



FINAL VALIDATION REPORT

for the GS-VER Project Activity

“Samsun Landfill Gas to Energy Project, Turkey”

in

Turkey

Report No. 21215307

Version No. 04, 2012-04-27

TÜV Rheinland (China) Ltd.

I. Project description:

Project title: GS VER Project Samsun Landfill Gas to Energy Project, Turkey
GS 935

Host Country: Turkey

Methodology: ACM0001. v.11 ☒ Large Scale ☐ Small Scale
ACM0002. v.12.1

Annual average emission reductions (estimate): 58,669 tCO₂e/yr

GHG reducing measure/technology: Methane recovery in landfill for energy production, displacing fossil fuel based power grid generation with renewable energy

Party	Project Participants	Party considered a project participant
Turkey (Host)	Samsun Avdan Enerji Uretim Ve Tic. AS (Project Owner)	No
Turkey (Host)	Mavi Consultants (Carbon Consultants)	No

II. Validation:

Contract party: Samsun Avdan Enerji Uretim Ve Tic. AS

Validation Team:

Role	Full name	Appointed for Sectoral Scopes	Affiliation
Team Leader	Mr. Heidelmann	1.2; 13.1; 13.2; 15.2	TÜV Rheinland Energie und Umwelt GmbH
Technical Review	Ralf Kober (TR)	1,2; 7.1; 13.1	TÜV Rheinland Energie und Umwelt GmbH
Auditor	Jürgen Wiesmann	1.2	TÜV Rheinland Energie und Umwelt GmbH
Trainee	Timothy Cowman	N/A	TÜV Rheinland Energie und Umwelt GmbH
Local Expert	Guerhan Bahadir	N/A	TÜV Rheinland Turkey
Local Expert	Hatice Ekenler	N/A	On behalf of TÜV Rheinland Energie und Umwelt GmbH

Validation Phases:

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

Validation Status:

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

III. Validation Report:

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Final approval: ☒	Released Date: 2012-04-27	Designated Operational Entity (DOE): TÜV Rheinland (China) Ltd. TÜV Rheinland (China) Ltd., Unit 707, AVIC Building, No.10B, Central Road, East 3rd Ring Road, Chaoyang District, Beijing 100022, People's Republic of China Tel.: +86 10 65 66 66 60 (ext.169), Fax: +86 10 65 66 66 67 E-mail: ghg-doe@bj.chn.tuv.com	

Abbreviations

BE	Baseline Emission
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CM	Combined Margin
CO ₂	Carbon Dioxide
DECC	The Department of Energy and Climate Change
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
ERPA	Emission Reduction Purchase Agreement
FSR	Feasibility Study Report
GHG	Greenhouse Gas
GS	Gold Standard
GSC	Global Stakeholder Consultation
I	Interview
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
kW	Kilo Watt
kWh	Kilo Watt Hours
LoA	Letter of Approval
MoV	Means of Verification
MW	Mega Watt
MWh	Mega Watt Hours
NDRC	National Development and Reform Commission
NGO	Non Government Organisation
OM	Operating Margin
OSV	On Site Visit
PD	Project Developer
PO	Project Owner
PDD	Project Design Document
PE	Project Emission
SA	Sensitivity Analysis
SttC	Supplier Information to Client
STHS	Stakeholder Survey
t	Tonne

UNFCCC	United Nations Framework Convention on Climate Change
VER	Verified Emissions Reductions
VVM	Validation and Verification Manual

Executive Summary – Validation Opinion

The validation team assigned by the DOE (TÜV Rheinland Japan Ltd.) concludes that the GS VER Project Activity “Samsun Landfill Gas to Energy Project” in Turkey as described in the Passport (version 5, Date: 13.04.2012) and PDD (version 5, Date: 13.04.2012), meets all relevant requirements of the Gold Standard (GS) for VER project activities including GS Requirements version 2.1, GS Toolkit, article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords), the subsequent decisions by the COP/MOP and CDM Executive Board. The selected baseline/monitoring methodologies are applicable to the project and correctly applied. The validation report and the validation protocol are summarizing the findings of the validation. The reviews of the final Passport and PDD and the subsequent follow-up interviews have provided the validation team with sufficient evidence to determine the fulfilment of all stated criteria

The validation team of the DOE has performed a validation of the “Samsun Landfill Gas to Energy Project” in the Turkey as described in the Passport (version 5, Date: 13.04.2012) and PDD (version 5, Date: 13.04.2012), in the Republic of Turkey. The validation has been performed under consideration of the following validation processes, criteria and methodology:

Validation Process: Validation has been performed in the following steps:

- Desk review of publicly available and confidential documents (10/2011)
- On-site assessment (20 & 21/10/2011)
- Review of resubmitted PDD and GS Passport (version 01, 21/11/2010)
- Initial list of CARs and CLs (02/12/2010)
- Initial feedback to CARs and CLs from Project Proponents with updated versions of PDD and GS Passport (version 2, 13/01/2011)
- Delivery of the Draft Validation report (08.02.2011)
- Assessment of feedback and updating of list of CARs and CLs (18.02.2011)
- Further feedback from Project Proponents with updated versions of PDD and GS Passport (version 3, 22/02/2011)
- Assessment of feedback and revision of Validation Protocol (03/03/2011)
- Validation Report - Version 01 (22/03/2011)
- Internal Review (28/03/2011);
- Validation Report - Version 02 (02/04/2011)
- GS Review Requests, Round 1 (24/06/2011)
- GS Passport (version 4) 26/01/2012
- PDD (version 4) 27/01/2012
- Response to GS Review Request and Revised Validation Report ITR (19/01/2012)
- GS Review Requests, Round 2 (16/03/2012)
- GS Passport (version 5) 13/04/2012
- PDD (version 5) 13/04/2012
- Response to GS Review Request and Revised Validation Report ITR (27/04/2012)

Validation Criteria: the following G/S VER Project requirements have been considered:

- Article 12 of the Kyoto Protocol,
- Modalities and procedures for CDM (Marrakech Accords)
- Subsequent decisions by the COP/MOP and CDM Executive Board

- Gold Standard Requirements for Gold Standard Version 2.0/2.1
- Gold Standard Toolkit for Gold Standard Version 2.0/2.1
- Host Country Criteria
- Criteria given to provide for consistent project operations, monitoring and reporting.
- Validation Methodology: The procedures as described in the CLEAN DEVELOPMENT MECHANISM VALIDATION AND VERIFICATION MANUAL (Version 01.1) – Annex 3 to EB 51 Report and the Gold Standard Requirements for Gold Standard Version 2 for the regular project cycle have been applied by the validation team.

The host country is the Republic of Turkey, which ratified the Kyoto Protocol on 28th May 2009 and is considered an Annex I Party to the United Nations Framework Convention on Climate Change. There is so far no national agency in place responsible for issuing a Letter of Approval. Through the verification of the original invitations it was possible to validate that the Ministry of Environment and Forestry and The Ministry of Environment and Forestry and the GS focal point/25/ were made aware of the project, and were invited to but did not attend the Stakeholder Consultation meeting and have been solicited for feedback though no formal approval is required as the project is voluntary.

The project correctly applies the large-scale methodology ACM0001 version 11.0 and large-scale CDM methodology ACM0002, version 12.1.0.

By recovering methane from a landfill site in order to produce energy in the process displacing fossil fuel based power grid generation with renewable energy, the project results in reductions of CO₂ emissions and non CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario as there is no regulation for flaring in Turkey or for the generation of energy from landfill gas as validated through the analysis of relevant local environmental and waste management legislation.. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 58,669 tCO₂equivalent per year over the selected 7 year crediting period. The emission reduction forecast has been checked through detailed analysis of the supplied project documentation and spreadsheets and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The project proponent has resolved all Corrective Action Requests and Clarification Requests as stated in the Validation Protocol. In summary, it is Validation Team's opinion that the GS VER Project "Samsun Landfill Gas to Energy Project" in Turkey as described in the PDD of Version 05, 13/04/2012 and Passport Version 05, 13/04/2012, meets all relevant GS requirements for the VER and all relevant host country criteria and applies the baseline and monitoring methodologies ACM0001, Version 11.0 and ACM0002 Version 12.1.0 correctly. TÜV Rheinland thus requests the registration of the Project as a VER GS project activity.

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1 INTRODUCTION

Samsun Avdan Enerji Uretim Ve Tic. AS (Project Owner) have commissioned the DOE to perform a validation of the GS-VER Project Activity “Samsun Landfill Gas to Energy Project” in Turkey (hereafter referred to as “the project”). This report summarises the findings of the validation of the project, performed on the basis of GS criteria for VER projects and in addition the UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. The term “UNFCCC criteria” refers to Article 12 of the Kyoto Protocol, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant GS and UNFCCC criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all GS VER projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified emission reductions (VERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the GS Passport and PDD. The GS Passport is reviewed against the relevant criteria stated in GS Requirements Version 2.1 and the GS Toolkit. The PDD is reviewed against the relevant criteria stated in Article 12 of the Kyoto Protocol, the simplified modalities and procedures for small-scale CDM project activities and decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0001 version 11.0 and ACM0002 version 12.1.0. The validation team has, based on the recommendations on the Validation and Verification Manual (VVM) employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of VERs.

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

2 METHODOLOGY

The validation consists of the following three phases:

- I a desk review of the GS passport and PDD
- II on-site visit and follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

2.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

Nº	Document
1	a) PDD for the “Samsun Landfill Gas to Energy Project” version 1, 21/11/2010 b) PDD for the “Samsun Landfill Gas to Energy Project” version 2, 13/01/2011 c) PDD for the “Samsun Landfill Gas to Energy Project” version 3, 22/02/2011 d) PDD for the “Samsun Landfill Gas to Energy Project” version 4, 27/01/2012 e) PDD for the “Samsun Landfill Gas to Energy Project” version 5, 13/04/2012
2	a) GS Passport for the “Samsun Landfill Gas to Energy Project” version 1, 21/11/2010 b) GS Passport “Samsun Landfill Gas to Energy Project” version 2, 13/01/2011 c) GS Passport “Samsun Landfill Gas to Energy Project” version 3, 22/02/2011 d) GS Passport “Samsun Landfill Gas to Energy Project” version 4, 26/01/2012 c) GS Passport “Samsun Landfill Gas to Energy Project” version 5, 13/04/2012
3	CDM Project Design Document Form (CDM-PDD), Version 03, in effect as of 28 July 2006
4	Approved consolidated baseline and monitoring methodology ACM0001, “Consolidated baseline and monitoring methodology for landfill gas project activities”, version 11.0
5	Approved consolidated baseline and monitoring methodology ACM0002, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 12.1.0
6	Methodological Tool “for the demonstration and assessment of additionality”, version 05.2
7	Methodological Tool “Combined tool to identify the baseline scenario and demonstrate additionality”, version 02.2
8	Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site version 4
9	Tool to determine project emissions from flaring gases containing methane EB28 Annex 13
10	Tool to calculate the emission factor for an electricity system, version 1.1
11	Guidelines on the assessment of investment analysis, version 03.1
12	Gold Standard Requirements version 2.0/2.1, effective June 2009 (hereafter GS Requirements)

13	Gold Standard Toolkit for Gold Standard Version 2.0/2.1, June 2009 (hereafter GS Toolkit)
14	Gold Standard Pre-feasibility Assessment Checklist for GS V2.1 Retroactive Projects
15	Feasibility Study Report for Samsun including Gas prognosis, November 2009
16	Construction and Operational Permits
17	Organizational Structure of the Company (Organogram)
18	Documentation on legal status of the land
19	Electricity Generation License/ EMRA Approval incl. eventual capacity changes
20	Environmental Impact Assessment Report in the form of written confirmation that no EIA is requested for the project (EIA Exemption Certificate – ÇED)
21	ODA Declaration of project developer for the project as Annex 1 within the GS passport version 03 22/02/2011
22	Initial Loan agreement of the project considered as the project start date
23	Supporting spreadsheet on Investment Analysis 28/12/2010
24	Supporting spreadsheet on emission reduction calculation 28/12/2010
25	Local Stakeholder Consultation Report including invitation tracking table, copies of invitations and participant list.
26	Non-technical summary and presentation for the Stakeholder Feedback Round
27	Invitations for the Stakeholder Feedback Round
28	Stakeholder feedback evaluation form
29	Technical information relating to projects - site layout and equipment specifications
30	Monitoring manual for Gold Standard Landfill gas projects Mavi Consultants (03.01.2011)
31	Extract of Test Report on flow measurements at the project location from the FSR
32	List of LFG collection of energy projects in Turkey. Source: License database of Energy Market Regulatory Agency
33	Specifications of monitoring meters
34	Waste Disposal figures - Samsun Environmental and Forestry Department
35	Environmental Map of Turkey for Efficiency Factors.
36	Relevant documentation from the Turkish Energy Market Regulatory Authority
37	Forest Law (Nr. 6831)
38	Energy Efficiency Law (Nr. 5627)
39	Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy (Nr. 5346)
40	Environmental law 3 Law Nr. 2872 4 Law Nr: 5216, Article 7
41	World Bank Doing Business Report
42	European bank for Reconstruction and Development - Strategic Review,
43	OECD report – “Country Risk Classifications of the Participants to the Arrangement on Officially Supported Export Credits”
44	Relevant information from the Turkish Electricity Transmissions Company (TEAIS)
45	“TURKEY Greenhouse Gas Inventory, 1990 to 2005” Annex 2

46	IPCC 2006 Guidelines for National Greenhouse Gas Inventories For climate data (1975-2006 Averages):
47	Guidelines for completing the Project Design Document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM) version7
48	GS Registry online
49	Technical terms of reference for the LFG utilization contract
50	Construction Start Report - SEF-Energietechnik GmbH 18/09/2010
51	Renewable Energy Resources for the Purpose of Generating Electrical Energy "Law No. 5346"
52	SFR report for the Samsun project
53	Feasibility Study by German Engineering Company Haase Energietechnik for two landfill gas to energy projects in Turkey.
54	Haase Energietechnik Products and Services. http://www.haase-energietechnik.de/Pdf/en/Products_and_Services.pdf

The main changes that have occurred between the originally submitted PDD (version 01 21/11/2010) and the GS Passport (version 01 21/11/2010) and the final versions of the PDD (version 5, 13/04/2012) and the GS Passport (version 5, 13/04/2012) submitted for registration are changes related to the resolution of the CARs and CLs contained in Annex A of the Validation Protocol. No changes have occurred that would compromise the conclusion of the validation report.

2.2 Follow-up Interviews with Project Stakeholders

On the 20 & 21/10/2010 the Validation Team of TÜV Rheinland has performed personal interviews with representatives of the project owner, local authorities, relevant stakeholders and the carbon consultant at Samsun city and landfill site in Turkey in order to confirm and to resolve issues identified during the desk review. The main topics of the interviews were:

- Background information;
- Licensing and permits;
- Present onsite situation and project implementation status;
- Carbon and Sustainability Monitoring;
- The local stakeholder consultation process;
- Project technology;
- Baseline and additionality determination;
- Host country specific information – electricity grid, relevant legislation etc.

Interviews were carried out with the following stakeholders and the main topics of focus are highlighted in the table below:

Time	Organization	Agenda/Topic/ Objectives	Interviewed Persons
Audit Day 1 20/10/2010 – Istanbul			
14.00	Mavi Consultants	Review of PDD, Passport, Investment Analysis, Emissions Calculations, country specific data	CDM Consultant - Yagmur Karabulut

		and procedure for following steps.	
Audit Day 2 21/10/2010 – On-Site (Samsun)			
8:30	Samsun Avdan Enerji Uretim Ve Tic. A. S	Opening Meetings - Introduction of Participants, Introduction of Audit Procedure and Method, Review of Agenda Documentation Review – Technical Document review (Licenses, Feasibility Study, EIA/PIF) investment analysis and company structure	CEO - Erol Iren
9.30	Samsun Avdan Enerji Uretim Ve Tic. A. S	Onsite - Document review and interviews - present situation and plans for expansion, working conditions, power plant, environmental issues and waste water treatment.	Local employees - Mehmet Zengin (Munic. vehicle operator on site, local from Asagi Avdan village) Aydin Acar (construction worker from Asagi Avdan village) Halil Selin (construction worker from Yukari Avdan village) Key technical staff - Dr. Arnd Seyfert (technical planning company – SEF Engineering), Adrian Caduff (technical planning company - SEF Engineering) & Sinan Bektas (civil engineer)
12.00	Samsun Avdan Enerji Uretim Ve Tic. A. S	Project Site Inspection – Onsite	Contracted Construction Company. Local Municipality Staff onsite - Fatih Kutbay (landfill director, Samsun Mun.) Mehmet Zengin (Munic. vehicle operator on site, local from Asagi Avdan village)
14.30	Local Stakeholders	Interviews with local stakeholder (local authorities and directly affected people) in relation to the	Mukhtars of neighbouring villages, local

		project and sustainability issues.	residents and onsite employees - Ali Koc (mukhtar), Catkaya village
16.00	Local Municipality Environmental Department	History of Site, tender agreement and environmental licensing procedure and situation.	Local Municipality Environmental Department - Figen Akin (department head, Samsun Mun.) Omer Albayrak (Samsun Provincial Director of Envir.) Head Office Staff - Erol Iren

A follow-up interview was conducted on 13/12/2011 with two representatives of Samsun Municipality: Mr. Fatih KUTBAY, who is responsible for the municipal landfill, and Ms. Figen AKIN, Department Head for Environment in Samsun Municipality.

2.3 Resolution of Outstanding Issues

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

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

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the GS Project of Samsun Landfill Gas to Energy Project is enclosed in Appendix A to this report.

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

- mistakes have been made with a direct influence on project results;
- GS VER and/or methodology specific requirements have not been met; or
- there is a risk that the project would not be accepted as a GS VER project or that emission reductions will not be certified.

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

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

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the GS passport and the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i>

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
<i>If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the CAR or CL is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1. Validation protocol tables

2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for GS VER validation and verification.

2.5 Validation Team

Role	Full name	Appointed for Sectoral Scopes	Affiliation
Team Leader	Mr. Heidelbergmann	1.2; 13.1; 13.2; 15.2	TÜV Rheinland Energie und Umwelt GmbH
Technical Review	Ralf Kober (TR)	1,2; 7.1; 13.1	TÜV Rheinland Energie und Umwelt GmbH
Auditor	Jürgen Wiesmann	1.2	TÜV Rheinland Energie und Umwelt GmbH
Trainee	Timothy Cowman	N/A	TÜV Rheinland Energie und Umwelt GmbH
Local Expert	Guerhan Bahadir	N/A	TÜV Rheinland Turkey
Local Expert	Hatice Ekenler	N/A	On behalf of TÜV Rheinland Energie und Umwelt GmbH

3 VALIDATION FINDINGS

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

The final validation findings relate to the project design as documented and described in the revised and resubmitted GS passport (Version 05 – 13/04/2012) and Project Design Document (Version 05 – 13/04/2012).

3.1 Project Eligibility

The project is located in Turkey, a host country that does not have a quantitative reduction target under the Kyoto Protocol. Turkey acceded as the 189th Party to the UNFCCC on 24 May 2004 and only ratified the Kyoto Protocol on the 28th May 2009. Turkey is therefore now listed in Annex-I to the UNFCCC, but not listed in Annex-B to the Kyoto Protocol (no quantified emissions limitation or mitigation commitment in the first commitment period of the Kyoto Protocol from 2008 to 2012), therefore, not a Party to the Kyoto Protocol. The reason is, that Turkey was not a party to the convention adopted in 1992 when the Kyoto Protocol was negotiated, and it is not currently included in the agreement's Annex-B, which includes 39 countries that are obliged to reduce their greenhouse emissions to 1990 levels between 2008-12. Turkey is therefore eligible as a host country for Gold Standard Voluntary Offset Projects and can participate efficiently in the Voluntary Carbon Markets.

In addition through reviewing the PDD and Passport and conducting an onsite visit it was possible to confirm that the project involves the reduction of the greenhouse gases eligible under the GS - Carbon Dioxide (CO₂) and Methane (CH₄).

The project is a landfill gas to energy project that replaces grid connected fossil-fuel power plants and hence qualifies as a Renewable Energy Supply type project within the GS:

- The Renewable Energy Supply category is defined as the generation and delivery of energy services (e.g. mechanical work, electricity, heat) from non-fossil and non-depletable (landfill gas excluded) energy sources.

Based on the Toolkit Annex C the project falls within the “Biogas (landfill gas and biogas from agro-processing, wastewater and other residues)” category. According to Gold Standard rules, 65% of the Landfill Gas must be in use for energy services delivery on average annual bases. The Feasibility Study Report (FSR)/15/ demonstrates a utilisation factor of 100%, and based on interviews and analysis of the business plan/23/ there is no doubt that project activity once implemented will look to utilise as close to 100% as possible of the LFG over the total crediting period.

The project qualifies has been selected as a large scale project as despite its average emissions reduction being 58,669 tCO₂e/yr and consequently under the 60,000 tCO₂e/yr

average emissions reductions threshold from its fifth year at full operation it will exceed this limit.

Category	Scale		
	Large	Small	Micro
CDM	Every project exceeding the small scale boundary	- Renewable energy project, capacity < 15 MW - Energy efficiency project, improvement <60 GWh per annum Source: UNFCCC Resources	Non existent
Ji			Non existent
VER			Any eligible project, reduction < 5,000 tCO ₂ equivalent per annum

Source: Gold Standard Requirements Version 2.1, effective June 2009

The project proponent (PP) clearly states in the PDD/1/ that the project is not a debundled part of a large or small-scale project and the validation team successfully crosschecked this statement through confirming that no similar projects in the region are registered on the GS registry/48/ and in addition that no project was witnessed within a kilometre of the site during the site visit.

The ODA declaration /21/ included within the project documentation is in direct accordance with the template from the GS Annex D.

The project in accordance with the GS requirements /12/, correctly applies the regular project cycle. The project was first submitted to the GS registry/48/ on 07.09.2010 through the uploading of the LSC report amongst other key documentation. The tender for the project was signed with the municipality on the 28/07/2010 /48/ and already contained referencing to potential carbon credits and can therefore be considered as prior consideration. The mobilisation on the site began on 13/09/2010 with a report of the state of the site completed by the engineering company dated 18/09/2010 /50.

3.2 Project Design Document

The Project Design Document (PDD), version 05, 13/04/2012, is in compliance with the currently valid Large Scale PDD template/3/ in affect as of 28th July 2006 and in accordance with the applicable guidance document/47/.

3.3 Project Description

The Project is located south-west of Samsun city centre, at an air distance of ca. 8 km in Black Sea Region / Samsun Province in Turkey. The geographic coordinates of the project site are given as 41° 14' 45' N and 36° 13' 16' E these were confirmed during the physical

visit to the site through checks made through the Internet.

The Project involves the utilization of methane gas collected from the landfill of Samsun city for energy generation. The present waste management system at the site involves no collection of methane gas for flaring or energy production with it therefore being released into atmosphere without any utilisation which was confirmed via visible witnessing and discussion regarding the history and present use of the site with the project participant and local municipality during the onsite visit.

The validation team reviewed the technical description and layout drawings of the project /29/ which will generate electrical energy from LFG. The Project will employ up to 4 gas engine generators with 1.2 MWe capacity each producing an expected maximum net electricity generation of 28,800 MWh per year within the crediting period. Electricity produced by the project will meet the energy needs of the project site and the excess is to be exported to the Turkish Power. In emergency situations, the methane will be destroyed by an open flare located at the same project site. The project activity does not reflect current practice in Turkey for waste management facilities. Of 08 registered Independent Power Producers(IPP) located at Landfill sites utilising similar power generation technology to the project activity all 08 of them, representing 100%, are considering the extra revenues from the potential sales of VERs which was validated through data available on the GS Registry/48/..

The start date of the project is 13/09/2010 which is considered as the mobilisation on site, contract for equipment were finalised before this date though these were for a limited amount of piping and the location of the chief technical onsite to lay the first pipes is therefore considered as the start date. This information was confirmed through verifying the first onsite report from the chief engineer of the project developer team and the contract for the pipes . The project has an expected operational lifetime of 28 years based the contract with the Samsun Municipality. A 7-year renewable crediting period was therefore selected, starting on 01/06/2011.

Starting date of the first crediting period	Expected project operational lifetime	Crediting period
01/06/2011	28 years	7 years

It is the validation team's opinion that the project description found in the PDD is complete and accurate.

In accordance with the methodology ACM0001/4/ the project boundary is the physical, geographical site of the landfill where the gas is captured and destroyed/used. The supplied documentation included a technical description and design of the methane collection system and the LFG energy plant /29/. For methodology ACM0002/5/ the project boundary is defined as the project power plant and all power plants connected physically to the Turkish national electricity grid. The national grid electricity importing statistics are clearly listed in Annex 3 of the PDD/1/.

The table below summarizes the GHG emissions involved in the project boundary in accordance with the ACM0001 and ACM0002:

	GHGs involved	Description
Baseline emissions	CO ₂	CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity
	CH ₄	LFG emissions from waste degradation
Project emissions	CH ₄	LFG capture and flaring - When flare does not operate, methane emissions are subtracted.
	CO ₂	On-site electricity – project's own emissions from electricity consumption are to be subtracted.
Leakage	Not Involved	No leakage calculation is required since the equipment is not being transferred to or from another activity

Through the interviews with relevant technical staff from the project participants and the municipality, analysis of the technical information made available and physical witnessing on the onsite visit it is the validation teams opinion that the identified boundary is appropriate for the project and the selected sources and gases in the PDD Version 05 from 13/04/2012 are justified for the project activity.

3.4 Deviations in GHG Emission Reduction Estimation (GS Standard Conservativeness Principle)

The project has also been validated in direct response to the GS standard conservativeness principle. Firstly it is the opinion of the validation team that the baseline has been constructed in a conservative manner and this have been argued through utilisation of the correct tool and with the support of transparent data.

In addition, at the time of writing, the latest versions of the selected methodologies have been used as a base for completing the PDD. ACM0001 version 11 valid from 11 Jun 09 onwards and ACM0002 version 12.1 valid from the 17th September 2010 onwards.

The choice of the baseline has been clearly described in the PDD and its conservative approach has been addressed further in the additionality section of this document. In relation to the overview of current relevant legislation within Turkey, this is comprehensively presented within the PDD covering electricity, environmental and waste management areas. The common practice analysis has also been presented clearly within the additionality section.

3.5 GHG Emission Reductions

All assumptions made for estimating GHG are listed in the PDD

Yes

Grid emission factor according to combined margin calculation (Annex 2 of the PDD /1/.

First order decay model utilised based on the waste disposal figures from the FSR/15/ and “tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site” /8/.

All data used by project participants are listed in the PDD

Yes

Net electricity production (Section A.2 of PDD /04/)

Methane produced based on volume and waste and composition from FSR /15/ and the assumed collection ratio (PDD B.6.3).

Their references and sources also listed in the PDD	Yes	Reference documents for electricity production of fossil fuelled power stations from Turkish grid operator TEIAS, The FSR and default values from the selected methodologies.
Formulas, parameters, values are complete, accurate, transparent and conservative	Yes	See B.6.1 and Annex 3 of the PDD /01/.
Methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and emission reductions	Yes	See section B.6.1 of PDD/01/.
All the emissions of baseline emissions can be replicated using the information provided in the PDD	Yes	See section B.6.1 of PDD/01/.

3.6 Additionality

Gold Standard and CDM Criteria on Additionality

Additionality has been proven in the PDD /01/ by application of the “Tool for the demonstration and assessment of additionality” version 5.2 /6/ with the main components of “Investment Analysis” and “Common Practice Analysis”.

The consideration of the project as a Gold Standard VER project requires serious consideration of the VERs prior to implementation and as previously outlined in this report the initial tender as signed with the municipality on the 28/07/2010 /48/ already contained referencing to potential carbon credits and can therefore be considered as prior consideration.

The prior consideration of the project is proven through the CDM and carbon credits revenues being present in the Technical terms of reference for the LFG utilization contract /49/ specifically within article 11.1. The contract was signed with the municipality on 28th July 2010.

Through analysis of the local legislation regarding waste management and the environment the project, due to the non-legal requirement/53/ within the host country to flare or indeed generate energy from landfill gas means the decision required for the implementation of the project is one of to invest or not. Therefore, in this case, the benchmark investment analysis has been correctly applied.

This investment analysis has been applied within the PDD to demonstrate that the Project is not the most economically or financially attractive or economically feasible one. The project will benefit from selling electricity to the grid so a benchmark analysis is adopted in the PDD. The calculation of the chosen financial indicator the IRR has been carried out inline with the “Guidelines on the assessment of Investment Analysis” as closely checked by the validation team. Through analysis of local legislation regarding waste management and the environment it was possible to validate that there is no stipulation from local legislation for a tipping fee therefore the only income for the project has been correctly identified as the energy sales and no other saving. Through cross-checking across the two relevant documents The validation team has assessed the investment analysis by validating the plausibility of all key assumptions at the time of decision-making.

The only revenue generated by the project activity is the sale of electricity which depends on the price (€-cents per kWh) and the amount of electricity produced by the LFG to energy project and supplied to the grid. The price of 5.5 €-cents per kWh is set according to the Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy “Law No. 5346” /51/. Despite this the project owner, based on figures utilized within the feasibility study, has decided to use the conservative figure of 6.6 (€-cents per kWh).

The other crucial impact parameter in this calculation is the amount of electricity generated by the proposed VER project activity, which is determined by the amount of landfill gas captured at the site and the generator efficiency. The volume of landfill gas is calculated by

following the methodology ACM0001 and the Tool to calculate Emissions from Solid Waste Disposal Sites based on input data from the feasibility study, in particular the volume and composition of the solid waste at the Samsun landfill (Section 3.1.1 of the Feasibility Study) as well as the 60% collection rate (60%) of the landfill gas. The generator efficiency of 38% is also taken from the feasibility study.

The CAPEX and the timeline for CAPEX are taken from the PP's own investment plan that was prepared at the time of the investment decision. OPEX are also based on the PP's investment plan. Where appropriate values have been deflated to constant prices in order to ensure conservativeness. The CapEx and OPEX have been validated via comparison with other similar projects via information made available to the DOE. Specific CapEx per MWh and specific O&M costs per MWh have been used to compare the project to two other similar projects in Turkey.

LFG Project	Country	CapEx Euro/MW	O&M Euro/MWh
Samsun	Turkey	756,354	26,91
Average for two other LFG projects. Based on Feasibility Study by German Engineering Company Haase Energietechnik /53/, /54/	Turkey	1,194,539	46,11

The comparison shows that the project has specific CapEx and O&M costs that are significantly lower than that of two other similar projects. The data from the reference projects is taken from a feasibility study prepared by a reputable German Engineering firm with vast experience in the landfill gas sector.

The time horizon considered in the investment analysis is 20 years, the maximum according to the Guidelines on the Assessment of Investment Analysis. The overall project lifetime is 29 years (of which 28 years are operating years) as determined by the duration of the contract between PPs and the Samsun Municipality. In the investment analysis the remaining value of the assets is included as a residual value in the last year (2029). The residual value is not only based on the book value, which is almost negligible after 19 years of depreciation. In addition it includes not only the full value of the working capital but also 20% of the original CAPEX in order to cover future returns from the project. 20% of the CAPEX is conservative given that (a) in 2029, the project has already operated for 19 years, with only 9 more years (32%) coming, (b) after 2028 the landfill gas generated by the project and the associated power generation decreases rapidly to one-third of the 2028 value by 2038, and (c) the operating lifetime of the gas engines, which account for approximately 70% of the CAPEX, is 50,000 hours according to the "Tool to determine the remaining lifetime of equipment" which is less than 12 years even at a low utilization rate of 50% per year. It would therefore be appropriate to use a residual value of zero for three of the four gas engines, since they would have reached the end of their operational lifetime by 2028.

2. The benchmark pre-tax WACC of 12.9% is calculated based on three input values, the

loan interest rate of 7%, the debt-to-equity ratio of 50% and the threshold equity IRR of 15%. The loan interest rate is clearly conservative when compared to other renewable energy projects in Turkey. Average Euribor rates between 2007 and 2010 were above 3% and a typical premium for renewable energy projects would be 4-6%. An equity ratio of 50% is in line with the default value and conservative as the project is financed by 100% equity. The 15% threshold for equity IRR is based on a 2009 World Bank study, which suggests a 15% benchmark rate for hydro or wind power plants. Using this value is conservative as landfill gas projects have a much higher risk (due to the uncertainty about the available landfill gas and the fact that there is less experience with them in Turkey. In fact the World Bank study suggests a 20% IRR for Biomass Gas Renewable Energy projects, which could be considered applicable to the project.

The following conclusion can be given by the audit team:

- The project IRR (without carbon revenue) of 9.8% is below the benchmark of 12.9%
- The parameter used in the financial calculations could be validated according to the UNFCCC guidelines.
- The suitability of the applied/selected benchmark has been verified.
- All underlying assumptions are appropriate and traceable.
- The financial calculations are traceable and correct.

In addition a sensitivity analysis was performed by enforcing a variation on the main variables that could significantly affect the result. The chosen variables were power, gas collection, O&M and CapEx, calculated at a variant up to $\pm 10\%$. These selected variables are found to be reasonable and were subject to the type of variations that could potentially make the project viable. It is the validation Team's opinion that there are no other variables that should be considered. The sensitivity analysis performed demonstrates that the project still would not achieve the benchmark IRR without revenue from the sale of GS VER's. Therefore it is appropriate to conclude that the investment analysis is sufficiently robust to demonstrate that the project is not financially or economically attractive under a range of varying assumptions.

The sensitivity performed by the project proponents demonstrates that the calculated IRR values are in all of the cases not higher than the selected benchmark if:

- The CapEx is reduced by 10% (IRR = 10.3%)
- The operating cost is reduced by 10% (IRR = 11.4%)
- Electricity Revenues increase by 10% (IRR = 12.1%)
- The Gas collected is increased by 10% (IRR = 12.1%)

Thus the audit team concludes that the presented result of the investment analysis proves the required additionality of the proposed VER project activity by an investment barrier.

No additional barrier analysis has been included for this project through a comprehensive common practice analysis has been carried out. Turkey has been selected as the geographical boundary for the common practice analysis and due to the nation's unique position within the Kyoto Protocol this has been deemed appropriate. Firstly based on information as supplied by the Turkish Statistical Institute only 39% of the Turkish population is served by municipal disposal services. Of this waste that is delivered to landfills the project activity does not reflect current practice in Turkey for waste management facilities. Of 08

registered Independent Power Producers located at Landfill sites all 08 of them, representing 100%, considered the extra revenues from the potential sales of VERs.

In summary, it is sufficiently demonstrated that the project is not a likely a baseline scenario and that emission reductions occurring from this will hence be additional.

3.7 Sustainability Assessment

The project has utilised the sustainable development assessment matrix as required by the GS and it have been completed inline with the guidelines as presented in Annex I. The total score obtained has been presented as +8 with:

- Environmental Indicators having a subtotal of +4
- Social Indicators subtotal of +1
- Economic Indicators subtotal of +3

Therefore none of the subtotals have been scored as less than positive and in addition none of the individual indicators have been awarded with a negative score. Firstly the “Do no harm: assessment has been based on accurate and up-to-date information and it is safe to consider that the project will not cause any environmental or social harm through its implementation. All the assumptions used to define the score values have been revised by the validator, based on submitted documentation and the on-site visit and is considered valid and up-to-date.

3.8 Gold Standard for Stakeholder Consultation and SFR

The Local stakeholder consultation process has been carried out inline with the guidance as set out by the GS. The project was not required to carryout an official stakeholder procedure as an EIA exemption certificate was awarded by the Ministry of Environment and Forests /20/.

Therefore a meeting was set up in order to carry out the local stakeholder consultation for his development. This meeting took place on 01.09.2010 at the Local Agenda 21 Hall, in Samsun city. All relevant stakeholders have been invited through the project consultant’s websites and through local newspaper announcements and written and personal invitations one week before the initial stakeholder meeting/25/. As required by the GS a list of the consulted stakeholders has been submitted to the validator. Moreover, the GS-supporting NGOs have been invited to participate. The National GS Focal Point of Turkey and the Ministry of Environment and Forestry were also invited and informed about the project activity. A report and a summary of the Local Stakeholder Meeting were submitted to the validation team.

The meeting and invitations contained a non-technical summary of the project, the explanation of the sustainable development impacts and a checklist on environmental and social impacts. Questions raised during the meeting were answered by the representatives of the project owner Samsun Avdan Enerji Uretim Ve Tic. AS and the carbon consultant Mavi Consultants. The participants then took part in an exercise to complete the sustainability matrix and this was used to generate the final combined matrix.

The stakeholder feedback round has been commenced through the delivery of invitations /27/ in accordance with the GS requirements and toolkit. The latest versions of the PDD, LSC report and GS Passport have been made available to the relevant stakeholders in electronic form on the GS registry, can be requested directly from the carbon consultant and in addition in hard copy from the local village head. This is clearly described in the invitation letter submitted to TUV Rheinland in a translated version. The original Turkish version was checked for consistency by translating particular sections. The Stakeholder Feedback Round (SFR) invitation process was started on January 27, 2011 (date when the invitations were sent out), whereas five of the invitations were sent insignificantly later. Underlying documentation made available to the validation team includes:

- The original e-mail files that were sent out for invitation of stakeholders
- The fax transmission reports of the original stakeholder invitations
- The postal service delivery slips of the stakeholder invitations
- The returned evaluation forms
- Signed hand delivery confirmation notes

The invitation tracking table in the SFR report /52/ is produced according to GS modalities and follows the instructions as per Table 2.1 of the GS toolkit to identify the coded stakeholder invitees. According to the SFR report 28 stakeholders received an invitation by either surface mail, fax or e-mail. The validation team was able to conclude that the invitation process was properly initiated on February 3rd, 2011 as indicated in the SFR report. Supporting evidence documentation as mentioned above suggests that five stakeholders received the invitation by Fax, five stakeholders received the invitation by surface mail and eighteen have been invited by e-mail. This is consistent with the invitation tracking table in section A.1 of the SFR report. This was proven by the fax-transmission reports, the original e-mail message files and the hand delivery notes signed by the recipients.

The invitation letters have been submitted and were reviewed pertaining to the consistency with the description in the PDD, whereas the invitation text itself is written in a comprehensive manner and all relevant information is given on the letter of invitation to enable the stakeholder to either download the project documentation by using the GS project database or referring to the submitted contact details of the carbon consultant. The returned evaluation forms were sent from the municipality of Samsun on the 31st of January and suggest that the LSC report correctly reflects the meeting and that the PO acts according to his commitments.

The consolidated SD matrix is written in a comprehensive and transparent manner taking into account that no stakeholder feedback was received ever since the SFR was initiated. The SD

matrix includes sufficient information related to the single parameters and monitoring implementation as required by the GS toolkit. The validation team was therefore able to conclude that SFR was carried out in conformity with GS requirements, the documentation was transparent and reflects the actual SFR process as taken place without physical meeting and the correct conclusions were made that affect monitoring of the project based on the SD matrix assessment.

Hence the requirements for local stakeholder process for Gold Standard projects have been fulfilled.

3.9 Pre-feasibility Assessment

This project is not already under operation or previously been submitted to the UNFCCC and therefore this step is not applicable.

3.10 Monitoring Requirements and Plan

The validator has verified that the monitoring plan is in accordance with the applied methodologies, all parameters that are deemed necessary for the estimation of the emission reductions have been included. In particular a monitoring plan overview and system flow diagram PDD/1/ (section B.7.2) and the detailed monitoring manual /47/ have been submitted to the validation team in conjunction with interviews that took place on the site visit.

In addition the following 12 additional parameters are included in the Passport and will be monitored to further confirm that the project is contributing positively to Sustainable Development in the region.

Air Quality (Score: +)

Water Quality and Quantity (Score: +)

Soil condition (Score: +)

Other pollutants (Score: +)

Quality of employment (Score: 0)

Access to affordable and clean energy services (Score: +)

Quantitative employment and income generation (Score +)

Balance of payments and investment (Score: +)

Technology transfer and technological self-reliance (Score: +)

These indicators are further described in the LSC Report and GS Passport.

These parameters and the process for monitoring are clearly shown under section G of the Passport. There is a clear indication of the method of monitoring, the frequency and who is responsible which is further elaborated within the monitoring manual/47/. Hence the sustainability monitoring plan is plausible and verifiable if implemented as stated in the GS Passport.

Carbon Monitoring:

The selected methodologies require the monitoring of the electricity supplied by the project activity to the grid, the electricity imported from the grid, the emissions factor for the Turkish

national electricity grid, total amount of landfill gas, amount of landfill gas used for electricity generation, temperature, pressure, methane fraction of the landfill gas, amount of landfill gas flared and the operational hours of power plant.

Data and parameters that are available at validation

Parameters necessary to calculate the grid emission factor have to be determined ex-ante are listed in the PDD and have been verified during the desk research and on-site assessment. The combined margin emission factor is determined ex-ante based on the most recent information available.

Data and parameters to be monitored

The parameter to be monitored during the operation of the landfill gas to energy project activity can be split clearly into two sections those for the electricity element components and those for the methane capture and destruction.

For the electricity component the net electricity supply and electricity imported from the grid are the basis for the emission reduction calculation. Both will be measured continuously and recorded monthly by two separate meters from both the project proponent and the local authority TEIAS and crosschecked with energy sales invoices. There are two main electricity meters, owned and sealed by TEIAS: a primary meter and a secondary or back-up meter.

For the landfill gas component the total quantity of landfill gas generated and the landfill gas fed into the electricity generator is measured by continuous flow meter. The average methane fraction of the landfill gas is measured by a continuous analyzer, the temperature by a temperature sensor on gas pipe and the pressure of the landfill gas by a pressure gauge.

In both cases the procedure for calibration, accuracy and maintenance of monitoring equipment and the responsibilities are clearly mentioned in section B.7. of the PDD. The data is collected in a central information management system and will be kept for at least 2 years following the end of the crediting period.

Overall Management system

The management system has been clearly outlined in the monitoring manual /47/ and is deemed suitable with a general manager identified to oversee the power plant manager and technical maintenance staff who it is stated will receive relevant training where applicable.

The monitoring plan presented in the PDD /01/ and the more detailed monitoring manual /47/. Are in compliance with the requirements of the selected methodologies/4/5/. The implementation of the monitoring plan has been discussed with the project proponents and carbon consultant. Sufficient evidence has been given that the project proponent will be able to implement the monitoring plan.

3.11 Environmental Impact Assessment G/S

In accordance with the requirements as set out by the GS the project has fulfilled Turkish requirements concerning Environmental Impact Assessments through obtaining a letter of exemption from carrying out a EIA from the Ministry of Forest and Environment /30/. This document, the No EIA Required Certificate ÇED in the Turkish language has been approved

on 14.10.2010, has been made available in hard copy to the validation team on the site visit and subsequently in digital form.

As the Sustainable Indicator Matrix of the project does also not contain any negative scores, from the view of Gold Standard requirements no voluntary EIA was necessary to be conducted in addition.

Hence the project is considered to comply with the environmental impact criteria.

3.12 Gold Standard Requirements from 8-week registration review period

Comment/Request 1.	Consistency of information within all project documents
1. The PP is requested to update the information on methodology applied on the Gold Standard Registry. The registry still reflects AMD I.D instead of ACM0002.	
2. The final validation report provided by the DOE refers to the final PDD to be dated as 24/02/2011, whereas the final version of the PDD (version 03) uploaded on the Gold Standard Registry (on 07/04/2011) is dated 18/03/2011. The DOE is requested to revise the validation report accordingly and confirm that no changes have occurred which would compromise the conclusion of the validation report.	
3. The Feasibility Report (page no.17) provided by the PP talks about a cogeneration plant, the project however is only a power generation project activity. Please clarify.	
Response by Project Proponent (round 1):	
1.	As previously explained for other projects, the PP has no access to these sections of the Registry. The GS can change the registry as it requests.
2.	This request addresses the DOE. The revised PDD for this round is version 4.
3.	The PP has considered the option of selling excess heat to potential buyers. However, there has been no buyers for the heat, therefore the Project design does not involve a cogeneration plant. The design of the Project allows the PP to integrate a waste heat collection system, so in future if the PP finds any buyer for the excess heat it might consider adding such a system.
Response by DOE (round 1):	
2.	The updated validation report now refers to version 4 of the PDD, dated 27/01/2012 as the final PDD. No changes have occurred that would compromise the conclusion of the validation report. This statement has also been included in Section 2.1 of the validation report.
3.	The validation team confirmed via a site inspection during the site visit and interviews with employees and local stakeholders that the project only includes power generation and is not a co-generation activity. The investment analysis in the PDD and the relevant source documents, in particular the investment analysis done by the PPs at the time of the investment decision, include neither revenue from heat sales nor costs (CAPEX or OPEX) for heat generation.
Response by GS (round 2):	
1.	Comment/Request closed. The GS will make the required changes on the GS Registry.
2.	Comment/Request open. The version 4 of the PDD is dated 06/2/2012 instead of 27/01/2012. Please make the required changes accordingly.
3.	Comment/Request closed.
Response by Project Proponent (round 2):	
2.	The latest PDD, version 5, is dated correctly. Also, for compliance reasons date of PDD v.4 is

revised to 27/01/2012.

Comment/Request 2.	Baseline emissions
The PDD states that $AF = 0$ because the national regulations do not require any LFG destruction. The validation report states that DOE can confirm that there was no LFG flared in the baseline. Page 7 of the methodology states that <i>"In cases, where the baseline system for collection and destruction of methane is not installed prior to project implementation and/or measurements of the amount of methane that is destroyed are not available then the destruction efficiency of the system mandated by regulatory or contractual requirements (E_{BL}) should be assumed to be equal to the theoretical efficiency of the specific system for collection and destruction of methane that is defined in the regulation or contract. In other cases, a <u>procedure for estimating the amount of landfill gas that would be captured in absence of the project activity shall be provided in the CDM-PDD validated by the DOE. This procedure shall be used to estimate the MD_{Hist} to estimate the baseline destruction efficiency.</u></i> DOE shall clarify how it has validated that there were no contractual or other requirements to collect and destruct methane for the Municipality who has been operating the landfill since 1996. In doing so the DOE shall note that $MCF = 1$ has been assumed which is applicable for the landfill which is anaerobic managed solid waste disposal site with controlled placement of waste. DOE should investigate through consultations with Municipality or through other means, if any systems were planned to collect and destruct methane when the landfill was commissioned in 1996 considering that the landfill would have <u>significant anaerobic conditions causing safety concerns.</u> DOE should also validate as to what is the situation with other landfill sites in Turkey where there are no LFG based power generation projects. In absence of any LFG collection and flare system in the baseline the DOE and PP shall provide information as to how frequently landfill fires incidents took place in the pre-project scenario, if any.	
Response by Project Proponent (round 1):	
This request also addresses the DOE. There is no agreement between the PP and the municipality which forces the PP to destroy LFG. The agreement gives the PP the right to collect and utilise the LFG on site. Furthermore, this agreement is about the Project activity itself, which would not have existed in the absence of the Project activity. Therefore there exists no regulatory or contractual enforcement which results in any type of LFG destruction that would be captured in absence of the Project activity. The landfill has been in operation under the management of the municipality with no LFG collection system in place (which means that there is no LFG destruction). Meetings with municipality representatives during site visits also support this fact. There is no legal enforcement to collect or destroy methane, therefore municipalities are not inclined to invest in such systems. Regarding safety concerns, according to feasibility study <i>"some degassing equipment is placed next by the landfill body. For example - two gas collecting stations as well as a landfill gas main pipe between the gas collecting stations and the utilization area..."</i>. The interviews on site (and also interviews with very experienced international engineers of GS935 who have also experience in other landfills of Turkey) have also revealed that there has been not even simple flaring at those venting pipes. The international expert has provided a letter (provided to the DOE) on current and historical fires on site, confirming that there was no fire on site before the Project activity. The waste management practice on site shows that large amounts of waste is dumped and terraced at site and that the site is designed as a managed solid waste disposal site where the incoming waste is weighed continuously, stored and terraced properly in deep valleys, the bottom soil is sealed with impermeable materials, the leachate is collected and transported to city	

treatment plant, the site is closed by wires, groundwater analyses are carried out periodically, etc. Therefore the assumption of anaerobic managed solid waste disposal site should be considered to be valid.

The landfill is a newly built site and there have been no LFG collection pipes installed in the landfill. In the baseline, there are two gas collecting stations as well as a landfill gas main pipe between the gas collecting stations and the utilization area¹, however there existed no gas collection pipes. Also there have been no fires or explosions before the Project activity. Please note that the landfill is in operation since 2008, and not since 1996 as suggested above.

Response by DOE (round 1):

The validation team has conducted an interview with two representatives of Samsun Municipality: Mr. Fatih KUTBAY, who is responsible for the municipal landfill, and Ms. Figen AKIN, Department Head for Environment in Samsun Municipality.

The validation team has confirmed that there are no laws, regulations or policies that mandate municipalities to combust the landfill gas from already existing landfills. The new Regulation for Managed Waste Disposal from 26 March 2010 treats existing and new landfills differently. Only new landfills have to control their landfill gas. According to Mr. KUTBAY and Ms. AKIN the landfill is operated by the Municipality via the company Allakent İmar İnşaat. The company is owned by the Municipality, and there are no contractual obligations to combust the landfill gas. Since 28 July 2010 the municipality has transferred the responsibility for the treatment of the landfill gas to the private company Avdan Enerji as part of the project.

When the landfill was first put into operation in 2008, there was no system to destroy landfill gas. There were only pipes for venting to the atmosphere. Between 2008 and 2010 no combustion of landfill gas took place at the project site.

Mr. KUTBAY and Ms. AKIN confirmed that the landfill site was anaerobically managed solid waste disposal site with controlled placement of waste. Since 2008 wastes are collected by waste trucks equipped with presses. When the trucks arrive at the landfill the waste is weighed and placed on the landfill. The landfill site is terraced. The bottom of the landfill is covered with an impermeable layer. The leachate is collected and treated at the landfill site. Before 01 September 2010 the leachate was transported to the municipal wastewater treatment plant. The groundwater is analyzed periodically and the reports are archived. After the landfill is filled up, it is covered with soil.

The validation team also confirmed that the anaerobic treatment of solid waste is in compliance with Turkish safety laws and regulations. Conditions at the Samsun landfill compare well with other landfills in Turkey, where no combustion of landfill gas takes place. According to Mr. KUTBAY and Ms. AKIN older landfills often did not meet government regulations on safety and the environment. By contrast, when the Samsun landfill was constructed in 2008 it was designed to meet all government regulations for safety and the environment. Only residential waste and no hazardous wastes are deposited at the Samsun landfill.

Mr. KUTBAY and Ms. AKIN also confirmed that there have not been any fires at the landfill since its commissioning in 2008.

Response by GS (round 2):

¹ Section 1.6, Feasibility Study

Comment/Request closed.

Comment/Request 3. Application of baseline methodology
1. The PP is requested to revise the plausible alternative scenario of power generation component discussed in the PDD (page no.14) from 'P2' to 'P6'. Please note that the methodology ACM0001, version 11 (page no.5) is applicable only if the alternatives to power generation component are scenarios P4 or P6.
Response by Project Proponent (round 1):
The PDD is revised accordingly, by replacing P6 with P2.
Response by DOE (round 1):
Response by GS (round 2):
Comment/Request closed.

Comment/Request 4. Additionality – Investment Analysis
1. The PP is requested to clarify if the 'Feasibility Report' and 'PP's own Feasibility Assessment' referred to in the investment analysis are two separate documents or not. If yes, the PP is requested to clarify why some of the input values like power generation are taken from the 'Feasibility Report' whereas other input values like tariff, project cost, etc. are referred from the internal assessment. As a reference source to these input values, the PP should also upload a copy of the financial feasibility report on the Gold Standard registry to maintain transparency. Moreover, the DOE should also discuss whether the IRR calculated in the PDD is in line with the Feasibility Report, and if not, why. 2. <i>Benchmark:</i> The PP is requested to provide clear and transparent information regarding the calculation of 'Post-tax WACC' as it not clear in the investment analysis excel sheet as to how this figure has been derived at. The DOE is also requested to confirm if the calculation of 'Post-tax WACC' has been validated. 3. <i>Lifetime:</i> DOE shall clarify what project lifetime has been considered. The PDD mentions the lifetime as 20 years whereas the Validation report says this to be 15 years. Investment analysis shall be conducted over lifetime of the project activity or if shorter period is <i>used then</i> PP shall include the fair value of the project activity assets at the end of the assessment period. It is expected that such fair value calculations will include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets at the end of assessment period. 4. The DOE shall clarify how they have deemed the electricity tariff for this project appropriate considering that higher tariff has been used for other similar project, GS745. 5. The DOE shall clarify how they have validated the PLF and hence electricity generation for this project. In doing so, DOE should provide information on maximum PLF achieved during the technical lifetime of the project considering number of engines operating in that particular year. 6. The Running Expenses (O&M costs) have been assumed to be increasing annually till 15 years whereas the revenues from sale of electricity are constant. The DOE shall justify how this is reasonable to assume that revenues will remain constant whereas the O&M costs are increasing. In doing so, the DOE shall also validate the inflation rate considered in calculations.
Response by Project Proponent (round 1):
These requests also address the DOE.
1. There are two separate documents for this Project activity; one (technical) feasibility report that is prepared by a third party (international engineering firm), and a financial model spreadsheet ("PP's own Feasibility Assessment"). Financial indicators are only taken from the PP's own

Feasibility Assessment (i.e. cash flow spreadsheet). For certain parameters in the baseline spreadsheet the term feasibility study was used interchangeably with this cash flow, therefore for compliance purposes these reference explanations in the spreadsheet are corrected. Both documents are uploaded to the registry for transparency. The IRR question: the PP has calculated an IRR of 19.7%. The main reason for this is that power generation estimates of the PP significantly overshoot the estimates calculated according to ACM0001 (as in the baseline spreadsheet). The power generation estimates in the PP's own Feasibility Assessment are based on the maximum theoretical landfill LFG capacity (and not the actual equipment capacities to be installed as MW), therefore the calculated figures in the spreadsheet baseline are used. Please note that the original high IRR calculations are based on obviously flawed assumptions on LFG availability and shall therefore be treated with due care.

2. As the Project activity can also be carried out by other investors, using an internal benchmark is not appropriate according to CDM additionality tool. Therefore the benchmark calculation is revised by using a WACC approach, assuming 7% loan interest rate (which is a conservative and plausible figure considering historical and current Euribor rates), and assuming 50/50 E/D ratio (which is conservative as the Project owner has assumed and realized the Project with 100% equity), and using generic cost of equity of 15% from a World Bank study on Turkish projects (this is conservative since the study suggests 20% for biomass gas projects). The spreadsheet includes all formulas, references to these formulas and other sources used in WACC calculations.

3. The investment horizon of the Project is 20 years. At the end of this period, a fair remaining value is added as an income, in agreement with the guidance of the UNFCCC. As there is no reliable market information about the gain/loss on top of the remaining book value of similar projects, only book value is considered.

The PP itself has assumed an electricity price of 6.6 EUR cents/kWh in PP's own Feasibility Assessment (cash flow spreadsheet) at the time of investment decision. The investment analysis should take those parameters into account that are applicable at the time of investment decision. At the time of investment decision, the guaranteed electricity price was 5.5 EUR cents/kWh, which is lower than this assumption. The electricity price guaranteed by the recently revised renewable energy law is 7.3 USD cents/kWh, which is approximately 20% lower than the electricity price (6.6 EUR cents/kWh) assumed for the benchmark analysis calculations, and should therefore be considered conservative.

4.

5. Plant load factor of the Project has no practical use, and is calculated only for informational purposes based on the second operational year as it represents a whole year. As the Project plans expansions throughout its investment horizon (from 1.2 MW to 4.8 MW) at different dates of a year in coming years, it is a quite challenging task to calculate the maximum PLF, the modeling of which is beyond the technical capabilities of the PP.

6. The PP has assumed in PP's own Feasibility Assessment (cash flow spreadsheet) increasing personnel costs and increasing other costs by 5% annually, all other revenues and costs held constant. These increases have been erased in the revised spreadsheet.

Response by DOE (round 1):

The feasibility study that was prepared in 2010 does not include an IRR calculation. Moreover, in contrast to both the pre-feasibility study of 02/11/2009 and the feasibility study of 05/02/2010 the project only generates electricity and no heat. As a result, the validation team was unable to assess the investment analysis solely based on the feasibility study. The validation team has assessed the investment analysis by validating the plausibility of all key assumptions at the time of decision-making.

The only revenue generated by the project activity is the sale of electricity which depends on the price (€-cents per kWh) and the amount of electricity produced by the LFG to energy project and supplied to the grid. The price of 5.5 €-cents per kWh is set according to the Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy “Law No. 5346” /51/. Despite this the project owner, based on figures utilized within the feasibility study, has decided to use the conservative figure of 6.6 (€-cents per kWh).

The other crucial impact parameter in this calculation is the amount of electricity generated by the proposed VER project activity, which is determined by the amount of landfill gas captured at the site and the generator efficiency. The volume of landfill gas is calculated by following the methodology ACM0001 and the Tool to calculate Emissions from Solid Waste Disposal Sites based on input data from the feasibility study, in particular the volume and composition of the solid waste at the Samsun landfill (Section 3.1.1 of the Feasibility Study) as well as the 60% collection rate (60%) of the landfill gas. The generator efficiency of 38% is also taken from the feasibility study.

The CAPEX and the timeline for CAPEX are taken from the PP’s own investment plan that was prepared at the time of the investment decision. OPEX are also based on the PP’s investment plan. Where appropriate values have been deflated to constant prices in order to ensure conservativeness. The CapEx and OPEX have been validated via comparison with other similar projects via information made available to the DOE. As shown in the validation report, the project contains a CapEx cost significantly lower than other similar projects and the total O&M costs are consistent with that of similar plants.

The remaining value of capital equipment, in particular the generator sets, has been calculated based on depreciation over twelve years. This is in line with the “Tool to determine the remaining lifetime of equipment”. The tool provides a default lifetime of 50,000 hours for gensets, which corresponds to 4167 hours per year over the twelve year period, i.e. a utilization rate of less than 50%. This is conservative.

2. The benchmark pre-tax WACC of 12.9% is calculated based on three input values, the loan interest rate of 7%, the debt-to-equity ratio of 50% and the threshold equity IRR of 15%. The loan interest rate is clearly conservative when compared to other renewable energy projects in Turkey. Average Euribor rates between 2007 and 2010 were above 3% and a typical premium for renewable energy projects would be 4-6%. An equity ratio of 50% is in line with the default value and conservative as the project is financed by 100% equity. The 15% threshold for equity IRR is based on a 2009 World Bank study, which suggests a 15% benchmark rate for hydro or wind power plants. Using this value is conservative as landfill gas projects have a much higher risk (due to the uncertainty about the available landfill gas and the fact that there is less experience with them in Turkey. In fact the World Bank study suggests a 20% IRR for Biomass Gas Renewable Energy projects, which could be considered applicable to the project.

3. The time horizon considered in the investment analysis is 20 years, the maximum according to the Guidelines on the Assessment of Investment Analysis. The overall project lifetime is 29 years (of which 28 years are operating years) as determined by the duration of the contract between PPs and the Samsun Municipality. Please note that the operational lifetime varies by project component. 12 years have been used as lifetime of the gas engines, which comprise the bulk of the CAPEX. This is in line with the “Tool to determine the remaining lifetime of equipment”, which suggests a default value of the 50,000 hours. At a utilization rate of 4167 hours per year (less than 50%) this corresponds to a twelve year period. For the construction work a 25-year lifetime has been applied,

which almost matches the 28 years overall project lifetime and is hence appropriate. In the investment analysis the remaining value of the assets is included as a residual value in the last year (2028), which is calculated as the difference between the original value of the assets and the annual depreciation.

4. The validation team has reviewed the revised Renewable Energy Law of 29 December 2010. The project will be eligible for the new tariffs once the Law is fully implemented. The validation team has accepted the electricity price assumption of €66 / MWh in the investment analysis as sufficiently conservative at the time of the investment decision. The assumption is in line with the feasibility study and higher than the €55 / MWh that was included as feed-in tariff in the Renewable Energy Law at the time of the investment decision. PPs could not expect that the tariffs would be raised.

5. The validation team has validated the power production based on the availability of landfill gas captured at the site and the generator efficiency. The volume of landfill gas is calculated by following the methodology ACM0001 and the Tool to calculate Emissions from Solid Waste Disposal Sites based on input data from the feasibility study, in particular the volume and composition of the solid waste at the Samsun landfill (Section 3.1.1 of the Feasibility Study) as well as the 60% collection rate (60%) of the landfill gas. The generator efficiency of 38% is also taken from the feasibility study

6. Inflation has been removed from the revised investment analysis, in particular from the personnel costs. PPs have also ensured that Municipality royalties are calculated as a constant percentage (20.5%) of the power revenues. The whole investment analysis is therefore based on constant prices which ensures consistent treatment of revenues and costs.

Section 3.6 of the Validation report has been adjusted accordingly.

Response by GS (round 2):

1. Comment/Request closed.

2. Comment/Request closed.

3. Comment/Request open: The book value of the project activity assets at the end of the assessment period has been included in the investment analysis, as per the CDM guidelines on investment analysis, the fair value calculations should also include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets at the end of assessment period. Hence, the **PP** is requested to revise the excel sheet accordingly. The DOE shall provide their opinion on the fair value to be considered based on their local expertise.

4. Comment/Request closed.

5. Comment/Request closed.

6. Comment/Request open: The **PP** is requested to further provide more information pertaining to what expenses have been considered under the 'Maintenance' in the excel sheet as the maintenance cost has been observed to be increasing every year. The **DOE** is also further requested to justify how the O&M costs considered by the PP is reasonable as the O&M cost considered in the investment analysis is way above 50% of the total project cost, unlike the O&M costs of 'Real project A' and 'Real project B' referred to in the validation report.

Response by DOE (round 2):

3. The time horizon considered in the investment analysis is 20 years, the maximum according to the Guidelines on the Assessment of Investment Analysis. The overall project lifetime is 29 years (of which 28 years are operating years) as determined by the duration of the contract between PPs and the Samsun Municipality. In the investment analysis the remaining value of the assets is

included as a residual value in the last year (2029). The residual value is not only based on the book value, which is almost negligible after 19 years of depreciation. In addition it includes not only the full value of the working capital but also 20% of the original CAPEX in order to cover future returns from the project. 20% of the CAPEX is conservative given that (a) in 2029, the project has already operated for 19 years, with only 9 more years (32%) coming, (b) after 2028 the landfill gas generated by the project and the associated power generation decreases rapidly to one-third of the 2028 value by 2038, and (c) the operating lifetime of the gas engines, which account for approximately 70% of the CAPEX, is 50,000 hours according to the “Tool to determine the remaining lifetime of equipment” which is less than 12 years even at a low utilization rate of 50% per year. It would therefore be appropriate to use a residual value of zero for three of the four gas engines, since they would have reached the end of their operational lifetime by 2028.

6. The specific CAPEX and OPEX costs have been recalculated based on the latest information provided by the PPs and compared with data for two reference projects in Turkey. The data from the reference projects is taken from a feasibility study prepared by a reputable German Engineering firm with vast experience in the landfill gas sector, which is a credible source of comparable information. The comparison shows that the project has specific CAPEX (€/MW) and specific O&M costs (€/MWh) that are significantly lower than that of two other similar projects and hence conservative. The ratio of specific OPEX to specific CAPEX is slightly lower than the one for the reference projects.

Response by Project Proponent (round 2):

3. Please note that other than the gen-sets (which usually have a short lifetime²) and switchgear equipment on site, the project assets (i.e. vertical and horizontal piping etc.) are hardly salvageable and are of little value. It is hard to estimate a fair value (or a gain or loss) of a landfill project in the future. Nevertheless, upon GS request, a gain of 20% of the CapEx (which corresponds to 336 tEUR) is assumed as a gain and added to the remaining asset value for compliance. The Excel sheet and PDD are revised accordingly. Please note that the cash flow conservatively assumes that no replacement or renewal of generators and gas engines will be necessary at all throughout the project, although the operational lifetime for gen-sets are around 50,000 hours. This would mean that after 20 years (i.e. ca. 150,000 hours) the overused gen-sets would practically have little value. Although having extended the project investment horizon from 15 to 20 years, the PP has not added any additional cost (e.g. increased maintenance for older equipment, big overhaul or replacement of gen-sets following the end of their useful economic lives etc.) for the years 15-20, which is conservative.

6. According to the financial cash flow of the project owner (uploaded to registry), the running costs include the following items: material and labor costs for continuous piping extension³ and related construction work on site, field maintenance and regulation, insurance, personnel⁴ and equipment maintenance. Equipment maintenance costs have no breakdown, they are rather calculated based on power generation. As stated in the PDD, the Project is expected to start with a capacity of 1.2 MW and reach 4.8 MW in coming years. As a result of larger number of gen-sets and higher power

² Gas engines combusting LFG have a relatively short operational life (Sample: http://www.ge-energy.com/products_and_services/products/gas_engines_power_generation/ge_jenbacher_type_2_gas_engine.jsp).

³ Please note that the Samsun landfill is a new site and the Project assumes laying new pipes throughout the Project lifetime as new waste comes in.

⁴ The assumption of 3 personnel (1 personnel for each shift, which is a conservative assumption) is not increased although installed capacity increases to 4-fold afterwards.

generation, consumption of lubricants and other materials, repairs, spare parts etc will increase, which is the reason why O&M costs⁵ are expected to increase in coming years. Please also note that as project capacity increases 4-fold throughout the project lifetime, the maintenance costs increase approximately 2-fold, which is conservative.

Comment/Request 5. Monitoring
1. The PP is requested to remove the parameter <i>Temperature of exhaust of the flare</i> as this is not required to be monitored in the case of open flares as per the “Tool to determine project emissions from flaring gases containing methane”; EB28, Annex 13. 2. <i>Sustainable Development Monitoring Plan</i>: The Gold Standard would like to recommend the PP to add the monitoring of ‘Leachate Management’ in the sustainable development monitoring plan owing to the huge impact it can have on the surrounding environment of the project activity. Even though another party manages the leachate, the PP may like to co-ordinate with them and report the proper functioning of the management plan. The environmental impacts of the leachate generated from the landfill are too significant to be ignored.
Response by PP (round 1):
1. The Project will install an enclosed flare, the PDD is revised accordingly. This revision has also affected emission reductions slightly. The parameter <i>Temperature of exhaust of the flare</i> is not taken out of the monitoring plan, as it is needed to determine whether the flare is operational in that specific hour. 2. The PP agrees that the leachate is an important aspect of landfills and has an important impact on the environmental performance of the landfills that clearly and transparently reflects itself and is easily explainable to stakeholders. However, the Project does not include any leachate-related liabilities and the management of leachate is not included in the Project activity boundaries. The Project activity itself is not expected to have any significant positive or negative impact on this leachate management practice. Moreover, the leachate management is actually the responsibility of the municipality, without control of the PP. The leachate is collected by the municipality and is stored at a leachate pond, where a subcontractor treats the leachate and get paid by the municipality. As the PP has no relationship to the subcontractor, and because of practical difficulties in obtaining data from the municipality for public disclosure purposes, monitoring of leachate is practically not feasible or possible. The Feasibility Study talks about leachate, because a small amount of the leachate will gather in LFG collection pipes (that will be installed for the Project) and this leachate will be separated from the LFG so the LFG can be combusted. This leachate will also be drained into the leachate pond. Therefore the Project has no leachate management component.
Response by GS (round 2):
1. Comment/Request closed. 2. Comment/Request open: The Gold Standard would like to reinstate that the environmental impacts of the leachate generated from the landfill are too significant to be ignored. Even though, another party manages the handling and treatment of waste, any bad press arising due to negative impacts of the leachate will impact the entire GS project activity. Also, as indicated by the DOE in Comment/Request no.7, the PP is requested to include the monitoring of the ground water in the SD monitoring plan to ensure that there is no negative impact on the water quality.
Response by DOE (round 2):
The DOE is of the opinion that possible leachate emissions are outside of the control of the PP

⁵The cash flow does not foresee any big overhaul or replacement of gen-sets, or any O&M cost increase for older equipment. This is (quite) conservative.

and are not affected by the project. The monitoring of the ground water is under the sole control and responsibility of the Samsun Municipality.

Response by Project Proponent (round 2):

2. The PP would like to kindly stress out again that leachate collection, treatment and management is not related to the Project activity anyhow. The Project owner has no control over, whatsoever, or responsibility for leachate and any good- or bad management of the leachate cannot be attributed to the Project activity, because the upstream landfill management is carried out by the Samsun Municipality and the downstream leachate management is carried out by a private third party assigned by the Municipality, with no intervention or knowledge from PP's side. Please note that the Municipality does not publicly report leachate/ground water quality. The PP hereby emphasizes that the leachate quality is not related to the sustainability performance of the Project activity itself and that the border of sustainability impacts should be differentiated clearly between the Project and the whole Samsun landfill. Please note that the PP or the Samsun Municipality cannot guarantee the provision of such reports for GS (i.e. public) reporting purposes periodically.

In order to comply with GS' requests, the PP hereby commits itself to monitor this indicator as long as there exists publicly available information for the leachate/ground water quality. The Passport is revised accordingly.

Comment/Request 6. Do no harm assessment

1. The Gold Standard would also like to recommend the PP to relate the assessment of Safeguarding Principles to the national laws and regulations wherever applicable to the maximum possible extent. For instance, compliance to the "Regulation on the Assessment and Management of Environmental Noise" and "Regulation on the Control of Solid Wastes" can be used for the justification of Safeguarding Principle no. 9 and "Regulation on Labourer Health and Labour Safety" can be referred to for Safeguarding Principle no.8. The **PP** then should also include its monitoring in the SD monitoring plan if the project activity is obligated to report its compliance to the relevant national authorities.

Response by Project Proponent (round 1):

1. The GS Passport (Section: Safeguarding Principles, Nr. 8 and 9) is revised, as requested.

Response by DOE (round 1):

Response by GS (round 2):

Comment/Request closed.

Comment/Request 7. Sustainable Development Matrix

1. The **PP** is requested to provide justification as to why the neutral scoring of the following SD indicators considered in the LSC report was changed to positive scores in the final GS passport. The **DOE** is also requested to clarify how they have validated the revision in the SD scores of LSC report and the final GS passport.

- Water Quality and Quantity
- Biodiversity
- Quality of employment
- Livelihood of the poor
- Access to affordable and clean energy services
- Human and Institutional capacity

- Quantitative employment and income generation
- Balance of payment
- Technology transfer and technological self-reliance

2. *Employment Quality*: The **PP** is requested to provide clarification on how there is a positive impact on this indicator from the project activity, when the GS Passport indicates a potential risk of injuries to the employees/workers in the Do no Harm Assessment. The GS would recommend the PP to mark this indicator negative and then neutralize it with the help of mitigation plan in the form of safety and precautionary measures, which will be followed during the operation of the project activity.

3. *Soil condition*: The **PP** should note that there is a potential risk of landslide on the landfill site, which creates a negative impact on this SD indicator due to the project activity. The PP should then change this score to a neutral with the help of mitigation measures like storing of waste in terraces, covering the waste by soil, etc. as discussed in the GS Passport.

4. *Biodiversity*: The **PP** is required to provide further clarification on how there is a positive impact on this SD indicator. As the landfill operations can cause harbouring of disease vectors such as rats and flies and injuries to wildlife. As discussed in the GS Passport, landfills can facilitate the multiplication and dissemination of the pathogenic agents and their accompanying breed (insects, rats, crows, stray dogs), which may harm some mammals, birds, insects deserting the area, or other beings that feed on refuse (rats, crows). Because of these negative effects, GS would recommend the PP to give a negative score to this indicator and then neutralize it with the help of mitigation plans like covering the waste etc. as discussed in the GS Passport.

5. *Livelihood of the poor*: The **PP** is requested to discuss how there is a positive impact on this SD indicator with reference to the definition as provided in the Annex I of the GS Toolkit Version 2.1

Response by Project Proponent (round 1):

1. The scores given in the LSC report had been updated as the PP believes that some of those (positive) indicators can be monitored in an effective way. Otherwise, these indicators would not be monitored. The PP can revert back to the previous (neutral) scores if the GS requests it that way, which would mean a more limited monitoring plan.

2. Quality of Employment indicator already includes various employment aspects such as fair payment, social security, work health and safety measures, prevention of dangerous work, no discrimination etc. This indicator in the monitoring plan will focus on the quality (not their number) of the jobs. The passport tries to objectively list all possible risks for the Project activity, and as in every usual job (including office jobs) there is always a risk of injury, which is a default, standard risk. The Project will take all necessary precautions for health and safety, which is an improvement considering the baseline and the mentioned risk is not a particular risk that is posed compared to the baseline. The score of this indicator is revised to zero.

3. The Project needs to collect LFG in an efficient and sustainable way. Therefore the incoming solid waste will be formed in terraces, piping and soil covering will be carried out with utmost care, as it is needed for good operation of the Project. Any land slide would diminish the amount of collected LFG. In the baseline, however, landslide risks are usually of secondary importance where the landfill operator might focus on cost minimization and operational optimization instead of other concerns. Landslides (i.e. wasteslides) have been observed in landfills in Turkey⁶. Therefore the Project will contribute to the baseline in terms of landslide risk, which is

⁶ Example: <http://wmr.sagepub.com/content/13/4/305.abstract>

the reason why this indicator was scored positively. Please note that the monitoring of waste terraces is a subjective issue and is a technically challenging indicator for monitoring/verification. Therefore the PP can score this indicator to zero with no monitoring, if the GS prefers it that way.

4. Biodiversity will not be monitored, as it is difficult to effectively and successfully monitor the effects of the Project on the animals. The passport and scoring is revised accordingly.

5. This indicator, *Livelihood of the poor*, is removed from the monitoring plan and is scored zero.

Response by DOE (round 1):

The score changes have been the outcome of the process of resolving CARs and CLs. In general they have been done in order to comply with GS guidance, especially Annex I of the GS Toolkit, and the experience from other registered renewable energy projects in Turkey. Typically a positive score was assigned when there was a measurable parameter (in line with Annex I of the GS Toolkit) that showed a positive contribution of the project to a particular sustainable development indicator.

- Water Quality and Quantity. The validation team has confirmed via interviews with the municipality that the bottom of the landfill is covered by an impermeable layer, that the leachate from the landfill is collected and treated in a waste water treatment plant. Since 01/09/2010 the leachate is treated on-site, before the leachate was transported to the municipal waste water treatment plant. The ground water is regularly monitored in order to ensure that there is no negative impact on water quality. These measures have been put in place by the Municipality even before the start of the project. The project therefore does not have any impact on local water quality. However, by replacing power generation at grid-connected power plants, the project reduces the volume of cooling water discharged. The positive evaluation is therefore justified.

- For the indicators "Biodiversity", "Quality of employment", "Livelihood of the Poor" and "Human and Institutional Capacity" the neutral score has been re-instated in the updated GS Passport.

- Access to affordable and clean energy services: According to the validated PDD, the project replaces electricity from grid-connected power plants, especially from fossil-fuel fired power plants. The change in energy use can be monitored with parameters suggested in Annex I of the GS Toolkit. This is also in line with the scoring done for a large number of renewable energy projects registered by GS.

- Quantitative employment and income generation: The validation team has confirmed via interviews with Samsun Municipality that during the construction phase there are 15 people employed and that during the operation phase there are a number of permanent positions created (technicians, electricians, security personnel). Most of the employees are local people.

- Balance of payment: According to the validated PDD, the project replaces electricity from grid-connected power plants, especially from fossil-fuel fired power plants. As a result the project decreases the need for energy imports, especially natural gas. The impact can be monitored with parameters suggested in Annex I of the GS Toolkit. This is also in line with the scoring done for a large number of renewable energy projects registered by GS.

- Technology transfer and technological self-reliance: According to the validated PDD, the utilization of landfill gas for power production is still very new in Turkey. The project is one of the first projects in this area. As a result, the project helps to build capacity and this capacity building enables spill-over effects by replicating similar project to spread the technology. The impact can be monitored with parameters suggested in Annex I of the GS Toolkit.

Sections 3.7 and 3.10 of the Validation report have been updated accordingly.

Response by GS (round 2):

1. Comment/Request closed.

2. **Comment/Request closed.**
3. **Comment/Request closed.**
4. **Comment/Request closed.**
5. **Comment/Request closed.**

Comment/Request 8. Stakeholder Feedback Round
1. The PP is requested to provide the 3 comments, which were received during the stakeholder feedback round. 2. The PP should provide screen shots of the e-mail invitations and the postal delivery confirmations of the invitations that were sent for stakeholder feedback round in the SFR report.
Response by Project Proponent (round 1):
1. These 3 comments have already been included transparently in the SFR report, Annex 2. In case the GS requests the original copies, these can be sent by post to the GS. 2. The SFR report is revised accordingly and uploaded to the registry.
Response by DOE (round 1):
Response by GS (round 2):
1. Comment/Request closed. 2. Comment/Request open. The screen shots of the e-mail invitations and the postal delivery confirmation of the invitations have not been provided in the SFR report. The PP is requested to provide the same.
Response by Project Proponent (round 2):
2. The screenshots of email invitations and postal delivery confirmations are now provided to DOE and GS as a separate attachment.

Comment/Request 9. Data /information to be provided
1. The PP is requested to upload a copy of the 'Cover Letter' (Annex S) on the Gold Standard registry to avoid any further delays in the registration of the project activity
Response by Project Proponent (round 1):
The cover letter is uploaded to the registry.
Response by DOE (round 1):
Response by GS (round 2):
Comment/Request closed.
