Verification and certification report form for CDM programme of activities

(version 01.0)

Complete this form in accordance with the "Attachment. Instructions for filling out the verification and certification report form for CDM programme of activities" at the end of this form.

VERIFICATION AND CERTIFICATION REPORT		
Title of the programme of activities (PoA)	Landfills' gas capture, flaring and use program in Morocco	
UNFCCC reference number of the PoA	UNFCCC ID: PoA6568	
Version number(s) of the PoA-DD(s) applicable to this report	2	
Version number of the verification and certification report	1.2 TN P-No. : 8000464314 – 16/127	
Completion date of the verification and certification report	27/02/2017	
Monitoring period number	MP 1	
Duration of this monitoring period	28/02/2014 – 31/07/2016[1]	
Number and version number of the monitoring report to which this report applies	4.0	
Coordinating/managing entity (CME)	Fonds d'Equipement Communal (FEC)	
Host Party(ies)	Host Party(ies) of the PoA	Is this a host Party to a CPA covered in this report?(yes/no)
	Morocco	Yes
Sectoral scope(s)	Scope: 13 / Technical Area: 13.1	
Selected methodology(ies)	ACM0001 version 12.0: Flaring or use of landfill gas	
Selected standardized baseline(s)	n.a.	
Total estimated GHG emission reductions or net GHG removals for this monitoring period in the included CPA(s) covered in this report	397,472 t CO_{2e}	
Total certified GHG emission reductions or net GHG removals for this monitoring period for the included CPA(s) covered in this report	11,169 t CO_{2e}	

[1] There was a change in start date of the crediting period. See related section and http://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/S173W8HI9MNUPREYKQOT6VJ5LFB4DX/view

Name of DOE	TÜV NORD CERT GmbH
Name, position and signature of the approver of the verification and certification report	 Evgeni Sud Final Approver

SECTION A. Executive summary

The International Bank for Reconstruction and Development (IBRD) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic verification of the CDM Programme of Activities (CDM-PoA):

"Landfills' gas capture, flaring and use program in Morocco"

with regard to the relevant requirements for CDM PoAs.

This verification covers the period from 28/02/2014 to 31/07/2016 (including both days).

The project reduces GHG emissions due to
The PoA aims to reduce GHG emissions from landfills in Morocco by introducing landfill gas capture and destruction equipment e.g. flare or gensets.

Details of the PoA location are given in table A-1 below:

Table A-1: Project Location

No.	Project Location
CPA # 1	Oum Azza landfill
Host Country	Morocco
Region:	Oum Azza
Project location address:	Near city of Rabat
Latitude:	+33.8727
Longitude:	-6.8089

Basic technical details of the PoA are summarized in table A-2.

Table - A-2: Technical data of the project activity CPA#1

Parameter	Unit	Value
Flare		
Manufacturer	-	BFM Haase
Capacity	N/m³	1,500
Units	-	1
Type of flare	-	Enclosed, HTN 7.5
Gas quantity		
Min	Nm³/h	300
Max (design point)	Nm³/h	1500
Gas quality		
Min	Vol.-%	20
Design point	Vol.-%	50
Max	Vol.-%	100
Combustion temperature	°C	>1000

No gas engine to destroy LFG has been introduced so far as the amount of landfill gas is lower than expected. The flare has been commissioned on 30 and 31/07/2015. The gas collection (45 vertical wells) and transport system has been installed in the months of February to March 2015. Additional 2 horizontal wells have been installed in the month of May 2016. However those horizontal wells are upto date not connected to the gas transport system and to the flare system as confirmed via inspection of the same during site visit.
As could be seen from the raw data the flare has to be even shut down due to LFG quantity and quality esp during the testing phase of the flare in the month of August 2015.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document but the implementation of the gas engine set which is still pending due to gas availability and quality.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM001 ver. 12
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 1st periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: 11,169 t CO2e

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	IR	Winter	Stefan	TN CERT GmbH	x	x	x	x
2.	Other Expert	IR	Doukkali	Khalid	TN CERT GmbH	x	x	x	x

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	EI	Li	Yongjun	-
2.	Approver	IR	Sud	Evgeni	TÜV NORD CERT

SECTION C. Means of verification

C.1. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- the last revision of the PoA-DD including the monitoring plan/PoA-DD/,
- the last revisions of the CPA-DDs
- the last revision of the validation report/VAL/,
- CPA inclusion reports
- documentation of project equipment and operations/VER/
- the monitoring report, including the claimed emission reductions for the PoA/MR/,
- the emission reduction calculation spreadsheet/XLS/.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

C.2. On-site inspection

Duration of on-site inspection: 27/09/2016 to 28/09/2016				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Opening meeting at Oum Azza Landfill including status of the project and future development	Oum Azza Landfill	27/09/2016	Stefan Winter Khalid Doukkali
2.	Walk through the site and Inspection of flaring system, control room, and location of the meters			
3.	Interview with personnel and monitoring manager			
4.	Evidence assessment			
5.	Data check against supportings			
6.	Data collection, aggregation and processing			
7.	Quality assurance	CME office	28/09/2016	
8.	ER and PE calculation review			
9.	Presentation of findings			
10.	Closing meeting			

C.3. Interviews

No.	**Interviewee**			**Date**	**Subject**	**Team member**
	Last name	**First name**	**Affiliation**			
1.	Freire Coloma	Javier	The Worldbank	27/09/2016	Opening meeting, Project implementation	Stefan Winter Khalid Doukkali
2.	Zirah	Anne-Sophie	The Worldbank	27/09/2016 – 28/09/2016	MR, project implementation ER calculation Calibration procedure	
3.	Platonova-Oquab	Alexandrina	The Worldbank	27/09/2016	Opening meeting	
4.	El Koubbi	Adil	TEODEM			
5.	Balafres	Sanaa	Fond d'Equipement Communal	27/09/2016 – 28/09/2016	Opening and closing meeting	
6.	El Idrissi	Said			CME organization of PoA	
7.	Bouchefaa	Nisrine	Teodem / Groupe	27/09/2016	Training planning and	

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
			Pizzorno Environment	– 28/09/2016	certificates	
8.	Eden	Christopher	Ecomethanogene	27/09/2016	Project development, planning implementation and operation Monitoring equipment Maintenance, repair Data collection, aggregation and processing	
9.	Assi	Mohamed	Teodem			
10.	Zniber	Said	Groupe Pizzorno Environment	27/09/2016 – 28/09/2016	Opening and Closure meeting	

C.4. Sampling approach

C.4.1 Sampling during monitoring

☒	No sampling approach has been used by the PP to determine the monitored parameters
☐	A sampling approach has been taken for the following monitored parameter(s):

Parameter	Sampling approach [1)]	Sampling Type [2)]	Population	Sample Size

[1)] *Sampling Approaches:*

SiRS: Simple Random Sampling
StRS: Stratified Random Sampling
SS: Systematic Sampling
CS: Cluster Sampling
MSS: Multi-stage Sampling

[2)] *Sampling Types:*

PS: Parameter Sampling

C.4.2 Sampling approaches during verification

☒	No sampling approach has been used by the VT to verify the monitored parameters
☐	A sampling approach has been applied by the VT for the following monitored parameter(s):

Parameter	Sampling approach [1)]	Sampling Type [2)]	Population	Sample Size

[1)] *Sampling Approaches:*

SiRS: Simple Random Sampling
StRS: Stratified Random Sampling
SS: Systematic Sampling
CS: Cluster Sampling
MSS: Multi-stage Sampling

[2)] *Sampling Types:*

AS: Acceptance Sampling
PS: Parameter Sampling
COM: Full data check at higher data aggregation levels and sampling at original data levels

C.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General	-	-	-
Compliance of the monitoring report with the monitoring report form	-	-	-
Remaining forward action requests from validation and/or previous verification	-	-	-
Specific-case CPA(s) considered for verification and covered in this report	-	-	-
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	-	-	-
Implementation and operation of the management system	-	-	-
Post-registration changes	-	-	-
• Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline	-	-	-
• Corrections	-	-	-
• Inclusion of a monitoring plan in a registered PoA-DD (including its generic CPA-DD(s))	-	-	-
• Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline	-	-	-
• Changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA	-	-	-
• Types of changes specific to afforestation and reforestation activities	n.a.	n.a.	n.a.
Component project activity(ies)	-	-	-
Compliance of the CPA implementation with the included CPA design document	-	1	-
Post-registration changes	-	-	-
• Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline	-	-	-
• Corrections	-	-	-
• Changes to the start date of the crediting period	1	-	-
• Inclusion of a monitoring plan to an included CPA-DD	-	-	-
• Permanent changes to the monitoring plan as described in the included CPA-DD, applied methodology, or applied standardized baseline	-	-	-
• Changes to the programme design of the included CPA-DD	-	-	-
• Types of changes specific to afforestation and reforestation component project activities	-	-	-
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	1	-
• Data and parameters fixed ex ante or at renewal of crediting period	-	-	-
• Data and parameters monitored	1	2	-

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
• Implementation of sampling plan	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	1
Assessment of data and calculation of emission reductions or net removals	-	-	-
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	-	1	-
• Calculation of project GHG emissions or actual net GHG removals by sinks	-	1	-
• Calculation of leakage GHG emissions	-	-	-
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	-	-	-
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included specific-case CPA	-	-	-
• Remarks on difference from estimated value in registered PDD	-	-	-
Others (please specify)	1	-	-
Total	3	6	1

SECTION D. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may have been confirmed or revised. Furthermore reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete verification has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting for issuance is conducted.

SECTION E. Verification opinion

The International Bank for Reconstruction and Development (IBRD) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic verification of the CDM Programme of Activities (CDM-PoA): “Landfills’ gas capture, flaring and use program in Morocco” with regard to the relevant requirements for CDM Programme of Activities. The PoA reduces GHG emissions due to collection and destruction of landfill gas in the host coutry of Marocco.
This verification covers the period from 28/02/2014 to 31/07/2016 (including both days).

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document but the implementation of the gas engine set which is still pending due to gas availability and quality,
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM0001 ver. 12,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately,
- the monitoring system is in place and functional. The project has generated GHG emission reductions,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP further confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: 11,169 t CO_{2e}.

SECTION F. Certification statement

As a duly accredtited DOE, TÜV NORD CERT confirms that the CDM PoA

“Landfills’ gas capture, flaring and use program in Morocco”

registered under

UNFCCC-No. : PoA6568

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 1

from: 28/02/2014

to: 31/07/2016

(including both days) as follows:

Emission reductions: 11,169 t CO_{2e}.

Essen, 27/02/2017

Stefan Winter
Team Leader

SECTION G. Verification findings - General

G.1. Compliance of the monitoring report with the monitoring report form

Means of verification	A draft monitoring report was submitted to the verification team by the project participants. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received. By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-PoA-MR-FORM has been used. Further it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance. The following sources of information have been used in this context: • /MR/ • /MRT/ • /unfccc/	
Findings	☒	The latest reporting template CDM-PoA-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.
	☐	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.
	☒	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:
		CAR 2, CAR3
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	-	

G.2. Remaining forward action requests from validation and/or previous verification

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose FARs might have been raised.
Likewise FARs might have been raised in the course of previous verifications.
In the course of this verification the latest version of the PDD /PDD/ and the previous verification report /VER/, where applicable, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

☒	There were no open issues which have been addressed in the latest version of the validation report.
☐	All open issues from the validation have been appropriately addressed in the context of previous verifications.
☐	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
☐	The following issues related to the validation have **not** yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

(ii) Open issues from previous verifications:

☒	N/A – as this is the first monitoring period for this CDM project activity.
☐	There were no open issues which have been addressed in the previous verification report
☐	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
☐	The following issues related to the previous verification have **not** yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

G.3. Specific-case CPA(s) considered for verification and covered in this report

Reference number of the specific-case CPA included in the PoA as of the end of this monitoring period	Is the specific-case CPA considered for this verification? (yes/no)	Version number of the registered PoA-DD to which the specific-case CPA complies with	Confirmation that a request for issuance including the specific-case CPA has been published for the previous monitoring period (Y/N)
6568-0001: Landfill's gas (LFG) capture, flaring and use at the Oum Azza landfill.	Yes	2	Yes

SECTION H. Verification findings – Programme of activities

H.1. Compliance of the programme implementation with the registered programme design document

Means of verification	By means of an in-depth review of the PoA-DD in its latest form – as downloaded from the UNFCCC project site - and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the PoA-DD and whether all physical features of the project are in place. The following has been checked: implemented technology, project equipment as well as monitoring and metering equipment. Further is has been checked if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period and consistent notations of key equipment (meters etc.) in PoA-DD, MR and calculation spreadsheet are applied. Interviews with operational personnel have been carried out, QMS records, maintenance records, instrument specifications were checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred. Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs. The following sources of information have been used in this context: • /PoA-DD/ • /CPA-DD/ • /MR/ • /VVS/ • /XLS/

	• /MRT/ • /TS/, /RAW/, /RP/ • /unfccc/	
Findings	☐	The project has been implemented as described in the latest version of the PoA-DD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.
	☐	The following deviations from the registered / approved project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): - N/A
	☒	In this context the following CARs, CLs have been raised: - CL 1 - CL 2 - CAR 1
	In case of phased implementation:	
	☐	N/A
	☐	The phased implementation has correctly and in sufficient detail been described in the latest version of the PoA-DD.
	☒	The description in section D.1 of the MR differs in content or the level of detail from the latest version of the PoA-DD. However, the description in the MR is correct and reflects the situation during the site inspection.
	☐	The project description in the PoA-DD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A or add as appropriate
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	During onsie visit it has been identified that a gas collection and transport system has been installed to retrieve the LFG from the Oum Azza landfill. The LFG is transported to a cleaning system and furtheron to a high temperature gas flare. Further all required and related monitoring equipment has been also installed. However no gas engine for methane destruction and electricity generation has been installed yet. This is mainly due to the reason that the LFG quality and quantity is not as expected. Methane content in average at approx. 30% and quantity at 320 m³/h only. This has been confirmed based on check of raw data/RAW/ and Weekly and mponthly reports prepared by CPA Implementer and provided to CME/RP/. Besides that even if a gas engine could be operated from the LFG point of view current host country regulations do prevent the project from being allowed to feed mid voltage level electricity to the grid. The related law is currently under revision but has not been approved yet. Based on that the project could not obtain a permit for power generation so far but has submitted a dossier to the ministry of energy by 01/08/2016 as start to apply for the permit. From the interviews conducted and background search it is sufficiently demonstrated to the DOE that the delay in installation of gas engines is mainly out of the scope of the CPA implementer. The project operator however also as taken countermeasures to increase the gas quality and quantity e.g. by consutruction of horizontal wells instead or additional to vertical wells. Even though the horizontal wells are not connected to the gas collection system yet due to financial burdens. As per interview and actions taken the DOE is convinced that the CPA imementer will install and operate gas engines in the future. However a CAR 1 has been raised to further specifiy the changes and revised phased implementation in the MR.	

H.2. Implementation and operation of the management system

Means of verification	The verification team conducted a review of the PoA-DD and checked related information against observations found during onsite inspection and interviews conducted during the onsite visit to respective personnel. The following sources of information have been used in this context: • /PoA-DD/ • /TRAIN/ • /Interviews/
Findings	-
Conclusion	The CDM PoA is managed by FEC as the Coordinating Entity. More specifically, the management and coordinating PoA's tasks will be carried out by the Sustainable Development and Partnerships Directorate (SDPD) at FEC. Besides the carbon finance activity, the SDPD has a global mission of sustainable development projects mainstreaming within FEC's programme of activities. It comprises five permanent and dedicated staff members: a Managing Director, an Assistant Director, a Financial Analyst, a Technical Analyst and an administrative and follow up support person. The CME has - Formal request from the interested municipality or the operator of its landfill to participate in the CDM PoA. - Arrangements for training and capacity development for personnel - System/procedure to avoid double counting - Provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA - Measures for contios improvement of the PoA management - Record keeping system for each CPA under the PoA (currently one) Based on onsite check and interviews DOE has found that the system is in place, appropriate and effective.

H.3. Post-registration changes

☒ By means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the registered PoA-DD and the applied methodology.

☐ Post registration changes have been identified and are assessed in detail in the subsequent steps.

H.3.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

☒	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM).have been submitted to the UNFCCC prior to the current monitoring period.		
☐	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved (approval No.:)
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved (approval No.:)

		Appr.date	
		Ref.No.	
☒	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	
	2	Issue:	
☐	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

H.3.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	During the verification of the current MP no need for corrections has been identified.		
☐	The following corrections have been applied:		
	1	Issue:	
	2	Issue:	
	The PoA-DD has been revised accordingly: (New) version No.: Revision date:		
	It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.		
	☐ A related post registration change has been submitted prior to the issuance request. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z. ☐ A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		

H.3.3. Inclusion of a monitoring plan in a registered PoA-DD (including its generic CPA-DD(s))

☒	N/A - as this monitoring plan was part of the registered PoA-DD /CPA-DD
☐	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC..

☐	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

H.3.4. Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
☐	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref.No.	
☒	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
☐	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

H.3.5. Changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No CoPD has been submitted to the UNFCCC prior to the current monitoring period

☐	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref.No.	
☒	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following CoPD.is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
☐	The following CoPD for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

H.3.6. Types of changes specific to afforestation and reforestation activities

☒	N/A - as this monitoring plan was part of the registered PDD

SECTION I. Verification findings – Component project activity(ies)

I.1. Compliance of the CPA implementation with the included CPA design document

Means of verification	By means of an in-depth review of the CPA-DD in its latest form – as downloaded from the UNFCCC project site - and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the CPA-DD and whether all physical features of the project are in place. The following has been checked: implemented technology, project equipment as well as monitoring and metering equipment. Further is has been checked if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period and consistent notations of key equipment (meters etc.) in CPA-DD, MR and calculation spreadsheet are applied. Interviews with operational personnel have been carried out, QMS records, maintenance records, instrument specifications were checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred. Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs. The following sources of information have been used in this context:

	• /CPA-DD/ • /MR/, /MRT/ • /VVS/ • /XLS/ • /QMS/ • /TS/ • /PID/ • /LY/ • /COM/ • /MAN/ • /unfccc/
Findings	CAR 1
Conclusion	During onsie visit it has been identified that a gas collection and transport system has been installed to retrieve the LFG from the Oum Azza landfill. The LFG is transported to a cleaning system and furtheron to a high temperature gas flare. Further all required and related monitoring equipment has been also installed. However no gas engine for methane destruction and electricity generation has been installed yet. This is mainly due to the reason that the LFG quality and quantity is not as expected. Methane content in average at approx. 30% and quantity at 320 m³/h only. This has been confirmed based on check of raw data/RAW/ and Weekly and mponthly reports prepared by CPA Implementer and provided to CME/RP/. Besides that even if a gas engine could be operated from the LFG point of view current host country regulations do prevent the project from being allowed to feed mid voltage lavel electricity to the grid. The related law is currently under revision but has not been approved yet. Based on that the project could not obtain a permit for power generation so far but has submitted a dossier to the ministry of energy by 01/08/2016 as start to apply for the permit. From the interviews conducted and background search it is sufficiently demonstrated to the DOE that the delay in installation of gas engines is mainly out of the scope of the CPA implementer. The project operator however also as taken countermeasures to increase the gas quality and quantity e.g. by consutruction of horizontal wells instead or additional to vertical wells. Even though the horizontal wells are not connected to the gas collection system yet due to financial burdens. As per interview and actions taken the DOE is convinced that the CPA imementer will install and operate gas engines in the future. However a CAR 1 has been raised to further specifiy the changes and revised phased implementation in the MR.

I.2. Post-registration changes

☒ By means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the registered CPA-DDs and the applied methodology.

☐ Post registration changes have been identified and are assessed in detail in the subsequent steps.

I.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

☒	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM).have been submitted to the UNFCCC prior to the current monitoring period.

☐	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved (approval No.:)
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved (approval No.:)
		Appr.date	
		Ref.No.	
☐	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	
	2	Issue:	
☐	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

I.2.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	During the verification of the current MP no need for corrections has been identified.		
☐	The following corrections have been applied:		
	1	Issue:	
	2	Issue:	
	The CPA-DD has been revised accordingly: (New) version No.: Revision date:		
	It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.		
	☐ A related post registration change has been submitted prior to the issuance request. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z. ☐ A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		

I.2.3. Changes to the start date of the crediting period

Due to the commissioning of the project on 30-31/07/2015 the start date of the crediting period has been postponed from 01/03/2013 to 28/02/2014 by one year. A related notification has been forwarded by the PP to the UNFCCC as indicated during interviews conducted during site inspection. A related CL 2 has been raised. The start date has been changed and related project webpage has been revised accordingly and is now in line with the documents provided. Pls see related project page:
http://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/S173W8HI9MNUPREYKQOT6VJ5LFB4DX/view

I.2.4. Inclusion of a monitoring plan to an included CPA-DD

☒	N/A - as this monitoring plan was part of the included CPA-DD
☐	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
☐	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

I.2.5. Permanent changes to the monitoring plan as described in the included CPA-DD, applied methodology, or applied standardized baseline

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
☐	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref.No.	
☐	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	

	2	Issue:	
☐	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

I.2.6. Changes to the programme design of the included CPA-DD

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
☐	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref.No.	
☒	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following CoPD is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
☐	The following CoPD for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

I.2.7. Types of changes specific to afforestation and reforestation component project activities

☒	N/A - as this CPA is no afforestatzion or reforestation project.

I.3. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

Means of verification	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the

	MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: • /MR/ • /ACM0001/ • /TA/ • /unfccc/			
Findings	☒	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PoA-DD)		
		The breakdown of MP accordance of the referenced tools is as follows:		
		1	Title (of the tool)	Combined tool to identify the baseline scenario and demonstrate additionality
			Version	2.1
			MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)
		2	Title (of the tool)	Tool Emissions from solid waste disposal sites
			Version	6.0.1
			MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)
		3	Title (of the tool)	Tool to calculate baseline, project and/or leakage emissions from electricity consumption
			Version	1
			MP compliance	☒ full compliance ☐ findings have been raised ☐ N/A (for MP)
	☒	4	Title (of the tool)	Tool to determine project emissions from flaring gases containing methane
			Version	1
			MP compliance	☒ full compliance ☐ findings have been raised ☐ N/A (for MP)
		5	Title (of the tool)	Tool to determine the mass flow of a greenhouse gas in a gaseous stream
			Version	2.0.0
			MP compliance	☒ full compliance ☐ findings have been raised ☐ N/A (for MP)
		6	Title (of the tool)	Tool to calculate the emission factor for an electricity system
			Version	02.2.1
			MP compliance	☒ full compliance ☐ findings have been raised ☐ N/A (for MP)
		7	Title (of the tool)	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion
			Version	2

			MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)
	☒	The breakdown of MP accordance of the applicable SB is as follows:		
		1	Title (of the SB)	Name of SB
			Version	
			MP compliance	
	☐	In this context the following CARs, CLs, FARs have been raised:		
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	-			

I.4. Compliance of monitoring activities with the registered monitoring plan

I.4.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification

By means of comparison of the MR and the ER calculation with the latest version of the registered PoA-DD the verification team has checked whether all parameters fixed ex-ante or at renewal of the crediting period have been applied correctly.
The following parameters have been fixed at validation:

- GWP_{CH4}: 25 tCO2e/tCH4
- OX_{top_layer}: 0.1 [-]
- η_{PJ}: 50%
- $\varphi_{Default}$: 0.75 [-]
- F: 0.5 [-]
- $DOC_{f,Default}$: 0.5 kg/kg
- $MCF_{Default}$: 1.0 [-]
- DOC_j:

Waste type j:	DOCj [% wet waste]
Wood and wood products	43
Pulp, paper and cardboard (other than sludge)	40
Food, food waste, beverages and tobacco (other than sludge)	15
Textiles	24
Garden, yard and park waste	20
Glass, plastic, metal, other inert waste	0

- K_j:

Waste type j	(MAT ≤ 20°C) and Wet (MAP/PET >1)
Pulp, paper, cardboard (other than sludge), textiles	0.06
Wood, wood products and straw	0.03
Other (non-food) organic putrescible, garden and park waste	0.10
Food, food waste, sewage sludge, beverages and tobacco	0.185

- F_y = f: 0
- $TDL_{j,y}$: 20% for grid elec. or 0% for back-up diesel genset
- $TDL_{k,y}$: 3%
- $EF_{grid,CM,y}$: 0.6639 tCO2e/MWh
- W_x: 13,730,762 t
- $P_{n,j,x}$:

Waste type j	Waste composition (% wet waste)
Wood and wood products	1
Pulp, paper, cardboard (other than sludge)	6
Food, food waste, beverages and tobacco (other than sludge)	45
Textiles	5

Garden, yard and park waste	22
Glass, plastic, metal, other inert waste	21 (calculated: 100 – sum of above)

Further it has been checked whether the GWP for the respective period have been correctly applied.
The following sources of information have been used in this context:

- /MR/
- /XLS/
- /PoA-DD/
- /PS/
- /VVS/
- /unfccc/
- /RAW/
- /TS/

Findings	☒	The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.
	☐	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: - N/A
	☐	In this context the following CARs, CLs, FARs have been raised:
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The ex-ante determined values have been correctly and consistently applied. No mistake has been identified.	

I.4.2. Data and parameters monitored

Means of verification	During the verification all relevant monitoring parameters (as listed in chapter E.7.1 of the PoA-DD and esp. B.6 of CPA-DD) have been verified with regard to the (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).	
Findings	For details please refer to appendix 5 CAR 3	
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	It can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements. Where findings have been raised the same have been resolved.	

I.4.3. Implementation of sampling plan

Means of verification	The verification team has been checked whether the PPs have applied a sampling approach to determine the monitored values. Further it has been checked whether the PPs have correctly applied the implemented sampling plan including

	(i) description of the implemented sampling design (ii) collected data (iii) analysis of collected data (iv) demonstration on whether the required confidence/precision has been met. The following sources of information have been used in this context: • /MR/ • /XLS/ • /PoA-DD/ • /CPA-DD/.			
Findings	☒	The PPs have not applied sampling approaches for the parameters monitored.		
	☐	The PPs have applied sampling approaches for the following parameters monitored.		
		1	Parameter:	
			Name:	
			Description on how the sampling efforts and survey comply with the validated sampling plan:	
		2	Parameter:	
			Name:	
			Description on how the sampling efforts and survey comply with the validated sampling plan:	
	☐	In this context the following CARs, CLs, FARs have been raised:		
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	-			

I.5. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	During the verification the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated PDD and/or the applicable calibration standards. The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6). The following sources of information have been used in this context: • /MR/ • /XLS/ • /CAL/.	
Findings	☒	Based on the details listed in appendix 6 the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.

	☐	Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to appendix 6
	☒	In this context the following CARs, CLs, FARs have been raised: CL1 and CAR 4
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	-	

I.6. Assessment of data and calculation of emission reductions or net removals

I.6.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified: • *Transparency:* It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • *Parameter consistency:* It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • *Correctness:* It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology. • *Completeness:* It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: • /MR/ • /XLS/.	
Findings	☐	The calculation of the baseline emissions was found to be fully compliant with the above stated principles. The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
	☐	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.
	☒	In this context the following CARs, CLs, FARs have been raised: CAR 5
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.

	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Where corrections where required a revised baseline emissions calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct. Two ER calculation templates are prepared. One template w.r.t. the calculation from the raw data which also contains one sheet with the data fixed ex-ante, one sheet for hourly average data, one for the ER calculation on monthly basis and one for inputing the raw data downloaded from the remote server. Another template contains the ER summary result for the monitoring period on monthly basis. The raw data/parameters are continuously monitored, recorded every 5 minutes and aggregated to average hourly values in line with related tool and methodology. DOE has checked the template and the related equations against the methods and equations provided in the CPA-DD, methodology and tools. The raw data in the template has been checked against the single monthly raw data sheets as well as monthly reports. The baseline emissions are calculated as following: $BEy = (1-OX) \times (F_{CH4PJ,}y-F_{CH4,BL,y}) \times GWP_{CH4}$ $F_{CH4,PJ,y} = F_{CH,flared,y} + F_{CH4,EL,y}$ $F_{CH4,EL,y} = 0$ as no gas engine for electricity generation has been installed yet due to reasons described above. LFG is only destroyed by a flare. Further as per CPA-DD $F_{CH4,BL,y}$ is equal to zero. $F_{CH4,flared} = F_{CH4,sent-flare} - PE_{flare}/ GWP_{CH4}$ $F_{CH4,sent\_flare} = V_{t,wb} * v_{CH4,t,wb} * \rho_{CH4}$ Option C is used to calculate the density of the methane since a humidity sensor is installed (Tt) and Pn and Tn are monitored: $\rho_{CH4} = P_n * MM_{CH4} / R_u * T_n$ $PE_{flare} = \Sigma TM_{RG,h} \times (1 - \eta_{flare,h}) \times GWP_{CH4}/1000$ With $TM_{RG,h}$ equal to $F_{CH4,sent-flare}$ $\eta_{flare,h} = 1 - (TM_{FG,h} / TM_{RG,h})$ $TM_{FG,h}$ is calculated as following: $TM_{FG,h} = (TV_{n,FG,h} \times fv_{CH4,FG,h}) / 1000000$ $TV_{n,FG,h} = V_{n,FG,h} \times FM_{RG,h}$ Based on the above the DOE confirms that the method is correct and in line with CPA-DD, methodology and tools however CAR 5 has been raised and resovled.	

I.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified: • Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: • /MR/ • /XLS/.	
Findings	☐	The calculation of the project emissions was found to be fully compliant with the above stated principles. The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods

		described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	☒	In this context the following CARs, CLs, FARs have been raised:
		CAR 6
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Where corrections where required a revised PE calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct. Two sources for project emissions have to be observed for this project activity: 1. Project emissions due to electricity consumption 2. Project emissions from flaring of gas containing methane The latter PE_{flare} is already described above for calculation of baseline emissions. Project emissions from electricity consumption are calculated as following: $PE_{EC,y} = EC_{PJ,j,y} \times EF_{EL,y} \times (1 + TDL_{j,y})$ With $EC_{PJ,j,y}$ Net quantity of electricity consumed from the grid (MWh) $EF_{EL,y}$ Emission Factor of the grid used for CPA's electric consumption (tCO2/MWh) $TDL_{j,y}$ Average technical transmission and distribution losses in the grid in the year *y* Project emissions from fossil fuel consumption have been assessed in the CPA-DD and set to zero which is verified to be reasonable and plausibile based on document check and onsite inspection. Besides during this site visit it has been identified that there is additional electricity consumption on the landfill outside the project area which is clearly contributable to the project activity. This is the operation of two water pumps dewatering the landfill esp the area where the wells are located. However as they are operated onsite the landfill the electricity is not monitored via the elec meter of the project activity but by the general meter of the landfill. Based on that the exact electricity consumption cannot be determined. Due to this the PP opted to calculate the related project emissions by considering the capacity of the pump motor and assuming an operation of 8760 hours a year with an addition of 10%. The DOE has checked the name plates of the pump and confirm that the capacity applied is correct and that the calculation is correct and conservative as the pumps are only operating part time and not all year round and an addition for transmission losses. This is in line with PS Appendix 1 §3. And there considered in line with the requirements. Based on the above the DOE confirms that the method is correct and in line with CPA-DD, methodology and tools however CAR 6 has been raised and been resolved.	

I.6.3. Calculation of leakage GHG emissions

Means of verification	During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified: • Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation

	provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: • /MR/ • /XLS/.	
Findings	☒	The calculation of the project emissions was found to be fully compliant with the above stated principles. The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	☐	In this context the following CARs, CLs, FARs have been raised:
		-
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	As per CPA-DD no leackage has to be considered.	

I.6.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately - Total baseline emissions, - Total project emissions, - Total leakage, - Total emission reductions. It has been assessed whether the values are correct or need to be revised as a consequence of issues identified above.	
Findings	☒	Section H.4 of the MR includes in a summary table of the emission reductions calculation.
	☒	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.
	☒	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in the ER calculation.
	☐	During the verification issues with impact on the ER calculation have been identified.
	☐	In this context the following CARs, CLs, FARs have been raised:
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.

	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	-	

Specific-case CPA reference number	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_2e)	Leakage (tCO_2e)	GHG emission reductions or net GHG removals by sinks (tCO_2e)		
				Results achieved in the period up to 31 December 2012	Results achieved in the period from 1 January 2013 onwards	Results achieved in the entire monitoring period
CPA1	11,247	78	0	0	11,169	11,169
Total	11,247	78	0	0	11,169	11,169

I.6.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included specific-case CPA

Means of verification	The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD. It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.	
Findings	☒	*Case 1:* The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	☐	*Case 2:* The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	☐	*Case 3:* The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	☒	In this context the following CARs, CLs, FARs have been raised: CL1 and CL2
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	As already stated due to low gas availability and quality no gas engines could be installed and the expected amount of LFG could not been reached. Therefore the emission reduction during this onitoring period are significantly lower than ex-ante calculated.This could be confirmed during onsite inspection, interviews conducted and documents checked. CL1 and CL 2 have been raised as the change in start date and extention of monitoring period have impact on the related ex-ante values as currently stated in MR. CL1 and CL2 have been resolved. The PP finally decided not to extend this monitoring period and the change in start date has been notificied to the UNFCCC via provided Email and UNFCCC receipt confirmation Email. The start date has been changed to 28/02/2014, postponed forward by 364 days which is less than 1 year and therefore in line with VVS ver 9 §307 and PS ver 9 §276 the CPA start date of the crediting period was not prior to the date of registration and will not be prior after the change as well as PS ver 9 §278 no prior approval is required as the start date is postponed by 364 days which is less than one year and the PP has notified UNFCCC accordingly.	

	As the commissioning of the flare was 30-31 July 2015 this change had no impact on the ER calculation as the new start date is still prior to the actual operation start of the flare.

Specific-case CPA reference number	Value estimated in ex ante calculation in the included specific-case CPA-DD(s)	Actual values achieved by the specific-case CPA(s) during this monitoring period
CPA	134,336	11,169
Total	134,336	11,169

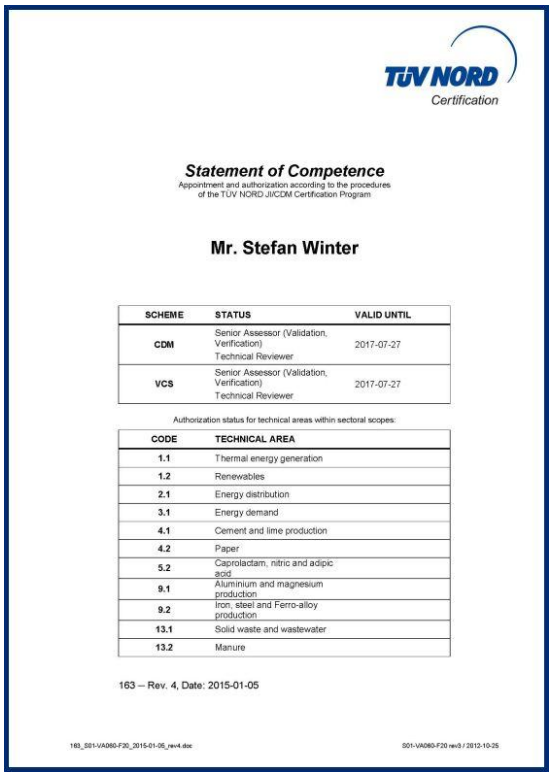
I.6.6. Remarks on difference from estimated value in registered PDD

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD (E.8.5) the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	☒	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	☐	*For case 3:* The PP has provided a related justification in the MR. The reasons for the increase are as follows:
	☐	In this context the following CARs, CLs, FARs have been raised:
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The justifications provided where found to be reasonable and the underlying facts have been verified by the team.	

Appendix 1. Abbreviations

Abbreviations	Full texts
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO_2	Carbon dioxide
CO_{2eq}	Carbon dioxide equivalent
CL	Clarification Request
DVerR	Draft Verification Report
ER	Emission Reduction
FAR	Forward Action Request
FEC	Fond d'Equipement Communal
GHG	Greenhouse gas(es)
IM	Interview Memo
LFG	Landfill gas
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PoA-DD	Programme of Activity Design Document
CPA-DD	Component Project Activity Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
XLS	Emission Reduction Calculation Spread Sheet

Appendix 2. Competence of team members and technical reviewers



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Stefan Winter

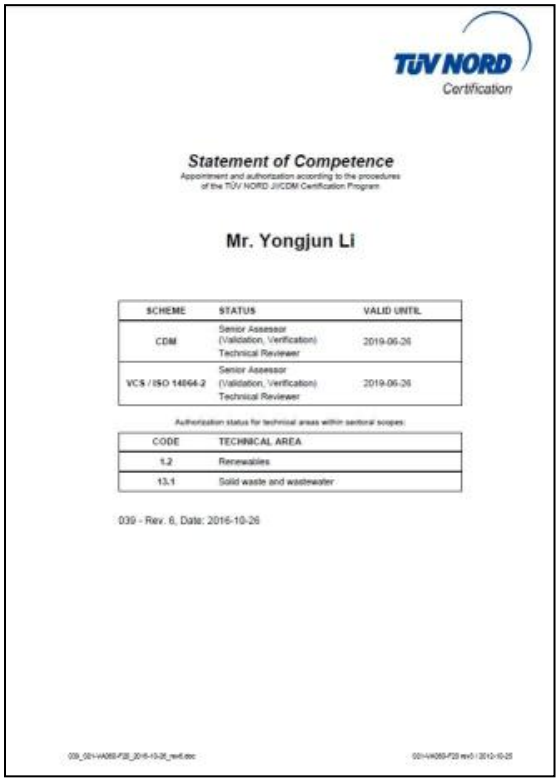
SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Caprolactam, nitric and adipic acid
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
13.1	Solid waste and wastewater
13.2	Manure

163 – Rev. 4, Date: 2015-01-05

163_S01-VA060-F30_2015-01-05_rev4.doc S01-VA060-F20 rev3 / 2012-10-25



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Yongjun Li

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-06-26
VCS / ISO 14064-2	Senior Assessor (Validation, Verification) Technical Reviewer	2019-06-26

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
13.1	Solid waste and wastewater

039 - Rev. 6, Date: 2016-10-26

039_S01-VA060-F30_2016-10-26_rev6.doc S01-VA060-F20 rev3 / 2012-10-25

Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1	UNFCCC	**/ACM001/**	Applied large scale methodology ACM0001 ver. 12, "Flaring or use of landfill gas"		Other
2	DOE	**/CPM/**	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		Other
3	IPCC	**/IPCC/**	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp	Other
4	UNFCCC	**/KP/**	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
5	UNFCCC	**/MA/**	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
6	UNFCCC	**/MRT/**	Monitoring Report Form (CDM-MR-FORM), Version 5.1	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
7	UNFCCC	**/POA-DD/**	Project Design Document for CDM PoA project: "Landfills' gas capture, flaring and use program in Morocco" version 2, dated 05/12/2012		Other
8	UNFCCC	**/CPA-DD/**	Component Project Activity Design Document for CPA1: "Landfill's gas (LFG) capture, flaring and use at the Oum Azza landfill." version 4, dated 05/12/2012		Other
9	UNFCCC	**/PS/**	CDM Project Standard (Version 9.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
10	PP	**/VAL/**	Validation Report for CDM PoA project "Landfills' gas capture, flaring and use program in Morocco" version 5, dated 05/12/2012 Validation Report for inclusion of CDM CPA1 "Landfills' gas capture, flaring and use program at the Oum Azza landfill" version 4, dated 05/12/2012		Other
11	UNFCCC	**/VVS/**	CDM Validation and Verification Standard (Version 09.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
12	UNFCCC	**/SAMPLE/**	"Guidelines for Sampling and Surveys for CDM Project Activities	https://cdm.unfccc.int/Reference/	Other

No.	Author	Reference	Title	References to the document	Provider
			and Programme Activities" (Version 03.0) "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities" (version 4.1)	Guidclarif/index.html http://cdm.unfccc.int/Reference/Standards/index.html	
13	UNFCCC	**/TA/**	• Tool to calculate project or leakage CO2 emissions from fossil fuel combustion Version 2 • Emissions from solid waste disposal sites Version 7 • Tool to calculate baseline, project and/or leakage emissions from electricity consumption Version 1 • Project emissions from flaring Version 2.0.0 • Tool to calculate the emission factor for an electricity system Version 4.0 • Tool to determine the mass flow of a greenhouse gas in a gaseous stream Version 2.0.0	http://cdm.unfccc.int/Reference/tools/index.html	Other
14	UNFCCC	**/GOT/**	Glossary "CDM terms" (version 08.0)	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu	Other
15	Manufacturers	**/TS/**	Technical data sheets of the monitoring equipment installed and/or technical manual: - Flare stack including drawing of the flare stack) - Elec. Meter - Thermocouples - Pressure sensor - Temp. and humidity sensor - Exhaust gas analyzer (data sheet and manual) - LFG analyzer (data sheet and manual) - Flow meters		PP
16	PP	**/XLS/**	Emission reductions spreadsheet (initial, final and revised version due to incomplete and again due to minor issue) - Template - Monthly calculations - Spreadsheet based on annual calculation - Summary		PP

No.	Author	Reference	Title	References to the document	Provider
17	PP	**/RAW/**	Raw data spreadsheets covering the monitoring period as retrieved from the remote server		PP
18	Manufacturer/certifying entity	**/CAL/**	Calibration certificates of the measurement equipment installed - LFG analyzer - Exhaust gas analyzer - Flow meters - Pressure transmitter - Thermoucouples - Temp. and humidity sensor - Elec. meter Calibration certificates of the inert gas bottle and standard gas bottles Please refer to Annex 6 for further details.		PP
19	CPA Implementer	**/RP/**	Weekly and mponthly reports prepared by CPA Implementer and provided to CME		CPA Implementer
20	ENC energy	**/COM/**	Checklist for Commisioning and system validation by ENC Energy dated 31/07/2015		PP
21	Riegonor	**/LY/**	Layout diagram of the Oum Azza landfill including positioning of wells and gas collection system		CPA Implementer
22	ENC energy/Teodem	**/TRAIN/**	Training records: - Operation of project - Maintenance - Monitoring equipment - Automatic monitoring system - Health and safety		CPA Implementer
23	ENC energy	**/PID/**	Project PID diagram including all measurement equipments installed and wiring		CPA Implementer
24	ENC energy Ably Carbon	**/MAN/**	Operation and maintenance manual for the flare stack and gas treatment system dated 24/07/2015 CDM Opertion manual ver 2 dated 27/10/2015		CPA Implementer Ably Carbon
25	Ably Carbon	**/IA/**	Internal audit reports dated 02/11/2015		Ably Carbon
26	PP/UNFCCC	**/NOT/**	Email notification to UNFCCC by PP World Bank w.r.t. postpoining the start date of the crediting period dated 28/10/2016 Email on confirmation on receipt of related notification by UNFCCC dated 30/10/2016		PP
27	PP	**/MR/**	Monitoring report for CDM PoA project “Landfills’ gas capture, flaring and use program in Morocco” version 1, dated 05/09/2016 version 2, dated 12/10/2016 version 3, dated 12/12/2016 version 4, dated 23/02/2017		PP
28	CPA Implementer	**/PSD/**	Email by Christopher Eden confirming the installation dates of the vertical and horizontal wells		PP

No.	Author	Reference	Title	References to the document	Provider
			including Excel list of all wells their numbering and the date of construction dated 23/02/2017		

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

Table 3. Remaining FAR from validation and/or previous verification

FAR ID	xx	**Section no.**	E.2	**Date:** DD/MM/YYYY
Description of FAR				
n.a.				
Project participant response (1st round)				**Date:** DD/MM/YYYY
Documentation provided by project participant (1st round)				
☐	Changes in the PoA-DD		Section(s):	New version No.:
☐	Changes in the CPA-DD		Section(s):	New version No.:
☐	Changes in MR		Section(s):	New version No.:
☐	Changes in XLS		Worksheet(s):	New version No.:
☐	Other:			
DOE assessment (1st round)				**Date:** DD/MM/YYYY
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☐ The finding is closed			

Table 4. CL from this verification

CL ID	1	**Section no.**		**Date:** 28/09/2016
Description of CL				
Clarification is requested whether the monitoring period will be extended by one more month as indicated during site visit.				
Project participant response (1st round)				**Date:** 12/10/2016
We have decided to keep the end date of the monitoring period to 31/07/2016.				
Documentation provided by project participant (1st round)				
☐	Changes in the PDD		Section(s):	New version No.:
☐	Changes in MR		Section(s):	New version No.:
☐	Changes in XLS		Worksheet(s):	New version No.:
☐	Other:			
DOE assessment (1st round)				**Date:** 26/10/2016
CL closed. Informaiton is not relevant anymore. MP covers 28/02/2014 – 31/07/2016. The end date was not changed. The UNFCCC project site has been checked.				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CL ID	2	**Section no.**		**Date:** 28/09/2016
Description of CL				
During site visit interview with the CME and PP it was indicated that the PP/CME intends to change the start date of the crediting period to a later date. However this has not been indicated to UNFCCC yet. MR might require related changes.				
Project participant response (1st round)				**Date:** 12/10/2016
The start date of the crediting period will be post-poned by 1 year, notification to UNFCCC secretariat will be done.				
Documentation provided by project participant (1st round)				
☐	Changes in the PDD		Section(s):	New version No.:
☐	Changes in MR		Section(s):	New version No.:
☐	Changes in XLS		Worksheet(s):	New version No.:

☐	Other:		

DOE assessment (1st round)	**Date:** 26/10/2016
As per decision by PP the start date of the CP will be postpones by 1 year to 28/02/2014. Please provide notification and indication when start date has been revised as per project viewpage.	
Project participant response (2nd round)	**Date:** 31/10/2016
Notification Email to UNFCCC as well as confirmation Email provided.	

Documentation provided by project participant (2nd round)

☐	Changes in the PDD	Section(s):	New version No.:
☐	Changes in MR	Section(s):	New version No.:
☐	Changes in XLS	Worksheet(s):	New version No.:
☒	Other: /NOT/		

DOE assessment (2nd round)	**Date:** 03/11/2016

PP has provided Email notification sent to UNFCCC dated 28/10/2016 indicating postponing the start date of the crediting period to 28/02/2014. This is less than one year as the previous start date of the crediting period was 01/03/2013. Further PP provided Email by UNFCCC where the receipt of the notification has been confirmed. As the commissioning of the flare was 30-31 July 2015 this change had no impact on the ER calculation as the new start date is still prior to the actual operation start of the flare. The UNFCCC´s POA and CPA project site has been checked as well.

However UNFCCC has raised following issue during IRC:

In accordance with paragraph 244 (a), (b) and (c) of Project Standard version 09, the DOE is requested to provide more information about the implementation plan of CPA-001, in particular installation schedule and actual installation of the vertical and/or horizontal wells at the landfill site. Further, the DOE is also requested to substantiate whether any project emissions are accountable due to activities before and during the commissioning of flare i.e. 28/02/2014 – 31/07/2015.

Project participant response (3rd round)	**Date:** 23/02/2017

MR has been revised accordingly t provide further specifics.

Besides specification has been made that any elec consumption including those prior to commissioning of the flare has been accounted for as project emissions.

Documentation provided by project participant (3rd round)

☐	Changes in the PDD	Section(s):	New version No.:
☒	Changes in MR	Section(s):	New version No.: 4
☐	Changes in XLS	Worksheet(s):	New version No.:
☒	Other: /PSD/		

DOE assessment (3rd round)	**Date:** 24/02/2017

MR checked version 4 of MR which provides now the dates of the installation of the vertical and horizontal wells in section D.1 of the MR. The dates have been crosschecked with an Email provided by the head of operation including a list of the installation dates of each single well (vertical and horizontal). Further the number of the wells has been checked during onsite inspection and can be confirmed as correct. Besides the installation of the wells has been checked on plausibility with the raw data of gas collection and by interview with Eden Christopher head of plant operation.

As based on raw data, interview with personnel, CME and CPA implementer as well as especially checklist for commisioning and system validation by ENC Energy the plant has been commissioned only on 31/07/2015. The gas collection (45 vertical wells) and transport system has been installed in the months of February to March 2015. Additional 2 horizontal wells have been installed in the month of May 2016. Therefore no elec consumption occurred prior to the operation of the plant as also the compressors have only installed on 18/09/2015 and 01/12/2015. The dates have been crosschecked during sitwe visit with interview to personnel, monthly project progress report. To be conservative the additional elec consumption of the two compressors of 4 kW capacity has been considered from the start of their installation until the end of the monitoring period +10%. No other accountable elec has been identified during onsite visit and check of supporting documents. Further no other GHG emission sources have been identified which are accountable by the project activity prior and during commissioning of the flare esp. Considering other already registered LFG project activities validated and verified by the DOE and the verification team.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CL ID	3	Section no.		Date: 28/09/2016
Description of CL				
Clarification is requested whether type R thermocouple is installed based on the calibration certificate provided and the related manual w.r.t. numbering of a thermocouple: *The certificate states a number of **05-20387210-0500.** Each number has a certain definition as per manual* *All start with 05* *dimension: 2 = 10 x 6 mm* *inner tube: 0 = none* *holding tube: 38 = 1.4841 15x2* *head: 7 = BUS* ***thermocouple type: 2 = S*** *thermocouple type: 1 = standard* *fastening: 0 = none* *Please crosscheck and clarify.*				
Project participant response (1st round)				**Date:** 03/10/2016
It is indeed a thermocouple type S. A thermocouple type S class 1 has an accuracy of +/-1°C, as specified in the manufacturer table on type / accuracy levels (provided). The information has been updated in the MR version 2.				
Documentation provided by project participant (1st round)				
☐	Changes in the PDD	Section(s):		New version No.:
☒	Changes in MR	Section(s): G2		New version No.: 2
☐	Changes in XLS	Worksheet(s):		New version No.:
☒	Other: Thermocouple Types.pdf			
DOE assessment (1st round)				**Date:** 26/10/2016
Ok. As per onsite inspection and check with manufacturer specification Type S thermocouple is installed. MR has been updated accordingly. The accuracy class is of +/-1°C as indicated by manufacturer specification.				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

Table 5. CAR from this verification

CAR ID	1	Section no.	D.1	Date: 28/09/2016
Description of CAR				
Further specification is requested w.r.t. the phased implementation of the gas engines as provided in the CPA-DD in the MR as it is confirmed during site visit and by ER spreadsheet that LFG availability is insufficient (quantity and quality) as well as no permit for grid connection has been issued yet.				
Project participant response (1st round)				
Although the CPA-DD refers to a schedule of deployment of engines, it is also mentioned that this schedule is EXPECTED and that "the calendar is based on prevision on LFG flow. Quality and quantity of LFG to be extracted is still to be tested. Therefore this calendar is provisional and subject to change/revision depending on gas quality and flow". Currently, the gas quality and quantity does not enable to install a gas engines. The CPA Implementer is taking actions to improve the LFG production, such as the installation of new gas wells on a more recent cell, leachate pumping, balancing of the wells, improvement of the network etc. In parallel, the law authorizing private power producers to deliver medium voltage electricity to the grid, which was passed in 2015, is still pending to be ratified.				
Documentation provided by project participant (1st round)				**Date:** 03/10/2016
☐	Changes in the PDD	Section(s):		New version No.:
☒	Changes in MR	Section(s): D.1		New version No.: 2
☐	Changes in XLS	Worksheet(s):		New version No.:

☐ Other:	

DOE assessment (1st round)	**Date:** 26/10/2016
Ok. According to table 3 of the registered CPA-DD in 2016 in total 3 engines should be in operation. However as per confirmed by checking the raw data/RAW/ and the weekly and monthly reports/RP/ low LFG quality and quantity and esp as per pending permit for private power producer no engine has been installed until the time of onsite visit. The PP intends to install engines in accordance to gas availability as soon as the permit is obtained. Related application has been submitted as per interviews conducted during site visit. Due to this and as CPA-DD in footnote 9 clearly refers "Calendar is based on prevision on LFG flow. Quality and quantity of LFG to be extracted is still to be tested. Therefore this calendar is provisional and subject to change/revisions depending on gas quality and flow." the DOE considers the project as implemented as indicated in the corresponding CPA-DD.	
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	2	**Section no.**	F	**Date:** 28/09/2016
Description of CAR				
Section F states that the data is kept for 3-6 months on a remote server. As per onsite inspection and interview with personnel it has been identified that it is stored for 3 months. Revision and specification requested. Specification and clarification is requested w.r.t. the responsibility of the monitoring manager and the Biogas technician indicated in the diagram. Further specification is requested for Section F w.r.t. description of the monitoring system as per CPA-DD B.6.1 and found during site visit.				
Project participant response (1st round)				
Reference to 6 months has been deleted. Section F has been revised to include more details on the monitoring system and the responsibilities of the monitoring manager and the biogas technician.				

Documentation provided by project participant (1st round)		**Date:** 03/10/2016
☐ Changes in the PDD	Section(s):	New version No.:
☒ Changes in MR	Section(s): F	New version No.: 2
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

DOE assessment (1st round)	**Date:** 26/10/2016
Ok. The related reference has been revised specifying the period to 3 months according to onsite observations. Ok. Further specification has been provided to include the responsibilities of the Monitoring Manager and the Biogas Technician. Besides QA/QC procedures have been also included and procedure of data collection, aggregation and processing. The description has been checked and found in line with the observations made during site inspection as well as during interviews conducted with related personnel.	
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	3	**Section no.**	G.1, G.2	**Date:** 28/09/2016
Description of CAR				

Clarification is requested why not all parameters as per CPA-DD have been included in the monitoring section of the monitoring report. Next to parameters on dry basis which have been excluded as the related parameters on wet basis are monitored the following parameters could not be found:

- $F_{CH4,sent\text{-}flare,y}$
- $PE_{flare,y}$
- $FV_{RG,h}$
- $PE_{EC,y}$
- Related parameters w.r.t. elec generation (it is understood that no genset has been installed but clarify why parameters are not given with reference to "not applicable")

Data provided ex-ante are not completely given in MR as indicated in CPA-DD, some are missing. Pls clarify.

Project participant response (1st round)

- $F_{CH4,sent\text{-}flare,y}$: this parameter is not monitored, it is calculated based on parameters $V_{t,wb}$, $v_{CH4,t,wb}$ and ρ_{CH4} and it can be verified in the ER calculations
- $PE_{flare,y}$: this parameter is not monitored, it is calculated based on parameters $TM_{RG,h}$ and η_{flare} and it can be verified in the ER calculations
- $FV_{RG,h}$: this parameter is already considered as $V_{t,wb}$. $FV_{RG,h}$ is the name in the "Tool to determine project emissions from flaring gases containing methane" and $V_{t,wb}$ is the name in the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream". Both tools being referenced and applicable as per the methodology.
- $PE_{EC,y}$ this parameter is not monitored, it is calculated based on parameter EC_{PJ} and it can be verified in the ER calculations
- Related parameters to electricity generation are now referenced as "not applicable"
- In addition, it also indicated that "Parameters η_{PJ}, $\varphi_{default}$, F, $DOC_{f,default}$, $MCF_{default}$, DOC_j, k_j, f, W_x, $p_{n,i,x}$ are not presented here as they are not relevant for monitoring".

Documentation provided by project participant (1st round)		**Date:** 03/10/2016
☐ Changes in the PDD	Section(s):	New version No.:
☒ Changes in MR	Section(s): G1 and G2	New version No.: 2
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

DOE assessment (1st round) — **Date:** 26/10/2016

- $F_{CH4,sent\text{-}flare,y}$: The parameter is calculated as following $V_{t,wb}$ x $v_{CH4,t,wb}$ x ρ_{CH4}. These three parameters are monitored or again is determined by further parameters e.g. ρ_{CH4} via Pn x MM_{CH4} /(Ru x Tn). Therefore $F_{CH4,sent\text{-}flare,y}$ is no actual monitoring parameter. Based on that the related parameter box has not been included in the MR which is deemed reasonable and plausible. Related reference has been included in MR.
- $PE_{flare,y}$: The parameter is calculated as following $\Sigma TM_{RG,h}$ x $(1\text{-}\eta_{flare,h})$ x GWP_{CH4} / 1000. These three parameters are monitored or fixed ex-ante e.g. GWP_{CH4}. $\eta_{flare,h}$ is again determined by two other parameters $TM_{FG,h}$ and $TM_{RG,h}$. Therefore $PE_{flare,y}$ is no actual monitoring parameter. Based on that the related parameter box has not been included in the MR which is deemed reasonable and plausible. Related reference has been included in MR.
- $FV_{RG,h}$: Ok. Specification has been made in MR to clarify that this is identical with $V_{t,wb}$.
- $PE_{EC,y}$: The parameter is calculated as following $\Sigma EC_{PJ,j,y}$ x $EF_{EL,y}$ x $(1 + TDL_{j,y})$. These three parameters are monitored or fixed ex-ante e.g. $TDL_{j,y}$. Therefore $PE_{EC,y}$ is no actual monitoring parameter. Based on that the related parameter box has not been included in the MR which is deemed reasonable and plausible. Related reference has been included in MR.
- Further as the LFG is monitored on wet basis related parameters required for dry basis monitoring have not been provided as they are not relevant. Besides as no energy plant is in operation yet as indicated due to low quality and quantity of LFG as well as pending permit the parameters $F_{CH4,EL}$, $EC_{BL,k,y}$, and Operation hours are also not provide as not relevant/applicable during this monitoring period. Related reference has been included in MR.
- Finally w.r.t. all related parameters which have been only relevant for ex-ante calculation have also not been provided for this monitoring in section G.1. Related reference has been included in MR.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	4	**Section no.**	G.2	**Date:** 28/09/2016

Description of CAR

Following issues w.r.t. data and parameters monitored during this monitoring period have been identified:

1. $v_{CH4,t,wb}$:
   - Gas analyzer has been exchanged: related information on second analyzer incl cal dates serial# etc are missing
2. T_{flare}:
   - Considering 31/08/2016 as end date of the monitoring period a delay in calibration has been identified for the related monitoring equipment thermocouple from 01/08/2016 until 01/09/2016.
   - Thermocouple has been exchanged: related information on second Thermocouple incl cal dates serial# etc are missing
3. Pt: clarification is requested why information w.r.t. calibration on 13/06/2016 is not provided in MR
4. For the gas analyzer parameters $v_{CH4,t,wb}$, $fv_{CH4,FG,h}$ and $t_{O2,h}$ clarification is requested whether and how the zero calibration against inert gas and value calibration against standard gas is conducted as indicated in the CPA-DD. Further the calibration certificate dates of the inert and standard gas are not mentioned and provided. Besides clarification is requested w.r.t. the validity of the calibration stated from 01/08/2015 – 31/07/2016.
5. Clarify why parameter $fv_{CH4,FG,h}$ (concentration of methane in the exhaust gas of the flare in dry basis at normal conditions in the hour h) is provided instead of $fv_{CH4,h}$.
6. $t_{O2,h}$: the parameter description is inconsistent with the CPA-DD
7. Other flare parameters: clarification and supporting document is requested w.r.t. value of minimum flow rate of the flare as stated in the MR.
8. $EC_{PJ,y}$: parameter description is not identical with the description given in related CPA-DD.

Project participant response (1st round)

1. $v_{CH4,t,wb}$: information on the second gas analyzer has been added
2. -
3. Pt: information on calibration of 13/06/2016 has been added
4. $v_{CH4,t,wb}$, $fv_{CH4,FG,h}$ and $t_{O2,h}$: information on calibration has been added and updated as requested.
5. Parameter $fv_{CH4,h}$ relates to the concentration of methane in the residual gas, it is the same as $v_{CH4,wb}$. ($fv_{CH4,h}$ is the name in the "Tool to determine project emissions from flaring gases containing methane" and $v_{CH4,wb}$ is the name in the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream". Both tools being referenced and applicable as per the methodology). Whereas $fv_{CH4,FG,h}$ relates to the concentration of methane in the exhaust gas
6. $t_{O2,h}$ and $fv_{CH4,FG,h}$: the description of these parameters has been corrected to be consistent with the CPA-DD
7. Other flare parameters: the minimum CH_4 concentration of 20% and the minimum flow rate of 300 Nm^3/h are based on the flare specifications. Reference to 150 Nm^3/h has been deleted.
8. $EC_{PJ,y}$: parameter description has been corrected to be consistent with the CPA-DD.

Documentation provided by project participant (1st round)			**Date:** 03/10/2016
☐	Changes in the PDD	Section(s):	New version No.:
☒	Changes in MR	Section(s): G2	New version No.:2
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other: 01_Technical Description_FLARE_EN.pdf		
DOE assessment (1st round)			**Date:** 26/10/2016

1. Ok. Related information for the second analyzer has been incl. now and correct as per onsite inspection of the equipment and techn. Specs.
2. T_{flare}:
   Ok. As the PP has now decided to keep the end date of the monitoring period on 31/07/2016 these two points are not relevant any longer as the exchange is after the end date of the monitoring period. FAR has been extended by one issue to consider the delay in the next verification.
3. Ok. Related information is now provided.
4. Ok. The description how zero check and check against standard gas has been provided now for the parameters. Further the inert gas is specified as well as concentration of the standard gas and the validity of the gases as indicated on the bottle. This is in line with the data found during site visit inspection were this is done automatically. Also the measurement point has been indicated. The validity of the gases are all beyond the end date of the monitoring period.
5. Ok. Clarification provided and parameter description revised in line with CPA-DD. Further, specification in parameter $v_{CH4,t,wb}$ is provided as well.
6. $t_{O2,h}$:Ok. The description is now in line with the CPA-DD.
7. Ok. MR has been revised to specify that the minimum requirement of flow is 300 m³/h and not 150 m³/h as checked during site visit and related technical data sheet of the flare.
8. Ok. The description is now in line with the CPA-DD.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	5	**Section no.**	H.1	**Date:** 28/09/2016

Description of CAR

Following issues w.r.t. baseline emission calculation have been identified:

Equation for baseline emissions in MR is inconsistent with equations (1) and esp (2) of CPA-DD.

Project participant response (1st round)

Further equations have been added in the MR version 2

Documentation provided by project participant (1st round)			**Date:** 03/10/2016
☐	Changes in the PDD	Section(s):	New version No.:
☒	Changes in MR	Section(s): H.1	New version No.: 2
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		

DOE assessment (1st round) **Date:** 26/10/2016

Ok. Based on MR ver 2 provided the equations have been adjusted to be now in line with related CPA-DD.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	6	**Section no.**	H.2	**Date:** 28/09/2016

Description of CAR

Following issues have been identified w.r.t. project emissions:

MR states the following "PE_{flare} is calculated as X tCO2e for the monitoring period." Clarify the "X".

During onsite inspection is has been identified that compressors are used to extract leachate from the landfill to collect the landfill gas. Clarification is requested whether the related electricity consumption is considered as project emissions.

The emissions reductions is based on 5 minute basis, tool esp flare efficiency requires hourly therefore clarify why ER calculation is not based on hourly method.

Project participant response (1st round)

Reference to “X” has been replaced by a value.

ER calculations have been revised to consider flare efficiency hourly values.

Two compressors are used to extract leachate from the landfill. Each compressor has a nominal capacity of 4 kW.

The first compressor was installed on 18/09/2015 (as verified in the Monthly Report 09/2015) to serve 3 leachate pumps. For the months of September and October, it was functioning from 8:00 to 16:00, 3 days a week.

The second compressor was installed in December 2015 to serve 4 additional leachate pumps. It has been functioning 24 hours a day, 6 days a week.

To be conservative, we will assume that the compressors have been functioning 24 hours x every day since installation + 10%. The amount of electricity consumed due to leachate pumping during the monitoring period is estimated as:

((24 hours x 318 days x 4 kW x (1+10%)) + ((24 hours x 244 days x 4 kW x (1+10%)) = 59.347 MWh.

It corresponds to (59.347 MWh x 0.6639 tCO_2/MWh x (1 + 20%)) = 47.3 tCO_2e project emissions.

Documentation provided by project participant (1st round)		**Date:** 03/10/2016
☐ Changes in the PDD	Section(s):	New version No.:
☒ Changes in MR	Section(s): H2	New version No.: 2
☒ Changes in XLS	Worksheet(s): ER summary	New version No.: 2
☐ Other:		

DOE assessment (1st round)	**Date:** 26/10/2016
Ok. The “X” has been exchanged by the related value which is correct as per ER spreadsheet. Ok. The ER calculation method has been revised in line with the related tool to be on hourly basis. ER spreadsheet has been checked and found correctly revised. Ok. As per onsite inspection the electricity consumption due to the project activity for the leachate pumps has been considered now. As per onsite check the capacity applied can be confirmed based on check of the related name plates as well as the calculation method. Further this approach/calc method is in line with PS Appendix 1 §3.	

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Table 6. FAR from this verification

FAR ID	1	**Section No.**	G.2	**Date:** 28/09/2016
Description of FAR				
FAR is raised as the delay in calibration for the parameter T_{flare} is affecting the next subsequent verification from 01/08/2016 to 01/09/2016.				
Project participant response				**Date:** DD/MM/YYYY
Information on calibration delay of the thermocouple to be reported in the monitoring report of the next verification.				
Documentation provided by project participant				
☐ Changes in the PDD		Section(s):		New version No.:
☐ Changes in MR		Section(s):		New version No.:
☐ Changes in XLS		Worksheet(s):		New version No.:
☐ Other:				
DOE assessment				**Date:** DD/MM/YYYY

Conclusion *Tick the appropriate checkbox*	☒ To be checked during the next periodic verification

Appendix 5. Monitored Parameters

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
A. $V_{t,wb}$		Volumetric flow of the LFG in time interval *t* on a wet basis		
a) Measurement / Determination method (VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /POADD/ /ACM001 / /TS/ /TA/	*Description:* The volumetric flow of LFG is measured continuosly on wet basis by a thermal mass flow meter E+H Proline Prowirl200.Two identical flow meters have been installed FT1 and FT2. FT1 before the blower and FT2 before the flare. For this monitoring period only the flow meter FT2 is relevant as it is close to the flare stack. The parameter is measured continuously and data is recorded every 5 minutes by an automatic monitoring system (AEMS). Data is obtained by the AEMS storing the data in a remote server. The biogas technican is downloading the data from the remote server weekly and monthly. These data and reports are checked on weekly basis by the monitoring manager. The raw data is extracted and then aggregated values are prepared on weekly basis. Those weekly and monthly reports are generated and forwarded to CME even though the CME as well as the consultant, the World Bank have access to all data and information of the project via drop box. The monitoring manager is sending an Email to the CME and the consultant attaching the weekly and monthly report and the raw data. *Verifier´s action:* By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. *Conclusion:* The parameter is monitored as per CPA-DD.	**Ok**	Ok
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)	/CAL/ /MM/	*Description:* The meters have an accuracy of ±0.75%. Further the initial calibration has been conducted on 15/04/2015. No	**Ok**	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*	/TS/	subsequent calibration is required as it has a lifelong calibration. This is indicated in the technical data sheet. *Verifier´s action:* By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection *Conclusion:* The meter has been duly calibrated for this entire monitoring period considering that the project has started operation from 01/08/2015 onwards.		
c) Correctness (VVS, §§ 389-393) *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /RAW/ /XLS/ /RP/	☒ Correct ☐ Not correct (initial assessment) *Description:* The data is obtained digitally. 5 minutes data are recorded and aggregated to average hourly values for calculation. The is monitored to calculate the quantitiy of methane collected from the landfill and sent to the flare stack. *Verifier´s action:* By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets as well as crosschecked against monthly and weekly reports. Further data of FT2 (after the blower) flow meter have been also crosschecked with data as per FT1 flow meter (before the blower). *Conclusion:* The values are correctly monitored and the calculation method and way is correct too. No incosnistecnies have been identified. No implausible data have been found.	**Ok**	Ok
B. $v_{CH4,t,wb}$		Volumetric fraction of CH_4 in time interval *t* on a wet basis		
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).*	/IM01/ /POADD/ /ACM001/ /TS/	Description: The volumetric fraction of methane (CH4) in the LFG is measured by a Geotech FAU gas analyser GA 14466. The analyzer measures the methane content in m^3/m^3 as well as on wet basis as shown by the meter. The meter has been exchanged with identical analyzer of same manufacturer and type with serial number GA 14465 on 23/04/2016.	~~**CAR 4**~~	Ok

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/TA/	The parameter is measured continuously and data is recorded every 5 minutes by an automatic monitoring system (AEMS). Data is obtained by the AEMS storing the data in a remote server. The biogas technican is downloading the data from the remote server weekly and monthly. These data and reports are checked on weekly basis by the monitoring manager. The raw data is extracted and then aggregated values are prepared on weekly basis. Those weekly and monthly reports are generated and forwarded to CME even though the CME as well as the consultant, the World Bank have access to all data and information of the project via drop box. The monitoring manager is sending an Email to the CME and the consultant attaching the weekly and monthly report and the raw data. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. Checked Email dated 23/09/2016 with attachments. Conclusion: The parameter is monitored as per CPA-DD. Besides the volumetric fraction is monitored on the same basis as the related flow rate/quantity of the LFG. However CAR 4 has been raised.		
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.*	/CAL/ /MM/	Description: The analyzer has an accuracy of 2.0%, even 0.2% at autocalibration. Further the factory calibration has been conducted on 18/04/2015 and is in use since 01/08/2015. The analyzer is in autocalibration mode and validity is till 31/07/2016. The analyzer has been exchanged on 23/04/2016. The analyzer conducts a zero calibration against ambient air and a value calibration against standard gas on 5 minute basis. Verifier´s action: by means of checking MR, CPA-DD, technical data sheet and onsite inspection. Conclusion: The meter has been duly calibrated for this entire	~~**CAR 4**~~	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.		monitoring period considering that the project has started operation from 01/08/2015 onwards. However CAR 4 has been raised as MR does not indicate whether the analyzer has conducted zero calibration against inert gas and value calibration against standard gas. Besides related calibration certificates of the inert and standard gas are not mentioned and provided and information on the exchanged analyzer is missing.		
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: The parameter is monitored to calculate the amount of methane destroyed by the project activity during this monitoring period. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets as well as monthly reports. Conclusion: No inconsistency or mistake has been identified. The value is calculated as per CPA-DD.	**Ok**	Ok
C. **P_t**		Pressure of the LFG in time interval *t*		
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /POA-DD/ /ACM001/ /TS/ /TA/	Description: Pressure of the LFG is measured by pressure sensor E+H Cerabar M PMP51 serial number K5060D01129. The parameter is required to determine the density of the LFG. The parameter is measured continuously and data is recorded every 5 minutes by an automatic monitoring system (AEMS). Data is obtained by the AEMS storing the data in a remote server. The biogas technican is downloading the data from the remote server weekly and monthly. These data and reports are checked on weekly basis by the monitoring manager. The raw data is extracted and then aggregated values are prepared on weekly basis. Those weekly and monthly reports are generated and forwarded to CME even though the CME as well as the consultant, the World Bank have access to all data and information of the project via drop box. The monitoring manager is sending an Email to the CME and the consultant attaching the	**Ok**	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		weekly and monthly report and the raw data. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. Conclusion: The parameter is monitored as per CPA-DD. Besides the volumetric fraction is monitored on the same basis as the related flow rate/quantity of the LFG. However CAR 4 has been raised.		
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*	/CAL/ /MM/ /MR/ /TS/	Description: The meter has an accuracy of 0.15%. Further the factory calibration has been conducted on 20/05/2015 and is in use since 01/08/2015. The calibration frequency is annually. Verifier´s action: by means of checking MR, CPA-DD, technical data sheet and onsite inspection. Conclusion: Considering the commissioning of the project as of 31/07/2015 and the end date of monitoring period as 31/07/2016 as per MR ver 1 the equipment is duly calibrated. However CAR 4 and CL 1 have been raised.	~~**CAR 4**~~ ~~**CL 1**~~	Ok
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /XLS/ /RAW/ /RP/	☒ Correct ☐ Not correct (initial assessment) Description: Measured in order to determine the density of methane. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets as well as monthly reports. Conclusion: No inconsistency or mistake has been identified. The value is calculated as per CPA-DD.	**Ok**	Ok
D. **T_t**		Temperature of the LFG in time interval *t*		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /POADD/ /ACM001/ /TS/ /TA/	Description: Temperature of the LFG is measured by temperature sensor Avenisense Wateract-air serial number 10036. The parameter is required to determine the density of the LFG. The parameter is measured continuously and data is recorded every 5 minutes by an automatic monitoring system (AEMS). Data is obtained by the AEMS storing the data in a remote server. The biogas technican is downloading the data from the remote server weekly and monthly. These data and reports are checked on weekly basis by the monitoring manager. The raw data is extracted and then aggregated values are prepared on weekly basis. Those weekly and monthly reports are generated and forwarded to CME even though the CME as well as the consultant, the World Bank have access to all data and information of the project via drop box. The monitoring manager is sending an Email to the CME and the consultant attaching the weekly and monthly report and the raw data. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. Conclusion:		
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring*	/CAL/ /MM/ /MR/ /TS/	Description: The thermocouple has an accuracy of typically 0.2°C and in maximum 0.5°C. Further the factory calibration has been conducted on 15/06/2015 and is in use since 01/08/2015. A subsequent calibration has been conducted on 30/08/2016. The calibration frequency is annually. Verifier´s action: by means of checking MR, CPA-DD, technical data sheet and onsite inspection. Conclusion: Considering the commissioning of the project as of 31/07/2015 and the end date of monitoring period as 31/07/2016	~~CL 1~~	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
equipment has been carried out in line with the latest EB guidance. *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*		as per MR ver 1 the equipment is duly calibrated. However CL 1 has been raised.		
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /XLS/ /RAW/ /RP/	☒ Correct ☐ Not correct (initial assessment) Description: Measured in order to determine the density of methane. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets as well as monthly reports. Conclusion: No inconsistency or mistake has been identified. The value is calculated as per CPA-DD.		
E. **T_{flare}**		Temperature in the exhaust gas of the flare		
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /POADD/ /ACM001/ /TS/ /TA/	Description: Temperature in the exhaust gas of the flare is measured by Günthe Type R thermocouple serial number 05-20387210-0500. The parameter is measured continuously and data is recorded every 5 minutes by an automatic monitoring system (AEMS). Data is obtained by the AEMS storing the data in a remote server. The biogas technican is downloading the data from the remote server weekly and monthly. These data and reports are checked on weekly basis by the monitoring manager. The raw data is extracted and then aggregated values are prepared on weekly basis. Those weekly and monthly reports are generated and forwarded to CME even though the CME as well as the consultant, the World Bank have access to all data and information of the project via drop box. The monitoring manager is sending an Email to the CME and the consultant attaching the weekly and monthly report and the raw data. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical	~~CL 3~~	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		data sheets. Conclusion: The parameter has been duly monitored however CL3 has been raised as it is unclear which type of thermocouple is actually installed based on documents provided.		
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*	/CAL/ /MM/	Description: The thermocouple has an accuracy of +-1.5%. Further the factory calibration has been conducted on 27/07/2015 and is in use since 01/08/2015. The calibration frequency is annually or it is exchanged by another new thermocouple. Therefore the calibration validitiy was due on 31/07/2016. A new thermocouple is installed on 02/09/2016 with calibration validity until 01/09/2017. Verifier´s action: By means of checking the technical description and calibnration certificate, technical manual and interview with personnel during site visit. Conclusion: The thermocouple is calibrated however delay in calibration has been identified from 01/08/2016 until 031/08/2016. Therefore CAR 4 has been raised. FAR1 is raised as the delay in calibration will also affect the next subsequent verification activity for the day of 01/09/2016.	~~**CAR 4**~~ **FAR 1**	FAR 1
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /XLS/ /RAW/ /RP/	☒ Correct ☐ Not correct (initial assessment) Description: The value is monitored to determine the flare efficiency. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets as well as monthly reports. Conclusion: No inconsistency or mistake has been identified.	**Ok**	Ok
F. **$fv_{CH4,FG,h}$**		Concentration of CH_4 in the exhaust gas of the flare		
a) Measurement / Determination method *(VVS, §§ 389-393)*	/IM01/ /POADD/ /ACM001	Description: The concentration of CH_4 in the exhaust gas of the flare is measured by a Servomex Servopro 4900 gas analyser serial number 653383.	~~**CAR 4**~~	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/ /TS/ /TA/	This parameter is monitored to determine the flare efficiency. As a simplified approach during determination of the flare efficiency only CH4 is monitored. The remaining gas is considered as N2 in line with related tool. The parameter is measured continuously and data is recorded every 5 minutes by an automatic monitoring system (AEMS). Data is obtained by the AEMS storing the data in a remote server. The biogas technican is downloading the data from the remote server weekly and monthly. These data and reports are checked on weekly basis by the monitoring manager. The raw data is extracted and then aggregated values are prepared on weekly basis. Those weekly and monthly reports are generated and forwarded to CME even though the CME as well as the consultant, the World Bank have access to all data and information of the project via drop box. The monitoring manager is sending an Email to the CME and the consultant attaching the weekly and monthly report and the raw data. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. Conclusion: The parameter is monitored as per CPA-DD. However CAR 4 has been raised.		
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB*	/CAL/ /MM/ /MR/ /TS/	Description: The analyzer has an accuracy of 1.0% of reading or 0.5 ppm at autocalibration. Further the factory calibration has been conducted on 15/06/2015 and is in use since 01/08/2015. The analyzer is in autocalibration mode and validity is stated in MR with 31/07/2016. Verifier´s action: by means of checking MR, CPA-DD, technical data sheet and onsite inspection. Conclusion: As per onsite check the analyzer conducts a zero calibration against inert gas (N2) and a value calibration against standard gas.	~~CAR 4~~	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
guidance. *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*		The meter has been duly calibrated for this entire monitoring period considering that the project has started operation from 01/08/2015 onwards. However CAR 4 has been raised as MR does not indicate whether the analyzer has conducted zero calibration against inert gas and value calibration against standard gas. Besides related calibration certificate dates of the inert and standard gas are not mentioned and provided. Further clarification is requested w.r.t. the validity of the calibration stated from 01/08/2016 – 31/07/2016.		
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: The parameter is used to determine the flare efficiency. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets as well as monthly reports. Conclusion: No inconsistency or mistake has been identified.	**Ok**	Ok
G. **$t_{O2,h}$**		Volumetric fraction of O_2 in the exhaust gas of the flare		
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /POADD/ /ACM001/ /TS/ /TA/	Description: The volumetric fraction of O_2 in the exhaust gas of the flare The parameter is measured continuously and data is recorded every 5 minutes by an automatic monitoring system (AEMS). Data is obtained by the AEMS storing the data in a remote server. The biogas technican is downloading the data from the remote server weekly and monthly. These data and reports are checked on weekly basis by the monitoring manager. The raw data is extracted and then aggregated values are prepared on weekly basis. Those weekly and monthly reports are generated and forwarded to CME even though the CME as well as the consultant, the World Bank have access to all data and information of the project via drop box. The monitoring manager is sending an Email to the CME and the consultant attaching the	~~**CAR 4**~~	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		weekly and monthly report and the raw data. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. Conclusion: Parameter is monitored as per DD. However CAR 4 has been raised.		
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*	/CAL/ /MM/ /MR/ /TS/	Description: The analyzer has an accuracy of 1.0% of reading or 0.5 ppm at autocalibration. Further the factory calibration has been conducted on 15/06/2015 and is in use since 01/08/2015. The analyzer is in autocalibration mode and validity is stated in MR with 31/07/2016. Verifier´s action: by means of checking MR, CPA-DD, technical data sheet and onsite inspection. Conclusion: As per onsite check the analyzer conducts a zero calibration against inert gas (N2) and a value calibration against standard gas. The meter has been duly calibrated for this entire monitoring period considering that the project has started operation from 01/08/2015 onwards. However CAR 4 has been raised as MR does not indicate whether the analyzer has conducted zero calibration against inert gas and value calibration against standard gas. Besides related calibration certificate dates of the inert and standard gas are not mentioned and provided. Further clarification is requested w.r.t. the validity of the calibration stated from 01/08/2016 – 31/07/2016.	~~**CAR 4**~~	Ok
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.*	/MR/ /XLS/ /RAW/	☒ Correct ☐ Not correct (initial assessment) Description: This parameter is sued to determine and calculate the flarwe efficiency. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw	**Ok**	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.		data sheets as well as monthly reports. Conclusion: No inconsistency or mistake has been identified.		
H. **$EC_{PJ,y}$**		Quantity of electricity consumed by the CPA		
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /POA-DD/ /ACM001/ /TS/ /TA/	Description: The quantity of electricity consumed by the CPA is measured by an electricity meter type Siemens Sentron PAC3200 serial number LQN1315. The parameter is measured continuously and data is recorded every 5 minutes by an automatic monitoring system (AEMS). Data is obtained by the AEMS storing the data in a remote server. The biogas technican is downloading the data from the remote server weekly and monthly. These data and reports are checked on weekly basis by the monitoring manager. The raw data is extracted and then aggregated values are prepared on weekly basis. Those weekly and monthly reports are generated and forwarded to CME even though the CME as well as the consultant, the World Bank have access to all data and information of the project via drop box. The monitoring manager is sending an Email to the CME and the consultant attaching the weekly and monthly report and the raw data. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. Conclusion: Parameter is monitored as per DD. However CAR 4 is rasied as the parameter description is not identical with the description given in related CPA-DD.	~~**CAR 4**~~	Ok
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that*	/CAL/ /MM/	Description: The meter has an accuracy of 0.5%. Further the elöectrcity meter is factory calibrated and is in use since 01/08/2015. No subsequent calibration is required as indicated in the technical data sheet.	**Ok**	Ok

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*		Verifier´s action: by means of checking MR, CPA-DD, technical data sheet and onsite inspection and interview with technicians. Conclusion: The monitoring equipment is duly calibrated for this entire monitoring period considering the start of this project activity from 01/08/2015 onwards.		
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /XLS/ /RAW/	☐ Correct ☒ Not correct (initial assessment) Description: The electricity consumption is required to calculate related project emissions. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets as well as monthly reports. Conclusion: No inconsistency or mistake has been identified however CAR 6 has been raised.	~~CAR 6~~	Ok
I. **Other flare operation parameter**		Data and parameters required to monitor whether the flare operates within the range of operating conditions according to the manufacturer specifications		
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /POADD/ /ACM001/ /TS/ /TA/	Description: The Data and parameters required to monitor whether the flare operates within the range of operating conditions according to the manufacturer specifications are volumetric flow rate and volumetric methane content of the LFG. Please refer to the related parameter assessment $V_{t,wb}$ and $v_{CH4,t,wb.}$ Further the minimum volumetric flow and methane content as per MR are indicated with V > 150 m³/h and v > 20 $\%_{CH4.}$ For further details refer to related parameter assessments. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. Conclusion: The parameter is monitored as per DD. as per	~~CAR 4~~	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		technical data sheet. CAR 4 is rasied as to clarify the inconsistency with the technical data sheet which gives as minimum gas quantity 300 m³/h.		
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*	/CAL/ /MM/	Description: Please refer to the related section for the parameters $V_{t,wb}$ and $v_{CH4,t,wb.}$	**n.a.**	n.a.
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /TS/	☒ Correct ☒ Not correct (initial assessment) Description: Data is indirectly monitored and checked against technical data sheet. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets, monthly reports a well as technical data sheet. Conclusion: No inconsistency or mistake has been identified. Please see above rasied CAR to clarify the inconsistency in minimum gas quantity between MR and technical data sheet.	~~**CAR 4**~~	Ok
J. $V_{t,db}$, $v_{CH4,t,db}$, $M_{t,wb}$, $M_{t,db}$, $p_{H2O,t,sat}$, $F_{CH4,EL}$, $EC_{BL,k,y}$, and Operation hours of the energy plant				
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL)*	/IM01/ /POADD/ /ACM001 /	Description and conclusion: The parameters are correctly mentioned in MR as they are not monitored as no engine is installed yet and therefore there nothing is or can be monitored. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD,	**Ok**	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/TS/ /TA/	methodology, tools as well as onsite inspection and technical data sheets.		
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*		Description: As currently no monitoring equipment has been installed this itme is not applicable.	**Ok**	Ok
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /TS/	☒ Correct ☐ Not correct (initial assessment) Description and conclusion: The parameter is correctly mentioned as they are not monitored as no engine is installed yet and therefore there is nothing to be monitored. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets, monthly reports a well as technical data sheet.	**Ok**	Ok
K. $F_{CH4\text{-}sent\text{-}flare,y}$		Mass flow of methane in the LFG sent to the flare		
a) Measurement / Determination method	/IM01/	Description: The parameter is calculated and not monitored.	~~**CAR 3**~~	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
(VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/POADD/ /ACM001/ /TS/ /TA/	Therefore no monitoring equipment is installed and required. The parameter is calculated as following: $V_{t,wb} * v_{CH4,t,wb} * \rho_{CH4}$ Where: $V_{t,wb}$ Volumetric flow of the LFG in time interval *t* on a wet basis $v_{CH4,t,wb}$ Volumetric fraction of CH_4 in time interval *t* on a wet basis ρ_{CH4} Density of methane (kg CH_4/m^3 CH_4) Please refer to those parameters for further details Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. Conclusion: The parameter is calculated correctly in line with the related CPA-DD. However CAR 3 and CAR 4 have been raised.	~~**CAR 4**~~	
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*		Description: As the parameter is calculated and not monitored it is not applicable.	**Ok**	Ok
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report*	/ACM0001/ /TA/	☒ Correct ☐ Not correct (initial assessment) Description and conclusion: The parameter is correctly calculated in line with the CPA-DD and methodology and related	**Ok**	Ok

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
is correct or determined in a conservative manner. *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/XLS/	tool. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets, monthly reports a well as technical data sheet as well as methodology and tool.		
L. PE_{flare}		Project emissions from flaring gases containing methane		
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /POADD/ /ACM001/ /TS/ /TA/	Description: The parameter is calculated and not monitored. Therefore no monitoring equipment is installed and required. The parameter is calculated as following: $\Sigma TM_{RG,h} \times (1 - \eta_{flare,h}) \times GWP_{CH4}/1000$ Where: $TM_{RG,h}$ Mass flow of methane in the residual gas stream, which is the same as $F_{CH4,sent\_flare}$ $\eta_{flare,h}$ Flare efficiency (fraction) when LFG is flared GWP_{CH4} Global Warming Potential of methane (t CH_4/t CO_2) Please refer to those parameters for further details Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets. Conclusion: The parameter is calculated correctly in line with the related CPA-DD. However CAR 3 and CAR 4 have been raised.	~~1. CAR 3~~ ~~CAR 4~~	Ok
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*		Description: As the parameter is calculated and not monitored it is not applicable.		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*				
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/ACM0001/ /TA/ /XLS/	☒ Correct ☐ Not correct (initial assessment) Description and conclusion: The parameter is correctly calculated in line with the CPA-DD and methodology and related tool. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets, monthly reports a well as technical data sheet as well as methodology and tool.		
M. $PE_{EC,y}$		Mass flow of methane in the LFG sent to the flare		
a) Measurement / Determination method *(VVS, §§ 389-393)* *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /POADD/ /ACM001/ /TS/ /TA/	Description: The parameter is calculated and not monitored. Therefore no monitoring equipment is installed and required. The parameter is calculated as following: $EC_{PJ,j,y} \times EF_{EL,y} \times (1 + TDL_{j,y})$ Where: $EC_{PJ,j,y}$ Net quantity of electricity consumed from the grid (MWh) $EF_{EL,y}$ Emission Factor of the grid used for CPA's electric consumption (tCO_2/MWh) $TDL_{j,y}$ Average technical transmission and distribution losses in the grid in the year *y* Please refer to those parameters for further details Verifier´s action: By means of checking MR, CPA-DD, PoA-DD, methodology, tools as well as onsite inspection and technical data sheets.	~~CAR 3~~ ~~CAR 4~~	Ok

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Conclusion: The parameter is calculated correctly in line with the related CPA-DD. However CAR 3 and CAR 4 have been raised.		
b) Accuracy and QA/QC Procedure *(VVS, §§ 394-400)* *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.*		Description: As the parameter is calculated and not monitored it is not applicable.		
c) Correctness *(VVS, §§ 389-393)* *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/ACM0001/ /TA/ /XLS/	☒ Correct ☐ Not correct (initial assessment) Description and conclusion: The parameter is correctly calculated in line with the CPA-DD and methodology and related tool. Verifier´s action: By means of checking MR, CPA-DD, PoA-DD as well as onsite inspection as well as ER spreadsheet and raw data sheets, monthly reports a well as technical data sheet as well as methodology and tool.		

Appendix 6. Calibration dates and validity of installed monitoring equipment

Table A-6: Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
Thermal mass flow meter	$V_{t, wb}$	K3262219000	Endress+Hauser Proline Prowirl R 200	± 0.75 %	15/04/2015	15/04/2015	Liefelong calibration	☒ No ☐ Yes	From: To:
Gas analyser	$V_{CH4, t, wb}$	GA14466	Geotech FAU	2% 0.2% with autocalibration	18/04/2015 Start of use 01/08/2015	31/05/2016 (exchanged by GA14465 on 23/04/2016)	One year	☒ No ☐ Yes	From: To:
Gas analyser	$V_{CH4, t, wb}$	GA14465	Geotech FAU	2% 0.2% with autocalibration	08/04/2016	08/04/2016 (since 23/04/2016 in use)	One year	☒ No ☐ Yes	From: To:
Presure sensor	P_t	K5060 D01129	Endress+Hauser Cerabar M PMP51	0.15%	20/05/2015 Start of use 01/08/2015	13/06/2016	One year	☒ No ☐ Yes	From: To:
Temperature and humidity sensor	T_t	10036	Avenisense Wateract-air	Typical 0.2°C Max 0.5°C	15/06/2015 Start of use 01/08/2015	30/08/2016	01/08/2015 to 31/07/2016	☒ No ☐ Yes	From: To:
Thermocouple	T_{flare}	05-2038721 0-0500	Günther Type R	• ±1.5°C	27/07/2015 Start of use 01/08/2015	Replaced on 02/09/2016	01/08/2015 to 31/07/2016	☒ No ☐ Yes	From: To:
Gas analyser	fvCH4,FG,h	653383	Servomex Servopro 4900	1% of reading or 0.5 ppm	15/06/2015 Start of use 01/08/2015	13/06/2016 Besides Auto calibration against inert gas and standard every 15 days.	Auto calibration against inert gas and standard gas every 15	☒ No ☐ Yes	From: To:
Gas analyser	tO2,h	653383	Servomex Servopro 4900	0.05%	15/06/2015 Start of use 01/08/2015			☒ No ☐ Yes	From: To:

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
						The standard and inert gas validity are until 14/01/2019	days. The standard and inert gas validity are until 14/01/2019		
Electricity meter	ECPJ,y	LQN1315	Siemens Sentron PAC3200	0.5%	initial factory calibration	n.a.	n.a.	☒ No ☐ Yes	From: To: