
B.2.10	Are the underlying assumptions appropriate, e.g. what is considered as waste in the baseline is considered to have zero value?	/1/	DR	All assumptions will be determined at CPA level.		OK
B.2.11	Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.12	Is the time period of the investment analysis and operating time of each generic CPA realistic? Has salvage value been taken into account? Is working capital returned in the last year of operation?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.13	When a feasibility study report or similar approved by the government is used as the basis for the investment analysis: Can it be confirmed that the values used in the PoA-DD are fully consistent with the FSR and is the period of time between finalization of the FSR and the investment decision adequate?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.14	How was the amount of output (e.g. sales of electricity) assessed?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.15	How was the output price (e.g. electricity price) assessed?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2.16	How were the investment costs assessed? Were the data available and valid at the time of decision?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.17	How were the O&M costs assessed? Were the data available and valid at the time of decision?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.18	Describe the assessment of the other input parameters. Were the data available and valid at the time of decision?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.19	Was the financial calculation spreadsheet verified and found to be correct?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.20	Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.21	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
B.2.22	Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of an investment analysis.		OK
	Barrier analysis (VVS § 124-127)					
B.2.23	Are the barriers identified complimentary to a potential investment analysis? Does the barrier have a clear impact on the financial returns so that it can be assessed in an investment analysis? Each barrier is discussed separately.	/1/	DR	Yes, an Access to Finance barrier, technology barrier and barrier due to prevailing practice are also considered with any other barriers. CAR 3 The barrier analysis does not follow the Guidelines for objective demonstration and assessment of barriers. No evidences sources are provided to substantiate argumentations made, it	~~CAR 3~~	OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				is not clear to which of the different alternatives the barriers are referred to.		
B.2.24	How were the investment barriers assessed to be real? Are the investment barriers substantiated by a source independent of the project participants?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.25	How does CDM alleviate the investment barriers?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.26	Is each generic CPA prevented by the *Guidelines for objective demonstration and assessment of barriers* e investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.27	How were the technological barriers assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.28	How does CDM alleviate the technological barriers?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.29	Is each generic CPA prevented by the technological barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.30	How were the barriers due to prevailing practise assessed to be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.31	How does CDM alleviate the barriers due to prevailing practise?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2.32	Is each generic CPA prevented by the barriers due to prevailing practise and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.33	How were the other barriers assessed to be real? Are the other barriers substantiated by a source independent of the project participants?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.34	How does CDM alleviate the other barriers?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
B.2.35	Is each generic CPA prevented by the other barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	This will not specified at PoA level, but will be determined at each CPA as part of a barrier analysis.		OK
	Common practice analysis (VVS § 128-130)					
B.2.36	What is the geographical scope of the common practice analysis? Is this justified?	/1/	DR	In accordance with the VVS /21/ a common practice analysis is only required for large scale projects. As this is a SSC project, the common practice analysis was not required.		OK
B.2.37	What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has this been justified?	/1/	DR	In accordance with the VVS /21/ a common practice analysis is only required for large scale projects. As this is a SSC project, the common practice analysis was not required.		OK
B.2.38	What is the data source(s) used for the common practice analysis?	/1/	DR	In accordance with the VVS /21/ a common practice analysis is only required for large scale projects. As this is a SSC project, the common practice analysis was not required.		OK
B.2.39	How many similar non-CDM-projects exist in the region within the scope?	/1/	DR	In accordance with the VVS /21/ a common practice analysis is only required for large scale projects. As this is a SSC project, the common practice analysis was not required.		OK
B.2.40	How were possible essential distinctions between the project	/1/	DR	In accordance with the VVS /21/ a common		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
activity and similar activities assessed?			practice analysis is only required for large scale projects. As this is a SSC project, the common practice analysis was not required.		
B.2.41 What is the conclusion of the common practice analysis?	/1/	DR	In accordance with the VVS /21/ a common practice analysis is only required for large scale projects. As this is a SSC project, the common practice analysis was not required.		OK
Conclusion					
B.2.42 What is the conclusion with regard to the additionality of the project activity?	/1/	DR	A conclusion will only be made once the corrective actions have been closed. But additionality is going to be demonstrated primarily at CPA level for each component of the program. The PoA-DD provides the framework for additionality demonstration in alignment with the relevant guidelines and tools /28/, /38/, /47/.	~~CL 3~~ ~~CL 4~~ ~~CAR 3~~	
B.3 Eligibility Criteria (VVS § 196) *Eligibility criteria to assess eligibility of CPAs to be included to PoA.*					
B.3.1 Are the geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA?	/1/	DR	The eligibility criteria specify that the CPA must be located in the geographical boundary of South Africa. Eligibility criteria have been documented in A.4.2.2 CAR 4 The eligibility criteria does not contain all the elements contemplated in §13 of the "Standard for the development of the eligibility criteria"	~~CAR 4~~	OK
B.3.2 Are there conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo)?	/1/ /9/	DR	The eligibility criteria identifies the need to avoid double counting. Section 6 of the CME quality manual elaborates on the way this will occur /9/.	~~CL 5~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				CL 5 Possible double counting of baseline emissions has not been identified as one of the risks of using multiple methodologies and treated in the PoA consequently.		
B.3.3	Are there specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications?	/1/	DR	Yes, this is described as energy from renewable biomass through anaerobic digestion.		OK
B.3.4	Are there conditions to check the start date of the CPA through documentary evidence?	/1/	DR	The start date of each CPA shall be after the start of validation of the PoA, and the CPA implementer would need to provide documentary evidence (purchase order, contractual or payment evidence) related to real action and implementation of the CPA.		OK
B.3.5	Are there conditions that ensure compliance with applicability and other requirements of single or multiple methodology/ies applied by CPAs?	/1/	DR	The CPA implementer and CME need to assess compliance with the relevant applicability conditions of the applied methodologies in section D.2 of the CPA-DD		OK
B.3.6	Are there conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality, and are these in accordance with the requirements of the PoA Standard?	/1/	DR	Additionality is determined at CPA level using barrier analysis. This is done in section D.5 of the CPA-DD.		OK
B.3.7	Are there PoA-specific requirements stipulated by the CMEs including any conditions related to undertaking local stakeholder consultations and environmental impact analysis?	/1/	DR	All environmental impacts and stakeholder consultation will be conducted at CPA level as part of the EIA process.		OK
B.3.8	Where applicable, are the target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation) specified?	/1/	DR	This is not applicable to this particular PoA and the measure applied.		OK
B.3.9	Where applicable, are there conditions related to sampling requirements for a PoA in accordance with the approved	/1/ /29/	DR	It is stipulated that any sampling must meet the confidence/precision limits of 90/10 as stipulated		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	guidelines/standard from the Board pertaining to sampling and surveys?			by the guidelines /29/.		
B.3.10	Where applicable, are there conditions that ensure that CPA in aggregate meets the small-scale or micro-scale threshold criteria and remain within those thresholds throughout the crediting period of the CPA?	/1/	DR	The installed capacity needs to ensure that the small or micro scale thresholds are maintained throughout the crediting period.		OK
B.3.11	Where applicable, are there requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories?	/1/ /30/ /33/	DR	Each CPA needs to demonstrate that the CPA is not a debundled component of a large scale activity by following the "Guidelines on assessment of debundling for SSC project activities" /30/ & the annex /33/.		OK
B.3.12	Are there conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance?	/1/	DR	Funding sources are confirmed as not being from official development assistance at the PoA level, and each CPA needs to provide evidence of finance sources to ensure no Annex I official development assistance is used.		OK
B.3.13	Are all eligibility criteria verifiable, and sufficiently objective and comprehensive to permit the assessment of the inclusion of CPAs in the PoA?	/1/ /9/	DR	Yes, the requirement for objective documentation or verifiable evidence of claims and linked to the CME Quality manual /9/ with a dedicated resource in the CME to check this was acceptable to the validation team.		OK
B.4	**Application of methodologies by the PoA (VVS §190)**					
B.4.1	Does the PoA apply approved methodologies and the correct and valid version thereof? If during the course of validation the originally applied version of the methodology expires, a CAR shall be raised in Table 3 of the validation protocol. Any new requirements of the revised version of the methodology not yet validated in Table 2 of the validation protocol shall be validated in Table 3 as part of the assessment of the CAR raised.	/1/ /24/ /25/	DR	The PoA program applies AMS-III.D and/or AMS-I.C versions 18.0 and 19.0. These were the correct methodologies at the time of the validation.		OK
B.4.2	If the programme applies multiple methodologies, is their	/1/	DR	The small scale methodologies are in line with		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	application in accordance with the PoA Standard?	/23/ /34/.		the guidelines regarding multiple methodology application /23/ & /34/.		
B.4.3	If the PoA applies small-scale methodologies, does the PoA also comply with the general guidelines to SSC CDM methodologies, which provides guidelines on equipment capacity, equipment performance/lifetime, baseline identification for type-II/III Greenfield project activities, sampling and other monitoring-related issues?			Yes, the PoA applies the General guidelines for SSC CDM methodologies /38/		OK
B.5	**Management system of the PoA (VVS § 186)** *Assessment of the PoA management systems in accordance with the PoA standard*					
B.5.1	Is there a clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies?	/1/ /9/	DR	The CME has developed a CME Quality manual /9/ which includes a clear definition of the roles and responsibilities in section 3 thereof. CAR 5 It is not available yet the Management System Manual describing all the information contemplated in §9 of the "Standard for the development of Eligibility criteria"	~~CAR 5~~	OK
B.5.2	Are there records of arrangements for training and capacity development for personnel?	/1/ /9/	DR	The CME has developed a CME Quality manual /9/ which includes arrangements for training and capacity development in section 4 thereof. See CAR 5	~~CAR 5~~	OK
B.5.3	Are there procedures for technical review of inclusion of CPAs?	/1/ /9/	DR	The CME has developed a CME Quality manual /9/ which includes technical review of inclusion in section 5 thereof See CAR 5	~~CAR 5~~	OK
B.5.4	Is there a procedure to avoid double counting (e.g. to avoid the case of including a new CPA that has already been	/1/	DR	The CME has developed a CME Quality manual /9/ which includes a procedure to avoid double	~~CAR 5~~	OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	registered either as a CDM project activity or as a CPA of another PoA)?	/9/		counting in section 6 thereof. See CAR 5		
B.5.5	Is there a records and documentation control process for each CPA under the PoA?	/1/ /9/	DR	The CME has developed a CME Quality manual /9/ which includes records and document control process in section 7 thereof See CAR 5	~~CAR 5~~	OK
B.5.6	Are there measures for continuous improvements of the PoA management system?	/1/ /9/	DR	The CME has developed a CME Quality manual /9/ which includes measures for continuous improvement of the PoA management system in section87 thereof See CAR 5	~~CAR 5~~	OK
B.5.7	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, there is clear evidence that the CPA implementer is active in the CDM component of the CPA and is required to keep records, sign contracts and report on performance regularly. This was deemed to be acceptable by the DNV Validation team. See CAR 5	~~CAR 5~~	OK
C Duration of the PoA, Crediting Period (VVS § 197)						
C.1.1	Is the PoA starting date and length of the PoA clearly defined and evidenced?	/1/	DR	Starting date was originally stated at the time of the validation site inspection stated as 1 August 2012 in B.1 of the PoA-DD (version 1) /1/ and the length of the program was documented as 28 years in section B.2.		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
C.1.2	D.2. Does the PoA design documentation confirm that the length of the PoA does not exceed 28 years (60 years for A/R)?	/1/	DR	Section B.2 stipulates the length of the programme at 28 years.		OK
D Environmental Impacts (VVS § 134-137, VVS § 199-200)				☐ Analysis at PoA level ☒ Analysis at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
D.1.1	Are there any host country requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? Does the approval contain any conditions that need monitoring? For small-scale project activities, is an assessment of the environmental impacts of the proposed CDM project activity is required by the host Party?	/1/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK
D.1.2	Does the PoA comply with environmental legislation in the host country?	/1/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK
D.1.3	Will the PoA create any adverse environmental effects?	/1/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK
D.1.4	Have identified environmental impacts been addressed in the PoA design?	/1/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK
D.1.5	Has an analysis of the environmental impacts of the PoA and each generic CPA been sufficiently described?	/1/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK
D.1.6	Are transboundary environmental impacts considered in the analysis?			Not applicable as stakeholder consultation will be done on a CPA level		OK
E Local stakeholder consultation (VVS § 138-140, VVS § 201-202)				☐ Consultation at PoA level ☒ Consultation at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
E.1.1	Have relevant stakeholders been consulted?	/1/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK
E.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/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK
E.1.4	Is a summary of the stakeholder comments received provided?	/1/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK
E.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	Not applicable as stakeholder consultation will be done on a CPA level		OK

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PART II. Generic component project activity (CPA)						
A Description of each generic CPA (VVS § 189)						
A.1.1	Does the description of each generic CPA sufficiently cover all relevant elements, is accurate and does it provides the reader with a clear understanding of the nature of the proposed CPAs?	/1/	DR	*Yes, the Generic CPA-DD document is included in PART II of the PoA-DD document /1/.*		OK
A.1.2	If applicable, are all different types of generic CPAs clearly described?	/1/	DR	*All generic CPA types are described in Part II of the PoA-DD documentation.*		OK
B Application of a baseline and monitoring methodology(ies)						
B.1 Title and reference of the approved baseline and monitoring methodology(ies) selected						
B.1.1	Are the exact reference and title of approved methodology(ies) and tools listed?	/1/ /24/ /25/ /39/ /40/ /41/ /42/ /43/ /44/ /45/	DR	Yes, the following two methodologies and tools were listed: AMS-III.D "Methane recovery in animal manure management system" (Version 17) /24/ AMS-I.C "Thermal energy production with or without electricity" (Version 19). /25/ The following tools are applicable to the PoA, each CPA will apply the relevant tools: "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 2) /39/ "Tool to determine the baseline efficiency of thermal or electric energy generation systems" (Version 1) /40/ "Tool to determine the remaining lifetime of		OK

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				equipment" (Version 1) /41/ "Tool to calculate the emission factor for an electricity system" (Version 02.2.1) /42/ "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" (Version 5.1.0) /43/ "Tool to determine project emissions from flaring gases containing methane" (Version 1) /44/ "Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities" (Version 1) /45/		
B.1.2	Are valid version of approved methodology(ies) and tools applied?	/1/ /24/ /25/ /39/ /40/ /41/ /42/ /43/ /44/ /45/	DR	Yes, the following two methodologies and tools were listed and their versions checked: AMS-III.D "Methane recovery in animal manure management system" (Version 17) /24/ AMS-I.C "Thermal energy production with or without electricity" (Version 19). /25/ The following tools are applicable to the PoA, each CPA will apply the relevant tools: "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 2) /39/ "Tool to determine the baseline efficiency of thermal or electric energy generation systems" (Version 1) /40 "Tool to determine the remaining lifetime of equipment" (Version 1) /41/ "Tool to calculate the emission factor for an electricity system" (Version 02.2.1) /42/ "Tool to determine methane emissions avoided		OK

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			from disposal of waste at a solid waste disposal site" (Version 5.1.0) /43/ "Tool to determine project emissions from flaring gases containing methane" (Version 1) /44/ "Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities" (Version 1) /45/		
B.2 Applicability of methodology (and tools) (VVS § 73-77) *Insert a row for each applicability criteria of the applied methodology (and tools)*					
Conditions for methodology AMS-III.D					
B.2.1 How was it validated that each specific CPA complies with the following applicability criteria: This methodology covers project activities involving the replacement or modification of anaerobic animal manure management systems in livestock farms to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane. It also covers treatment of manure collected from several farms in a centralized plant. This methodology is only applicable under the following conditions (a) The livestock population in the farm is managed under confined conditions (b) Manure or the streams obtained after treatment are not discharged into natural water resources (e.g. river or estuaries), otherwise AMS-III.H "Methane recovery in wastewater treatment" shall be applied (c) The annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5°C (d) In the baseline scenario the retention time of manure	/1/	DR	All CPAs that apply methodology AMS-III.D must comply with condition (a) to (e). This will be included and determined in the CPA DD for the specific CPA.		OK

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	waste in the anaerobic treatment system is greater than one month, and in case of anaerobic lagoons in the baseline, their depths are at least 1 m (e) No methane recovery and destruction by flaring, combustion or gainful use takes place in the baseline scenario?					
B.2.2	How was it validated that each specific CPA complies with the following applicability criteria: The project activity shall satisfy the following conditions (a) The residual waste from the animal manure management system shall be handled aerobically, otherwise the related emissions shall be taken into account as per relevant procedures of AMS-III.AO "Methane recovery through controlled anaerobic digestion". In case of soil application, proper conditions and procedures (not resulting in methane emissions) must be ensured (b) Technical measures shall be used (including a flare for exigencies) to ensure that all biogas produced by the digester is used or flared (c) The storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester. If the project proponent can demonstrate that the dry matter content of the manure when removed from the animal barns is larger than 20%, this time constraint will not apply?	/1/	DR	For each of the elements: (a) For all CPAs residual waste from the animal manure management system shall be handled aerobically, otherwise the related emissions shall be taken into account as per relevant procedures of AMS-III.AO "Methane recovery through controlled anaerobic digestion" In case of soil application, proper conditions and procedures (not resulting in methane emissions) shall be ensured; (b) All CPAs shall ensure that all biogas produced by the digester is used or flared. The PoA requires flaring for the system if the gas is not utilised. (c) For all CPAs the storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester. If the CPA implementer can demonstrate that the dry matter content of the manure when removed from the animal barns is larger than 20%, this time constraint will not apply		OK
B.2.3	How was it validated that each specific CPA complies with the following applicability criteria: Projects that recover methane from landfills shall use AMS-III.G "Landfill methane recovery" and projects for wastewater treatment shall use AMS-III.H. Project for composting of animal	/1/	DR	These project activities are not included in the PoA – therefore this applicability criteria is not applicable.		OK

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	manure shall use AMS-III.F "Avoidance of methane emissions through composting". ?					
B.2.4	How was it validated that each specific CPA complies with the following applicability criteria: Different options to utilise the recovered biogas as detailed in paragraph 3 of AMS-III.H are also eligible for use under this methodology. The respective procedures in AMS-III.H shall be followed in this regard?	/1/	DR	Only activities under paragraph 3.a (direct thermal or electrical energy generation) are eligible under this PoA		OK
B.2.5	How was it validated that each specific CPA complies with the following applicability criteria: New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the "General Guidelines to SSC CDM methodologies"?	/1/ /38/	DR	CPAs that involve greenfield projects and capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the "General Guidelines to SSC CDM methodologies" /38/.		OK
B.2.6	How was it validated that each specific CPA complies with the following applicability criteria: The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the "General Guidelines to SSC CDM methodologies"?	/1/	DR	Not applicable under this PoA, anaerobic digesters will not be replaced		OK
B.2.7	How was it validated that each specific CPA complies with the following applicability criteria: Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO_2 equivalent annually from all Type III components of the project activity"?	/1/	DR	CPAs are limited to those that result in emission reductions of less than or equal to 60 kt CO2 equivalent annually from all Type III components of the project activity		OK
	Conditions for methodology AMS-I.C					
B.2.8	How was it validated that each specific CPA complies with the following applicability criteria: This methodology comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel?	/1/	DR	This PoA applies renewable energy technology derived from renewable biomass. This is in compliance with the requirements of the applicability criterion.		OK
B.2.9	How was it validated that each specific CPA complies with	/1/	DR	CPAs that apply methodology AMS-I.C shall		OK

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	the following applicability criteria: Biomass-based cogeneration systems are included in this category. For the purpose of this methodology "cogeneration" shall mean the simultaneous generation of thermal energy and electrical energy in one process?			generate thermal energy or electricity and thermal energy through cogeneration		
	B.2.10How was it validated that each specific CPA complies with the following applicability criteria: Emission reductions from a biomass cogeneration system can accrue from one of the following activities: (a) Electricity supply to a grid; (b) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for consumption by other facilities (c) Combination of (a) and (b).?	/1/	DR	CPAs applying methodology AMS.I.C need to comply with (a) and/or (b). This needs to be checked during inclusion of all CPAs.		OK
B.2.11	How was it validated that each specific CPA complies with the following applicability criteria: The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities)?	/1/	DR	For CPAs that involve thermal energy generation, the capacity of the project equipment shall be equal to or less than 45MW thermal, which meets the requirements. This needs to be checked during inclusion of all CPAs		OK
B.2.12	How was it validated that each specific CPA complies with the following applicability criteria: For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities)?	/1/	DR	No co-fired options will be applicable in this PoA – so this was not applicable to the PoA.		OK
B.2.13	How was it validated that each specific CPA complies with the following applicability criteria: The following capacity limits apply for biomass cogeneration units: (a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used	/1/	DR	This will be evaluated at each CPA inclusion, (a) For CPAs where the emission reductions include both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal (b) For CPAs where the emission reductions of the cogeneration project activity are		OK

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	for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant); (b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal; (c) If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW?			solely on account of thermal energy production, the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal (c) For CPAs where the emission reductions of the cogeneration project activity are solely on account of electrical energy production, the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW These are all within the limits of the applicability criterion.		
B.2.14	How was it validated that each specific CPA complies with the following applicability criteria: The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6, and should be physically distinct from the existing units?	/1/	DR	The limits would apply to new plants – as only new plants are considered in the PoA. The compliance to this applicability criterion will be checked at the inclusion of new CPAs.		OK
B.2.15	How was it validated that each specific CPA complies with the following applicability criteria: Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category?	/1/	DR	This is not applicable in this PoA, as the PoA does not involve CPAs that seek to retrofit an existing facility for renewable energy generation		OK
B.2.16	How was it validated that each specific CPA complies with the following applicability criteria: New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in	/1/ /38/	DR	The "General guidelines for SSC CDM methodologies" /38/ stipulate the condition that Type II and III greenfield projects and project activities involving capacity additions may use Type II and Type III small-scale methodologies provided that they can demonstrate that the most		OK

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	the "General Guidelines to SSC CDM methodologies?			plausible baseline scenario for the project activity or PoA is the baseline provided in the respective Type II an Type III small-scale methodology. The "General guidelines for SSC CDM methodologies" does not stipulate this conditions for Type I greenfield projects or for Type I project activities involving capacity addition. For CPAs that apply methodology AMS-III.D /or AMS-III.AO, compliance with this condition should /24/ be demonstrated. For CPAs that only apply methodology AMS-I.C /25/ (Type I small scale methodology), this condition is not applicable		
B.2.17	How was it validated that each specific CPA complies with the following applicability criteria: If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation?	/1/	DR	Not applicable to this PoA, anaerobic digesters does not use solid biomass as feedstock		OK
B.2.18	How was it validated that each specific CPA complies with the following applicability criteria: Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions?	/1/	DR	Not applicable to this PoA, anaerobic digesters does not use processed solid biomass as feedstock.		OK
B.2.19	How was it validated that each specific CPA complies with the following applicability criteria: If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s)	/1/	DR	CPAs that deliver electricity and/or steam/heat to a third party, a contract between the supplier and the consumer(s) shall be entered into to ensure there is no double-counting of emission reductions. The CME quality manual /9/ also has	~~CL 6~~	OK

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	of the energy will have to be entered into that ensures there is no double-counting of emission reductions?			provision for checking of double counting of any CPA. CL 6 Some of the methodology applicability requirements (i.e. point 3 of applicability requirements of meth. AMS III-AO, points 11 to 14 of meth. AMS I.C or eligibility criteria for indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity guidelines) need to be included in the PoA-DD . In addition the CME has not justify why there are not multi-methodological cross effects in compliance with §10 of the Standard for application of multiple CDM methodologies.		
B.2.20	How was it validated that each specific CPA complies with the following applicability criteria: If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions?	/1/	DR	This will be checked with the inclusion of each new CPA. CPAs that recovers and utilizes biogas for power/heat production and applies this methodology on a stand alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity, shall be taken into account either as project or leakage emissions.		OK
B.2.21	How was it validated that each specific CPA complies with the following applicability criteria: Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided?	/1/	DR	Not applicable to this PoA, anaerobic digesters does not use charcoal as feedstock		OK
B.2.22	How was it validated that each specific CPA complies with the following applicability criteria: Project activity under a Programme of Activities must comply with stipulated conditions	/1/	DR	The applicability criteria are to be evaluated as below: (a) All CPAs that use biomass residues shall comply with the requirements of		OK

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	(a) In the specific case of biomass project activities the applicability of the methodology is limited to either project activities that use biomass residues or processed biomass (e.g. briquette) only or biomass from dedicated plantations complying with the applicability conditions of methodology AM0042 or paragraph 5 in methodology AMS-III.AQ, see F-CDM-SSCwg ver 01 SSC_577 (b) In the specific case of biomass project activities the determination of leakage shall be done following the general guidance for leakage in small-scale biomass project activities (attachment C of Appendix B of simplified modalities and procedures for small-scale clean development mechanism project activities; decision 4/CMP.1) or following the procedures included in the leakage section of AM0042 (c) In case the project activity involves the replacement of equipment, and the leakage from the use of the replaced equipment in another activity is neglected, because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified?			renewable biomass or dedicated plantations (as relevant), these have been included into the PoA-DD documentation for evaluation. No solid biomass is to be utilised in this PoA. (b) For all CPAs the determination of leakage shall be done following the general guidance for leakage in small-scale biomass project activities (attachment C of Appendix B of simplified modalities and procedures for small-scale clean development mechanism project activities /39/ (c) In case the project activity involves the replacement of equipment, an independent monitoring of scrapping of replaced equipment will be implemented.		
Conditions for Renewable Biomass						
B.2.23	How was it validated that each specific CPA complies with the following applicability criteria: The biomass is woody and non-biomass and originates from croplands and/or grasslands where: (a) The land area remains cropland and/or grasslands or is reverted to forest; and	/1/	DR	To be confirmed with each new CPA included that uses renewable biomass as a feedstock. All CPAs using biomass from dedicated plantations shall demonstrate that the CPA comply with conditions (a) to (d).		OK

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	(b) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and (c) Any national or regional forestry, agriculture and nature conservation regulations are complied with (d) Biomass complies with the dedicated plantation applicability conditions described in Methodology AM0042 or Methodology AMS-III.AQ (see F-CDM-SSCwg ver 01 SSC_577). Applicability conditions are describe in tables below?					
B.2.24	How was it validated that each specific CPA complies with the following applicability criteria: The biomass is a biomass residue, that means biomass by-products, residues and waste streams from agriculture, forestry and related industries (a) Where, the use of that biomass residue in the project activity does not involve a decrease of carbon pools, in particular dead wood, litter or soil organic carbon, on the land areas where the biomass residues are originating from?	/1/	DR	All CPAs using biomass residues shall demonstrate that the baseline is one of the following: 1. The biomass residues are dumped or left to decay under mainly aerobic conditions. 2. The biomass residues are dumped or left to decay under clearly anaerobic conditions. 3. The biomass residues are burnt in an uncontrolled manner without utilizing them for energy purposes Where manure is applied as compost/fertilizer in the baseline, the residual waste from the digester should be applied as compost/fertilizer in the project activity. All CPAs using biomass residues shall demonstrate that the use of biomass residue in the project activity does not involve a decrease of carbon pools. This will be evaluated at the inclusion of		OK

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				each new CPA.		
Conditions for dedicated plantations as in methodology AM0042						
B.2.25	How was it validated that each specific CPA complies with the following applicability criteria: Applicability conditions (a) Biomass used by the project facility is not stored for more than one year (b) The dedicated plantation must be newly established as part of the project activity for the purpose of supplying biomass exclusively to the project (c) The biomass from the plantation is not chemically processed (e.g. esterification to produce biodiesel, production of alcohols from biomass, etc.) prior to combustion in the project plant but it may be processed mechanically or be dried (d) The site preparation does not cause longer-term net emissions from soil carbon. Carbon stocks in soil organic matter, litter and deadwood can be expected to decrease more due to soil erosion and human intervention or increase less in the absence of the project activity (e) The land area of the dedicated plantation will be planted by direct planting and/or seeding (f) After harvest, regeneration will occur either by direct planting or natural sprouting (g) Grazing will not occur within the plantation (h) No irrigation is undertaken for the biomass plantations (i) The land area where the dedicated plantation will be established is, prior to project implementation, severely degraded and in absence of the project activity would have not been used for any other agricultural or forestry activity. The land degradation can be demonstrated using one or more of the following indicators: a. Vegetation degradation, e.g. Crown cover of pre-existing trees has decreased in the recent	/1/	DR	All CPAs using biomass from dedicated plantations will need to comply with the conditions in methodology AM0042. This will be evaluated at CPA inclusion stages on a CPA level where applicable. No criteria have been set at PoA level.		OK

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	past for reasons other than sustainable harvesting activities b. Soil degradation, e.g. Soil erosion has increased in the recent past c. Anthropogenic influences, e.g. There is a recent history of loss of soil and vegetation due to anthropogenic actions; and Demonstration that there exist anthropogenic actions/activities that prevent possible occurrence of natural regeneration?					
Conditions for dedicated plantations as in methodology ASM-III.AQ, paragraph 5						
B.2.26	How was it validated that each specific CPA complies with the following applicability criteria: The project activity does not lead to a shift of pre-project activities outside the project boundary i.e. the land under the proposed project activity can continue to provide at least the same amount of goods and services as in the absence of the project?	/1/	DR	All CPAs using biomass from dedicated plantations shall demonstrate that the project activity does not lead to a shift of pre-project activities outside of the project boundary. This will be evaluated at CPA inclusion stages on a CPA level where applicable. No criteria have been set at PoA level.		OK
B.2.27	How was it validated that each specific CPA complies with the following applicability criteria: The plantations are established on a land: i) Which was at the start of the project implementation, classified as degraded or degrading as per the "Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities"; or ii) Area that is included in the project boundary of one or several registered A/R CDM project activities iii) Plantations established on the peatlands are not eligible even if qualifying under condition (i) and (ii) above?	/1/	DR	This will be evaluated at CPA inclusion stages on a CPA level where applicable. No criteria have been set at PoA level.		OK
B.2.28	Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the	/1/ /24/	DR	According to methodology AMS-III.D, /24/ the baseline scenario is the situation where, in the		OK

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	methodology?	/25/		absence of the project activity, biomass and other organic matter (including manure where applicable) are left to decay within the project boundary and methane is emitted to the atmosphere. Therefore, the current waste and or manure management practice at each CPA will be the baseline scenario for that CPA. Three baseline alternatives were considered under methodology AMS-I.C /25/ and are listed in section B.4 of the PoA-DD document. This is acceptable and considered the baseline for the project activity.		
B.3	**Project boundary of each generic CPA (VVS § 82-87)**					
B.3.1	What are each generic CPA's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/	DR	The system boundaries of the various generic CPA options have been defined in section B.3 of the PoA-DD. Five possible scenarios (A through E) were presented in the initial PoA-DD ammneded to three later. They are clearly defined in accordance with the applicable methodologies, and the boundaries are clearly indicated graphically.		OK
B.3.2	Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/	DR	A number of greenhouse gases and their sources have been clearly identified and tabulated in B.3 of the PoA-DD. This list was considered complete by the validation team.		OK
B.3.3	Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/	DR	No other emission sources were identified that were not foreseen in the methodologies.		OK

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B.4 Baseline scenario determination and description (VVS § 88-95 / Identification of alternatives to the project activity (VVS § 113-116) *Ensure that the evaluation of all alternatives provided and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this.*					
B.4.1 Which baseline scenarios have been identified? Is the list of baseline scenarios complete? Does the list include as one of the options that the project activity is undertaken without being registered as a proposed project activity? Does the list contains all plausible alternatives which are viable means of supplying the comparable outputs or services that are to be supplied by the proposed project activity?	/1/	DR	The baseline included the project activity without CDM finance as an alternative. For Solid Waste Disposal project activities the baseline has resulted to be combinations of the disposal of the waste on a landfill and stockpile without the capture of landfill gas. For Animal Waste Management System CPA different baselines have identified in function of the type of live stock considered: • For piggeries and dairies the baseline is a combination of uncovered anaerobic lagoon and pit storage below animal confinement • For Cattle feedlots the baseline is a combination of dry lot and solid storage • For poultry farms s the baseline is a combination of dry lot and solid storage and poultry manure with litter. For Energy generation the baseline is grid produced electricity and /or thermal energy production using fossil fuel. These baseline scenarios are in compliance with the applicability requirements of the applicable	~~CL 7~~	OK

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			methodologies as the baselines are situations in which, in the absence of the project activity, biomass and other organic matter are left to decay within the project boundary and the methane is emitted into the atmosphere. CL 7 The two sequential stages in which the combinations of the baseline scenarios for waste management systems have been embedded need to be defined more clear in the PoA-DD		
B.4.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/	DR	For Solid Waste Disposal, the following three alternative scenarios have been considered: 1) The project activity not implemented as CDM Project 2) Disposal of the waste at landfill where landfill gas captured is flared 3) Disposal of the waste on a landfill or stockpile without the capture of the landfill gas For Animal Waste Management Systems the following 13 alternatives have been considered: 1) Pasture/Range/Paddock 2) Daily spread 3) Burned for fuel 4) Solid Storage 5) Dry Lot 6) Liquid/Slurry 7) Pit Storage below animal confinements 8) Deep Bedding 9) Composting 10) Poultry manure with litter 11) Aerobic Treatment	~~CL 8~~	OK

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			12) Uncovered Anaerobic Lagoon 13) Anaerobic Digester (Project Activity without CDM revenues) CL 8 For clarity, the Animal Waste Management Systems alternatives called “anaerobic digester” should be called “anaerobic digester without CDM revenues” For Energy generation the following three alternative scenarios have been considered: 1) Energy generation from renewable biomass, not undertaken as a CDM project activity; 2) Existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant; Existing grid-connected power plants and thermal energy generation using fossil fuel.		
B.4.3 What is the baseline scenario?	/1/	DR	The baseline scenario is the situation where, in the absence of the project activity, biomass and other organic matter (including manure where applicable) are left to decay within the project boundary and methane is emitted to the atmosphere. Therefore, the current waste and or manure management practice at each CPA will be the baseline scenario for that CPA. Applicable technologies/measures and methodology: Description of the baseline scenario Project activities that install biogas thermal: The simplified baseline is the fuel		OK

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			energy plants that produce renewable thermal energy for on-site consumption or for consumption by other facilities and displace fossil fuel use.	consumption of the technologies that would have been used in the absence of the project activity, times an emission factor for the fossil fuel displaced. See below the "Criteria on determining the thermal energy baseline emissions".		
			Project activities that install biogas cogeneration plants that produce renewable electricity for supply to the grid and/or for captive use and/or renewable thermal energy for on-site consumption or for consumption by other facilities and displace fossil fuel use.	One of the following baseline scenarios should be applicable: • Electricity is imported from a grid and thermal energy (steam/heat) is produced using fossil fuel. • Electricity is imported from a grid and thermal energy (steam/heat) is produced from biomass. Emission reduction		

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				from heat generation are not eligible. For thermal energy, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity, times an emission factor for the fossil fuel displaced. See below the "Criteria on determining the thermal energy baseline emissions". For electricity, the baseline scenario is that the electricity displaced from the grid by the project activity would have otherwise been generated by the operation of grid connected power plants. The CO2 emission factor for the South African national grid is calculated below.		
			Project activities that	For thermal energy,		

			involve the addition of renewable energy energy units (thermal energy or cogeneration units) at an existing renewable energy production facility.	the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity, times an emission factor for the fossil fuel displaced. The baseline demonstration for capacity addition projects should be applied as describe below in "Description of baseline for new facilities and project activities involving capacity addition". Also see below the "Criteria on determining the thermal energy baseline emissions". For electricity, the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power		

				plants. The CO2 emission factor for the South African national grid is calculated below.		
B.4.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR	The baseline determination is in line with the applied methodologies.		OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	The baseline determination is in line with the applied methodologies and conservative assumptions were made in the development thereof.		OK
B.4.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies? Does the baseline scenario comply with all applicable and enforced legislation?	/1/ /48/	DR	A section on national and/or sectoral policies is included in the baseline determination and this discussed the national governments PPA and IPP processes available to project developers. The PoA-DD also considers the clarifications from EB22 /48/ on the sectoral and national policies.		OK
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /24/ /25/	DR	The baseline scenario determination is comprehensive and is compatible with the available data and literature sources and approved methodologies AMS-III.D and/or AMS-I.C /24/, /25/ applied by the PoA.		OK
B.4.8	Is the baseline determination adequately documented in the PoA-DD? • All assumptions and data used by the project participants are listed in the PoA-DD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted	/1/	DR	*The baseline determination has been adequately addressed in section B.4 of the PoA-DD.*		OK

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	and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the PoA-DD. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity					
B.5	**Demonstration of eligibility for each generic CPA**					
B.5.1	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The proposed CPA must be located in the geographical boundary of South Africa	/1/	DR	The CPA needs to be located within the geographic boundary of South Africa. This is demonstrated in section A.7 of the CPA-DD.		OK
B.5.2	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The CME must implement precaution measures to avoid double counting of emission reductions	/1/ /9/	DR	The CME shall follow the procedure to avoid double counting in Section C (d) in the PoA-DD and also covered in the CME Quality Manual /9/. Confirmation by the CPA implementer that the CPA is neither registered as an individual CDM project activity nor is part of another registered PoA. This is documented in Section A.13 of the CPA-DD		OK
B.5.3	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The starting date of the project activity must not be before the date of commencement of validation of the PoA	/1/ /9/	DR	The staring date of the project activity means the earliest date at which either the implementation or construction or real action of a project activity begins. The CPA implementer will provide the CME with any significant purchase order, contract or payment evidence related to the construction of the project activity, as stipulated in the CMA Quality Manual /9/. This is documented in Section A.8.1 of the CPA-DD.		OK
B.5.4	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The proposed CPA must implement one of the eligible	/1/ /9/	DR	Indicate that the CPA will apply one of the eligible methodologies or methodology combinations. The project boundaries in the		OK

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	methodologies or methodology combinations for the PoA. Also, the proposed CPA must comply with the applicability conditions of the applicable methodology			PoA-DD also provides some scenarios for the project too. Also, assess compliance with the specific methodology applicability conditions. This is documented in Section D.2 of the CPA-DD		
B.5.5	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The CPA must demonstrate additionality as per eligibility criteria	/1/	DR	Additionality needs to be demonstrated and this is presented in section D.5 of the CPA-DD.		OK
B.5.6	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The CPA must comply with PoA conditions related to undertaking local stakeholder consultations and environmental impact analysis	/1/	DR	The CPA needs to provide necessary environmental impact assessment and local stakeholder consultation information and documentation. This is documented in Section B and C of the CPA-DD		OK
B.5.7	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The CPA must confirm that no Official Development Aid will be involved or diverted	/1/ /9/	DR	The CME Quality Manual /9/ stipulates that the CPA implementer needs to provide evidence for the sources of funding for the project activity. This needs to include evidence that it is not Official Development Aid. This is documented in Section A.11 of the CPA-DD		OK
B.5.8	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The PoA has no specific target group or distribution mechanism, therefore there is no eligibility criteria for target groups or distribution mechanisms	/1/	DR	This was accepted by the validation team.		OK
B.5.9	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? All relevant parameters will be monitored for each CPA. However, only a statistically acceptable sample will be verified by the DOE	/1/	DR	Sampling must meet a confidence / precision limits of 90/10. 100% sample was taken by the validation team.		OK
B.5.10	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? CPA in aggregate must meet the small-scale or micro-scale	/1/	DR	Each CPA needs to demonstrate that the installed capacity of the small-scale or micro-scale CPA in aggregate will remain within the threshold		OK

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	threshold criteria			criteria throughout the crediting period of the CPA. This is documented in Section D.2 of the CPA-DD		
B.5.11	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The proposed CPA must pass the de-bundling check	/1/	DR	Each CPA needs to demonstrate that it is not a debundled component of a large scale activity by following the "Guidelines on assessment of debundling for SSC project activities". This is documented in Section A.12 of the CPA-DD		OK
B.6	**Algorithms and/or formulae used to determine emission reductions of each CPA (VVS § 96-100)**					
	Data and parameters that are available at validation and that are not monitored					
B.6.1	How was the Amount of methane that would have to be captured and combusted in the year *y* to comply with the prevailing regulations available at validation verified?	/1/	DR	A figure of zero was used as there would have been no methane capture under the baseline, and there are no mandatory requirements in South Africa to capture methane.		OK
B.6.2	How was the Model correction factor to account for model uncertainties available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.3	How was the Global Warming Potential (GWP) of methane available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.4	How was the Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.5	How was the Fraction of methane in the SWDS gas (volume fraction) available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.6	How was the Fraction of degradable organic carbon (DOC) that can decompose available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.7	How was the Methane correction factor available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.8	How was the Fraction of degradable organic carbon (by	/1/	DR	An IPCC default value /57/ was used as per the		OK

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	weight) in the waste type *j* available at validation verified?	/57/		methodology.		
B.6.9	How was the Decay rate for the waste type *j* available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.10	How was the Maximum methane producing potential of the volatile solid generated for animal type "*LT*" available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.11	How was the Annual methane conversion factor for the baseline animal waste management system *j*, stage 1 available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.12	How was the Annual methane conversion factor for the baseline animal waste management system *j*, stage 2 available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.13	How was the Fraction of manure handled in stage 1 of the baseline manure management system *j* available at validation verified?	/1/	DR	This is specific to AMWS systems.		OK
B.6.14	How was the Fraction of manure handled in stage 2 of the baseline manure management system *j* available at validation verified?	/1/	DR	This is specific to AMWS systems.		OK
B.6.15	How was the Density of the methane available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.16	How was the Model correction factor to account for model uncertainties available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.17	How was the Default average animal weight of a defined population available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.18	How was the Volatile solids for livestock "LT" entering the animal manure management system in year *y* (on a dry matter weight basis, kg dm/animal/year) available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.19	How was Installed capacity of the power plant available at validation verified?	/1/	DR	From the basic engineering package /8/ or equivalent design capacity documentation.		OK
B.6.20	How was the Captive power available at validation verified?	/1/	DR	From the basic engineering package /8/ or equivalent design capacity documentation.		OK

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B.6.21	How was the Installed capacity of the thermal plant available at validation verified?	/1/ /8/	DR	From the basic engineering package /8/ or equivalent design capacity documentation.		OK
B.6.22	How was the Plant availability available at validation verified?	/1/ /8/	DR	From the basic engineering package /8/, manufacturers specification or equivalent design capacity documentation.		OK
B.6.23	How was the CO_2 emission factor of the grid in year *y* available at validation verified?	/1/ /42/	DR	The emission factor is determined once at the validation stage using the *Tool to calculate the emission factor for an electricity system* /42/.		OK
B.6.24	How was the Estimated net electrical energy that would have been produced by the existing units under the observed availability of the renewable resource in year *y* available at validation verified?	/1/	DR	This is estimated based on manufacturer specifications and plant design records.		OK
B.6.25	How was the Date at which the existing generation facility is likely to be replaced or retrofitted in the absence of the CDM project activity available at validation verified?	/1/ /41/	DR	This will be specific to each CPA and based on *Tool to determine the remaining lifetime of equipment* /41/		OK
B.6.26	How was the estimated thermal energy that would have been produced by the existing units under the observed availability of the renewable resource for year *y* available at validation verified?	/1/	DR	This will be specific to each CPA and based on manufacturers specifications for the equipment.		OK
B.6.27	How was the Average of historical thermal energy levels delivered by the existing facility, spanning all data from the most recent available year (or month, week or other time period) to the time at which the facility was constructed, retrofitted, or modified in a manner that significantly affected output (i.e. by 5% or more) available at validation verified?	/1/	DR	This will be specific to each CPA and based on manufacturers specifications for the equipment.		OK
B.6.28	How was the Estimated thermal energy that would have been produced by the existing units under the observed availability of renewable resources in year *y* available at validation verified?	/1/	DR	This will be estimated based on CPA specific equipment installation.		OK

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B.6.29	How was the Efficiency of the plant using fossil fuel that would have been used in the absence of the project activity available at validation verified?	/1/	DR	This will be specific to each CPA and based on manufacturers specifications for the equipment.		OK
B.6.30	How was the CO_2 emission factor of the fossil fuel that would have been used in the baseline plant available at validation verified?	/1/	DR	This will be determined from either fuel supplier, physical measurements, regional or national default values or finally IPCC default values.		OK
B.6.31	How was the Degradation rate constant available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.32	How was the Annual methane conversion factor for the project manure storage device *l* available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology along with any manufacturer specific data for the installed plant..		OK
B.6.33	How was the Model correction factor to account for model uncertainties available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.34	How was the Oxidation factor of the project SWDS (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.35	How was the Fraction of methane in the SWDS gas (volume fraction) available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.36	How was the Fraction of degradable organic carbon (DOC) that can decompose available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.37	How was the Methane correction factor of the project SWDS available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.38	How was the Fraction of degradable organic carbon (by weight) in the residual waste available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.39	How was the Decay rate for residual waste available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.40	How was the Global Warming Potential for N_2O available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.41	How was the Emission Factor for emissions from N inputs available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK

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B.6.42	How was the Ratio of molecular weights of N_2O and N available at validation verified?	/1/	DR	Check from molecular weights of chemicals using IUPAC standard.		OK
B.6.43	How was the Fraction that volatilises as NH_3 and NO_x for synthetic fertilizers available at validation verified?	/1/ /57/	DR	An IPCC default value /57/ was used as per the methodology.		OK
B.6.44	In case any of the parameters above were determined based on sampling, was the sample adequate and did it comply with the specific guidance in the applicable methodology or, if no such guidance is available in methodology, did it achieve a 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities?	/1/	DR	*No sampling was used to determine the values, so this was not applicable in this PoA.*		OK
	Baseline emissions					
B.6.45	Are the calculations documented according to the approved methodology and tool and in a complete and transparent manner?	/1/ /10/	DR	The baseline emissions have been documented in a clear and transparent manner in the PoA-DD /1/ and in the CER spreadsheet /10/ and were determined in accordance with the stated methodologies. CL 9 The formulae reported in the PoA-DD for ex-post emission reductions for waste treatment in the project activity does not take into consideration the project leakages as requested in procedure AMS III.AO and the Emission reductions ex-post for AMS I.C should be indicated more clearly in the PoA-DD. In addition the CPA-DD should justify why there is no competing use of biomass, and that the equipment is not transferred from another activity	~~CL 9~~	OK
B.6.46	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	The baseline calculations were determined in accordance with the relevant guidelines and displayed conservative assumptions when required to determine the baseline emissions.	~~CL 10~~ ~~CL 11~~	OK

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				CL 10 IPCC generic data has been used when site specific data were available but without motivating whether this choice is in compliance with the conservativeness principle. CL 11 *Annex 3 does not report the yearly decay as indicated at page 27 of PoA-DD.*		
B.6.47	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	*Uncertainties, if they arose, were properly addressed in the baseline emissions determination.*		OK
B.6.48	If the calculations of baseline emissions are based on sampling, does this comply with the Standard for sampling and surveys?	/1/	DR	*No sampling was used to determine the values, so this was not applicable in this PoA.*		OK
	Project emissions					
B.6.49	Are the calculations documented according to the approved methodology and tool and in a complete and transparent manner?	/1/ /10/	DR	The project emissions have been documented in a clear and transparent manner in the PoA-DD /1/ and in the CER spreadsheet /10/ and were determined in accordance with the stated methodologies.		OK
B.6.50	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	The project calculations were determined in accordance with the relevant guidelines and displayed conservative assumptions when required to determine the baseline emissions.		OK
B.6.51	Are uncertainties in the project emission estimates properly addressed?	/1/	DR	*Uncertainties, if they arose, were properly addressed in the project emissions determination.*		OK
B.6.52	If the calculations of project emissions are based on sampling, does this comply with the Standard for sampling and surveys?	/1/	DR	*No sampling was used to determine the values, so this was not applicable in this PoA.*		OK
	Leakage					
B.6.53	Are the leakage calculations documented according to the approved methodology and in a complete and transparent	/1/ /10/	DR	The leakage has been documented in a clear and transparent manner in the PoA-DD /1/ and in the		OK

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	manner?			CER spreadsheet /10/ and was determined in accordance with the stated methodologies.		
B.6.54	Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	The leakage calculations were determined in accordance with the relevant guidelines and displayed conservative assumptions when required to determine the leakage.		OK
B.6.55	Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	*Uncertainties, if they arose, were properly addressed in the leakage determination.*		OK
B.6.56	If the calculations of leakage emissions are based on sampling, does this comply with the Standard for sampling and surveys	/1/	DR	*No sampling was used to determine the values, so this was not applicable in this PoA.*		OK
	Emission Reductions					
B.6.57	Algorithms and/or formulae used to determine emission reductions: • All assumptions and data used by the project participants are listed in the PoA-DD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PoA-DD and supporting files to be submitted for registration.	/1/	DR	*The algorithms and/or formulae used in the PDD to determine emission reductions included all assumptions and were properly referenced, documents were adequately referenced, the values were deemed to be reasonably used and the methodology was correctly applied*		OK
B.7	**Monitoring plan (VVS § 131-133)**					
	Data and parameters monitored					
B.7.1	Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/	DR	During the SV and in the amended monitoring plan in version 3 of the PoA-DD it was verified that the monitoring plan is in accordance with the methodologies. CL 12 The **monitoring** requirements reported in	~~CL 12~~	OK

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				the applicable methodologies need to be included in the PoA Monitoring Plan		
B.7.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	All relevant and required parameters have been included in the monitoring plan in the PDD. CL 13 Not for all parameters to be monitored reported in E.7.1 it is indicated the measurement method to be used.	~~CL 13~~	OK
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/ /57/ /67/	DR	• Fraction of methane captured at the SWDS and flared, combusted or used in another manner – to be obtained from Written information from the operator of the solid waste disposal site and/or site visits at the solid waste disposal site • Total amount of organic waste prevented from disposal in year *x – to be obtained from* Use mass or volume based measurements. • Average animal weight of a defined livestock population at the project site – will be obtained from farm records. • Number of days in year *y* that the treatment plant was operational – would be obtained from plant records. • Annual average number of animals of type "*LT*" in year *y* – will be obtained from farm records • Number of days animals are alive in the farm in the year *y* – will be obtained from farm records		OK

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			• Number of animals produced/bought annually of type *LT* for the year *y* – will be obtained from farm records • Daily average gross energy intake – will be obtained from farm records and AWMS operational records. • Digestible energy of the feed in present – from IPCC default value /57/ • Fraction of GE – country specific values to be used. • Fraction of the dry matter feed intake – from IPCC default value /57/ • Energy density of the feed in MJ/kg fed to livestock type LT – from IPCC default value /57/ • Quantity of manure treated from livestock type *LT* and animal manure management system *j* - mass or volume based measurements from operational records to be used. • Specific volatile solids content of animal manure from livestock type *LT* and animal manure management system *j* in year *y* – *to be measured by an accredited laboratory* • Genetic source of the production operations livestock originate from an Annex I Party – from farm records • Formulated feed rations (*FFR*) which are optimized for the various animal(s), stage of growth, category,		

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			weight gain/productivity and/or genetics – from farm records • Where applicable, the proper soil application (not resulting in methane emissions) of the residual waste shall be monitored – monitored and recorded by CPA operational personnel. • On site inspections for each individual farm included in the project boundary where the project activity is implemented for each verification period – CME and CPA implementers • $BG_{flare,y}$: Biogas flow to the flare – Measured - flow meters • $BG_{elec,y:}$ Biogas flow to the electricity generation system– Measured - flow meters • $BG_{thermal,y:}$ Biogas flow to the thermal energy generation system– Measured - flow meters • Temperature of the biogas – measured from temperature gauge (thermocouple likely to be integrated into flow measurement) /67/. • Biogas pressure – measured by instrumentation • Net quantity of thermal energy supplied by the project activity during the year *y – calculated as per methodology AMS-I.C* /25/		

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			• Total actual thermal energy produced in year *y* by all units, existing and new project units – *calculated as per methodology AMS-I.C* /25/ • The actual, measured thermal energy production of the existing units in year *y – calculated as per methodology AMS-I.C* /25/ • The net quantity of steam/heat supplied by the retrofit project activity during the year *y – calculated as per methodology AMS-I.C* /25/ • Quantity of hot air – measured instrumentally • Quantity of steam – Measured - flow meters • Temperature – measured instrumentally • Pressure – measured instrumentally • The amount of net renewable electricity supplied to the grid or displaced from the grid as a result of the implementation of the CDM project activity in year - Measured – electricity gauge • The total net electrical energy supplied to a grid or displaced from the grid in year *y* by all units, existing and new project units - Measured – electricity gauge • The actual, measured net electrical energy supplied to the grid or		

			displaced from the grid by the existing units in year *y* - Measured – electricity gauge • Quantity of electricity consumed in the project boundary in year *y* - Measured – electricity gauge • Quantity of biomass type *k* consumed in year *y – measure either by mass or volume by the CPA implementation and operational personnel* • Moisture content of the biomass type *k – measured by instrumentation* • Volatile solid content of the biomass type *k* consumed in year *y – measured at an accredited laboratory* • Pressure in the exhaust gas of the flare – measured with a pressure instrument • Temperature in the exhaust gas of the flare – measured with a temperature gauge • Methane content in the biogas – measured by gas analyser • Volumetric flow rate of the residual gas in dry basis at normal conditions in hour h – measured by flow meter • Flare efficiency in hour *h – depending on whether an open or enclosed flare is used – a default value will be used.* • $Q_{y,WT}$: Quantity of waste transported from the SWDS in the year y – CPA operational records		

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			• $Q_{y,LT}$: Quantity of raw manure transported in the year y – CPA operational records • $Q_{y,sludge}$: Quantity of digester residual waste transported in year y – CPA operational records • $CT_{y,WT}$: Average truck capacity for waste transportation from SWDS – CPA operational records • $CT_{y,LT}$: Average truck capacity for manure transportation – CPA operational records • $CT_{y,sludge}$: Average truck capacity for residual waste transportation – CPA operational records • $DAF_{w,WT}$: Incremental distance for waste transportation from SWDS – CPA operational records such as logbooks from trucks • $DAF_{w,LT}$: Incremental distance for manure transportation – CPA operational records such as logbooks from trucks • DAF_{sludge}: Incremental distance for residual waste transportation – CPA operational records such as logbooks from trucks • Vehicle fuel consumption in litres per kilometre – CPA operational records such as logbooks from trucks and standard fuel consumption for truck types (or IPCC values)		

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			• Fuel density – data sourced from oil companies on product specifications • Net calorific value of the fuel used for transport inside the project boundary in year *y* – data sourced from oil companies on product specifications, or national default values or IPCC values • Emission factor of the fuel for transport outside the project boundary – data sourced from oil companies on product specifications, or national default values or IPCC values • Fraction of volatile solids handled by storage device *l* – *CPA specific based on the Use of mass or volume based measurements* • Annual average interval between manure collection and delivery for treatment at a given storage – Operational records from CPA personnel • Fraction of methane captured at the project SWDS and flared, combusted or used in another manner – SWDS operational records (log books) and site inspections by CME/CPA implementer • Total amount of residual disposed of in SWDS in year x – *CPA specific based on the Use of mass or volume based measurements*		

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			• Quantity of fossil fuel type *i* combusted in process *j* inside the project boundary in year *y* – *use of mass or volume meters – if small day tanks are used, a dipping system using a "ruler" will be used and records kept in logbooks by the CPA operational team* • Weighted average net calorific value of the fossil fuel type *i* combusted inside the project boundary in year *y* – data sourced from oil companies on product specifications, or national default values or IPCC values • CO_2emission factor of fossil fuel type *i* combusted inside the project boundary – data sourced from oil companies on product specifications, or national default values or IPCC values • Quantity of fossil fuel type *c* combusted in process *j* outside the project boundary in year *y* – *if small day tanks are used, a dipping system using a "ruler" will be used and records kept in logbooks by the CPA operational team* • Weighted average net calorific value of the fossil fuel type *c* combusted outside the project boundary in year *y* – data sourced from oil companies on product specifications, or national		

			default values or IPCC values • CO_2emission factor of fossil fuel type *c* combusted outside the project boundary – data sourced from oil companies on product specifications, or national default values or IPCC values • Quantity of biomass transported outside the project boundary in the year *y* – *use of mass or volume based measurement instruments, specific to each CPA, and monitored as part of CPA operational records* • Average truck capacity for transportation outside the project boundary – CPA operational records • Average incremental distance for biomass transportation outside the project boundary – CPA operational records such as truck logbooks or tracking system on trucks • Vehicle fuel consumption in litres per kilometre – CPA operational records such as logbooks from trucks and standard fuel consumption for truck types (or IPCC values /57/) • Fuel density – data sourced from oil companies on product specifications • Net calorific value of the fuel used for transport outside the project boundary in year *y* – data sourced from oil companies on product specifications,		

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			or national default values or IPCC values • Emission factor of the fuel for transport outside the project boundary – data sourced from oil companies on product specifications, or national default values or IPCC values • Mass of synthetic fertilizer type i applied – On site operational records from CPA implementer • Mass of organic fertilizer type j applied – On site operational records from CPA implementer • Nitrogen content of synthetic fertilizer type i applied – information gained from fertiliser supplier, and product information sheets/data • Nitrogen content of organic fertilizer type j applied – information gained from fertiliser supplier, and product information sheets/data • Demonstration that the biomass residue type k from a specific source would continue not to be collected or utilized, e.g. by an assessment whether a market has emerged for that type of biomass residue (if yes, leakage is assumed not be ruled out) or by showing that it would still not be feasible to utilize the biomass residues for any purposes – from CPA specific operational records at site of		

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				biomass generation • Quantity of available biomass residues of type *k* or *m* in the region – surveys or statistics from the defined geographical region specified in each CPA • Quantity of available biomass residues of type *k* or *m* that are utilized in the defined geographical region – surveys or statistics from the defined geographical region specified in each CPA • Identify the most carbon intensive fuel type from the national communication, other literature sources (e.g. IEA). Possibly consult with the national agency responsible for the national communication / GHG inventory. If available, use national default values for the CO_2 emission factor. Otherwise, IPCC default values may be used – national communications or other published literature		
B.7.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/ /57/	DR	• Fraction of methane captured at the SWDS and flared, combusted or used in another manner – to be obtained from Written information from the operator of the solid waste disposal site and/or site visits at the solid waste disposal site. Not measured • Total amount of organic waste		OK

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			prevented from disposal in year *x – to be obtained from* Use mass or volume based measurements. Accuracy based on manufacturers' specifications and applicable standards. Weighbridge accuracy is accepted as this is the basis for farm commercial records. • Average animal weight of a defined livestock population at the project site – will be obtained from farm records. Weighbridge accuracy is accepted as this is the basis for farm commercial records. • Number of days in year *y* that the treatment plant was operational – would be obtained from plant records. • Annual average number of animals of type "*LT*" in year *y* – will be obtained from farm records • Number of days animals are alive in the farm in the year *y* – will be obtained from farm records • Number of animals produced/bought annually of type *LT* for the year *y* – will be obtained from farm records • Daily average gross energy intake – will be obtained from farm records and AWMS operational records. • Digestible energy of the feed in present – from IPCC default value /57/ • Fraction of GE – country specific		

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			values to be used. • Fraction of the dry matter feed intake – from IPCC default value /57/ • Energy density of the feed in MJ/kg fed to livestock type LT – from IPCC default value /57/ • Quantity of manure treated from livestock type *LT* and animal manure management system *j* - mass or volume based measurements from operational records to be used. Measurement from weighbridge (external inputs) and/or flow meters on equipment. • Specific volatile solids content of animal manure from livestock type *LT* and animal manure management system *j* in year *y – to be measured by an accredited laboratory. Accuracy ensured by using accredited laboratories.* • Genetic source of the production operations livestock originate from an Annex I Party – from farm records • Formulated feed rations (*FFR*) which are optimized for the various animal(s), stage of growth, category, weight gain/productivity and/or genetics – from farm records • Where applicable, the proper soil application (not resulting in methane emissions) of the residual waste shall		

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			be monitored – monitored and recorded by CPA operational personnel. • On site inspections for each individual farm included in the project boundary where the project activity is implemented for each verification period – CME and CPA implementers • $BG_{flare,y}$: Biogas flow to the flare – Measured - flow meters. Accuracy will be according to applicable standard or manufacturer's specifications. • $BG_{elec,y:}$ Biogas flow to the electricity generation system– Measured - flow meters. Accuracy will be according to applicable standard or manufacturer's specifications. • $BG_{thermal,y:}$ Biogas flow to the thermal energy generation system– Measured - flow meters. Accuracy will be according to applicable standard or manufacturer's specifications. • Temperature of the biogas – measured from temperature gauge (thermocouple likely to be integrated into flow measurement) /67/. Accuracy will be according to applicable standard or manufacturer's specifications. • Biogas pressure – measured by		

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			instrumentation. Accuracy will be according to applicable standard or manufacturer's specifications. • Net quantity of thermal energy supplied by the project activity during the year *y – calculated as per methodology AMS-I.C* /25/ • Total actual thermal energy produced in year *y* by all units, existing and new project units – *calculated as per methodology AMS-I.C* /25/ • The actual, measured thermal energy production of the existing units in year *y – calculated as per methodology AMS-I.C* /25/ • The net quantity of steam/heat supplied by the retrofit project activity during the year *y – calculated as per methodology AMS-I.C* /25/ • Quantity of hot air – measured instrumentally. Accuracy will be according to applicable standard or manufacturer's specifications. • Quantity of steam – Measured - flow meters. Accuracy will be according to applicable standard or manufacturer's specifications. • Temperature – measured instrumentally. Accuracy will be according to applicable standard or manufacturer's specifications. • Pressure – measured instrumentally.		

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			Accuracy will be according to applicable standard or manufacturer's specifications. • The amount of net renewable electricity supplied to the grid or displaced from the grid as a result of the implementation of the CDM project activity in year - Measured – electricity gauge. Accuracy will be according to applicable standard or manufacturer's specifications. • The total net electrical energy supplied to a grid or displaced from the grid in year *y* by all units, existing and new project units - Measured – electricity gauge. Accuracy will be according to applicable standard or manufacturer's specifications. • The actual, measured net electrical energy supplied to the grid or displaced from the grid by the existing units in year *y* - Measured – electricity gauge. Accuracy will be according to applicable standard or manufacturer's specifications. • Quantity of electricity consumed in the project boundary in year *y* - Measured – electricity gauge. Accuracy will be according to applicable standard or manufacturer's specifications. • Quantity of biomass type *k* consumed		

			in year *y – measure either by mass or volume by the CPA implementation and operational personnel* • Moisture content of the biomass type *k – measured by instrumentation.* Accuracy will be according to applicable standard or manufacturer's specifications. • Volatile solid content of the biomass type *k* consumed in year *y – measured at an accredited laboratory. Accuracy ensured by accredited laboratory use.* • Pressure in the exhaust gas of the flare – measured with a pressure instrument. Accuracy will be according to applicable standard or manufacturer's specifications. • Temperature in the exhaust gas of the flare – measured with a temperature gauge. Accuracy will be according to applicable standard or manufacturer's specifications. • Methane content in the biogas – measured by gas analyser. Accuracy will be according to applicable standard or manufacturer's specifications. • Volumetric flow rate of the residual gas in dry basis at normal conditions in hour h – measured by flow meter. Accuracy will be according to applicable standard or manufacturer's		

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			specifications. • Flare efficiency in hour *h – depending on whether an open or enclosed flare is used – a default value will be used.* • $Q_{y,WT}$: Quantity of waste transported from the SWDS in the year y – CPA operational records • $Q_{y,LT}$: Quantity of raw manure transported in the year y – CPA operational records • $Q_{y,sludge}$: Quantity of digester residual waste transported in year y – CPA operational records • $CT_{y,WT}$: Average truck capacity for waste transportation from SWDS – CPA operational records • $CT_{y,LT}$: Average truck capacity for manure transportation – CPA operational records • $CT_{y,sludge}$: Average truck capacity for residual waste transportation – CPA operational records • $DAF_{w,WT}$: Incremental distance for waste transportation from SWDS – CPA operational records such as logbooks from trucks • $DAF_{w,LT}$: Incremental distance for manure transportation – CPA operational records such as logbooks from trucks • DAF_{sludge}: Incremental distance for residual waste transportation – CPA		

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			operational records such as logbooks from trucks • Vehicle fuel consumption in litres per kilometre – CPA operational records such as logbooks from trucks and standard fuel consumption for truck types (or IPCC values) • Fuel density – data sourced from oil companies on product specifications • Net calorific value of the fuel used for transport inside the project boundary in year *y* – data sourced from oil companies on product specifications, or national default values or IPCC values • Emission factor of the fuel for transport outside the project boundary – data sourced from oil companies on product specifications, or national default values or IPCC values • Fraction of volatile solids handled by storage device *l* – *CPA specific based on the Use of mass or volume based measurements* • Annual average interval between manure collection and delivery for treatment at a given storage – Operational records from CPA personnel • Fraction of methane captured at the project SWDS and flared, combusted or used in another manner – SWDS		

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			operational records (log books) and site inspections by CME/CPA implementer • Total amount of residual disposed of in SWDS in year x – *CPA specific based on the Use of mass or volume based measurements* • Quantity of fossil fuel type *i* combusted in process *j* inside the project boundary in year *y – use of mass or volume meters – if small day tanks are used, a dipping system using a "ruler" will be used and records kept in logbooks by the CPA operational team* • Weighted average net calorific value of the fossil fuel type *i* combusted inside the project boundary in year *y* – data sourced from oil companies on product specifications, or national default values or IPCC values • CO_2emission factor of fossil fuel type *i* combusted inside the project boundary – data sourced from oil companies on product specifications, or national default values or IPCC values • Quantity of fossil fuel type *c* combusted in process *j* outside the project boundary in year *y – if small day tanks are used, a dipping system using a "ruler" will be used and*		

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			records kept in logbooks by the CPA operational team • Weighted average net calorific value of the fossil fuel type *c* combusted outside the project boundary in year *y* – data sourced from oil companies on product specifications, or national default values or IPCC values • CO_2emission factor of fossil fuel type *c* combusted outside the project boundary – data sourced from oil companies on product specifications, or national default values or IPCC values • Quantity of biomass transported outside the project boundary in the year *y – use of mass or volume based measurement instruments, specific to each CPA, and monitored as part of CPA operational records* • Average truck capacity for transportation outside the project boundary – CPA operational records • Average incremental distance for biomass transportation outside the project boundary – CPA operational records such as truck logbooks or tracking system on trucks • Vehicle fuel consumption in litres per kilometre – CPA operational records such as logbooks from trucks and standard fuel consumption for truck		

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

			types (or IPCC values) • Fuel density – data sourced from oil companies on product specifications • Net calorific value of the fuel used for transport outside the project boundary in year *y* – data sourced from oil companies on product specifications, or national default values or IPCC values • Emission factor of the fuel for transport outside the project boundary – data sourced from oil companies on product specifications, or national default values or IPCC values • Mass of synthetic fertilizer type i applied – On site operational records from CPA implementer, accuracy from farm weighbridge. • Mass of organic fertilizer type j applied – On site operational records from CPA implementer, accuracy from farm weighbridge • Nitrogen content of synthetic fertilizer type i applied – information gained from fertiliser supplier, and product information sheets/data • Nitrogen content of organic fertilizer type j applied – information gained from fertiliser supplier, and product information sheets/data • Demonstration that the biomass residue type k from a specific source		

			would continue not to be collected or utilized, e.g. by an assessment whether a market has emerged for that type of biomass residue (if yes, leakage is assumed not be ruled out) or by showing that it would still not be feasible to utilize the biomass residues for any purposes – from CPA specific operational records at site of biomass generation • Quantity of available biomass residues of type *k* or *m* in the region – surveys or statistics from the defined geographical region specified in each CPA • Quantity of available biomass residues of type *k* or *m* that are utilized in the defined geographical region – surveys or statistics from the defined geographical region specified in each CPA • Identify the most carbon intensive fuel type from the national communication, other literature sources (e.g. IEA). Possibly consult with the national agency responsible for the national communication / GHG inventory. If available, use national default values for the CO_2 emission factor. Otherwise, IPCC default values may be used – national communications or other published		

				literature		
B.7.5	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR	• Average animal weight of a defined livestock population at the project site – will be obtained from farm records. Is calibrated annually. • Quantity of manure treated from livestock type *LT* and animal manure management system *j* - mass or volume based measurements from operational records to be used. Measurement from weighbridge (external inputs) and/or flow meters on equipment. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used • $BG_{flare,y}$: Biogas flow to the flare – Measured - flow meters. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used		OK

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			• $BG_{elec,y:}$ Biogas flow to the electricity generation system– Measured - flow meters. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used • $BG_{thermal,y:}$ Biogas flow to the thermal energy generation system– Measured - flow meters. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used. • Temperature of the biogas – measured from temperature gauge (thermocouple likely to be integrated into flow measurement) /67/. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the		

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			manufacturer's specifications are not available, international standards may be used • Biogas pressure – measured by instrumentation. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used. • Quantity of hot air – measured instrumentally. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used • Quantity of steam – Measured - flow meters. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may		

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			be used • Temperature – measured instrumentally. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used • Pressure – measured instrumentally. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used • The amount of net renewable electricity supplied to the grid or displaced from the grid as a result of the implementation of the CDM project activity in year - Measured – electricity gauge. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the		

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			manufacturer's specifications are not available, international standards may be used • The total net electrical energy supplied to a grid or displaced from the grid in year *y* by all units, existing and new project units - Measured – electricity gauge. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used. • The actual, measured net electrical energy supplied to the grid or displaced from the grid by the existing units in year *y* - Measured – electricity gauge. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used. • Quantity of electricity consumed in the project boundary in year *y* - Measured – electricity gauge. CPA		

			implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used. • Moisture content of the biomass type *k – measured by instrumentation.* CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used. • Pressure in the exhaust gas of the flare – measured with a pressure instrument. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used. • Temperature in the exhaust gas of the		

			flare – measured with a temperature gauge. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used. • Methane content in the biogas – measured by gas analyser. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used. • Volumetric flow rate of the residual gas in dry basis at normal conditions in hour h – measured by flow meter. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may		

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			be used. • Total amount of residual disposed of in SWDS in year x – *CPA specific based on the Use of mass or volume based measurements.* CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used • Mass of synthetic fertilizer type i applied – On site operational records from CPA implementer, accuracy from farm weighbridge. CPA implementers shall ensure that the equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used • Mass of organic fertilizer type j applied – On site operational records from CPA implementer, accuracy from farm weighbridge. CPA implementers shall ensure that the		

				equipment are calibrated either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used		
B.7.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	All monitoring parameters were checked and the monitoring frequency planned for each parameter was checked and found to be adequate, ranging from continuous online measurement for the equipment installed with probes (such as temperature, pressure, electricity and flow) to batch such as the weighbridge for mass of trucks and animals.		OK
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/ /9/	DR	The CME Quality Manual /9/ makes reference in section 7 to the CPA implementers responsibilities for collecting records and ensuring that they meet the requirements of the project documentation.		OK
B.7.8	In case any of the parameters will be determined based on sampling, is the sample plan adequate and does it comply with the specific guidance in the applicable methodology or, if no such guidance is available in methodology, does it achieve a 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities?	/1/	DR	*The only parameter that is close to sampling is the fraction of renewable biomass. This will be determined according to independent surveys, and the sampling they employed will be checked. Further to this, no sampling will be employed in the monitoring parameters.*		OK
	Ability of project participants to implement monitoring plan					
B.7.9	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/ /9/	DR	The CME quality Manual /9/ gives guidance to CPA implementers regarding the monitoring of the project activity. Further, the PoA-DD covers		OK

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				the management of data of the parameters in section 2 of B7.2. This section also covers the corrective action process if non conformities are identified.		
B.7.10	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/ /9/ /65/ /68/	DR	Each CPA implementer is expected to develop a system that will ensure all the operational management and required records and monitoring is done in accordance with the PoA-DD requirements. This is stipulated in the CME Quality Manual /9/. From interviews /65/, /68/ with the CME management team it was clear that this would be an important issue to discuss with CPA implementers as their emission reductions were resultant on good quality management thereof.		OK
B.7.11	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/ /9/ /65/ /68	DR	Each CPA implementer is expected to develop a system that will ensure all the operational management and required records and monitoring is done in accordance with the PoA-DD requirements. This is stipulated in the CME Quality Manual /9/. From interviews /65/, /68/ with the CME management team it was clear that this would be an important issue to discuss with CPA implementers as their emission reductions were resultant on good quality management thereof. The data reporting will be checked by the CME and by the DOE apart from any internal checks done by the CPA implementer and operational team.		OK
B.7.12	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/	DR	The maintenance of records was in accordance with the requirements for a period of two years after the crediting period.		OK

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	Monitoring of sustainable development indicators/ environmental impacts					
B.7.13	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/ /72/	DR	The South African DNA does not require the monitoring of Sustainable development criteria. This was confirmed in an interview with the DNA representatives /72/.		OK
B.7.14	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/ /72/	DR	The South African DNA does not require the monitoring of Sustainable development criteria. This was confirmed in an interview with the DNA representatives /72/. ~~CL 14~~ The Monitoring plan does not provide for the collection and archiving of relevant data concerning environmental, social and economic impacts. The CEM is requested to report in the PoA whether this is in line with SA sustainable development criteria	~~CL 14~~	OK
B.7.15	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/ /72/	DR	The South African DNA does not require the monitoring of Sustainable development criteria. This was confirmed in an interview with the DNA representatives /72/.		OK

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Table 3 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 1 The eligibility criteria does not take into consideration relevant SSC CDM criteria such as the "General Guidelines to SSC CDM Methodologies"	A.2.8	The eligibility criteria was improved to contain all these elements. See section A.4.2.2 [in version 2 of the CPA-DD] of the PoA-DD. For each eligibility criteria the confirmation method is describe together with the relevant section in the CPA-DD where the information can be found.	The PoA DD has been amended by the project proponent to include the elements contained in paragraph 13 of the Standard for the development of eligibility criteria for the inclusion of a project activity as a CPA under the PoA /36/. This includes a description of how this will be confirmed at each CPA. CAR is closed
CAR 2 Letters of Approval and Authorisation from the Host Country have not been issued yet	A.4.2	The DNA issued the letter on the 8th of February 2012, see document PoA.A3..	A Letter of Approval from the South African DNA – dated 8 February 2012 /20/ was received and accepted as being correctly issued and meeting the requirements. This was validated with Mr Patrick Tuwani, Deputy Director of the South African DNA by telephone. CAR is closed
CAR 3 The barrier analysis does not follow the Guidelines for objective demonstration and assessment of barriers. No evidences sources are provided to substantiate argumentations made, it is not clear to which of the different alternatives the barriers are referred to.	B.2.23	The additionality of a PoA as a whole is describe in section A.4.3 [in version 2 of the CPA-DD] , applying the barrier analysis. The barrier analysis has been divided in two steps ***Step 1: Identify barriers that would prevent the implementation of the proposed CDM project activity***	The barrier analysis was amended and included in version 3 of the PoA-DD as per the tool /47/. Evidence had been presented including the basic engineering package /8/, with its various referenced sources, and the feasibility study /16/. Objective evidence submitted in the baseline development

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		a) Technological barrier The technological barrier has been expanded to look at the following: i. Reference plants and track record in a developing country ii. Operator skill and labour requirements iii. Integration with existing grid and distribution network iv. Anaerobic digestion technology **b) Barrier due to prevailing practice:** The barrier has been divided to separately look at methane avoidance and renewable energy. For methane avoidance evidence from AWMS, confirmation letters the industry have been provided. For methane avoidance evidence from SWDS, the National Waste Management Strategy has been provided. For renewable energy a description of the current electricity mix is explained and the difficulties experienced by IPPs. Reference is made to information published on the Department of Energy's website, the White Paper on Renewable Energy and the Renewable Energy Feed-In Tariff (REFIT) programme. ***Step 2: Show that the identified barriers would not prevent the***	explains the various options for the applicable methodologies. The barrier analysis now clearly follows the guidelines. CAR is closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		implementation of at least one of the alternatives The barriers have comparatively an insignificant effect on the prevailing practise. Furthermore: The baseline development has been improved. The PoA (section E.4) now describe how the baseline will be identified as part of the development of each CPA. The current manure management practice at a specific farm is seen as the baseline. for that project. Therefore, any AWMS that meet the baseline applicability condition in AMS-III.D (paragraph 1) is eligible under this PoA. Baseline identification for <u>greenfield</u> piggery and dairy projects have also been describe. The reason for only including these two systems is that it is only possible to demonstrate that the most plausible baseline scenario is a anaerobic management system for piggeries and dairy milking parlours. For cattle feedlot, poultry farms and sheep feedlots, the alternative (step 4: alternative with the least emissions as the baseline) that remain are aerobic and therefore not eligible under the	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		methodology.	
CAR 4 The eligibility criteria does not contain all the elements contemplated in §13 of the "Standard for the development of the eligibility criteria"	B.3.1	The application condition for each Methodology deals with the relevant conditions in the "General Guidelines to SSC CDM Methodologies" see application condition nr 5 and 6 of methodology AMS-III.D and application condition nr 9 of Methodology AMS-I.C. The eligibility criteria have been amended to include the requirements of paragraph 3 of the General guidelines to SSC CDM methodologies in each applicable methodology, extracted below: **Methodology AMS-III.D:** 7. Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO2 equivalent annually from all Type III components of the project activity. 1. 2. **Methodology AMS-III.AO** 2. Measures are limited to those that result in emission reductions of less than or equal to	The eligibility criteria have been amended in version 3 of the PoA-DD to include the requirements of paragraph 3 of the General guidelines to SSC CDM methodologies /38/. The eligibility criteria are also in accordance with the three primary methodologies applied in the PoA AMS-III.D and/or AMS-I.C /24/ /25/ and the requirements of the PoA eligibility standard /36/. The corrective action taken by the project proponent addresses the requirements of the identified corrective action request. CAR is closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		60 kt CO_2 equivalent annually. 3. 4. **Methodology AMS-I.C** 4. The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities). 5. For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities). 6. The following capacity limits apply for biomass cogeneration units: (a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical)	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant); (b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		not exceed 45 MW thermal; (c) If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW. 6. The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6, and should be physically distinct from the existing units.	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 5 It is not available yet the Management System Manual describing all the information contemplated in §9 of the "Standard for the development of Eligibility criteria"	B.5.1	A management system has been developed, according to the "Standard for the development of Eligibility criteria "see section A.4.4.1 [of version 2 of the CPA-DD] of the PoA. The management system contain all the proposed topics in nr.9.	An operational and management plan was incorporated into section A4.4.1 of the PoA DD (version 2) / Section C in version 3. This covers roles and responsibilities within the CME and the process from identification of a potential CPA to ensuring that the CPA is not already covered by another CDM project or PoA. The control of documents and records and the process for PoA continual improvement. The CME Quality Manual /9/ also covers elements of the management plan and responsibilities for the implementation thereof. It was accepted that the management system manual as described in above complies with §9 of the *"Standard for the development of Eligibility criteria"* /36/. CAR is closed
CAR 6 The eligibility criteria for inclusion of a CPAs listed in section B.2 of the PoA-DD, does not describe the specifications of technology(ies)/measure(s) including the level and type of service, performance specifications, in accordance with the Standard for demonstration of additionality,	N/A	Third eligibility criterion revised.	In the revised PoA-DD, the CME revised the third eligibility criterion by stating that the CPA must involve the implementation of one of the technologies/measures described in section A.2, Part I in the PoA-DD. The CPA implementer shall demonstrate that the performance of the

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
development of eligibility criteria and application of multiple methodologies for programmes of activities, version 02.1 paragraph 3.2.1 (c).			equipment used in the proposed CPA comply with national or international standards. If this evidence is not available at the time of validation, it will be submitted during verification. This criterion is considered adequate specification of the technology/measure, including the level and type of service, performance specifications, to be used by CPAs. CAR is closed
CAR 7 The PoA-DD, pages 8-9 indicates that the PoA will cover multiple technologies/measures and/or multiple methodologies (i.e. scenario A: AMS.III-D and AMS.I-C; scenario B: AMS.III-D, scenario C: AMS.I-C; and energy scenarios 1, 2, and 3). However, the PP has not submitted generic CPAs (Part II. Generic component project activity) for each of the combinations of technologies/measures and/or methodologies, in accordance with the Guidelines for completing the programme design document form for small-scale CDM programmes of activities (version 01.0). Please also refer the CDM Project Standard, version 02.1, paragraph 143	N/A	The PoA-DD contains three generic documents, please see page 17 for the generic CPA-DD - project scenario A, page 119 for the generic CPA-DD - project scenario B and page 188 for the generic CPA-DD - project scenario C.	In the revised PoA-DD, the CME included the description of 3 different generic CPAs corresponding to the scenarios A, B and C, as required by paragraph 143 of the PS /22/. These are: - Generic CPA corresponding to scenario (A): methane avoidance from AWMS with the recovered methane being utilised for generation of thermal and/or electrical energy where only manure from piggeries and dairies are applicable for inclusion in the scope of methane avoidance application; - Generic CPA corresponding to

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			scenario (B): methane avoidance from AWMS with the recovered methane being destroyed where only manure from piggeries and dairies are applicable for inclusion in the scope of methane avoidance application; and - Generic CPA corresponding to scenario (C): generation of thermal and/or electrical energy with no claimed methane avoidance where only biomass that complies with the renewable biomass applicability conditions are applicable for inclusion in the scope of renewable energy generation application. CAR is closed
CL 1 It is not described in the PoA-DD whether the anaerobic treatment and/or the power plant in the CPA could be centralized serving to different solid waste / animal manure installations.	A.3.4	The technology/measure description in section A.4.2.1 [of version 2 of the CPA-DD] states that "The PoA also covers treatment of substrate collected from several sites in a centralized plant". Also, applicability condition nr.1 of methodology AMS-III.D contains this option.	The technology/measure description has been amended in the PoA DD (version 2) section A.4.2.1 / Section B.3 of Version 3 of the POA-DD /1/ to include the possibility of a centralised plant. This complies with the eligibility criteria of UNFCCC methodology AMS-III.D /25/ and is acceptable.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			CL is closed
CL 2 It is not described and motivated in the PoA-DD the rationale behind the proposed **sampling** criteria and that make the verification risks acceptable	A.7.1	The monitoring plan in section A.4.4.2 [of version 2 of the CPA-DD] now describe the proposed sampling method. The method is based on the multi-stage sampling approach. The primary sampling unit will be the CPAs under a specific CPA implementer and the secondary sample units will be the different project activities as defined in section A.4.2.1.	The UNFCCC standard requirement /36/ for a sampling system to meet a confidence/precision limits of 90/10 has been included. All CPAs have been included as possible sites for DOE verification in the future so the sampling criteria has been clarified to ensure that the verification risks are acceptable. This was applied in section A.4.4.2 of version 2 of the PoA-DD and Section B.7.2 of version 3. CL is closed.
CL 3 The PoA additionality elements described in section A.4.3 of the PoA-DD need to be substantiated with objective evidence.	B.1.2	The additionality of a PoA as a whole is describe in section A.4.3 [of version 2 of the CPA-DD], applying the barrier analysis. The new format is describe under CAR *5*	Section A.4.3 (of version 2) and transposed to Section B of version 3 describes the baseline development and not additionality which is addressed in accordance with tool Appendix B of the simplified modalities and procedures for small-scale CDM project activities /27/, Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories whereby Investment analysis has been chosen. The objective evidence submitted in the baseline development explains the various options for the applicable methodologies.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			CL is closed
CL 4 The additionality criteria reported in the PoA-DD repeat elements already considered at PoA level (identification of alternatives, compliance with mandatory regulations, common practice analysis, etc.) and not CPA specific (i.e. check that the CPA specific baseline treatment stages satisfy all the applicability criteria of the chosen methodologies, check that the financial parameters fixed at PoA are applicable to the specific CPA, etc.). In addition it has not been provided a letter from the poultry association in order to substantiate that anaerobic digesters are not common practice in the poultry sector.	B.2.4	The duplication of information has been removed by supplying different information in sections E.5.1 and E.5.2. Section E.5.1 broadly describe the two possible demonstration approaches a CPA can follow and it also give the investment analysis information that should be validated at PoA level. Section E.5.2 give the eligibility criteria for assessing a specific CPA's additionality. The letter from the poultry association has been received from Marius Gericke on the 20th of February and it has been included in supporting document PoA.E4.	The additionality criteria contained within the PoA DD have been amended to remove the duplications and repetitions and non-specific criteria. In addition, the letter from the Milk Producers Association /4/ was received and confirmed as dated 4 July 2011 and signed by Nico Schutte, and from Marius Gericke from the Poultry Association /7/ - this supplemented previous letters from the feedlot association /6/ and SA Pork Producers Organisation /5/. This was sufficient to resolve and provide clarity on this issue. CL is closed
CL 5 Possible double counting of baseline emissions has not been identified as one of the risks of using multiple methodologies and treated in the PoA consequently.	B.3.2	Justified using multiple methodologies. Also, the integration of methodology AMS-III.D and AMS-III.AO has been describe in methodology ASM-III.AO and therefore there is no risk for double accounting	The project proponent has addressed any potential multi-methodological effects in section E.2 in accordance with §10 of the Standard for application of multiple CDM methodologies /34/, furthermore, in terms of potential double counting of CPA's, this has been addressed in the eligibility criteria of inclusion in terms of Standard for the development of eligibility criteria for the inclusion of a project activity as a

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			CPA under the PoA /36/ and has an agreement /15/ with each CPA implementer that addresses double counting concerns too. The corrective action taken by the project proponent addresses the requirements of the identified clarification request. CL is closed
CL 6 Some of the methodology applicability requirements (i.e. point 3 of applicability requirements of meth. AMS III-AO, points 11 to 14 of meth. AMS I.C or eligibility criteria for indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity guidelines) need to be included in the PoA-DD. In addition the CME has not justify why there are not multi-methodological cross effects in compliance with §10 of the Standard for application of multiple CDM methodologies	B.2.30	The applicability requirements have been updated to include all requirements in the methodologies, see the applicability conditions for each methodology in section E.2. The multiple methodology justification for the PoA is demonstrated according to the "Standard for application of multiple CDM methodologies for a Programme of activities" in section E.2. According to the "General guidelines to SSC CDM methodologies", the Board approved the combination of any one of the Type III methodologies where activities lead to generation of methane, with any one of the Type I methodologies for utilising the methane generated for generation of renewable energy.	The inclusion of the outstanding eligibility criteria from methodology AMS-I.C /25/ have been checked and they are included in section E.2 of the PoA-DD. The possible multi methodological effects of the PoA have also been addressed in alignment with §10 of the Standard for application of multiple CDM methodologies /23/. This is deemed to be adequate to clarify the issue raised during the site visit. CL is closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		Furthermore, according to the "Standard for application of multiple CDM methodologies for a Programme of activities", where combinations of methodologies vary across CPAs, the CME must demonstrate that the implementation of the activities is integrated through the design of the programme. The fact that methodology AMS-III.D is already incorporated in methodology AMS-III.AO indicates that these two methodologies are integrated.	
CL 7 The two sequential stages in which the combinations of the baseline scenarios for waste management systems have been embedded need to be defined more clear in the PoA-DD	B.4.1	Big changes were made to the baseline description in section E.4. It now resembles the baseline description in the applicable the small scale methodologies. Therefore, the baseline scenario will be the current practise at the AWMS/SWDS. The current practise will be describe in a confirmation letter, signed by the AWMS/SWDS owner/manager. The method for calculating baseline emissions for sequential treatment are described under the AMS-III.D baseline emissions in section E.6.2. **Greenfield projects:**	The sequential stage anaerobic digestion has been expanded in version 3 of the PoA-DD to clarify the method for calculating baseline emissions for sequential treatment as per the approved methodology AMS-III.D /24/ baseline emissions determination. It was also clarified that sequential digestion will only be applied for piggeries on greenfield installations in accordance with the "General Guidelines to SSC CDM methodologies", paragraph 19 /28/. This is deemed to be adequate to clarify the issue raised during the site visit. CL is closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		Only the baseline for greenfield piggery projects are describe in section E.4 according to the "General Guidelines to SSC CDM methodologies", paragraph 19. Therefore, only piggery greenfield projects are eligible to for methane avoidance emission reduction under this PoA. The sequential treatment for greenfield piggery projects are describe in section E.4.	
CL 8 For clarity, the Animal Waste Management Systems alternatives called "anaerobic digester" should be called "anaerobic digester without CDM revenues"	B.4.2	The proposed change has been made, see the scenario description under "unlikely baseline scenarios for piggery AWMS" in section E.4.	The scenario has been clarified to ensure that the unlikely scenario is an anaerobic digestion without CDM revenue. This is deemed to be adequate to clarify the issue raised during the site visit. CL is closed
CL 9 The formulae reported in the PoA-DD for ex-post emission reductions for waste treatment in the project activity does not take into consideration the project leakages as requested in procedure AMS III.AO and the Emission reductions ex-post for AMS I.C should be indicated more clearly in the PoA-	B.6.45	The *ex-post* formula has been updated according to the formula in the AMS-III.AO methodology to include leakage. The ex-post emission reduction section has clearly been divided in two sections, one for methodology AMS-III.AO and AMS-III.D (methane avoidance) and	The formulae reported in the PoA-DD in section E.7 have been amended and are now compliant with the formulae in the three approved methodologies (AMS-III.D and/or AMS-I.C /24//25) that have been applied in the PoA. The competing use of biomass has been

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
DD. In addition the CPA-DD should justify why there is no competing use of biomass, and that the equipment is not transferred from another activity		one for methodology AMS-I.C (renewable energy). For each CPA it is now required to clarify that equipment is not transferred from another activity for the proposed CPA. This clarification is also now included in the FSCAD001-DD.	addressed in Section2.3 of B5.2 in the CPA-DD and is now included and justified clearly. The eligibility criteria (point (c)) refer to the use of replacement equipment and the CPA has confirmed that no replacement equipment has been used. This is deemed to be adequate to clarify the issue raised during the site visit. CL is closed
CL 10 IPCC generic data has been used when site specific data were available but without motivating whether this choice is in compliance with the conservativeness principle.	B.6.46	There are two methods for calculating Volatile solids (VS) for different livestock types. The different methods may be used under the following conditions. Where it can be demonstrated that the genetic source of the livestock originates from an Annex I Party, both methods may be applied. Where it can not be demonstrated that the genetic source of the livestock originates from an Annex I Party, only the enhanced characterisation method may be applied. The methodology does not apply the conservativeness principle on the	The use of generic IPCC data is in compliance with the method for determining volatile solids. It has been added that where any significant differences between the data available and the IPCC values are found, this is to be explained within the CPA. This is deemed to be adequate to clarify the issue raised during the site visit. CL is closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		selection of a method. The availability of information will determine which method will be used. The following condition was included in the PoA-DD and CPA-DD: Calculated values form the enhanced characterization method shall be compared with IPCC default values and any significant differences shall be explained	
CL 11 Annex 3 does not report the yearly decay as indicated at page 27 of PoA-DD.	B.6.46	This sentence referring to decay was removed from the PoA-DD. The baseline emission equation 4 (section E.6.2) now refers to the decay model. The decay model will only be relevant where emission reduction through methane avoidance from SWDS forms part of the CPA.	Version 3 of the PoA DD has been amended to provide clarity by the removal of the reference to annual decay, while any decay that would need to be determined, in terms of the methodology, is included in Equation 4 for $BE_{SWDS,y}$ in section E.6.2 of the document. This is deemed to be adequate to clarify the issue raised during the site visit. CL is closed
CL 12 The **monitoring** requirements reported in the applicable methodologies need to be included in the PoA Monitoring Plan	B.7.1	Please see the new monitoring objectives under the monitoring plan in section E.7.2. Section E.7.1 contain all the monitoring parameters required by the methodologies	The monitoring requirements for the various parameters have been completed to include contributions in all required sections including QA/QC procedures. This now fulfils the requirements for completing a PDD /32/.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			CL is closed
CL 13 Not for all parameters to be monitored reported in E.7.1 it is indicated the measurement method to be used.	B.7.2	Please see the description of measurement methods in section E.7.1. All the measurement methods was checked against the applicable methodologies and tools.	The measurement method has been included in section E.7.1 for all parameters that form part of the proposed CDM project activity. This clarifies the measuring method addressed the clarification request identified during the site validation. CL is closed
CL 14 The Monitoring plan does not provide for the collection and archiving of relevant data concerning environmental, social and economic impacts. The CEM is requested to report in the PoA whether this is in line with SA sustainable development criteria	B.7.14	The South African DNA was asked for a statement regarding the SA sustainable development criteria requirements concerning monitoring of environmental, social and economic impacts. The DNA's response was that here is no formal agreement, see supporting document, PoA, E7.	A Copy of an email from Lindiwe Olga Chauke, Director of the South African DNA /62/ was seen in which it is stated that there is no formal; requirement for the monitoring of SD criteria, this was confirmed in a meeting between DNV and the DNA in March 2012. This addressed the clarification request identified during the site validation. CL is closed

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
No FAR was addressed		No FAR was addressed

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APPENDIX B

PROTOCOL FOR ASSESSING COMPLIANCE OF SPECIFIC CPA WITH POA REQUIREMENTS

Table 1 Requirements checklist

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A Description of CPA (PS § 31, VVS § 62-63, § 189)						
A.1.	**Title, Technical description of CPA and Parties involved**					
A.1.1	Does section A.1 of the CPA-DD include a clearly identifiable project title, version number of the CPA-DD and date of the CPA-DD?	/1/	DR	☐ Clearly identifiable title of the project activity ☐ Version number of the PoA-DD is included ☐ Date of the PoA-DD is included.		
A.1.2	Is the CPA-DD is in accordance with the applicable requirements for completing CPA-DDs?	/1/	DR			
A.1.3	Does the description of the CPA sufficiently cover all relevant elements, is accurate and does it provides the reader with a clear understanding of the nature of the proposed CPA?	/1/	DR			
A.1.4	Does the CPA-DD provide information on the CPA implementer(s)? CPA implementers can be project participants of the PoA, under which the CPA is submitted, provided the name is included in the registered PoA.	/1/	DR			
A.1.5	Does the CPA-DD describe all the technologies and/or measures to be employed and/or implemented by the CPA including a list of the facilities, systems and equipment that will be installed and/or modified by the CPA	/1/	DR			
A.1.6	Does the CPA-DD adequately list all Party(ies) and CPA implementer(s) involved in the CPA and provide contact information in Appendix 1? Are all listed Party(ies) and CPA implementer(s) included in the PoA?	/1/	DR			
A.1.7	Does the CPA-DD provide geographic reference or other means of identification that allows for the unique identification of the CPA?	/1/	DR			

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.2. Duration of the CPA and crediting period					
A.2.1 Is the CPA starting date and operational lifetime clearly defined and evidenced?	/1/	DR			
A.2.2 Has the crediting period been clearly defined and is the start of the crediting period deemed to be reasonable?	/1/	DR			
A.2.3 Has it been confirmed that the length of the CPA crediting period does not exceed the end of PoA?	/1/	DR			
A.3. Estimated amount of emission reductions from the CPA					
A.3.1 Has the emission reduction forecast been checked and is it deemed likely that the stated amount is achieved given that the underlying assumptions do not change?	/1/	DR			
A.4. Public funding					
A.4.1 In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided 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?	/1/	DR			
A.5. Confirmation for CPA					
A.5.1 Has a confirmation been provided that the CPA is neither registered as an individual CDM project activity nor is part of another registered PoA?	/1/	DR			
B Environmental impacts (PS § 63-64, VVS § 134-135) *It is assessed whether environmental impacts of the CPA have been properly addressed.*			☐ Analysis at PoA level ☐ Analysis at CPA level This section must only be completed if the analysis of environmental impacts must be at CPA level.		
B.1.1 Has an analysis of the environmental impacts of the CPA been sufficiently described?	/1/	DR			

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.1.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA)?	/1/	DR			
B.1.3 Will the programme create any adverse environmental effects?	/1/	DR			
B.1.4 Are transboundary environmental impacts considered in the analysis?	/1/	DR			
B.1.5 Have identified environmental impacts been addressed in the programme design?	/1/	DR			
B.1.6 Does the programme comply with environmental legislation in the host country?	/1/	DR			
C Stakeholders' comments (PS § 65-69, VVS § 138-140) *It is assessed whether stakeholders have been properly consulted in the development of the CPA.*			☐ Consultation at PoA level ☐ Consultation at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
C.1.1 Have relevant stakeholders been consulted?	/1/	DR			
C.1.2 Have appropriate media been used to invite comments by local stakeholders?	/1/	DR			
C.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/	DR			
C.1.4 Is a summary of the stakeholder comments received provided?	/1/	DR			
C.1.5 Has due account been taken of any stakeholder comments received?	/1/	DR			
D Application of a baseline and monitoring methodology(ies)					
D.1. Title and reference of the approved baseline and monitoring methodology(ies) selected					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.1.1 Are the exact reference and title of approved methodology(ies) and tools listed?	/1/	DR			
D.1.2 Are valid version of approved methodology(ies) and tools applied?	/1/	DR			
D.2. Applicability of methodology (and tools) (VVS § 73-77) *The applicability of the methodology is checked through the eligibility criteria specifying the conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs*					
D.2.1. Do the eligibility criteria in D.5 below, in particular the eligibility criteria specifying the conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by the CPA, sufficiently demonstrate that the CPA complies with the applicability criteria of the applied methodology (and tools)? If not, provide below and assessment of the CPAs compliance with the applicability criteria.	/1/	DR			
D.2.2. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: This methodology comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel?	/1/	DR			
D.2.3. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: Biomass-based cogeneration systems are included in this category. For the purpose of this methodology "cogeneration" shall mean the simultaneous generation of					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
thermal energy and electrical energy in one process?					
D.2.4. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: Emission reductions from a biomass cogeneration system can accrue from one of the following activities Combination of (a) and (b)? a) Electricity supply to a grid; b) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for consumption by other facilities;					
D.2.5. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities).					
D.2.6. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities)?					
D.2.7. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: The following capacity limits apply for biomass cogeneration					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
units: a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant); b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal; If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW?					
D.2.8. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6, and should be physically distinct from the existing units?					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.2.9. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category?					
D.2.10. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the "General Guidelines to SSC CDM methodologies"?					
D.2.11. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation?					
D.2.12. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions?					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.2.13. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions?					
D.2.14. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions?					
D.2.15. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided?					
D.2.16. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: Project activity under a Programme of Activities must comply with stipulated conditions?					
D.2.17. If not already sufficiently demonstrated					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: In the specific case of biomass project activities the applicability of the methodology is limited to either project activities that use biomass residues or processed biomass (e.g. briquette) only or biomass from dedicated plantations complying with the applicability conditions of methodology AM0042 or paragraph 5 in methodology AMS-III.AQ, see F-CDM-SSCwg ver 01 SSC_577?					
D.2.18. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: In the specific case of biomass project activities the determination of leakage shall be done following the general guidance for leakage in small-scale biomass project activities (attachment C of Appendix B of simplified modalities and procedures for small-scale clean development mechanism project activities; decision 4/CMP.1) or following the procedures included in the leakage section of AM0042?					
D.2.19. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: In case the project activity involves the replacement of equipment, and the leakage from the use of the replaced equipment in another activity is neglected, because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
checked. The scrapping of replaced equipment should be documented and independently verified?					
D.2.20. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: The biomass is a biomass residue, that means biomass by-products, residues and waste streams from agriculture, forestry and related industries – (a) Where, the use of that biomass residue in the project activity does not involve a decrease of carbon pools, in particular dead wood, litter or soil organic carbon, on the land areas where the biomass residues are originating from?	/1/	DR			
D.3. Project boundary of CPA (VVS § 82-87)					
D.3.1. What is the CPA's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/	DR			
D.3.2. Is the CPA located within the geographical boundary of the proposed or registered PoA?	/1/	DR			
D.3.3. Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/	DR			
D.3.4. Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/	DR			

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.4. Baseline scenario determination and description (VVS § 88-95 / Identification of alternatives to the project activity (VVS § 113-116) *Ensure that the evaluation of all alternatives provided and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this*					
D.4.1. Which baseline scenarios have been identified? Is the list of baseline scenarios complete? Does the list include as one of the options that the project activity is undertaken without being registered as a proposed project activity? Does the list contains all plausible alternatives which are viable means of supplying the comparable outputs or services that are to be supplied by the proposed project activity?	/1/	DR			
D.4.2. How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/	DR			
D.4.3. What is the baseline scenario?	/1/	DR			
D.4.4. Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR			
D.4.5. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR			
D.4.6. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies? Does the baseline scenario comply with all applicable and enforced legislation?	/1/	DR			
D.4.7. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR			
D.4.8. Is the baseline determination adequately documented in the CPA-DD?	/1/	DR			

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
• All assumptions and data used by the project participants are listed in the CPA-DD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the CPA-DD. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity					
D.5. Demonstration of eligibility for the CPA					
D.5.1. Has it been sufficiently justified that the CPA complies with the following eligibility criteria? The proposed CPA must be located in the geographical boundary of South Africa	/1/	DR			
D.5.2. Has it been sufficiently justified that the CPA complies with the following eligibility criteria? The CME must implement precaution measures to avoid double counting of emission reductions	/1/	DR			
D.5.3. Has it been sufficiently justified that the CPA complies with the following eligibility criteria? The CPA must involve the implementation of one of the technologies/measures described in section A.6, Part I in the PoA-DD. The CPA implementer shall demonstrate that the performance of the equipment used in the proposed CPA comply with national or international standards. If this evidence is not available at the time of validation, it will be submitted during verification.	/1/	DR			
D.5.4. Has it been sufficiently justified that the CPA complies with	/1/	DR			

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	the following eligibility criteria? The starting date of the project activity must not be before the date of commencement of validation of the PoA					
D.5.5.	Has it been sufficiently justified that the CPA complies with the following eligibility criteria? The proposed CPA must implement one of the eligible methodologies or methodology combinations for the PoA. Also, the proposed CPA must comply with the applicability conditions of the applicable methodology	/1/	DR			
D.5.6.	Has it been sufficiently justified that the CPA complies with the following eligibility criteria? The CPA must demonstrate additionality as per eligibility criteria	/1/	DR			
D.5.7.	Has it been sufficiently justified that the CPA complies with the following eligibility criteria? The CPA must comply with PoA conditions related to undertaking local stakeholder consultations and environmental impact analysis	/1/	DR			
D.5.8.	Has it been sufficiently justified that the CPA complies with the following eligibility criteria? The CPA must confirm that no Official Development Aid will be involved or diverted	/1/	DR			
D.5.9.	Has it been sufficiently justified that the CPA complies with the The PoA has no specific target group or distribution mechanism, therefore there is no eligibility criteria for target groups or distribution mechanisms	/1/	DR			
D.5.10.	Has it been sufficiently justified that the CPA complies with the following eligibility criteria? All relevant parameters will be monitored for each CPA. However, only a statistically acceptable sample will be verified by the DOE	/1/	DR			
D.5.11.	Has it been sufficiently justified that the CPA complies with	/1/	DR			

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
the following eligibility criteria? CPA in aggregate must meet the small-scale or micro-scale threshold criteria					
D.5.12. Has it been sufficiently justified that the CPA complies with the following eligibility criteria? The proposed CPA must pass the de-bundling check	/1/	DR			
D.6. Algorithms and/or formulae used to determine emission reductions of the CPA (VVS § 96-100)					
Data and parameters that are available at validation and that are not monitored					
D.7.2. How was the Installed capacity of the power plant available at validation verified?	/1/	DR			
D.7.3. How was the Captive power available at validation verified?	/1/	DR			
D.7.4. How was the Plant availability available at validation verified?	/1/	DR			
D.7.5. How was the CO_2 emission factor of the grid in year *y* available at validation verified?	/1/	DR			
D.7.6. In case any of the parameters above were determined based on sampling, was the sample adequate and did it comply with the specific guidance in the applicable methodology or, if no such guidance is available in methodology, did it achieve a 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities?	/1/	DR			
Baseline emissions					
D.7.7. Are the calculations documented according to the approved methodology and tool and in a complete and transparent manner?	/1/	DR			
D.7.8. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR			
D.7.9. Are uncertainties in the baseline emission estimates properly	/1/	DR			

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
addressed?					
D.7.10. If the calculations of baseline emissions are based on sampling, does this comply with the Standard for sampling and surveys?	/1/	DR			
Project emissions					
D.7.11. Are the calculations documented according to the approved methodology and tool and in a complete and transparent manner?	/1/	DR			
D.7.12. Have conservative assumptions been used when calculating the project emissions?	/1/	DR			
D.7.13. Are uncertainties in the project emission estimates properly addressed?	/1/	DR			
D.7.14. If the calculations of project emissions are based on sampling, does this comply with the Standard for sampling and surveys?	/1/	DR			
Leakage					
D.7.15. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR			
D.7.16. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR			
D.7.17. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR			
D.7.18. If the calculations of leakage emissions are based on sampling, does this comply with the Standard for sampling and surveys	/1/	DR			
Emission Reductions					
D.7.19. Algorithms and/or formulae used to determine emission reductions: • All assumptions and data used by the project participants are listed in the CPA-DD and related document submitted	/1/	DR			

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PoA-DD and supporting files to be submitted for registration.					
D.7. Monitoring plan (VVS § 131-133)					
Data and parameters monitored					
D.7.1. Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/	DR			
D.7.2. Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR			
D.7.3. In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR			
D.7.4. In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR			
D.7.5. In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR			
D.7.6. Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR			
D.7.7. Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR			
D.7.8. In case any of the parameters will be determined based on sampling, is the sample plan adequate and does it comply with the specific guidance in the applicable methodology or, if no such guidance is available in methodology, does it	/1/	DR			

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	achieve a 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities?					
	Ability of project participants to implement monitoring plan					
D.7.9.	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/	DR			
D.7.10.	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/	DR			
D.7.11.	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/	DR			
D.7.12.	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/	DR			
	Monitoring of sustainable development indicators/ environmental impacts					
D.7.13.	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR			
D.7.14.	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR			
D.7.15.	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR			

APPENDIX C

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Felipe Antunes holds a Master's Degree in Production Engineering (Quality) and a Post Graduate Diploma in Environmental Management and Industrial Waste Management and Treatment. Possesses an International experience of more than 10 years in the field of quality and environmental auditing, working two years as the responsible of the QMS of Rede Metrológica RS and since 1999 as a QMS and EMS auditor in DNV.

He has experience of more than 3 years in validation and verification of numerous CDM projects in DNV, both in South America & abroad. He has also been actively involved in Management System Audits such as ISO 9001, ISO 140001 and OHSAS 18001 standards in various industrial sectors for more than 10 years in DNV.

His qualification and experience in CDM demonstrate him sufficient sectoral competence in energy generation from renewable energy sources, waste handling and disposal, and animal waste management.

Francisco Zamarron holds a 6 year Diploma in Civil Engineering and a 2 year post-graduated Master in Business Administration. He has an overall working experience of 25 years.

Before joining DNV in 1996 he has worked as a Project Manager in the construction sector, Business Developer Manager in process automation sector mainly for the oil and gas industry and Management Consultant for small and medium organizations. From 1996 until 2005 he has conducted, on behalf of DNV, third party Management System Audits against ISO 9001, ISO 14001, EMAS and ISO 14044 Standards in a large spectrum of industrial and service sectors.

Since 2005 he has continued his professional carrier in DNV in the climate change field, with particular focus on the Kyoto Protocol Mechanisms, as a CDM Validator and EU ETS Service Responsible. He has managed the validation of many CDM and has carried out verifications and technical review of numerous EU ETS reports. Through his work experience, he has acquired sectoral competence within energy generation from renewable energy sources and construction.

He has also experience in providing technical environmental advisory services and verifying corporate greenhouse gas emissions; emission reductions and product carbon footprints.

Geert Goorden holds a Master Degree in Bioscience Engineering (previously known as 'Agronomical Engineering') with specialisations in chemistry and soil science.
Having an overall experience of around 18 years.
Prior to joining DNV having 13 years experience in environmental consultancy to the oil and gas industry covering landfill engineering, soil and groundwater remediation, biodegradation of hydrocarbons, stabilisation of waste and brownfield development.
Before that, Mr Goorden was working for 3 years at the Food and Agriculture Organization of the UN. During long term assignments in Senegal and Lesotho he was involved as technical expert in land and water management, soil erosion control, soil fertility analysis and composting.
Mr Goorden started his career in the gaschromatographical laboratories of SGS dealing with chemical analysis of soil, water, air, fuels and petrochemical products.

He has experience of around 1 year in validation and verification of CDM projects and other 3rd party validation/verification services.
His qualification, industrial experience and experience in CDM demonstrate him sufficient sectoral competence in waste handling and disposal, animal waste management and agriculture.

Grant Little holds a Bachelor Degree in Pure and Applied Chemistry; with a Secondary Degree in Forest Products Manufacture and a Masters Degree in Business Administration . Having an overall experience of around 20 years. Prior to joining DNV having 16 years experience in the forest products industry covering Process Engineering, Sustainable Development, Forest eco-labeling and Environmental Management Systems. He also has over 5 years experience in the carbon project development and carbon markets in Africa and the Middle East where he worked for a carbon aggregator and a government owned company.

Simon Wong Yon Sing holds a Bachelor's Degree in Chemical Engineering with Environmental Engineering, with a year experience in the field of design and operation/maintenance of wastewater treatment as part of working in wastewater design & equipment supply services.

His experience in designing and maintaining the wastewater treatment systems covers the fields of various manufacturing and chemical industries in Malaysia.

He has experience of more than 5 years in validation and verification of numerous CDM projects in DNV, both in Malaysia and abroad. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in “Energy Generation from Renewable Energy Sources”, “Waste Handling and Disposal” and “Animal Waste Management System”.

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