



RINA

GOLD STANDARD VERIFICATION/CERTIFICATION REPORT

Final

“Kocaeli Landfill Gas to Electricity Project”
in
Turkey

Monitoring period: 01/07/2013 to 30/09/2014

Report N° 2014-TQ-67-MD

Revision N° 1.2 Aa



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Project Title: Kocaeli Landfill Gas to Electricity Project	Country: Turkey	Estimated VERs (tCO₂e): 153,272
GS Registration Reference N°: 1013	Monitoring period: 01/07/2013 to 30/09/2014	Certified VERs (tCO₂e): 167,249
Client: Korfez Enerji San. ve Tic. A.S.	Client contact: MR. Ahmet MUSLEHIDDINOGLU	
Report No.: 2014-TQ-67-MD	Revision: 1.2 Aa	Date of this report: 30/03/2015
Approved by (Final Report – AO Authorized office signing for the DOE):  Laura Severino		Date of approval: 31/03/2015

Methodology

Number: ACM0001	Version: 15.0.0 of 08/11/2013	Title: Flaring or use of landfill gas	Scale Large	SS(s): 13
RINA Services S.p.A. (RINA), commissioned by Korfez Enerji San. ve Tic. A.S., has verified the greenhouse gas emission reductions reported for the project activity “Kocaeli Landfill Gas to Electricity Project” in Turkey, GS Registration Reference N° 1013, for the period 01/07/2013 to 30/09/2014, with regard to the relevant requirements for GS activities. The verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable GS VER requirements, which refer to CDM rules, in order to be certified. The project was validated by TÜV Rheinland (Validation Report No: 21218553, Version no: 01 issued on 10/10/2012) and it was registered on 06/12/2012 under GS registration reference N° 1013. The GHG emission reductions were calculated on the basis of the approved methodology ACM0001, version 15.0.0, Flaring or use of landfill gas of 08/11/2013 and the monitoring plan included in the registered Project Design Document, version 06 of 31/10/2014. In conclusion, it is RINA's opinion that the project activity “Kocaeli Landfill Gas to Electricity Project”, in Turkey, as described in the Monitoring Report version 05 of 30/03/2015, meets all relevant requirements for GS and CDM activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology “ACM0001”, “Consolidated baseline and monitoring methodology for landfill gas project activities”, version 15.0 of 08/11/2013. Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/07/2013 to 30/09/2014 amount to 167,249 tCO₂e. Baseline Emissions 167,251 tCO₂e Project Emissions 2 tCO₂e Leakage 0 tCO₂e Net GHG emission reductions/removal 167,249 tCO₂e				

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Work verified by (Final Report)

Rita Valoroso



Keywords:

Climate Change, Kyoto Protocol, Verification, Gold Standard



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Abbreviations

BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CDM-PCP	Clean Development Mechanism Project Cycle Procedure
CDM-PS	Clean Development Mechanism Project Standard
CDM-VVS	Clean Development Mechanism Validation and Verification Standard
CER(s)	Certified Emission Reduction (s)
CH ₄	Methane
CR	Clarification Request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reductions
GHG(s)	Greenhouse gas(es)
GS	Gold Standard
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LSC	Large scale
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document
PE	Project Emission
PMUM	Market Financial Conciliation Center (Piyasa Mali Uzlastirma Merkezi)
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services Spa
SDI	Sustainable Development Indicator
SS(s)	Sectoral Scope(s)
SSC	Small Scale
TEIAS	Turkish Electricity Transmission Company (Turkiye Elektrik Iletim A.S.)
UNFCCC	United Nations Framework Convention on Climate Change
VERs	Verified Emission Reduction(s)

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Appendix A: Gold Standard Verification Protocol

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1 INTRODUCTION

Korfez Enerji San. ve Tic. A.S. has commissioned RINA to carry out the verification and certification of emission reductions reported for the registered “Kocaeli Landfill Gas to Electricity Project” project in Turkey, GS Registration Reference N° 1013, for the period 01/07/2013 to 30/09/2014.

This report summarizes the findings of the verification of the project, performed on the basis of GS VER requirements, which refer to CDM rules, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The objective of the verification is to have an independent review ex post determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered GS project activity during a defined monitoring period and to monitor the impact of project activity on sustainable development, throughout the monitoring of the non-neutral Sustainable Development Indicators and moreover to monitor all the mitigation and compensation measures put in place. Certification is the written assurance by the DOE that, during a specific time period, a proposed GS project activity achieved the reductions in anthropogenic emissions by sources of GHGs as verified and that all the defined Sustainable Development Indicators to be monitored have been monitored according to the sustainability monitoring plan and that all the mitigation measures forecast have been correctly and effectively implemented.

The objective of this verification/certification was to verify and certify emission reductions and effective implementation of the monitoring of sustainable development indicators and mitigation measures, reported for the “Kocaeli Landfill Gas to Electricity Project” project in Turkey for the period 01/07/2013 to 30/09/2014.

1.2 Scope

The verification scope is:

- to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- to evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement;
- to verify that reported GHG emission data is sufficiently supported by evidence;
- to evaluate whether all the mitigation measures have been effectively put in place according to the monitoring plan and that all the sustainable development indicators have been correctly monitored.

Verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable GS VER requirements which refer to CDM rules, in order to be certified.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

The GS criteria refer to GS requirements, GS Toolkit and supporting annexes.

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

2 METHODOLOGY

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

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The verification consisted of the following three phases:

- Desk review;
- On-site assessment;
- The resolution of outstanding issues and the issuance of the final verification report and certification.

The following sections outline each step in more detail.

2.1 Desk Review

The monitoring report, version 05 of 30/03/2015 [/3/](#), the emission reduction calculations provided in the form of a spreadsheet, “GS1013 Kocaeli Landfill Gas to Electricity Project ER Calculation v2 16022015.xlsx” version 02 of 16/02/2015 [/4/](#), the approved baseline and monitoring methodology ACM0001 version 15 [/11/](#), and all the documentation provided to support the monitoring period [/1 – 46/](#) were assessed as part of the verification. In addition, the Project Design Document (PDD) version 07 of 16/02/2015 [/1/](#), in particular as regards the baseline estimations and the monitoring plan, the Passport version 01 of 31/10/2014 [/2/](#), and the validation report, revision 01 of 10/10/2012 [/12/](#) for the project, were reviewed.

The following table lists the documentation that was reviewed during the verification.

/1/	OAK Danışmanlık: CDM-PDD for “Kocaeli Landfill Gas to Electricity Project” in Turkey, version 07 of 16/02/2015 OAK Danışmanlık: CDM-PDD for “Kocaeli Landfill Gas to Electricity Project” in Turkey, version 06 of 31/10/2014 OAK Danışmanlık: CDM-PDD for “Kocaeli Landfill Gas to Electricity Project” in Turkey, version 05 of 14/02/2013
/2/	OAK Danışmanlık: GS Passport for “Kocaeli Landfill Gas to Electricity Project” in Turkey, version 01 of 31/10/2014
/3/	OAK Danışmanlık: Monitoring Report for “Kocaeli Landfill Gas to Electricity Project” in Turkey, version 05 of 30/03/2015 OAK Danışmanlık: Monitoring Report for “Kocaeli Landfill Gas to Electricity Project” in Turkey, version 04 of 30/03/2015 OAK Danışmanlık: Monitoring Report for “Kocaeli Landfill Gas to Electricity Project” in Turkey, version 03 of 20/02/2015 OAK Danışmanlık: Monitoring Report for “Kocaeli Landfill Gas to Electricity Project” in Turkey, version 02 of 16/02/2015 OAK Danışmanlık: Monitoring Report for “Kocaeli Landfill Gas to Electricity Project” in Turkey, version 01 of 31/10/2014
/4/	OAK Danışmanlık: Emission Reduction Calculation Spreadsheet “ GS1013 Kocaeli Landfill Gas to Electricity Project ER Calculation v2 16022015.xlsx” version 02 of 16/02/2015 OAK Danışmanlık: Emission Reduction Calculation Spreadsheet “GS1013 Kocaeli Landfill Gas to Electricity Project ER Calculation v1 31102014.xlsx” version 01 of 31/10/2014
/5/	CDM Executive Board: Glossary of CDM Terms, version 07.0 of 23/11/2012
/6/	The Gold Standard: Clean Development Mechanism Validation and Verification Manual, version 30/07/2010
/7/	Gold Standard Foundation: Gold Standard Requirements, version 2.2 of 01/06/2012
/8/	Gold Standard Foundation: Gold Standard Toolkit, version 2.2 of 01/06/2012
/9/	The Gold Standard Foundation: Kocaeli Landfill Gas to Electricity Project, Turkey (GS1013) 3-week Registration Review Period Document of 12/05/2014
/10/	CDM Executive Board: Validation and Verification Standard, 07.0 of 01/06/2014
/11/	CDM Executive Board: Baseline and Monitoring Methodology “ACM0001”, “ Flaring or use of landfill gas ”, version 15.0.0 of 08/11/2013
/12/	RINA: Verification Report for “Kocaeli Landfill Gas to Electricity Project – Turkey” in Turkey,

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	No. 2013-TQ-24-MD revision 1.4 of 23/04/2014
/13/	CDM Executive Board: Methodological Tool "Combined tool to identify the baseline scenario and demonstrate the additionality" version 05.0.0 of 23/11/2012
/14/	CDM Executive Board: Methodological Tool "Project emissions from flaring" version 02.0.0 of 20/07/2012
/15/	CDM Executive Board: Methodological Tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" version 02.0.0 of 03/06/2011
/16/	CDM Executive Board: Methodological Tool "Emissions from solid waste disposal sites" version 06.0.1 of 02/03/2012
/17/	CDM Executive Board: Methodological Tool "Tool to calculate the emission factor for an electricity system" Version 04.0.0 of 04/10/2013
/18/	CDM Executive Board: Methodological Tool 'Tool to calculate baseline, project and/or leakage emissions from electricity consumption' version 01 of 16/05/2008
/19/	CDM Executive Board: Monitoring Report Form (CDM-MR-FORM), version 04.0 of 25/06/2014
/20/	Korfez Enerji San. ve Tic. A.S.: Operating Hours of Engines GM-01, GM-02 and GM-03 Daily Operation Form, of 01/07/2013, 31/12/2013 and 30/09/2014
/21/	Ministry of Energy and Natural Resources: Provisional Acceptance Protocol of 29/08/2014 (GM-3 and GM-4)
/22/	Turkish Electricity Transmission Company (TEIAS): Monthly Meter Reading Protocols from 01/07/2013 to 30/09/2014
/23/	Alpha Zähler: Calibration Report of the Main Electricity Meter of 13/04/2011
/24/	Endress&Hauser: Calibration Reports of the flow meters, sn J084F902000 of 14/08/2014
/25/	Set Teknolojileri: Calibration Certificate of Ultramat 23, serial no N1-A5-473 of 18/07/2014
/26/	SIEMENS: Data Sheet for Gas Analyzer Siemens Ultramat 23
/27/	Energy Market Regulatory Authority: Generation License numbered EU/3446-7/2093 of 15/06/2006
/28/	Gold Standard Foundation: Memo on Project Design Change of Kocaeli Landfill Gas to Electricity Project, Turkey of 31/10/2014
/29/	Korfez Enerji San. ve Tic. A.S.: The sample of raw data for 28/08/2013, 12/12/2013, 01/03/2014, 14/06/2014 and 20/09/2014, submitted on 06/01/2015
/30/	The Ministry of Trade and Industry: Regulation of Metering and Testing of Metering Systems of 24/07/1994
/31/	Picture of the Treatment Plant for Leachate, taken of 06/01/2015
/32/	Picture of the Temperature Meter WIKA with a serial no 1102D580, taken of 06/01/2015
/33/	Operational Instructions of T-mass 65l Thermal MassFlow Measuring System, submitted on 06/01/2015
/34/	Social Security Institution: Declaration of Employment for 19 Employees of 09/2014
/35/	Pictures of the Solaklar School, taken of 06/01/2015
/36/	Detam Group: Health and Safety Training Certificate of 02/09/2014 (1 Employee)
/37/	Detam Group: Health and Safety Training Certificate of 18/09/2014 (2 Employees)
/38/	Detam Group: Electrical Risks and Fire Training Certificate of 19/08/2014 (8 Employees)
/39/	Detam Group: Electrical Risks and Fire Training Certificate of 21/08/2014 (2 Employees)
/40/	Detam Group: Electrical Risks and Fire Training Certificate of 22/09/2014 (5 Employees)
/41/	Detam Group: Attendance List for Working at Height Training of 03/07/2014 (7 Employees)
/42/	Detam Group: Attendance List for Electrical Risks and Fire Training of 19/08/2014 (8 Employee)
/43/	Detam Group: Attendance List and Certificates for Occupational Hygiene and Diseases

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	Training of 22/09/2014 (6 Employees)
/44/	Detam Group: Attendance List and Certificates for Manual Handling and Use of Work Equipment Training of 22/09/2014 (4 Employees)
/45/	Detam Group: Occupational Health and Safety Signs and Boards Training Certificates (6 Employees)
/46/	Gold Standard: Annex AA "Gold Standard Procedures for Approval of Design Changes" of Gold Standard Guidelines, retrieved on 05/01/2015

2.2 On-site assessment

On 06/01/2015, RINA visited the plant located in Solaklar district, Kocaeli province of Turkey. During the on-site assessment of the project, all the equipment and the systems were accessible. RINA assessed the implementation and operation of the proposed project activity, reviewed the information flows for generating, aggregating and reporting the monitoring parameters, interviewed key personnel of the plant to confirm the operational and data collection procedures, cross-checked between information provided in the monitoring report and data plant, checked the monitoring equipment including calibration performance, reviewed calculations and assumptions made in determining the GHG data and emission reductions, checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters, checked the correct and effective implementation of the mitigation measures foreseen in the sustainability monitoring plan, to prevent violation or the risk of violating a safeguarding principle of the "Do No Harm" Assessment or to "neutralize" a Sustainable Development Indicator.

The project personnel were interviewed with the purpose to see how the monitoring procedures were implemented; the whole process was explained to the verification team during the site visit on 06/01/2015. The carbon consultant was interviewed about the monitoring report and related parameters on, which the whole process related emission reduction calculation and sustainability monitoring plan was explained.

During the site visit, the mukhtar and the school manager of Solaklar Village were interviewed about the improvements to the school library and villages from where the students come to the Solaklar Primary School. All the improvements related to the previous monitoring period were performed during this monitoring report. In addition, they were interviewed about the capacity addition and they confirmed that adding an engine does not effect to the village. Otherwise, to generate more electricity will be good for our country.

Additionally, the Izaydas Treatment Recovery Specialist, Arzu Ulutas was interviewed. She confirmed that the leachate is now sent to the treatment plant which is under IZAYDAS responsibility with the commissioning of the treatment plant. The plant /31/ is also visited during on site visit.

The key personnel interviewed and the main topics of the interviews are summarized in the table below.

	Date	Name and Role	Organization	Topic
/a/	06/01/2014	Omer AKYUREK Consultant	OAK Danismanlik	Monitoring plan Monitoring methodology
/b/	06/01/2014	Ahmet MUSLEHIDDINOGLU Carbon Project Developer	Korfez Enerji	Monitoring data Implementation status of the project
/c/	06/01/2014	Serdar ERUYSAL Plant Chief	Korfez Enerji	Monitoring equipments and operation Calibration certificates
/d/	06/01/2014	Turan Umit KARGIN Environmental Engineer	Korfez Enerji	Training Certificates Electricity Generation
/e/	06/01/2014	Burhan TUGTEKIN The Mukhtar	Solaklar Village	Benefit of the project to the village
/f/	06/01/2014	Murat SAHIN	Solaklar	Local Employment



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		Assistant of Mukhtar	Village	Project Effects Improvements to the School Treatment of Leachate
/g/	06/01/2014	Abdullah TILEKLIOGLU School Manager	Solaklar Village	
/h/	06/01/2014	Arzu ULUTAS Treatment Recovery Specialist	IZAYDAS	

2.3 Resolution of outstanding issues

The objective of this phase of the verification is to resolve any outstanding issues which need to be clarified for RINA's positive conclusion on the monitoring report and emission reductions.

To guarantee transparency a verification protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of verification and the results from verifying the identified criteria. The verification protocol consists of three tables; the different columns in these tables are described in the figure below (see Figure 1). The completed verification protocol is enclosed in Appendix A to this report.

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

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reductions;
- Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable GS VER requirements, which refer to CDM rules, have been met.

CARs, CRs identified are included in the verification protocol in Appendix A of this report.

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Figure 1 Gold Standard Verification protocol tables

Verification Protocol, Table 1 - Requirement checklist				
Checklist Question	Ref.	MoV	Comments	Conclusion
Checklist questions organized in five different sections.	Makes reference to documents where the answer to the checklist question or item is found.	Explain how conformance with the checklist question is investigated. Examples are document review (DR), interview or any other follow-up actions (I), cross checking (CC) with available information relating to projects, (N/A) means not applicable.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with checklist question so far.	For CAR and CR see the definitions above. OK is used if the information and evidence provided is adequate to demonstrate compliance with GS VER/CDC requirements which refer to CDM rules.

Verification Protocol, Table 2: Resolution of Corrective Action Requests and Clarification			
Corrective action requests and/or clarification requests	Reference to Table 1	Response by project participants	Verification Conclusion
The CAR and/or CRs raised in table 1 are repeated here.	Reference to the checklist question number in Table 1 where the CAR or CR is explained.	The responses given by the project participants to address the CARs and/or CRs.	The verification team's assessment and final conclusion of the CARs and/or CRs.

Verification Protocol, Table 3 - Forward Action Requests		
Forward action request	Reference to Table 1	Response by project participants Verification Conclusion
The FAR raised in table 1 is repeated here.	Reference to the checklist question number in Table 1 where the FAR is explained.	Response by the project participants on how forward action request will be addressed.

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2.4 Internal quality control

All the revisions of the verification report, before being submitted to the client, were subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent RINA instructions.

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

2.5 Verification team and the technical reviewer(s)

The verification team and the technical reviewers consist of the following personnel:

Role/Qualification	Last Name	First Name	Type of involvement*					
			DR	SV	REP	TE	TR	TER
GS Team Leader, GS Verifier, Technical Expert	Kıratlı	Tuğçe	X	X	X	X		
Technical Reviewer	Valoroso	Rita					X	X

*DR: Document Review; SV: Site Visit/Interview; REP: Reporting; TE: Technical Expert in Technical Area; TR: Technical Review; TER: Technical Expert in Technical Area for Technical Review.

3 VERIFICATION FINDINGS

The findings of the verification related to the monitoring period from 01/07/2013 to 30/09/2014 as documented and described in the monitoring report version 05 of 30/03/2015 [/3/](#) are stated in the following sections.

The verification requirements, the means of verification and the results from verifying the identified criteria are documented in more detail in the verification protocol in Appendix A.

3.1 Description of the project activity

The main information of the project is summarized in the table below.

Project Participant(s)	Korfez Enerji San. ve Tic. A.S.		
Project Title	Kocaeli Landfill Gas to Electricity Project – Turkey		
Location of the project	Solaklar District, Kocaeli Province of Turkey		
Methodology(ies)	" ACM0001", " Flaring or use of landfill gas ", version 15.0.0 of 08/11/2013 /11/		
Sectoral Scope(s)	13	RINA's Technical Area(s)	13.1
Registered PDD	Revision 05 of 14/02/2013 (Registered PDD) Revision 07 of 16/02/2015 (Revised PDD)		
Date of registration	06/12/2012	GS Registration Reference N°	1013
Starting date of the crediting period	01/03/2012		

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Project's crediting period	01/03/2012 to 28/02/2019
Monitoring period	01/07/2013 to 30/09/2014 (both days included)
Project documentation link	https://mer.markit.com/br-reg/public/project.jsp?project_id=103000000001917

The purpose of the project activity is the generation of the electricity by using the LFG from the landfill. It involves the installation of gas engines, gas extraction system, flaring system. The total capacity of the project activity is reach to 5.093 MW with adding two more engines with a capacity of 1.415 MWe as confirmed through the Temporary Acceptance Protocol /21/. The electricity produced is delivered to the Turkish national grid (TEIAS). The emission reductions are estimated to be 153,272 tCO₂e. During the monitoring period of 01/07/2013 to 30/09/2014 (both days included) the emission reductions to 167,249 tCO₂e.

The project activity aims to reduce the greenhouse gas emissions in Turkey by replacing fossil fuel power generation and contribute to the development of the wind energy sector in Turkey, as well as aims to support the local economy by creating local employment and providing equipment locally.

3.2 Remaining issues (FARs) from previous validation or verification

Based on the review of the first verification report of 22/02/2013 /12/, 4 FARs were addressed during verification.

FAR#1

SD.3 Human and Institutional Capacity: According to the PP's prescience, the following issues will be addressed;

- The floor of the classroom will be renewed.
- Classrom interior walls will be painted
- The computer class will be moved from upper floor to lower floor as requested by the school management
- Classroom doors will be repaired/renewed
- Data and electricity infrastructure will be renewed
- The library will be moved to its new place as requested by the school management

All these issued should be verified during the next verification site visit.

During on site visit, the school manager and the mukhtar were interviewed about the improvements to the school. He confirmed and it is also observed that the improvements to the school library were performed by the project activity as confirmed through the pictures of the library and the computer room /35/.

Hence, FAR#1 is closed.

FAR#2

SD.5 Management of Leachate: It is confirmed that the management of leachate is under the responsibility of IZAYDAS. The representatives defined that the leachate was treated in 42 Evler Water Treatment Center since the decision of the new leachate treatment centre was taken. However, it should be verified during the next monitoring period that the new centre is in operation and the leachate is treated.

During on site visit, the treatment recovery specialist (Arzu Ulutas) was interviewed. She confirmed that the leachate is sent to the treatment plant which is under IZAYDAS responsibility. The plant /31/ is also visited during on site visit.

Hence, FAR#2 is closed.

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FAR#3

Changing the title of the project activity in the GS Registry will be monitored during the next verification.

The title of the project activity is now defined as “Kocaeli Landfill Gas to Electricity Project” in the registered PDD [/1/](#), Monitoring Report version 01 [/3/](#) and GS Registry Market.

Hence, FAR#3 is closed.

FAR#4

Since the project owner is unable to find the document for initial calibration of the meter ID.25, the temperature meter WIKA TR-10_H, sn 1102D580 should be calibrated and monitored during the next verification.

No calibration was performed during the monitoring period from 01/07/2013 to 30/09/2014. Hence, FAR is not closed and will be monitored during the next verification.

3.3 Monitoring Report

The Monitoring Report for the project activity “ Kocaeli Landfill Gas to Electricity Project”, in Turkey, version 05 of 30/03/2015 and previous versions submitted by the Korfez Enerji San. ve Tic. A.S. have been the basis for the verification process.

The main changes between the MR version 01 of 31/10/2014 at the starting date of the verification activity and the MR version 05 of 30/03/2015 submitted for registration are the following:

Section of the MR	Description and reason for changing the information in that section
First Page	Registration date of the project activity is corrected. The version of the methodology is corrected. The name of the company is corrected as per the agreement with RINA.
A.6. Contact information of responsible persons/entities	The name and the mail of the contact person is changed.
B.1. Description of implemented registered project activity	Timeline of the project activity is added.
B.2. Post registration changes	The number of the gas engines and the total capacity of the project activity is revised.
D.2. Data and parameters monitored	The value for the operation hour is presented. The serial number of the mass flow meter is revised. The value of the electricity consumed for the year of 2014 is revised.
SECTION E. Calculation of emission reductions or GHG removals by sinks	The necessary corrections are made for the calculations.
F.1 Sustainability Monitoring Plan	The value for the air quality is re-calculated. The training list is presented. The employee list is revised as per the monitoring period. Current situation of water quality is revised as per the sewage truck invoice. The number of employees and locals are revised.
Appendix 1. Contact information of project participants and responsible persons/entities	The name and the mail of the contact person is changed.

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RINA confirms that the above MR is based on the currently valid MR template [/19/](#) and is completed in accordance with the applicable guidance document [/19/](#).

3.4 Project implementation

Actual implementation of the registered project activity

It was verified during the site visit conducted on 06/01/2015 that the proposed project activity has been implemented and it is in operation on 01/03/2012 in accordance with the project activity described in the registered PDD [/1/](#). The first design of the project activity is to commission 2 gas engines with a total capacity of 2.4 MW. After two years of the project registration on 06/12/2012, the capacity of the project activity is increased to 5.093 MW. The total installed capacity of the project activity is now 5.093 MW with 4 units of gas engines installed with a capacity of 1.2 MW (GM1), 1.063 MW (GM2), 1.415 MW (GM3) and 1.415 MW (GM4).

The project activity is registered as Gold Standard Project activity on 06/12/2012 as confirmed through the previous verification report [/12/](#).

4 units of gas engine have been installed with a total capacity of 5.093 MW (1.2 MW-GM1, 1.063 MW-GM2, 1.415 GM3 and 1.415 GM4), which are dedicated to the landfill gas extracted from the landfill area. 4 engines have been commissioned in three phase as explained below:

- On 02/03/2012, one power generation unit (GM-1) has commissioned as confirmed through the previous verification report [/12/](#).
- On 15/10/2012, one power generation unit (GM-2) has commissioned as confirmed through the previous verification report [/12/](#).
- On 29/08/2014, two power generation units (GM-3 and GM-4) has commissioned as confirmed through the Temporary Acceptance Protocol [/21/](#).

Post registration changes

The project activity has a capacity addition from 2.263 MW (2 Engines – GM1 and GM2) to 5.093 MW (4 Engines – GM3 and GM4) with adding two more engines with each capacity of 1.415 MW as confirmed through the Temporary Acceptance Protocol [/21/](#).

During this monitoring period 2 new engines (GM3 and GM4) are added to the project activity on 29/08/2014 as confirmed through the Temporary Acceptance Protocol [/21/](#).

The capacity addition procedures are applied according to the Annex AA “Gold Standard Procedures for Approval of Design Changes” of Gold Standard Guidelines [/46/](#). Currently, the project activity includes 4 engines with a total installed capacity of 5.093 MW.

The revised documents (i.e. revised PDD in track-change mode, memo of the design changes) were provided to the verification team.

Additionality

According to the Methodology ACM0001 version 15.0 [/11/](#), the following types of project activities are deemed automatically additional, if prior to the implementation of the project activity the LFG was only vented and/or flared but not utilized for energy generation:

- (a) The LFG is used to generate electricity in one or several power plants with a total nameplate capacity that equals or is below 10 MW;
- (b) The LFG is used to generate heat for internal or external consumption;
- (c) The LFG is flared.

Since the capacity of the project activity is below 10 MW, therefore, the project activity is deemed automatically additional. Therefore, the capacity addition of the project activity does not affect to the additionality.

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Scale of project

The capacity of the project activity is increased from 2.263 MW to 5.093 MW. Therefore, the scale of the project is the same with the previous monitoring period. The scale of the project activity is defined as large in the revised PDD [/1/](#).

Applicability of methodology

The project activity is a landfill plant with a capacity addition. The proposed project activity will not be able to benefit from any of these wells and could not be considered as “an investment into an existing LFG capture system”. In addition, the proposed project activity is designed in a way to make use of the LFG recovered for the delivery of electricity, where the excess LFG will be flared for emergencies. There will be no heat generation or supply of LFG to consumers. There are no recycling activities within the project activity. This methodology is not used in a combination of other approved methodologies. No changes or intervene has been made deliberately to increase generation compared to situation prior to the implementation of the project activity. No change is involved for the applicability after the capacity addition. Therefore, ACM0001 “Flaring or use of landfill gas”, version 15.0 of 08/11/2013 [/11/](#) is still applicable for this project activity.

Stakeholder feedback on design change

During the site visit performed on 06/01/2015, the village head of Solaklar District were interviewed about sustainable development indicators and effects of the capacity addition of the project. The villagers confirmed that they have no negative impact about the project activity and capacity addition did not affect villagers.

Sustainable Development Assessment

The meeting with stakeholders has been done to confirm if sustainable development parameters have to be changed or not and it is concluded that the capacity addition does not change the village that project lays on. During site visit, the verification team met with the head of the village and it is confirmed that no negative impact has been occurred.

Sustainable Development Monitoring Plan

There is no need to change Sustainable Monitoring Plan during this monitoring period against the capacity addition as per the interviews with the stakeholders.

Legislation

The generation of the project activity related to 2.263 MWe came into force on 06/10/2011. After capacity addition decision, the generation license of the project activity is amended to 5.093 MWe on 10/10/2013 [/47/](#).

3.5 Methodology for determining Emission Reductions.

According to the applied methodology ACM0001 “Consolidated baseline and monitoring methodology for landfill gas project activities” version 15.0.0 [/11/](#), the emission reductions have been calculated based on the following formula:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reduction in year y (tCO₂e/yr)

BE_y = Baseline emissions in year y (tCO₂e/yr)

PE_y = Project emissions in year y (tCO₂e/yr)

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LE_y = Leakage emissions in year y (tCO₂e/yr)

Baseline emissions

In accordance with ACM0001 “Flaring or Use of Landfill Gas” version 15.0.0 [/11/](#), baseline emissions are calculated as follows:

$$BE_y = BE_{CH_4,y} + BE_{EC,y}$$

Where:

BE_y = Baseline emissions in year y (tCO₂e/yr)

$BE_{CH_4,y}$ = Baseline emissions of methane from SWDS in year y (tCO₂e/yr)

$BE_{EC,y}$ = Baseline emissions associated with electricity generation in year y (tCO₂eq/yr)

Project emissions

In accordance with ACM0001 “Flaring or Use of Landfill Gas” version 15.0.0, the project emissions are calculated as follows:

$$PE_y = PE_{EC,y}$$

Where:

$PE_{EC,y}$ = Emission from consumption of electricity due to the project activity in year y (tCO₂e/yr).

Since there is no consumption of fossil fuels due to the project activity, for the purpose other than electricity generation, there are no emissions from fossil fuel consumption and therefore $PE_{FC,y}$, is equal to “0” and has not been included in equation.

The project emissions from consumption of electricity by the project activity $PE_{EC,y}$ shall be calculated using the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”.

When applying the tool, electricity sources j in the tool corresponds to the sources of electricity consumed due to the project activity.

$PE_{EC,y}$ is calculated as follows:

$$PE_{EC,y} = \sum EC_{PJ,y} * EF_{EL,j,y} * (1+TDL_{j,y}) =$$

Where:

$PE_{EC,y}$ = Project emissions from electricity consumption in year y (tCO₂e/year)

$EC_{PJ,y}$ = Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/year)

$EF_{EL,j,y}$ = Emission factor for electricity generation for source j in year y (tCO₂e/MWh)

$TDL_{j,y}$ = Average technical transmission and distribution losses for providing electricity to source j in year y

Leakage

According to methodology ACM0001 version 15.0.0 [/11/](#), no leakage effects need to be accounted. The project activity does not involve off-site transportation of waste materials

3.5.1 Compliance of the monitoring plan with the monitoring methodology and applicable methodological tools

The registered project activity applies the approved baseline and monitoring methodology ACM0001 version 15 [/11/](#). RINA confirms that the monitoring plan in the registered PDD [/1/](#) complies with the applied CDM methodology and with the sustainability indicators established by the Appendix D of the Gold Standard requirements [/7/](#).

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3.5.2 Deviation in GHG emission reduction

Additionality assessment has been performed according to the “Tool for the demonstration and assessment of additionality” approved by UNFCCC in the registered PDD [/1/](#). The baseline scenario selection and the calculation of emission reductions have been carried out in a conservative manner. An approved CDM methodology, ACM0001 version 15 [/11/](#) has been applied in order to determine the baseline scenario and calculate emission reductions.

3.5.3 Compliance of monitoring with monitoring plan

The monitoring plan in the monitoring report version 05 of 30/03/2015 [/3/](#) complies with the monitoring plan in the registered PDD [/1/](#) and both the monitoring methodologies, ACM0001 version 15 [/11/](#) has been properly implemented and followed. All the parameters, as listed in the following sections, have been monitored according the applied methodology and the relevant CDM EB decisions and GS requirements. The sustainability indicators in the monitoring report [/3/](#) comply with the sustainability indicators established by the Appendix D of the Gold Standard Requirements. No change has been occurred to the key sustainable development indicators during this monitoring period. RINA can thus confirm the implementation of the project monitoring was appropriate.

The following parameters have been monitored in accordance with the monitoring plan in the registered PDD [/1/](#) and the monitoring report [/3/](#).

3.5.3.1 Data and parameters fixed ex-ante or at renewal crediting period

DATA/PARAMETER	Source of data	Reported value for the project period	Assessment/Observation
OX_{top-layer} Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline	Tool: Emissions from solid waste disposal sites	0.1	The parameter is used for the calculation of baseline emission as per the tool of “Emissions from solid waste disposal sites” /16/ .
GWP_{CH4} Global Warming Potential of Methane	IPCC	25 tCO ₂ e/tCH ₄	As per the IPCC the value 25 is fixed for the second commitment period. It shall be updated according to any future COP/MOP decision.
EF_{EL,y} Emission factor for the production of the electricity	Registered PDD /1/	0.542 tCO ₂ eq/MWh	The parameter is used for calculation of baseline and project emission. The value is calculated ex-ante and has been fixed throughout the first crediting period as per the registered PDD /1/ .
W_{H2S} Fraction of Sulphide within the LFG	Registered Gold Standard Project Passport /2/	0.5%	As per the registered Gold Standard Project Passport /2/ is used for Gold Standard Sustainable Development Monitoring Parameter SD. 1 “Air Quality”.

3.5.3.2 Sampling plan

There are no data or parameter determined by a sampling approach.

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3.5.3.3 Data and parameters monitored ex-post

DATA/PARAMETER	Op _{j,h} – ID.22
Data Unit	-
Description	Operation of the equipment that consumes the LFG
Source of data to be used	The amount of hours is monitored with a counting device in each power generation unit
Value data for the monitoring period	GM1: 8,777 h GM2: 6,463 h GM3: 8,332 h GM4: 4,420 h
Measuring and reporting frequency; recording procedure	The counting devices of the engines are counting the operational hours continuously as the operational hours are also used for maintenance reasons. The operation hours are recorded daily as confirmed through the Daily Operation Forms /21/.
Type of monitoring equipment and its accuracy	The operation of the energy plant is measured for each power generation unit by a counting device. Every power generation unit has its own counting device totalizing the amount of hours.
Calibration frequency/interval	N/A
How were the values in the monitoring report verified and cross-checked?	The values used for calculation of baseline emission have been crosschecked with Daily Operation Form /20/.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	The operational hours of the MWM engine are recorded by the monitoring system; the operational hours of the Jenbacher engine are recorded manual at least daily.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	In case of failures of the data recording system, no emission reduction will be claimed for that period. A logbook will be written and will be registered the without data recording. During this monitoring period all the data were available and no failure is recorded.

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DATA/PARAMETER	Management of SWDS – ID.23
Data Unit	-
Description	Management of SWDS
Source of data to be used	One of the following sources could be used: - Original design of the landfill - Technical specifications for the management of the SWDS
Value data for the monitoring period	There have been no changes to the design of the landfill to increase methane generation which have been occurring prior to the implementation of the project activity.
Measuring and reporting frequency; recording procedure	Once each verification
Type of monitoring equipment and its accuracy	Visual inspection
Calibration frequency/interval	-
How were the values in the monitoring report verified and cross-checked?	The original design of the landfill is observed during the on-site visit. Two more engines were added near the previous ones.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	-
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	-

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DATA/PARAMETER	V _{t,db,engine} – ID.24
Data Unit	m ³ dry gas / h
Description	Volumetric flow of the gaseous stream in time interval t on a dry basis
Source of data to be used	The Volumetric flow of the gaseous stream is measured continuously through a mass flow meter
Value data for the monitoring period	2013: 5,289,567 2014: 12,754,828
Measuring and reporting frequency; recording procedure	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server.
Type of monitoring equipment and its accuracy	During the monitoring period the following instruments have been used: – Thermal mass flow measuring system by Endress & House, Proline t-mass 65I, sn J804F902000 The accuracy of Thermal mass flow Proline t-mass 65I is defined as 1.0% as confirmed through the data sheet /33/ .
Calibration frequency/interval	The flow meter has been calibrated on 14/08/2014 by the supplier as confirmed through the calibration record /24/ . The calibration frequency is 3 years as confirmed through the operational instructions /33/ .
How were the values in the monitoring report verified and cross-checked?	The values used for calculation of baseline emission have been crosschecked with the raw data of the ER Calculation, version 02 of 16/02/2015 /4/ .
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	In case of failures of the data recording system, no emission reduction will be claimed for that period. A logbook will be written and will be registered the without data recording. During this monitoring period all the data were available and no failure is recorded.

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DATA/PARAMETER	$V_{CH_4,t,db,engine}$ – ID.25
Data Unit	m ³ gas CH ₄ / m ³ dry gas
Description	Volumetric fraction of CH ₄ in a time interval t on a dry basis
Source of data to be used	The methane fraction in the LFG is measured continuously by a gas analyzer.
Value data for the monitoring period	2013: 49.94% 2014: 52.26%
Measuring and reporting frequency; recording procedure	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server.
Type of monitoring equipment and its accuracy	During the monitoring period the following instruments have been used: – Gas Analyzer, ULTRAMAT 23, sn 7MB2337-2CR10-3DR1 The accuracy of the gas analyzer ULTRAMAT 23 is 0.2% as confirmed through the ULTRAMAT data sheet of supplier /26/.
Calibration frequency/interval	The gas analyzer has been calibrated on 18/07/2014 by the supplier as confirmed through the calibration record /25/. The calibration frequency is 12 month as confirmed through the data sheet /26/.
How were the values in the monitoring report verified and cross-checked?	The values used for calculation of baseline emission have been crosschecked with the raw data of the ER Calculation, version 02 of 16/02/2015 /4/.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	In case of failures of the data recording system, no emission reduction will be claimed for that period. A logbook will be written and will be registered the without data recording. During this monitoring period all the data were available and no failure is recorded.

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DATA/PARAMETER	T_t – ID.26
Data Unit	K
Description	Temperature of the gaseous stream in a time interval t
Source of data to be used	Temperature measure
Value data for the monitoring period	2013: 43.92°C (317.07 °K) 2014: 44.60°C (317.75 °K)
Measuring and reporting frequency; recording procedure	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server.
Type of monitoring equipment and its accuracy	During this monitoring period the following temperature meter have been used: – Temperature meter WIKA TR-10_H, sn 1102D580 The accuracy of the temperature meter WIKA TR-10_H is defined as 1.0%.
Calibration frequency/interval	The project owner is unable to find the document for initial calibration of the meter ID.26. However even a conservative approach is adopted and the maximum error margin is applied (1% according to the manufacturers specifications) to the measurement results of the equipment will be would be still under 60 °C, which is below the threshold value for the applicability of dry gas as described under the MR.
How were the values in the monitoring report verified and cross-checked?	The values used for calculation of baseline emission have been crosschecked with the raw data of the ER Calculation, version 02 of 16/02/2015 /4/.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	In case of failures of the data recording system, no emission reduction will be claimed for that period. A logbook will be written and will be registered the without data recording. During this monitoring period all the data were available and no failure is recorded.

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DATA/PARAMETER	EC _{BL,y} – ID.27
Data Unit	MWh
Description	Net amount of electricity generated using LFG
Source of data to be used	The monthly meter reading protocols /22/ .
Value data for the monitoring period	2013: 9,250.50 MWh 2014: 22,299.20 MWh
Measuring and reporting frequency; recording procedure	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server and reported monthly.
Type of monitoring equipment and its accuracy	During this monitoring period the following electricity meters have been used: – Electricity meters ELSTER A1500, sn 00443932-2011 The accuracy of the electricity meter ELSTER A1500 is 0.5s as confirmed through the calibration report of the electricity meter /23/ .
Calibration frequency/interval	The electricity meter has been calibrated on 13/04/2011 by the Elster manufacturer as confirmed through the calibration record /23/ . As per the “Regulation of Metering and Testing of Metering Systems”, the meters shall be calibrated every 10 years. The calibration of meters is deemed appropriate and in compliance with the national regulation /30/ .
How were the values in the monitoring report verified and cross-checked?	The values used for calculation of baseline emission have been crosschecked with the Monthly Meter Reading Protocols /22/ .
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server and reported monthly.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	In case of failures of the data recording system, no emission reduction will be claimed for that period. A logbook will be written and will be registered the without data recording. During this monitoring period all the data were available and no failure is recorded.

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DATA/PARAMETER	EC _{PJ,y} – ID.28
Data Unit	MWh
Description	Quantity of electricity consumed by the project activity
Source of data to be used	The monthly meter reading protocols /22/ .
Value data for the monitoring period	2013: 2.84 MWh 2014: 3.34 MWh
Measuring and reporting frequency; recording procedure	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server and reported monthly.
Type of monitoring equipment and its accuracy	During this monitoring period the following electricity meters have been used: – Electricity meters ELSTER A1500, sn 00443932-2011 The accuracy of the electricity meter ELSTER A1500 is 0.5s as confirmed through the calibration report of the electricity meter /23/ .
Calibration frequency/interval	The electricity meter has been calibrated on 13/04/2011 by the supplier as confirmed through the calibration record /23/ . As per the “Regulation of Metering and Testing of Metering Systems”, the meters shall be calibrated every 10 years. The calibration of meters is deemed appropriate and in compliance with the national regulation /30/ .
How were the values in the monitoring report verified and cross-checked?	The values used for calculation of baseline emission have been crosschecked with the electricity page of the ER Calculation, version 02 of 16/02/2015 /4/ .
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	In case of failures of the data recording system, no emission reduction will be claimed for that period. A logbook will be written and will be registered the without data recording. During this monitoring period all the data were available and no failure is recorded.

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DATA/PARAMETER	TDL _{k,y} ; TDL _{j,y} – ID.29
Data Unit	-
Description	Average technical transmission and distribution losses in year y
Source of data to be used	As no reliable information could be found for this period, a default factor of 20% is used for TDL _{j,y} (used to calculate PE _{EC}) and a default factor of 3% is used for TDL _{k,y} (used to calculate BE _{EC}), which is in line with the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption.
Value data for the monitoring period	20%; 3%
Measuring and reporting frequency; recording procedure	It is used for calculation of project emission as per the “Tool to calculate baseline, project and/or leakage emission from electricity consumption”.
Type of monitoring equipment and its accuracy	-
Calibration frequency/interval	-
How were the values in the monitoring report verified and cross-checked?	The values used for calculation of project emission are confirmed through the methodological tool /18/ .
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	It is used for calculation of project emission as per the “Tool to calculate baseline, project and/or leakage emission from electricity consumption”.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	In case of failures of the data recording system, no emission reduction will be claimed for that period. A logbook will be written and will be registered the without data recording. During this monitoring period all the data were available and no failure is recorded.

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3.5.3.4 Gold Standard sustainability monitored parameters

Data variable	Source of Data	Reported value for the project period
SDI.1 Air Quality Levels of Sulphide combusted in the landfill gas engines	Data are calculated based on the amount of LFG destroyed in the engines.	91,142 m ³
Assessment		
The levels of Sulphide combusted in the landfill gas engines is calculated based on the amount of landfill gas combusted in the engines as 91,142 m ³ of H ₂ S has been reduced due to the project activity within this monitoring period as presented and calculated in the excel sheet /4/ .		

Data variable	Source of Data	Reported value for the project period
SDI.2 Quality of Employment Provided trainings	Attendance list and certificates of trainings	6 trainings were organized
Assessment		
The number of staff attended to various trainings is monitored through the training certificates and attendance list. During this monitoring period, 6 trainings were organized. The training certificates and attendance list were checked during the on-site inspection, from /36/ to /45/ .		

Data variable	Source of Data	Reported value for the project period
SDI.3 Human and Institutional Capacity	Improvements to the school library	On-site visit observation Interview of the village Mukhtar
Assessment		
The improvements to the school library are monitored at each monitoring period by visual observation and through the interview with the mukhtar of the Solaklar Village. During on site visit, the school manager and the mukhtar were interviewed about the improvements to the school. He confirmed and it is also observed that the improvements given below to the school library were performed by the project activity as confirmed through the pictures of the library and the computer room /35/. - The floor of the classroom will be renewed. - Classroom interior walls will be painted - The computer class will be moved from upper floor to lower floor as requested by the school management - Classroom doors will be repaired/renewed - Data and electricity infrastructure will be renewed - The library will be moved to its new place as requested by the school management		

Data variable	Source of Data	Reported value for the project period
SDI.4 Quantitative Employment and Income Generation Number of contracts	Social Security Institution	More than 12 people are employed currently
Assessment		
The number of contracts is monitored through the Social Security Institution /34/ . It is confirmed that project activity hired 19 Employees during this monitoring period.		

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Data variable	Source of Data	Reported value for the project period
SDI.5 Management of Leachate Management of Leachate	Interviews with IZAYDAS	The leachate is collected and treated by IZAYDAS.
Assessment		
The management of leachate is monitored annually by the evidences that the leachate is collected and is being treated by IZAYDAS. During on site visit, the treatment recovery specialist (Arzu Ulutas) was interviewed. She confirmed that the leachate is sent to the treatment plant which is under IZAYDAS responsibility. The plant /31/ is also visited during on site visit.		

3.5.4 Assessment of data and calculation of emission reductions

Availability of the data

All the monthly meter protocols [/22/](#) are available for the project participant. and checked during the site visit. In addition, daily data [/29/](#) that includes the parameters used to calculate emission reduction was sampled for the whole monitoring period and crosschecked with the raw data excel sheet [/4/](#).

Cross-check reported data

The data of generated electricity are transferred correctly to the excel sheet [/4/](#) and emission reduction is calculated correctly. The excel sheet is crosschecked with the monthly meter protocols [/22/](#) and it seems appropriate.

3.5.5 Accuracy of emission reduction calculations

The emission reduction calculations provided in the spreadsheet [/4/](#) have been verified to be correct and in line with the registered PDD [/1/](#).

The emission reductions from the project for the monitoring period as reported in the monitoring report revision 03 of 20/02/2015 [/3/](#) is equivalent to 167,249 tCO₂e. The reported emission reductions are 9.1% higher than the estimated emission reduction of 153,272 tCO₂e for the period as per the registered PDD [/1/](#). The combination of the use of default values during the ex-ante calculations results in approximately a deviation from the actual result from the FOD model.

The data presented in the monitoring report [/3/](#) were assessed by reviewing in detail project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. Sufficient evidence was presented and verified by RINA for the reported emission reductions as listed in the above Section 3.4.3.2.

3.5.6 Accuracy of the GS indicators of sustainable development

All the documented evidences related to the sustainable monitored parameters such as Declaration of Employment obtained from Social Security Institution [/34/](#), The photo of the treatment plant [/31/](#), training certificates and attendance list from [/36/](#) to [/45/](#) and the photo of the library and computer room are provided as objective evidence.

3.5.7 Management system and quality control

The monitoring arrangements in the monitoring plan are feasible within the project design. To guarantee the accuracy of the monitoring data periodic calibration of the installed monitoring equipment has been carried out according to definitions included in the monitoring plan of the registered PDD [/1/](#) and in accordance with the requirements of the manufacturer. All data are registered and processed electronically. At each booster station, a server unit receives all data sent from the meters and data in real time is saved to an internal memory every hour. Every day the server creates a file with all hourly data saved. The server also automatically calculates every hour the normal



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flow of landfill gas captured; the gas flow is multiplied with the real gas formula normating the gas flow to standard temperature and pressure. Temperature and pressure are real time values. The data stored at the booster station server are transferred once per month to a computer and a backup hard drive. In case of failures of the data recording system, no emission reduction will be claimed for that period. A logbook will be written and will be registered the period without data recording. The electricity generations supplied to the grid and electricity consumption from the grid are read remotely from the electricity meters by Automatic Meter Reading System (OSOS) by the TEIAS personnel. The data from the protocols are transferred to the excel sheet used for the emission reduction calculations.

Quality assurance and quality control procedure is taken to monitor the equipment and data collection. The monitoring systems on errors are checked regularly by the VER-Team. In the case of errors, corrective actions will be undertaken. All data are stored in the central daily form [/29/](#) withdrawn from the system. Every day the server creates a file with all hourly data saved and the stored data are transferred to a computer. There are daily checks if the data from the day before was stored successfully on the servers. Aggregation of data and cross checks takes place periodically.

Korfez Enerji San. ve Tic. A.S. (the project owner) is responsible for the operation and monitoring of the project activity and it is in line with the registered PDD [/1/](#).

The calculation of GS VERs for the first verification period is carried out through the spreadsheet "GS1013 Kocaeli Landfill Gas to Electricity Project ER Calculation v1 31102014.xlsx" [/4/](#). The on-site visit at Kocaeli landfill waste management plant confirmed that the monitoring and reporting is carried out consistently and in line with the established procedures.

The collected data during the monitoring period will be kept by the project owner at least two years after the last issuance of VERs as stated in the registered PDD [/1/](#) and monitoring report [/3/](#).

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4 VERIFICATION AND CERTIFICATION OPINION

RINA Services Spa (RINA) has performed verification of the emission reductions reported for the project activity "Kocaeli Landfill Gas to Electricity Project" in Turkey, GS Registration Reference N° 1013, for the period 01/07/2013 to 30/09/2014, with regard to the relevant requirements for GS activities.

The project participants of the "Kocaeli Landfill Gas to Electricity Project" project are responsible for:

- the preparation of greenhouse gas emissions data and the reported greenhouse gas emission reductions from the project on the basis set out in the monitoring plan contained in the registered project design document version 05 of 14/02/2013
- the development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of greenhouse gas emission reductions of the project

It is the responsibility of RINA to express an independent verification opinion about the project's conformity with the requirements of paragraph 62 of the CDM modalities and procedures, GS requirements and on the reported greenhouse gas emission reductions from the project.

Based on documented evidence and corroborated by an on-site assessment RINA can confirm that:

- the project has been implemented and operated as per the registered PDD;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable CDM and GS VER requirements;
- monitoring is in place as per the applied baseline and monitoring methodology;
- monitoring complies with the monitoring plan in the registered PDD;
- the monitoring plan in the registered PDD is as per the applied baseline and monitoring methodology.

It is RINA's opinion that the GHG emission reductions stated in the monitoring report version 05 of 30/03/2015 for the "Kocaeli Landfill Gas to Electricity Project" project in Turkey for the period 01/07/2013 to 30/09/2014 are fairly stated. The GHG emission reductions were calculated correctly, the sustainability development indicators were correctly monitored, on the basis of the approved monitoring methodology "ACM0001", "Flaring or use of landfill gas", version 15.0.0 of 08/11/2013, and the monitoring plan contained in the registered PDD.

Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/07/2013 to 30/09/2014 amount to 167,249 tCO₂e.

Year 2013 01/07/2013 to 31/12/2013 47,630 tCO₂e

Year 2014 01/01/2014 to 30/09/2014 119,619 tCO₂e

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	167,251
Project Emissions	2
Leakage	0
Net GHG emission reductions or removals	167,249

Istanbul, 30/03/2015



Tugce KIRATLI
GS Team Leader
RINA Denizcilik ve Belgelendirme Ltd. Sti.

Genova, 31/03/2015



Laura Severino
Authorized officer signing for the DOE
RINA Services S.p.A.

APPENDIX A

GOLD STANDARD VERIFICATION PROTOCOL

[illegible]

GS Verification/Certification Report N° 2014-TQ-67-MD, Rev. 1.2 Aa
GS VER REP-06-2013

Checklist Question		Reference	MoV ¹	Comments	Conclusion
				It was confirmed during on site visit that "Fethullah Demircan" will no longer be responsible for the carbon projects. However, his name is given as a contact person. Please clarify. The timeline with the new adding engines is not discussed in the monitoring report. Please clarify.	
A.3	Methodology applied for the registered project activity	/1/ /11/	DR	The registered project activity applies the approved baseline and monitoring methodology ACM0001 version 15 of 08/11/2013 /11/. However, the version given in the first page of the monitoring report is not in line with the PDD.	CR-3 OK
B Monitoring					
B.1 Monitoring plan					
B.1.1	Does the monitoring plan included in the registered GS project activity comply with the applied methodology?	/1/ /3/ /11/	DR, CC	The monitoring plan of the registered GS project activity complies with the applied methodology ACM0001 version 15 of 08/11/2013 /11/.	OK
B.1.2	Does the monitoring comply with the monitoring plan in the registered PDD?	/1/ /2/ /3/	DR, CC	The monitoring complies with the monitoring plan presented in the registered PDD /1/ and GS Passport /2/. The data and parameters that need to be monitored as per the registered PDD /1/ and GS Passport /2/ are listed in the following section of this verification protocol.	OK
B.1.3	Do the sustainability indicators included in the monitoring report comply with the minimum contents specified in paragraph 4.1 of the GS toolkit?	/1/ /3/ /8/	DR, CC	The sustainability indicators included in the monitoring report /3/ complies with the minimum contents specified in paragraph 4.1 of the GS Toolkit /8/.	OK
B.1.4	Have any changes been made to the key sustainable development indicators?	/1/ /3/	DR, CC, I	No change has been occurred during the monitoring period of 01/07/2013 to 30/09/2014 as confirmed through the site inspection and interviews.	OK
B.2 Data and parameters that are available at validation and that are not monitored					
B.2.1	Which parameters were available at validation and how were they verified?	/1/ /2/ /3/	DR, CC	The following parameters were available at validation stage and that doesn't need to be monitored during the crediting period: ID.1 Fraction of methane that would be oxidized in the top of layer of the SWDS in the baseline (OX_{top-layer}): It is defined as 0.1 as per the methodological tool "Emission from solid waste disposal sites".	OK

Checklist Question	Reference	MoV ¹	Comments	Conclusion
			ID.2 Global Warming Potential of methane (GWP_{CH_4}): It is defined as 25 tCO₂e/tCH₄ for the monitoring period that falls within the second commitment period as per the Kyoto Protocol in the registered PDD. Emission factor for the production of electricity in the project activity ($EF_{EL,y}$): The emission factor has been determined using the ex-ante option, so it is not requested to monitor and recalculate in this crediting period. The emission factor is determined to be 0.542 tCO₂/MWh in the registered PDD /1/. SD.1 Fraction of sulphide within the LFG determined ex-ante for SDI.3 (W_{H_2S}): It is defined as 0.5% in the registered GS Passport /2/. The parameter is used for GS Sustainable Development Monitoring Parameter SD.1 Air Quality.	
B.3 Data and parameters monitored				
B.3.1 Data/Parameter monitored / Data unit / Description / Source of data to be used / Value data for the monitoring period	/1/ /3/ /4/ /20/ /22/	DR, CC, I	ID.22 Operation of the equipment that consumes the LFG ($Op_{i,h}$): The amount of hours is registered by a counting device in each power generation unit. The operation hour of the engines could be confirmed through the daily operation form /20/. However, no value is calculated or presented in the monitoring report. Please clarify. In addition, in daily operation form with the date of 31/12/2013, the operation hour could be seen for GM-3 as 2,107 h. However, the commissioning date of the engine is 29/08/2014. Please clarify the intervening time. ID.23 Management of SWDS: Project participants will refer to the original design of the landfill to ensure that any practice to increase methane generation have been occurring prior to the implementation of the project activity. Any change in the management of the SWDS after the implementation of the project activity will be justified by referring to technical or regulatory specifications. ID.24 Volumetric flow of the gaseous stream (to the	CAR-2 OK

Checklist Question	Reference	MoV ¹	Comments	Conclusion
			electricity generating units) in time interval t on a dry basis ($V_{t,db,engine}$): It is measured continuously by a mass flow meter. The 2013 data is 5,289,567 and the 2014 data is 12,754,828 as confirmed through the raw data given in the calculation excel sheet /4/. ID.25 Volumetric fraction of CH_4 in a time interval t on a dry basis ($V_{CH_4,t,db,engine}$): It is measured continuously by a gas analyzer. The 2013 data is defined as 49.94% and the 2014 data is defined as 52.26% as confirmed through the raw data given in the calculation excel sheet /4/. ID.26 Temperature of the gaseous stream in a time interval t (T_t): It is measured by a temperature meter. The 2013 data is 43.92°C (317.07 °K) and the 2014 data is 44.60°C (317.75 °K) as confirmed through the raw data given in the calculation excel sheet /4/. However, the number of the ID should be revised as per the previous number of the "$V_{CH_4,t,db,engine}$" parameter. Please correct. ID.27 Net amount of electricity generated using LFG ($EC_{BL,y}$): It is measured continuously by electricity meter of the grid company. The 2013 value is 9,250.50 MWh and the 2014 value is 22,299.20 MWh as confirmed through the monthly meter reading protocols /22/. However, the number of the ID should be revised as per the previous number of the "T_t" parameter. Please correct. ID.28 Quantity of electricity consumed by the project activity ($EC_{P,j,y}$): It is measured continuously by electricity meter of the grid company. The 2013 value is 2.84 MWh and the 2014 value is 3.34 MWh as confirmed through the monthly meter reading protocols /22/. However, the 2014 value is not in line with the monthly meter reading protocols. In addition, the number of the ID should be revised as per the previous number of the "$EC_{BL,y}$" parameter. Please correct. ID.29 Average technical transmission and distribution losses in year y ($TDL_{k,y}$; $TDL_{i,y}$):	

Checklist Question	Reference	MoV ¹	Comments	Conclusion
			According to the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” a default factor of 20% and 3% is used. However, the 2014 value is not in line with the monthly meter reading protocols. In addition, the number of the ID should be revised as per the previous number of the “ $EC_{PJ,y}$ ” parameter. Please correct.	
B.3.2 Is the measurement equipment described? Is the accuracy of the measurement equipment addressed and deemed appropriate?	/1/ /3/ /23/ /26/ /33/	DR, CC, I	ID.22 Operation of the Energy Plant ($Op_{j,h}$): The operation of the energy plant is measured for each power generation unit by a counting device. Every power generation unit has its own counting device totalizing the amount of hours. ID.23 Management of SWDS: Project participants will refer to the original design of the landfill to ensure that any practice to increase methane generation have been occurring prior to the implementation of the project activity. Any change in the management of the SWDS after the implementation of the project activity will be justified by referring to technical or regulatory specifications. ID.24 Volumetric flow of the gaseous stream (to the electricity generating units) in time interval t on a dry basis ($V_{t,db,engine}$): The volumetric flow of the gaseous stream is measured continuously through the mass flow meter. During the monitoring period the following instruments have been used: – Thermal mass flow measuring system by Endress & House, Proline t-mass 65I, sn J804F902000 However, the serial no if the meter given in the monitoring report is not in line with the current mass flow meter. Please revise. The accuracy of Thermal mass flow Proline t-mass 65I is defined as 1.0% as confirmed through the operational instructions /33/. ID.25 Volumetric fraction of CH_4 in a time interval t on a dry basis ($V_{CH_4,t,db,engine}$): The volumetric fraction is	~~CAR-3~~ OK

Checklist Question	Reference	MoV ¹	Comments	Conclusion
			measured by a gas analyzer. During the monitoring period the following instruments have been used: – Gas Analyzer, ULTRAMAT 23 , sn 7MB2337-2CR10-3DR1 The accuracy of the gas analyzer ULTRAMAT 23 is 0.2% as confirmed through the ULTRAMAT data sheet of supplier /26/. ID.26 Temperature of the gaseous stream in a time interval t (T_J): It is measured using temperature meters. During this monitoring period the following temperature meters have been used: – Temperature meter WIKA TR-10_H, sn 1102D580 The accuracy of the temperature meter WIKA TR-10_H is defined as 1.0%. ID.27 Net amount of electricity generated using LFG ($EC_{BL,y}$): It is measured using electricity meters. During this monitoring period the following electricity meters have been used: – Electricity meters ELSTER A1500, sn 00443932-2011 The accuracy of the electricity meter ELSTER A1500 is 0.5s as confirmed through the calibration report of the electricity meter /23/. ID.28 Quantity of electricity consumed by the project activity ($EC_{PJ,y}$): It is measured using electricity meters. During this monitoring period the following electricity meters have been used: – Electricity meters ELSTER A1500, sn 00443932-2011 The accuracy of the electricity meter ELSTER A1500 is 0.5s as confirmed through the calibration report of the electricity meter /23/. ID.29 Average technical transmission and distribution losses in year y (TDL_{ky} ; $TDL_{j,y}$): It is used for calculation of project emission as per the “Tool	

Checklist Question	Reference	MoV ¹	Comments	Conclusion
			to calculate baseline, project and/or leakage emission from electricity consumption".	
B.3.3 Are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate?	/1/ /3/ /23/ /24/ /25/ /30/ /33/	DR, CC, I	ID.22 Operation of the Energy Plant ($Op_{i,h}$): The operation of the energy plant is measured for each power generation unit by a counting device. ID.23 Management of SWDS: Project participants will refer to the original design of the landfill to ensure that any practice to increase methane generation have been occurring prior to the implementation of the project activity. Any change in the management of the SWDS after the implementation of the project activity will be justified by referring to technical or regulatory specifications. ID.24 Volumetric flow of the gaseous stream (to the electricity generating units) in time interval t on a dry basis ($V_{t,db,engine}$): The flow meter has been calibrated on 14/08/2014 by the supplier as confirmed through the calibration record /24/. The calibration frequency is 3 years as confirmed through the operational instructions /33/. ID.25 Volumetric fraction of CH_4 in a time interval t on a dry basis ($V_{CH_4,t,db,engine}$): The gas analyzer has been calibrated on 18/07/2014 by the supplier as confirmed through the calibration record /25/. The calibration frequency is 12 month as confirmed through the data sheet /26/. ID.26 Temperature of the gaseous stream in a time interval t (T_j): During the first verification, a FAR is raised about the calibration of the temperature meter. FAR#4 Since the project owner is unable to find the document for initial calibration of the meter ID.26, the temperature meter WIKA TR-10_H, sn 1102D580 should be calibrated and monitored during the next verification. However, no calibration was performed during the monitoring period from 01/07/2013 to 30/09/2014. Hence, FAR is not closed and will be monitored during	CAR-4 OK

Checklist Question		Reference	MoV ¹	Comments	Conclusion
				the next verification. ID.27 Net amount of electricity generated using LFG ($EC_{BL,y}$): The electricity meter has been calibrated on 13/04/2011 by the Elster manufacturer as confirmed through the calibration record /23/. As per the "Regulation of Metering and Testing of Metering Systems", the meters shall be calibrated every 10 years. The calibration of meters is deemed appropriate and in compliance with the national regulation /30/. ID.28 Quantity of electricity consumed by the project activity ($EC_{PJ,y}$): The electricity meter has been calibrated on 13/04/2011 by the supplier as confirmed through the calibration record /23/. As per the "Regulation of Metering and Testing of Metering Systems", the meters shall be calibrated every 10 years. The calibration of meters is deemed appropriate and in compliance with the national regulation /30/. ID.29 Average technical transmission and distribution losses in year y (TDL_{ky} ; $TDL_{j,y}$): It is used for calculation of project emission as per the "Tool to calculate baseline, project and/or leakage emission from electricity consumption".	
B.3.4	Is the monitoring frequency adequate for all monitoring parameters? Is it in line with the registered monitoring plan?	/1/ /3/ /4/ /29/	DR, CC, I	ID.22 Operation of the Energy Plant ($Op_{i,h}$): The operational hours of the MWM engine are recorded by the monitoring system; the operational hours of the Jenbacher engine are recorded manual at least monthly. ID.23 Management of SWDS: Project participants will refer to the original design of the landfill to ensure that any practice to increase methane generation have been occurring prior to the implementation of the project activity. Any change in the management of the SWDS after the implementation of the project activity will be justified by referring to technical or regulatory specifications. ID.24 Volumetric flow of the gaseous stream (to the electricity generating units) in time interval t on a dry basis ($V_{t,db,engine}$): The monitoring system works with	OK

Checklist Question	Reference	MoV ¹	Comments	Conclusion
			continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.25 Volumetric fraction of CH₄ in a time interval t on a dry basis ($V_{CH_4,t,db,engine}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.26 Temperature of the gaseous stream in a time interval t (T_t): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.27 Net amount of electricity generated using LFG ($EC_{BL,y}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.28 Quantity of electricity consumed by the project activity ($EC_{PJ,y}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.29 Average technical transmission and distribution losses in year y (TDL_{ky} ; $TDL_{j,y}$): It is used for calculation of project emission as per the "Tool to calculate baseline, project and/or leakage emission from electricity consumption".	
B.3.5 Is the recording frequency adequate for all monitoring parameters? Is it in line with the registered monitoring plan?	/1/ /3/ /4/ /29/	DR, CC, I	ID.22 Operation of the Energy Plant ($Op_{i,h}$): The operational hours of the MWM engine are recorded by the monitoring system; the operational hours of the Jenbacher engine are recorded manual at least monthly. ID.23 Management of SWDS: Project participants will refer to the original design of the landfill to ensure that any practice to increase methane generation have been occurring prior to the implementation of the project activity. Any change in the management of the SWDS	OK

Checklist Question		Reference	MoV ¹	Comments	Conclusion
				after the implementation of the project activity will be justified by referring to technical or regulatory specifications. ID.24 Volumetric flow of the gaseous stream (to the electricity generating units) in time interval t on a dry basis ($V_{t,db,engine}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.25 Volumetric fraction of CH_4 in a time interval t on a dry basis ($V_{CH_4,t,db,engine}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.26 Temperature of the gaseous stream in a time interval t (T_t): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.27 Net amount of electricity generated using LFG ($EC_{BL,y}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.28 Quantity of electricity consumed by the project activity ($EC_{PJ,y}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.29 Average technical transmission and distribution losses in year y (TDL_{ky} ; $TDL_{j,y}$): It is used for calculation of project emission as per the "Tool to calculate baseline, project and/or leakage emission from electricity consumption".	
B.3.6	Does data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	/1/ /3/ /4/ /29/	DR, CC, I	ID.22 Operation of the Energy Plant ($Op_{i,h}$): The operational hours of the MWM engine are recorded by the monitoring system; the operational hours of the	OK

Checklist Question	Reference	MoV ¹	Comments	Conclusion
			Jenbacher engine are recorded manual at least monthly. ID.23 Management of SWDS: Project participants will refer to the original design of the landfill to ensure that any practice to increase methane generation have been occurring prior to the implementation of the project activity. Any change in the management of the SWDS after the implementation of the project activity will be justified by referring to technical or regulatory specifications. ID.24 Volumetric flow of the gaseous stream (to the electricity generating units) in time interval t on a dry basis ($V_{t,db,engine}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.25 Volumetric fraction of CH_4 in a time interval t on a dry basis ($V_{CH_4,t,db,engine}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.26 Temperature of the gaseous stream in a time interval t (T_t): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.27 Net amount of electricity generated using LFG ($EC_{BL,y}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.28 Quantity of electricity consumed by the project activity ($EC_{PJ,y}$): The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server. ID.29 Average technical transmission and distribution losses in year y (TDL_{ky} ; TDL_{ly}): It is	

Checklist Question	Reference	MoV ¹	Comments	Conclusion
			used for calculation of project emission as per the "Tool to calculate baseline, project and/or leakage emission from electricity consumption".	
B.4 Monitoring of GS indicators of sustainable development /environmental impacts				
B.4.1 Data/Parameter monitored / Data unit / Description / Source of data to be used / Value data for the monitoring period	/2/ /3/ /4/ /22/ /35/	DR, CC, I	The following GS sustainable development parameters are monitored as per the monitoring plan presented in the GS Passport /2/. SD.1 Air Quality: The level of sulphide combusted in the landfill gas engine is monitored at each monitoring period. The amount of H₂S is calculated based on the amount of LFG destroyed in the engines. As per the registered GS Passport /2/, in the calculation is used a conservative approach of 0.5% for the sulphide content. However, the value of the amount of LFG destroyed is not in line with the calculation excel sheet. The years are presented as 2012 and 2013 which are related with the previous monitoring period. Please clarify. SD.2 Quality of Employment: The provided trainings are monitored during the monitoring report. However, the attendance lists or the certificates are not provided to the verification team and the list is not presented in the monitoring report. Please clarify. SD.3 Human and Institutional Capacity: The improvements to the school library are monitored at each monitoring period by visual observation and through the interview with the mukhtar of the Solaklar Village and the school manager. During the previous monitoring period, a FAR is raised about this issue. SD.3 Human and Institutional Capacity: According to the PP's prescience, the following issues will be addressed; - The floor of the classroom will be renewed. - Classroom interior walls will be painted - The computer class will be moved from upper floor to lower floor as requested by the school	CAR-5 OK

Checklist Question		Reference	MoV ¹	Comments	Conclusion
				management - Classroom doors will be repaired/renewed - Data and electricity infrastructure will be renewed - The library will be moved to its new place as requested by the school management All these issued should be verified during the next verification site visit. During on site visit, the school manager and the mukhtar were interviewed about the improvements to the school. He confirmed and it is also observed that the improvements to the school library were performed by the project activity as confirmed through the pictures of the library and the computer room /35/. SD.4 Quantitative employment and income generation: The documentation of Social Security Institution /34/ is monitored during the monitoring period. 20 employees are defined in the Monitoring Report /3/. However, it is not in line with the Social Security Institution record (at least the record for September). The name of 4 employees given in the monitoring report could not be found in SGK records. In addition, the names of 3 employees are not written in the list given in the monitoring report. Please clarify. SD.5 Management of Leachate: The management of leachate is monitored annually by the evidences that the leachate is collected and is being treated by IZAYDAS. During on site visit, the treatment recovery specialist (Arzu Ulutas) was interviewed. She confirmed that the leachate is sent to the treatment plant which is under IZAYDAS responsibility. The plant /31/ is also visited during on site visit.	
B.4.2	Is the montiroing in line with the registered monitoring plan?	/1/ /3/	DR, CC	The monitoring complies with the monitoring plan presented in the registered PDD. The following GS sustainable development parameters are monitored as	OK

Checklist Question		Reference	MoV ¹	Comments	Conclusion
				per the registered monitoring plan: - Air Quality - Quality of Employment - Human and Institutional Capacity - Quantitative employment and income generation - Management of Leachate	
B.5 Management, quality assurance and quality control					
B.5.1	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/ /3/	DR, CC, I	An on-site inspection has been performed on 06/01/2015 and it is confirmed that the monitoring arrangements in the monitoring plan are feasible within the project design.	OK
B.5.2	Are procedures identified for day-to-day record handling (including what records to keep, storage area of records and how to process performance documentation)?	/1/ /3/	DR, CC, I	The Grid Company submits monthly a protocol to the project owner. The monthly electricity data are transferred to the excel sheet used for the emission reduction calculations. The electricity consumption is monitored continuously by two electricity meters. TEIAS is responsible for the calibration and maintenance of the electricity meters.	OK
B.5.3	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/ /3/ /29/	DR, CC, I	Quality assurance and quality control procedure is taken to monitor the equipment and data collection. The monitoring systems on errors are checked regularly by the VER-Team. In the case of errors, corrective actions will be undertaken. All data are stored in the central daily form /29/ withdrawn from the system. Every day the server creates a file with all hourly data saved and the stored data are transferred to a computer. There are daily checks if the data from the day before was stored successfully on the servers. Aggregation of data and cross checks takes place periodically. Korfez Enerji San. ve Tic. A.S. (the project owner) is responsible for the operation and monitoring of the project activity and it is in line with the registered PDD /1/.	OK
B.5.4	Will all monitored data required for verification and	/1/ /3/	DR, CC	It is mentioned in the Monitoring Report version 01 /3/	OK

Checklist Question		Reference	MoV ¹	Comments	Conclusion
	issuance be kept for two years after the end of the crediting period or the last issuance of VERs, for this project activity, whichever occurs later?			that The data is archived and stored electronically during the crediting period and two years after.	

TABLE 2 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Verification conclusion
CAR 1 It is confirmed during the site visit performed on 11/12/2014 that project activity is not implemented and operated as per the registered PDD /1/. 4 units of gas engine have been installed with a total capacity of 5.093 MWe (1.2 MW-GM1; 1.063 MW- GM2; 1.415 MW- GM3 and GM-4), which are dedicated to the landfill gas extracted from the landfill area. The 2 engine has been commissioned in one phase as per the capacity addition as explained below: - On 29/08/2014, two power generation units (GM-3 and GM-4) has commissioned as confirmed through the Temporary Acceptance Protocol /21/. However, the total capacity is defined as 9,338 MW in the PDD /1/ and monitoring report /3/. Please clarify.	A.2	In accordance with the clarification provided by GS on 20.01.2015, the capacity of the project activity is revised to 5.093 MWe. 2nd Round PP Respond: MR has been revised accordingly.	<u>Review 1 (17/02/2015):</u> The total capacity is now corrected as 5.093 MW in the monitoring report. Also the number of the engines is corrected as 4 except in Section B.2.1. "Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline". It is still presented as 7 turbines. Please correct. <u>Hence, CAR 1 is not closed.</u> <u>Review 2 (20/02/2015):</u> The total capacity is now corrected as 5.093 MW and the number of the engines is corrected as 4 in the monitoring report. <u>Hence, CAR 1 is closed.</u>
CAR 2 ID.22 Operation of the equipment that consumes the LFG ($Op_{i,h}$): The operation hour of the engines could be confirmed through the daily operation form /20/. However, no value is calculated or presented in the monitoring report. Please clarify. In addition, in daily operation form with the date of 31/12/2013, the operation hour could be seen for GM-3 as 2,107 h. However, the commissioning date of the engine is 29/08/2014. Please clarify the intervening time. ID.26 Temperature of the gaseous stream in a time interval t (T_j): The number of the ID should be revised as per the previous number of the "$V_{CH4,t,db,engine}$" parameter. Please correct. ID.27 Net amount of electricity generated	B.3.1	ID.22 Operation of the equipment that consumes the LFG ($Op_{i,h}$): The MR has been revised accordingly. Daily operation form has been provided to the DOE. As a rule of thumb a gap between the installation date and acceptance date since the engine has to be physically installed at the time of acceptance. The engine was operated before the acceptance (is referred as test period). This has not been taken into account since the electricity protocol does not take into account the electricity generation before acceptance.	<u>Review 1 (18/02/2015):</u> ID.22 Operation of the equipment that consumes the LFG ($Op_{i,h}$): The values of the engines are presented as GM1: 19,524 h; GM2: 12,301 h; GM3: 8,356 h; GM4: 4,425 h in the monitoring report. However, the values are not in line with the daily operation form (difference between 01/07/2013 and 01/10/2014) /20/. Please clarify. The test period hour can be taken into account since the electricity generation does not taken into account in PMUM. Therefore, the information is found acceptable. ID.26 Temperature of the gaseous stream in a time interval t (T_j): The

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Verification conclusion
using LFG ($EC_{BL,y}$): The number of the ID should be revised as per the previous number of the "T_t" parameter. Please correct. ID.28 Quantity of electricity consumed by the project activity ($EC_{PJ,y}$): The 2014 value is not in line with the monthly meter reading protocols. In addition, the number of the ID should be revised as per the previous number of the "$EC_{BL,y}$" parameter. Please correct. ID.29 Average technical transmission and distribution losses in year y (TDL_{ky} ; $TDL_{j,y}$): The 2014 value is not in line with the monthly meter reading protocols. In addition, the number of the ID should be revised as per the previous number of the "$EC_{PJ,y}$" parameter. Please correct.		ID.26 Temperature of the gaseous stream in a time interval t (T_t): MR has been revised accordingly. ID.27 Net amount of electricity generated using LFG ($EC_{BL,y}$): MR has been revised accordingly. ID.28 Quantity of electricity consumed by the project activity ($EC_{PJ,y}$): ID numbers were corrected accordingly. ID.29 Average technical transmission and distribution losses in year y (TDL_{ky} ; $TDL_{j,y}$): MR has been revised accordingly. 2nd Round PP Respond: The hours have been corrected by deducting the hours from the previous Monitoring Period.	number of the ID is now revised as per the previous number of the "$V_{CH4,t,db,engine}$" parameter. ID.27 Net amount of electricity generated using LFG ($EC_{BL,y}$): The number of the ID is now revised as per the previous number of the "T_t" parameter. ID.28 Quantity of electricity consumed by the project activity ($EC_{PJ,y}$): The 2014 value is now in line with the monthly meter reading protocols. In addition, the number of the ID is revised as per the previous number of the "$EC_{BL,y}$" parameter. ID.29 Average technical transmission and distribution losses in year y (TDL_{ky} ; $TDL_{j,y}$): The 2014 value is now in line with the monthly meter reading protocols. In addition, the number of the ID is revised as per the previous number of the "$EC_{PJ,y}$" parameter. Hence, CAR 2 is not closed. Review 2 (20/02/2015): ID.22 Operation of the equipment that consumes the LFG ($Op_{j,h}$): The values of the engines are presented as GM1: 8,777 h; GM2: 6,463 h; GM3: 8,332 h; GM4: 4,420 h in the monitoring report and they are now in line with the daily operation form /20/. Hence, CAR 2 is closed.
CAR 3 ID.24 Volumetric flow of the gaseous stream (to the electricity generating units) in time	B.3.2	MR has been revised accordingly.	Review 1 (18/02/2015): ID.24 Volumetric flow of the gaseous stream (to the electricity generating

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Verification conclusion
interval t on a dry basis ($V_{t,db,engine}$): The volumetric flow of the gaseous stream is measured continuously through the mass flow meter. During the monitoring period the following instruments have been used: Thermal mass flow measuring system by Endress & House, Proline t-mass 65I, sn J804F902000 However, the serial no if the meter given in the monitoring report is not in line with the current mass flow meter. Please revise.			units) in time interval t on a dry basis ($V_{t,db,engine}$): The serial no of the meter given in the monitoring report is now in line with the current mass flow meter. Hence, CAR 3 is closed.
CAR 4 ID.26 Temperature of the gaseous stream in a time interval t (T_j): During the first verification, a FAR is raised about the calibration of the temperature meter. FAR#4 Since the project owner is unable to find the document for initial calibration of the meter ID.25, the temperature meter WIKA TR-10_H, sn 1102D580 should be calibrated and monitored during the next verification. However, no calibration was performed during the monitoring period from 01/07/2013 to 30/09/2014. Hence, FAR is not closed and will be monitored during the next verification.	B.3.3	ID.26 Temperature of the gaseous stream in a time interval t (T_j): In accordance with the regulation the calibration frequency is 10 years for gasious environment meters (http://www.mevzuat.gov.tr/Metin.Aspix?MevzuatKod=7.5.6381&sourceXmlSearch=&MevzuatTliski=0). Although each meter has its initial callibration before being installed, the PP is having trouble with receiving any callibration document from the manufacturer. Therefore the PP has reordered a new meter from the manufacturer with a calibration certification. The correspondance between the PP and the manufacturer have been shared with the DOE. Taking into account that the monitored parameter is not a critical parameter and the emission reductions are not impacted with the value and the correspondance with the Manufacturer, the PP would like to request the FAR to be checked again in the next monitoring period.	Review 1 (18/02/2015): Since, the monitoring parameter is not a critical parameter for the emission reduction, the total value is accepted. However, the calibration of the new meter should be checked during the next verification. Hence, CAR 4 is closed and a FAR is raised.
CAR 5	B.4.1	SD.1 Air Quality:	Review 1 (18/02/2015):

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Verification conclusion
SD.1 Air Quality: The level of sulphide combusted in the landfill gas engine is monitored at each monitoring period. The amount of H₂S is calculated based on the amount of LFG destroyed in the engines. As per the registered GS Passport /2/, in the calculation is used a conservative approach of 0.5% for the sulphide content. However, the value of the amount of LFG destroyed is not in line with the calculation excel sheet. The years are presented as 2012 and 2013 which are related with the previous monitoring period. Please clarify. SD.2 Quality of Employment: The provided trainings are monitored during the monitoring report. However, the attendance lists or the certificates are not provided to the verification team and the list is not presented in the monitoring report. Please clarify. SD.4 Quantitative employment and income generation: The documentation of Social Security Institution /34/ is monitored during the monitoring period. 20 employees are defined in the Monitoring Report /3/. However, it is not in line with the Social Security Institution record (at least the record for September). The name of 4 employees given in the monitoring report could not be found in SGK records. In addition, the names of 3 employees are not written in the list given in the monitoring report. Please clarify.		MR has been revised accordingly. SD.2 Quality of Employment: Monitoring Report has been revised accordingly. SD.4 Quantitative employment and income generation: Monitoring Report has been revised accordingly. 2nd Reound PP Review: SD.2 Quality of Employment: The MR has been revised accordingly.	SD.1 Air Quality: The value of the amount of LFG destroyed is now in line with the calculation excel sheet. The years are now presented as 2013 and 2014 which are related with this monitoring period. SD.2 Quality of Employment: The training documents are now provided to the verification team. The attendance list is also added to the monitoring report. However, they are not in line. The listed trainings with 1 employee are not correct. Please examine the other pages of the documents. You can find other certificates there. SD.4 Quantitative employment and income generation: 19 employees are hired during the monitoring period as confirmed through the Social Security Institution /34/. Hence, CAR 5 is not closed. Review 2 (20/02/2015): SD.2 Quality of Employment: The training documents are now provided to the verification team. The attendance list is also added to the monitoring report. Hence, CAR 5 is closed.
CR 1 The name of the client given as Korfez Enerji A.S. is not in line with the contract signed with RINA. Please clarify.	A.1	Körfez Enerji is a special purpose company and is under the group Ortadoğu. Please refer to the website http://ortadoquenerji.com.tr/en/projelerimiz/z-ve-santrallerimiz/proje-ve-lisans-haritasi/# for more detail on the company structure.	Review 1 (17/02/2015): The contract is signed with Korfez Enerji San. Ve Tic. A.S. However, in the monitoring report "Korfez Enerji A.S." is presented. Please correct the client name. Hence, CR 1 is not closed.

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Verification conclusion
		2nd Round PP Respond: The client name is corrected as "Körfez Enerji Sanayi ve Ticaret Anonim Şirketi" under the MR.	<u>Review 2 (20/02/2015):</u> The name of the client given as Korfez Enerji Sanayi ve Ticaret A.S. is now in line with the contract signed with RINA. Hence, CR 1 is closed.
CR 2 The registration date of the project activity is 06/12/2012 as confirmed through the previous verification report performed by RINA /12/. However, it is not in line with the date given in the first page. Please clarify. It was confirmed during on site visit that "Fethullah Demircan" will no longer be responsible for the carbon projects. However, his name is given as a contact person. Please clarify. The timeline with the new adding engines is not discussed in the monitoring report. Please clarify.	A.2	MR has been revised accordingly. 2nd Round PP Review: Name has been revised accordingly.	<u>Review 1 (17/02/2015):</u> The registration date of the project activity is 06/12/2012 as confirmed through the previous verification report performed by RINA /12/. It is now in line with the date given in the first page. The contact person is now corrected as "Ahmet Muslihiddinoglu" in the monitoring report. However, the surname of the contact person is not true. Please clarify. The timeline of the engines is now discussed in the monitoring report. Hence, CR 2 is not closed. <u>Review 2 (20/02/2015):</u> The contact person is now corrected as "Ahmet Muslehiddinoglu" in the monitoring report. Hence, CR 2 is closed.
CR 3 The registered project activity applies the approved baseline and monitoring methodology ACM0001 version 15 of 08/11/2013 /11/. However, the version given in the first page of the monitoring report is not in line with the PDD.	A.3	MR has been revised accordingly.	<u>Review 1 (17/02/2015):</u> The registered project activity applies the approved baseline and monitoring methodology ACM0001 version 15 of 08/11/2013 /11/. The version given in the first page of the monitoring report is now corrected and in line with the PDD. Hence, CR 3 is closed.

TABLE 3 FORWARD ACTION REQUEST

Forward action request	Reference to Table 1	Response by project participants Verification conclusion
FAR 1 Since the project owner is unable to find the document for initial calibration of the meter ID.25, the temperature meter WIKA TR-10_H, sn 1102D580 should be calibrated and monitored during the next verification. No calibration was performed during the monitoring period from 01/07/2013 to 30/09/2014. Hence, FAR is not closed and will be monitored during the next verification.	B.3.3	PP's Response: Taking into account that the monitored parameter is not a critical parameter and the emission reductions are not impacted with the value and the correspondence with the Manufacturer, the PP would like to request the FAR to be checked again in the next monitoring period. RINA Opinion: Since, the monitoring parameter is not a critical parameter for the emission reduction, the total value is accepted. However, the calibration of the new meter should be checked during the next verification.



RINA

**CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE**

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

Tugce Kiratli

è qualificato come¹:
is qualified as:

**CDM-TEC, JI-TEC, VCS-TEC, GS-TEC, VCS-VAL, VCS-
VER, GS-VAL, GS-VER, GS-TL, VCS-TL**

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

1.2, 13.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2*	Energy generation from renewable energy sources	1
13.1	Waste handling and disposal	13

*Just for GS and VCS, not for CDM

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

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	26/11/2012	-
5	07/11/2014	Update qualification according to IS-QPT-GHG-00 REV13

Il Resp. QPT
Head of QPT

¹ Legend:

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

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

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

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



RINA

CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

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

Rita Valoroso

è qualificato come1:
is qualified as:

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

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

1.2, 13.1

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

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

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	18-01-10	-
9	22-12-2014	Update qualification according to AS ver.6.0

Il Resp. QPT
Head of QPT

¹ Legend:

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

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