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Validation Report

(including validation opinion)

ESTRE Ambiental S.A.

VALIDATION OF CHANGES FROM THE PROJECT ACTIVITY AS DESCRIBED IN THE REGISTERED PROJECT DESIGN DOCUMENT (NOTIFICATION) TOGETHER WITH VALIDATION OF THE REVISED MONITORING PLAN OF:

“ESTRE’s Paulinia Landfill Gas Project (EPLGP)”

UNFCCC **0165**-CDMP

REPORT NO. 600500492

02 February 2012

TÜV SÜD Industrie Service GmbH
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Validation of changes from the project activity as described in the registered PDD (Notification) together with validation of the revised monitoring plan:

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Report No.	Date of first issue	Revision No.	Date of this revision	Certificate No.
600500492	20-10-2011	02	02-02-2012	-
Subject: Validation of changes from the project activity as described in the registered PDD (Notification) together with validation of the revised monitoring plan				
Accredited TÜV SÜD Unit: TÜV SÜD Industrie Service GmbH Certification Body "climate and energy" Westendstr. 199 - 80686 Munich Federal Republic of Germany		TÜV SÜD Contract Partner: TÜV SÜD Industrie Service GmbH Caron Management Service Westendstr. 199 - 80686 Munich Federal Republic of Germany		
Client: ESTRE Ambiental S.A. Av. Presidente Juscelino Kubitschek, nº 1.830, torre IV, 4º andar, sala 11, São Paulo Brazil		Project Site(s): Estrada Municipal PLN 190 S/N, Bairro: Parque da Represa ZIP 13140-000, Paulínia, Brazil GPS coordinates (landfill gas plant): Latitude -22.773506° Longitude -47.196161°		
Project Title: ESTRE's Paulinia Landfill Gas Project (EPLGP)				
Applied Methodologies / Version: AM0003, version 03			Scope(s): 13 Technical area(s): 13.1	
Registered PDD date/version: 04-12-2005 / 2B Registration Date: 03-03-2006 Revised monitoring plan: 26-08-2010 (approved on 11-12-2010) Crediting Period: 14-09-2006 to 13-09-2013 (changed from: 01-05-2006 to 30-04-2013)		Revised PDD (including revised monitoring plan): Date: 3.1 Version: 18/01/2012		
Assessment Team Leader: Sebastian Hetsch Assessment Team Member: Georgios Agrafiotis Johann Thaler		Technical Reviewer: Madhuri Nanda Responsible CB person: Thomas Kleiser		
Summary of the Validation Opinion: ☒ The review of the revised documents and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of all stated criteria. In our opinion, the revised documents provide sufficient evidence to determine that the changes comply with all relevant UNFCCC requirements for revision of monitoring plans and do not raise concerns with respect to aspects outlined in paragraph 10(c) of the Procedures for notifying and requesting approval of changes from the project activity as described in the registered project design document (EB48, Annex 66). Hence TÜV SÜD will recommend the acceptance of the changes. ☐ The review of the project design documentation and the subsequent follow-up interviews have not provided TÜV SÜD with sufficient evidence to determine the fulfilment of all stated criteria. Hence TÜV SÜD will not recommend the acceptance of the changes.				

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Abbreviations

ACM	Approved Consolidated Methodology
AM	Approved Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CETESB	Companhia de Tecnologia de Saneamento Ambiental (Environmental Agency of the State of Sao Paulo)
CO₂e	Carbon dioxide equivalent
CR	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
ECONERGY	ECONERGY Brasil Ltda.
ER	Emission reduction
ESTRE	ESTRE Ambiental S.A.
FAR	Forward Action Request
GHG	Greenhouse gas(es)
KP	Kyoto Protocol
LFG	Landfill Gas
MP	Monitoring Plan
MR	Monitoring Report
PDD	Project Design Document
PLC	Programmable Logic Controller
PP	Project Participant
RAP	Preliminary Environmental Report

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TÜV SÜD TÜV SÜD Industrie Service GmbH

UNFCCC United Nations Framework Convention on Climate Change

VVM Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

In the context of the "Procedures for notifying and requesting approval of changes from the project activity as described in the registered project design document" (EB48, Annex 66), the validation objective is the performance of an independent assessment by a DOE on the permanent changes identified and informed to the PPs during the verification process between the information on the project activity as described in the registered PDD and the actual project activity and its operation. The validation assessment is carried out as per the requirements provided in the "Procedures for notifying and requesting approval of changes from the project activity as described in the registered project design document" and the "Guidelines on assessment of different types of changes from the project activity as described in the registered PDD" (EB48, Annex 67). A validation assessment is required after identifying and informing the PPs of any concerns related to the conformity of the actual project activity and its operation with the registered project design document.

In the context of the revision of the monitoring plan, the validation objective is the performance of an independent assessment by a DOE against all defined criteria set for the revision of a monitoring plan under the Clean Development Mechanism (CDM) as per EB49, Annex 28.

The assessment will finally result in a conclusion by the executing DOE whether the revised documents are appropriate to allow the acceptance of the changes (including revision of monitoring plan). The ultimate decision on the acceptance of the changes and approval to the revision of monitoring plan rests at the CDM Executive Board.

The project activity discussed by this validation report is registered as CDM activity with the registration N° 0165 and project title: ESTRE's Paulinia Landfill Gas Project (EPLGP)

1.2 Scope

In the context of the validation of changes from the project activity as described in the registered PDD (Notification), the scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. The core requirements on changes from the project activity as described in the registered project design document are given by the "Procedures for notifying and requesting approval of changes from the project activity as described in the registered project design document" and the "Guidelines on assessment of different types of changes from the project activity as described in the registered PDD" as referred below:

Paragraph 1: The DOE contracted by the project participant to perform verification shall "identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information".

In the context of the validation of revision of the monitoring plan, the scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. The core requirements on revised monitoring plans are given by annex 12 of the report of EB-31 and EB49, Annex 28 as referred below:

15. The request for revising monitoring plan is made in cases where:

- a. the monitoring plan in the registered CDM project activity document is found not to be consistent with the approved monitoring methodology applied to the registered project activity;*
or,

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- b. the proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced as a result of the revision;*

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

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2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the requirements and guidelines provided on the "Procedures for notifying and requesting approval of changes from the project activity as described in the registered project design document" (EB48, Annex 66), the "Guidelines on assessment of different types of changes from the project activity as described in the registered PDD" (EB48, Annex 67) and "Procedures for revising monitoring plans in accordance with paragraph 57 of the Modalities and procedures for the CDM" (EB49, Annex 28).

Furthermore, the assessment is also based on the requirements provided in the Validation and Verification Manual in its latest version, which aims to harmonize the approach and quality of all such assessment.

2.1 Appointment of the Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy". The composition of an assessment team has to be approved by the Certification Body ensuring that the required skills are covered by the team. The Certification Body TÜV SÜD operates four qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL)
- Greenhouse Gas Validator (GHG-V)
- Greenhouse Gas Validator Trainee (T)
- Experts (E)

It is required that the sectoral scope linked to the methodology has to be covered by the assessment team.

The validation team was consisting of the following experts (the responsible Assessment Team Leader is written in bold letters):

Name	Qualification	Coverage of scope	Coverage of technical area	Coverage of Financial aspects	Host country experience
Sebastian Hetsch	ATL	-	-	☒	-
Georgios Agrafiotis	GHG-V	☒	☒	☒	-
Johann Thaler	GHG-V	-	-	☒	☒

Technical Reviewer: Madhuri Nanda

2.2 Review of Documents

The revised documents submitted by the client and additional background documents related to emission reduction calculation, monitoring aspects and equipment configuration were reviewed as initial step of the validation process.

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2.3 Follow-up Interviews

According and as a result of the document review, TÜV SÜD discussed with the project participants the revised documentation by Email and telephone conversation/interviews during August 2011 to January 2012. The expansion of project equipment (flares, blowers, diesel generator) was already discussed during 7th verification on-site audit (April 2010) and 8th verification on-site audit (October 2010). The DOE came across the equipment configuration as described in Table 1 during the 7th and 8th verification and verified the same.

2.4 Internal Quality Control

As final step of a validation, the validation report has to undergo an internal quality control procedure by the Certification Body "climate and energy", i.e. each report has to be approved either by the head of the certification body or his deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one.

It rests at the decision of TÜV SÜD's Certification Body whether the revised documents will be submitted for approval to the EB or not.

3 SUMMARY OF FINDINGS

The DOE together with the PPs received on June 22, 2011 the following Request for Review (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1134989999.25/iProcess/TUEV-SUED1282634843.65/Review/8BNAVJLQEI3DJINQZA8WJBV56O2V2J/display>)

after having submitted the documents to UNFCCC for request for issuance related to the 8th verification (monitoring period: 26/02/2010 to 31/07/2010):

1. The DOE is requested to clarify why a notification of changes from the registered PDD has not been submitted as per EB48 Annex 66 considering that changes occurred, which affected the overall project operation/ability to deliver emission reductions as stated in the registered PDD, as follow: i) the project installed two diesel fuel generators that are not mentioned in the registered PDD; ii) the registered PDD assumed the installation of one 380kW blower, while the project installed four 75kW blowers; iii) the daily waste capacity of the landfill doubled to 5,000 t/day from 2,500 t/day as in the registered PDD; iv) the number of installed flares increased from 3 to 5 since last verification.
2. The DOE is requested to clarify how it confirmed that the monitoring plan is in accordance with the methodology considering that the applied methodology requires monitoring of working hours of the flare, which has not been included in the monitoring plan.

After having received the Request for Review, PPs decided to withdraw the issuance request and to submit this Notification together with a revision of the monitoring plan addressing the items mentioned in the Request for Review.

In the 1st part of this chapter 3, the DOE describes how it has validated the changes according to §10 of the Procedures for notifying and requesting approval of changes from the project activity as described in the registered project design document and thus addressing item 1 of the Request for Review, later on (in the 2nd part) the DOE explains how it has validated the revision of the monitoring plan and thus addressing item 2 of the Request for Review.

The procedures for notifying and requesting approval of changes from the project activity as described in the registered PDD (as per EB48, Annex 66) shall be applied by the DOE for permanent changes from the registered project activity under one of the following situations (as per paragraph 7):

- a) The project has never been implemented in accordance with description in the registered PDD; or
- b) Permanent changes occur after the project activity has been implemented in accordance with the description in the PDD and issuance of CERs has taken place.

For the given project activity "ESTRE's Paulinia Landfill Gas Project (EPLGP)", option b) is applicable as permanent changes took place after that the project activity had been implemented in accordance with the description in the PDD and after that issuance of CERs of several monitoring periods had taken place.

According to §10 of the Procedures for notifying and requesting approval of changes from the project activity the validation opinion by the DOE shall provide

(a) a description of changes as compared to the description in the registered PDD:

The registered PDD does not explicitly mention the number of flares, blowers and diesel generators applied in the project activity. It is said that "the flaring facility is estimated to need around 3,000

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MWh/year, however the capacity of the blower and/or the number of blowers is not mentioned. If following PPs assumption during PDD writing of a load factor of 90% and 8760 operational hours per year, the 3,000 MWh/year consumption indicated in the PDD would result in blower(s) total capacity of 380 kW.

The existence of "flares" is mentioned however not the number of such flares and regarding the diesel generators, nothing is mentioned except the consideration of "total amount of electricity used for gas pumping from the diesel fuelled generator" in the revised monitoring plan (approved 11-12-2010).

The revised PDD mentions in chapter A.4.3. the number of equipments including technical specifications used currently at Estre Paulinia landfill. The commissioning dates of each equipment are indicated as well, showing when what increase of equipment took place. Regarding the 5 flares currently in use, it is intended to install one more flare with nominal gas flow of 2,500 Nm³/h in the period between 2012 and 2013. The following table (Table 1) summarizes the number of each equipment (flares, blowers, diesel generators), capacity and commissioning date.

Table 1:

Flares	Nominal gas flow	Commissioning date
Flare 1	2,000 Nm ³ /h	14/09/2006
Flare 2	2,000 Nm ³ /h	14/09/2006
Flare 3	2,500 Nm ³ /h	18/02/2008
Flare 4	2,500 Nm ³ /h	01/03/2010
Flare 5	2,500 Nm ³ /h	01/03/2010
Blowers	Motor capacity / maximum gas flow capacity	Commissioning date
Blower 1 and 2	75 kW / 5,000 Nm ³ /h	14/09/2006
Blower 3 and 4	75 kW / 5,000 Nm ³ /h	01/03/2010
Diesel generators	Capacity	Commissioning date
STEMAC (WEG)	450 kVA	14/09/2006
HEIMER	512 kVA	01/03/2010 19/02/2010 (installation date)

All newly added information in A.4.3. of the PDD regarding the flare, diesel generator and blower specifications has been verified by the DOE to be correct during the 8th and previous verifications. The commissioning dates of the landfill gas plant on 14/09/2006, of the 3rd flare on 18/02/2008 and of additional equipment (2 more flares, 2 more blowers, 1 more diesel generator) on 01/03/2010 were evidenced by certificates (IRL 18, 23 and 19 respectively) from BIOTECNOGAS, the company responsible for assembly and testing of the equipment.

The technical specifications of the flares could be verified with photos of the TAGs of the flares, a signed letter from BIOTECNOGAS about landfill flare specifications and a technical note about landfill flare specifications (IRL 20,21,22), the ones of the blowers with photos of the TAGs of the blowers (IRL 24) and the ones of the diesel generators with photos of the TAGs of the diesel generators (IRL 26). Furthermore, the DOE could confirm the correctness of the information given in A.4.3. of the PDD and the availability of all equipment during verification on-site visits.

Regarding the amount of waste received by ESTRE Paulinia landfill, the registered PDD mentions in A.2. the following: "ESTRE has now 10 municipalities in the region under contract to dispose waste in CGR Paulinia. Considering these clients, as well as the private ones, CGR Paulinia receives around 2,500 tonnes of waste daily. Initially designed to receive 6.5 million tonnes, CGR Paulinia is now under expansion, with neighbour areas already under ESTRE's ownership. With this, CGR

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Paulinia will likely be twice as big in the near future". Even though the registered PDD already assumes the probability of doubling the amount of waste received by the landfill ("...will likely be twice as big in the near future..."), no explicit confirmation is given.

The revised PDD explicitly mentions now that "...CGR Paulinia has a capacity to receive up to 1,825,000 tonnes of waste per year (based on the operational license which establishes the daily capacity up to 5,000 tonnes of waste per day).....In the end, CGR Paulinia will have received about 16 million tonnes of waste."

The operational landfill license dated October 2007 (IRL 27), informs about the daily authorized waste disposal of 5,000 tons. Besides, ESTRE presented in an excel file (IRL 17) the historical and future amount of waste received for each month from the year 2000 until the closure of the landfill in 2014. The total amount of 16 million tons of waste and the landfill area of 603 thousand m² mentioned in A.3. of the revised PDD have been confirmed by the same excel file. 472,448 m² of the landfill area are further substantiated by several partial operational licenses which all of them were submitted to and verified by the DOE (IRL 41). For the last 3 cells in implementation and comprising an area of 18,515 m² no licenses are available yet since the licenses even though requested were not issued by the environmental authority yet. The solicitation of the licenses for this area has been submitted to the DOE (IRL 44). Besides, a very recent inspection report (which mentions amongst others these 3 cells) (IRL 42) issued by the environmental authority does not mention any manifestation, fine or restrictive comment regarding these cells. One landfill cell comprising an area of 112 thousand m² is planned to be implemented for the future, thus no license is available yet. This landfill cell is mentioned like all other cells in the submitted excel file (IRL 17) and it was confirmed by ESTRE during interview that this cell will be implemented in the near future. Besides, a photograph and a design drawing of this future cell have been submitted to the DOE (IRL 43).

The registered PDD mentions an area of 705 thousand m² however this area is not limited to the landfill area but also includes areas of supporting facilities (like e.g. offices, storehouses and others). If not considering these supporting facilities, the landfill area prior to Notification amounts to 375,284 m². That means in others words that the landfill area in the revised PDD (603 thousand m²) is about 60% higher than that in the registered PDD (prior to Notification). The complete landfill area of 375,284 m² is substantiated by partial operational licenses issued prior to expansion of the landfill which all of them were submitted to and verified by the DOE (IRL 41). Besides, the license N° 37000480 mentions the total area of 375,284 m².

According to IRL 17, waste received for every year remains below the limit of 1,825,000 tonnes of waste which results according to the environmental operational license based on the daily capacity of up to 5,000 tonnes of waste per day. Besides, the excel file IRL 31 shows the waste quantities received by Estre Paulinia landfill site from municipalities from 2005 to 2010 and clearly indicates an increase of municipalities compared to the 10 municipalities mentioned in the registered PDD.

Furthermore, the emission reduction calculation has been recalculated in the revised PDD. The revised ER excel calculation tool has been validated in detail by the DOE and all the modified data, assumptions and default values have been checked against reliable and plausible data sources.

The main changes in the revised ER calculation are the followings:

- amount of waste received by the landfill was updated using actual figures (for past years) and updated estimated figures (for future years). Table 2 shows a comparison between the original estimation of waste disposal (before the notification of changes) and the revised estimation of waste disposal at the time of notification of changes. The DOE validated the original and revised figures for waste disposed at Estre Paulinia landfill site with a signed declaration and excel file from ESTRE mentioning the quantity of solid waste in tones received since 2000 and prevision to be received until 2014 (IRL 16 and 17) and the original ER excel spreadsheet (IRL 34) and confirms the appropriateness of the revised figures. The landfill was supposed to be closed in 2010, however due to the landfill area expansion after project registry and considering the revised waste capacity of 16 million of the landfill according to information given in the Preliminary Environmental Report (RAP)

(IRL 40), the closure date has been revised to 2014. The extension of the landfill closure to 2014 is due to market related reasons. Commercial opportunities resulted in the addition of more municipalities disposing waste at Estre Paulinia landfill site during the years, culminating in an increase of amount of waste and landfill area.

-L_o: The value used in the revised ER calculation is 140 m³_{CH4}/t waste (instead of the previous value of 0.057 t_{CH4}/t waste). The value was changed in order to reflect more accurately the Brazilian reality according to a study of CETESB (environmental agency of Sao Paulo) for landfill projects implemented in the State of Sao Paulo. The DOE validated the revised value by public documents IRL 4 and 15 and confirms that the value of 140 m³_{CH4}/t waste has been conservatively chosen from the range between 140 m³_{CH4}/t waste and 180 m³_{CH4}/t waste indicated in the documents. It has to be noted, that at the time of registry of Estre Paulinia landfill project only very few public information regarding L_o value was available for landfill projects. For the previously used value of 0.057 t_{CH4}/t waste no reference is available and it is not known according to which data source the value was chosen. Even though the revised value (140 m³_{CH4}/t waste) is higher than the previously used value¹, it is acceptable and appropriate in the opinion of the validation team to update L_o to 140 m³_{CH4}/t waste in the revised PDD since this value has been validated against a credible and publicly available data source (as explained above) which reflects the local situation of the landfill whereas the data source for the value of 0.057 t_{CH4}/t waste is unknown.

-k: The value used in the revised ER calculation is 0.09 l/year (instead of the previous value of 0.12 l/year) which is conservative with respect to ER calculations. The revised value is based on studies of EPA and CETESB for projects in the State of Sao Paulo. The DOE validated the correctness of the value with IRL 4 and 15. The annual precipitation of more than 1,000 mm was further confirmed with the rainfall index of Paulinia, the location of the project activity (IRL 14). Again, it has to be noted, that at the time of registry of Estre Paulinia landfill project only very few public information regarding k value was available for landfill projects.

-leakage emissions resulting from grid electricity consumption and electricity consumption from the diesel generators were updated using actual figures (for past years) and updated estimated figures (for years 2011², 2012, 2013). The DOE could validate the correctness of the revised figures by 2 Excel files indicating the past and future diesel and grid electricity consumption (IRL 12 and 13) as well as by already verified leakage emission data in previous verifications. The estimated figures for 2011, 2012 and 2013 deem to be plausible in the context of the project activity in the opinion of the DOE.

¹ 0.057 t_{CH4}/t waste is equivalent to around 79.6 m³_{CH4}/t waste if considering the default value for methane density of 0.716 kg/m³ (as per the "Tool to determine project emissions from flaring gases containing methane", version 01).

² Actual electricity consumption figures for 2011 were not completely available during the time of validation of this Notification, thus the DOE accepted for 2011 estimates submitted by ESTRE.

Table 2:

Year	Original estimation of waste disposal before the Notification of Changes (tonnes of waste)	Revised estimation of waste disposal (tonnes of waste) at the time of Notification of Changes (tonnes of waste)	Difference (%)
2000	33,015	33,015	0
2001	191,465	191,465	0
2002	597,361	597,361	0
2003	351,373	351,373	0
2004	597,361	730,195	22
2005	597,361	792,689	33
2006	597,361	1,004,799	68
2007	597,361	1,335,269	124
2008	597,361	1,507,775	152
2009	597,361	1,418,013	137
2010	597,361	1,675,331	180
2011	0	1,658,122	-
2012	0	1,620,000	-
2013	0	1,620,000	-
2014	0	1,590,758	-

Observations to Table 2:

- 1) The original ER calculation spreadsheet does not indicate the amount of waste for 2011, 2012, 2013 and 2014.
- 2) The original estimation of waste disposal before the Notification of Changes was taken from the original ER calculation spreadsheet.
- 3) Regarding the revised estimation of waste disposal at the time of Notification of Changes: Values from 2000 to 2003 are based on real values and were already available at the time of PDD elaboration and thus are the same. Values from 2004 to 2010 are based on real values and are obviously different to the PDD estimates. The partly big differences between previous (prior to Notification) and revised figures are due to market related reasons. Commercial opportunities resulted in the addition of more municipalities disposing waste at Estre Paulinia landfill site during the years, culminating in a landfill area increase. Real values from 2004 to 2010 have not been available yet at the time of PDD elaboration. The 2011 value is based partly on real values and partly on estimates. The values 2012 to 2014 are based on estimates. The total value of 16,126,164 tonnes of waste is as per the information provided in the RAP which was verified by the DOE.

Emission reductions in the revised PDD and revised ER excel calculation file are finally higher than estimated in the registered PDD. The estimation in the revised PDD has been validated by the assessment team as described above and is considered to be appropriate.

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(b) an assessment on when the changes occurred, reasons for these changes taking place, whether the changes would have been known prior to registration of the project activity, and how the changes would impact the overall operation/ability of the project activity to deliver emission reductions as stated in the PDD:

When did the changes occur and what were the reasons for it?

The two main changes one can identify is the change in equipment and increase of amount of waste received by the landfill over the time.

The commissioning dates of the main equipment (flares, blowers, diesel generators) are indicated in Table 1. According to this Table it becomes obvious that, if considering 14/09/2006 (IRL 36) as the initial equipment configuration at operation start of the landfill gas plant, the main change took place on 01/03/2010 when 2 more flares, 2 more blowers and 1 more diesel generator were commissioned. One other small change took place on 18/02/2008 when the 3rd flare was commissioned. Estre Paulinia intends to install one more flare with nominal gas flow of 2,500 Nm³/h in the period between 2012 and 2013.

Regarding amount of waste received by the landfill, the most significant change is observed from 2007 onwards when the environmental operational license was issued on 10/10/2007 informing about the daily authorized waste disposal of 5,000 tons. Some increase can be already observed in the months prior to October 2007 and this is due to the fact that a previous environmental license, issued in November 2006, already authorized a daily waste disposal of 5,000 tons.

The differences between original figures and revised figures in the years between 2004 and 2010 are mainly based on the fact that the annual estimates in the PDD are not calculated with a daily waste disposal of 2,500 tonnes as mentioned in A.2. of the registered PDD, but with a much lower daily figure of around 1,600 tonnes. Highest waste volumes are reached from 2010 to 2014 however remain below the capacity of 1,825,000 tonnes of waste per year (based on the operational environmental license which establishes a daily capacity of up to 5,000 tonnes of waste per day).

The DOE verified the waste disposal figures by a signed declaration and excel file from ESTRE mentioning the quantity of solid waste in tones received since 2000 and prevision to be received until 2014 (IRL 16, 17) and information from CETESB about waste quantities received by Estre Paulinia landfill site from municipalities from 2005 to 2010 (IRL 31) and by interviews with personnel from ESTRE.

The reason for the increase of waste disposed at Estre landfill site over the time is due to supply-demand market based mechanisms. The additional waste mainly comes from municipalities which have no own adequate license and/or infrastructure to dispose waste elsewhere. In the case that those municipalities could not dispose their waste at Estre Paulinia landfill site, they would dispose it at the closest landfill however with lower level of operation standard than Estre Paulinia landfill site. It has been verified by the DOE by Sao Paulo State Inventory of solid residues, 2010 (IRL 38) that all potential landfill sites (which would receive waste in the absence of Estre Paulinia landfill site) are landfills without any landfill gas recovery system. Thus it is ensured that additional waste is not diverted from a landfill with an existing recovery system.

Information from CETESB about waste quantities received by Estre Paulinia landfill site from municipalities from 2005 to 2010 (IRL 31) shows the waste quantities received by Estre Paulinia landfill site from municipalities from 2005 to 2010 as well as those waste quantities which have been disposed at other disposal sites. IRL 31 substantiates the fact that a significant part of the waste increase over the last few years was due to more waste sent by municipalities to Estre Paulinia landfill site.

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The consequence of more waste disposed at Estre Paulinia landfill site and of an increased landfill area was an increase of the landfill gas production, thus making it necessary to put into operation more flares, blowers and diesel generator in order to be able to extract and flare the additional amount of biogas.

Were the changes known prior to registration of the project activity?

Even though the landfill expansion was anticipated in the registered PDD - A.2. of the PDD mentions that "...CGR Paulinia is now under expansion, with neighbor areas already under ESTRE's ownership. With this, CGR Paulinia will likely be twice as big in the near future" - such an expansion was not considered in the ER calculations that time because of non-availability of official confirmation of the same.

A Preliminary Environmental Report (RAP) referring to ESTRE Paulinia unit expansion area for the final disposal of solid waste, dated on June 2006 (very close to the registry date on March 03, 2006) was submitted to the DOE (IRL 40). The company ADISAN which was responsible for the elaboration of the RAP confirmed in a signed declaration (IRL 39) that the works for the RAP were initiated in January 2006 and concluded in June 2006. RAP is an official document which shows the landfill disposal expansion intention and is an instrument requirement by the environmental agency to obtain the previous environmental license, as well as to evaluate the environmental feasibility of the project activity presenting the environmental situation before and the predicted situation after the expansion. However, this RAP document does not specify an official confirmation or even exact date about the expansion. The 1st license approving the change to 5,000 tonnes per day waste disposal was issued only on 01/11/2006 (preliminary environmental operational license), valid for one year (IRL 28) and the definitive environmental operational landfill license, informing about the daily authorized waste disposal of 5,000 tons was issued almost one year later on 10/10/2007 (IRL 27), i.e. both licenses were issued clearly after project registry. Concluding, ESTRE anticipated the landfill disposal expansion prior to registration of the project activity, however had no official confirmation at that time whether this expansion would be approved by the environmental authorities and when the expansion would happen.

How do the changes impact the overall operation?

According to information provided by the project owner during interviews and verified by the assessment team during 7th and 8th verification on-site audits, the most significant changes regarding operational aspects are the followings:

-increase in equipment: apart from the equipment expansion described in Table 1, further additional equipment like 2 dump trucks, 2 dozers, 1 backhoe, 1 soil roller and 1 wheel loader are used for operational purposes. Those operational equipments could be cross-checked with the Installation license (IRL 35).

-increase of staff for operational purposes at the landfill (in total 14 people, i.e. 2 more people for each operational equipment).

How do the changes impact the ability of the project activity to deliver emission reductions?

The changes in the project activity will result in higher baseline emissions and thus higher emission reductions than estimated in the registered PDD. The revised baseline emission, project emission and emission reduction calculation estimate has been verified by the validation team and can be

confirmed to be reasonable and conservative in the revised PDD, version 3.1, dated 18/01/2012 (IRL 1) and revised ER excel calculation tool (IRL 2).

The validation team confirms that all calculations in the revised PDD and revised ER excel calculation tool have been correctly conducted. Real emission reductions will be verified by the DOE during verification activities. Table 3 shows a comparison of estimated emission reductions between the situation before notification (original ER calculation) and after notification (revised ER calculation).

Table 3

Year	Original Estimation of emission reductions (tonnes of CO ₂ e) before the Notification of Changes	Revised Estimation of emission reductions (tonnes of CO ₂ e) through the Notification of Changes	Difference (%)
2006 ³	169,747	384,096	126
2007	194,131	513,090	164
2008	215,757	651,903	202
2009	234,937	767,859	226
2010	251,949	905,013	259
2011	223,368	1,028,315	360
2012	198,019	1,136,286	473
2013 ⁴	175,536 ⁵	1,038,576	491
Total (tonnes of CO ₂ e)	1,663,444	6,425,138	286
Annual average (tonnes of CO ₂ e)	207,931	803,142	286

(c) an assessment, following the guideline by the Board, regarding whether or not the changes would impact the following aspects:

(i) Additionality of the project activity: The changes do not have any impact on additionality of the project, as no other revenues than CDM benefits are involved with the project activity and its changes. The increase in amount of waste received by the landfill results obviously in more equipment costs for the project owner and on the other side no income is expected by implementing and expanding the active gas collection and flaring system. B.2. in the registered PDD mentions "For

³ Comparison has been made for the whole year even though crediting period only started on 14/09/2006. Actual leakage emissions of 2006 (3.5 months) indicated in the ER excel calculation tool (worksheet "Diesel & grid consumption", columns B and C) were extrapolated to 12 months.

⁴ Comparison has been made for the whole year even though crediting period ends on 13/09/2013.

⁵ Only the original ER calculation spreadsheet indicates emission reductions for 2013, however not the registered PDD.

Validation of changes from the project activity as described in the registered PDD (Notification) together with validation of the revised monitoring plan:

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EPLGP⁶, the IRR is zero, since no sort of income is expected from installing the infra-structure for actively collecting the gas and flaring it. The project will go ahead if, and only if, there are CERs revenues in place." This does not change with the modifications addressed in the revised PDD. Thus, the DOE confirms that there is no impact on the additionality due to the changes. Since for Request for Registry no financial excel spreadsheet was submitted to UNFCCC, revision of such a spreadsheet is not applicable.

(ii) Scale of CDM project activity: Not applicable, as the project activity was prior to the change a large scale activity and will continue to be such one.

(iii) Applicability and application of approved baseline methodology under which the project activity has been registered: Not applicable, as with the change of the project activity the applied methodology continues to be applicable as the most appropriate one and the most appropriate baseline scenario remains the one mentioned in the registered PDD. As already mentioned in chapter 3, item (b), the DOE verified by Sao Paulo State Inventory of solid residues, 2010 (IRL 38) that all potential landfill sites (which would receive waste in the absence of Estre Paulinia landfill site) are landfills without any landfill gas recovery system. Thus it is ensured that additional waste is not diverted from a landfill with an existing recovery system.

The only possible and identified baseline scenario is the one already mentioned in the registered PDD, namely largely releasing the methane gas to the atmosphere (so called "passive venting"), no systematic flaring of the landfill gas and burn only a small part reflected in an adjustment factor of 20%. There is no law in Brazil requiring the collection or burning of landfill gas. The same is confirmed by the local and sectoral expertise of the DOE assessment team and was cross-checked with the data base of "Green Solution" which is updated every month to verify whether there is any new regulation for Estre Paulinia landfill site. An environmental legal audit is carried out every 6 months by the external company Olenscki Assessoria Ambiental Ltda. to verify whether Estre Paulinia landfill complies with all relevant regulations. The 2 most recent reports were submitted to the DOE and verified by the same (IRL 37).

Further minor changes were the update of the PPs and start of the crediting period in order to be in accordance with the UNFCCC website, inclusion of exact address and GPS coordinates (which have been verified by the DOE with the environmental license and Google Earth), chapter D.2.3.2. and E.2. (leakage emissions) have been illustrated in more detail and both leakage emissions from electricity consumption from the grid and diesel generators have been separately mentioned. The DOE confirms that the formula for the calculation of leakage emissions is correct and the applied emissions factor of 0.8 tCO₂e/MWh for diesel generators (> 200 kW) is appropriate as per AMS I.D., version 13⁷.

Revision of monitoring plan

The revised monitoring plan included the parameters "flare temperature" and "flare working hours" in order to be in accordance with the applied methodology AM0003, version 3. Both parameters are continuously measured by thermocouples (flare temperature) and PLC supervisory system (flare working hours). Thermocouples will be calibrated yearly, however the supervisory system does not need any calibration. A letter of the manufacturer ELSI (IRL 11) mentions that the calibration frequency of the thermocouples is the criterion of the user and as there is no norm or standard in

⁶ Estre Paulinia Landfill Gas Project

⁷ The reference to version 13 of AMS I.D were taken over from the revised monitoring plan (approved on 11/12/2010). Version 14 and 15 of AMS I.D indicate exactly the same emission factors for diesel generators, whereas later versions of AMS I.D do not indicate the emission factors for diesel generators anymore.

Validation of changes from the project activity as described in the registered PDD (Notification) together with validation of the revised monitoring plan:

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Brazil for a certain frequency to calibrate thermocouples, the DOE confirms with its local and sectoral expertise that the calibration frequency of one year is appropriate. In the case that calibration is carried out with delay, EB52, Annex 60 will be conservatively applied in the ER calculation. Even though calibration certificates of the thermocouples of the flares were already submitted to the validation team during this validation (IRL 8), the compliance of the calibration requirements and EB52, Annex 60 will be re-checked by the DOE for each verification. The specifications of the thermocouples were submitted to the DOE (IRL 10) and it can be confirmed that the thermocouples used in the project activity are well known and widely used. The fact that the supervisory system does not have to be calibrated was evidenced by a letter from BIOTECNOGAS (IRL 5).

The DOE confirms that the level of accuracy is not reduced as a result of the revision, but increased by including these 2 parameters. Besides, the DOE confirms that the revision is in accordance with the actual situation of the project activity. It could be confirmed during previous verification visits, that both parameters ("flare temperature" and "flare working hours") are already continuously monitored. Further, the revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity which mentions on pages 5, 6 and 9 the requirement to monitor flare temperature and flare working hours. The findings of previous verification reports have been taken into account. None of the findings has a direct impact on the revision of the monitoring plan.

The DOE ensures due to its sectoral and local expertise that the change does not compromise the conservativeness in the monitoring and verification process and of the emission reduction calculations.

TÜV SÜD considers the revised monitoring plan in the revised PDD as acceptable and reasonable. The revised monitoring plan reflects the reality and is in compliance with AM0003, version 3.

Validation of changes from the project activity as described in the registered PDD (Notification) together with validation of the revised monitoring plan:

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4 VALIDATION OPINION

TÜV SÜD has performed a validation of changes from the project activity as described in the registered project design document together with a validation of a revision of the monitoring plan of the CDM Project 0165:

ESTRE's Paulinia Landfill Gas Project (EPLGP)

The review of the revised documentation and the subsequent follow-up interviews has provided TÜV SÜD with sufficient evidence to determine the fulfillment of all stated criteria. In our opinion, the revised documentation provides sufficient evidence to determine that the changes do not raise concerns with respect to aspects outlined in paragraph 10(c) of the "Procedures for notifying and requesting approval of changes from the project activity as described in the registered project design document". Furthermore, revised emission reduction calculation has been validated by TÜV SÜD to be reasonable and conservative.

Besides, the revised monitoring plan meets all relevant UNFCCC requirements and is in line with the "Procedures for revising monitoring plans in accordance with paragraph 57 of the Modalities and procedures for the CDM" (EB49, Annex 28). It can be confirmed that:

- a. the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the revision, also can be confirmed that the proposed revision is in accordance to the project activity.
- b. the proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity.
- c. the findings of previous verification reports have been taken into account.

Hence TÜV SÜD will recommend the acceptance of the changes including the revised monitoring plan.

Munich, 02-02-2012

Munich, 02-02-2012

A handwritten signature in blue ink, appearing to read 'Thomas Kleiser'.

Thomas Kleiser
Head of the Certification Body
"climate and energy"
TÜV SÜD Industrie Service GmbH

A handwritten signature in blue ink, appearing to read 'S. Hetsch'.

Sebastian Hetsch
Assessment Team Leader

Validation of changes from the project activity as described in the registered PDD (Notification) together with validation of the revised monitoring plan:
"ESTRE's Paulinia Landfill Gas Project (EPLGP)"



Annex 1: INFORMATION REFERENCE LIST (IRL)

- (0) On-site interview at Estre Paulinia landfill site during 7th verification (April 2010) and 8th verification (October 2010) and Email and phone communication/interviews with PPs from August 2011 to January 2012.
- Bruno Tyaki de Araujo Caldas, Coordinator, Estre Ambiental S.A.
 - Adriano Francisco Almeida, Supervisor of the biogás system
 - Mauricio Bencic Rovea, Project consultant, Econergy Brasil Ltda.
 - Joao Augusto Sprovieri, Project consultant, Econergy Brasil Ltda.
 - Francisco Santo, Project consultant, Econergy Brasil Ltda.
- (1) Revised PDD, dated 18/01/2012, version 3.1.
- (2) Revised ER excel calculation tool, dated 18/01/2012, version 3.1.
- (3) AM0003 "Simplified financial analysis for landfill gás capture projects"
- (4) User manual of computer program "landfill gas – generation and electricity use" (from: manual do usuario do programa de computador), CETESB, version 1.0, dated 2006, Sao Paulo, Brasil.
- (5) Letter from BIOTECNOGAS confirming that flare operating hours are directly measured by PLC software and that this system does not require any calibration, letter dated 17/08/2011.
- (6) Email (dated 19/09/2011) from NATIXIS confirming that European Carbon Fund does not have offices in UK and Switzerland.
- (7) Photos of the TAGs (including serial numbers) of the thermocouples of the flares.
- (8) Calibration certificates of the thermocouples of the flares, calibration carried out by Run-Time:
- thermocouple of flare 1, calibration dated 14/01/2011, serial number 05-06/0617, calibration certificate N° 6/10
 - thermocouple of flare 2, calibration dated 10/01/2011, serial number 11-09/5207, calibration certificate 16/10
 - thermocouple of flare 3, calibration dated 10/01/2011, serial number 10-07-741, calibration certificate N° 15/10
 - thermocouple of flare 4, calibration dated 10/01/2011, serial number 11-09/5208, calibration certificate N° 17/10
 - thermocouple of flare 5, calibration dated 10/01/2011, serial number 11-09/5209, calibration certificate N° 18/10
- (9) Letter from BIOTECNOGAS confirming that the document "Elsi maximum permissible error" (indicating maximum accuracy limit and technical specifications of the thermocouples) is applicable to all ELSI thermocouples installed at Paulinia landfill gas extraction and combustion plant, letter dated 27/09/2011.
- (10) Specifications of flare thermocouples, ELSI, type S and PT100, document issued by BIOTECNOGAS, dated 08/04/2010.
- (11) Letter issued by ELSI confirming that calibration frequency of ELSI thermocouples type S and type PT100 is a criterion defined by the user of the instruments, dated 09/09/2011.
- (12) Diesel and grid electricity consumption (past and future), excel file "Diesel and grid electricity consumption 2011 09 16 FES", submitted in September 2011, finally merged with excel file mentioned under item (2).
- (13) Landfill gas indicators, excel file "INDICATIVOS Biogas_2011", submitted in August 2011.

Validation of changes from the project activity as described in the registered PDD (Notification) together with validation of the revised monitoring plan:

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(14) Rainfall index, Paulinia, Sao Paulo, Brasil,

<http://jornaldotempo.uol.com.br/climatologia.html/Paulinia-SP/>, accessed on 03/10/2011.

(15) Study about renewable electricity generation potential from landfills in urban regions and cities of Brazil (from: Estudo do potencial de geracao de energia renovavel proveniente dos "aterros sanitarios" nas regioes metropolitanas e grandes cidades do Brasil), CEPEA, March 2004, Piracicaba – SP, Brasil.

(16) Signed declaration ESTRE mentioning the quantity of solid waste in tones received since 2000 and prevision to be received until 2014, composition of waste and current and future layout of the landfill, dated 05/08/2011.

(17) Excel file ESTRE informing about the quantity of solid waste in tones received since 2000 and prevision to be received until 2014, composition of waste, area of the landfill.

(18) Certificate BIOTECNOGAS evidencing the start of the landfill gas plant, N° 028-BTG133/05-C, dated 14/09/2006.

(19) Certificate BIOTECNOGAS, N° 060-BTG076/09-C, certificate date: 05/03/2010, evidencing that the plant startup date after testing of the new system configuration was on March 01, 2010.

(20) Photos of the TAGs of the old and new flares.

(21) Signed letter by BIOTECNOGAS (manufacturer flare) about landfill flare specifications, dated 09/02/2009.

(22) Technical note about landfill flare specifications (additional information to IRL 21), dated 07/09/2006.

(23) Certificate BIOTECNOGAS about the commissioning of the 3rd flare with the serial number 110/07-C on 18/02/2008, Certificate N° 064-BTG110/07-C.

(24) Photos of the TAGs of the blowers.

(25) Daily occurrence book (Diario de bordas) N° 031, dated 19/02/2010 regarding the installation of diesel generator HEIMER, 512 kVA.

(26) Photos of the TAGs of the diesel generators.

(27) Environmental operational landfill license, informing about the daily authorized waste disposal of 5,000 tons; dated 10/10/2007, issued by CETESB, valid until 10/10/2012, N° 37000462.

(28) Previous environmental license, N° 01045, dated 01/11/2006, issued by CETESB, valid for one year, informing about the daily authorized waste disposal of 5,000 tons.

(29) Registered (original) PDD, version 2B, dated 04-12-2005.

(30) Environmental operational license, N° 37000328, dated 14/03/2006, issued by CETESB, valid until 14/03/2011, informing about the daily authorized waste disposal of 3,000 tons.

(31) Waste quantities received by Estre Paulinia landfill site from municipalities from 2005 to 2010, excel file (summary) submitted in October 2011,

<http://www.cetesb.sp.gov.br/Solo/relatorios/rsdomiciliares2005.zip>

<http://www.cetesb.sp.gov.br/Solo/relatorios/rsdomiciliares2006.zip>

<http://www.cetesb.sp.gov.br/Solo/relatorios/rsdomiciliares2007.zip>

http://www.cetesb.sp.gov.br/Solo/relatorios/rsdomiciliares_08.zip

<http://www.cetesb.sp.gov.br/Solo/relatorios/rsdomiciliares2009.zip>

<http://www.cetesb.sp.gov.br/userfiles/file/residuos-solidos/residuosSolidos2010.zip>.

(32) List of municipalities that send their waste to Estre Paulinia landfill site and most potential waste disposal site in the case that Estre Paulinia would not receive the waste,

<http://www.cetesb.sp.gov.br/solo/publicacoes-e-relatorios/1-publicacoes-/relatorios>

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(33) 2 Word files sent from Estre/Econergy on 07/10/2011 and 03/01/2012 responding DOE questions and doubts.

(34) Original ER excel spreadsheet, Econergy Brasil Ltda., dated 05/02/2005, no version indicated.

(35) Environmental installation license, N° 37000440, dated 20/04/2007, issued by CETESB, informing about the daily authorized waste disposal of 5,000 tons and additional operational equipment.

(36) Certificate evidencing the start of the landfill gas plant, N° 028-BTG133/05-C, dated 14/09/2006.

(37) Database (Green Solution software) with all applicable laws for landfills in Brazil and environmental legal audit reports by the external company Olenscki Assessoria Ambiental Ltda, dated 01/04/2011 and 16/12/2011.

(38) Sao Paulo State Inventory of solid residues, 2010:

<http://www.cetesb.sp.gov.br/solo/publicacoes-e-relatorios/1-publicacoes/-relatorios>

(39) Declaration signed by ADISAN ENGENHARIA E PROJETOS LTDA. confirming that elaboration of RAP was initiated in January 2006 and was concluded in June 2006.

(40) Preliminary Environmental Report (RAP) for Estre Paulinia landfill site, dated June 2006.

(41) Partial environmental operational licenses: N° 37000182 (dated 09/01/2004), 37000183 (dated 09/01/2004), 37000184 (dated 09/01/2004), 37000185 (dated 09/01/2004), 37000186 (dated 09/01/2004), 37000187 (dated 09/01/2004), 37000257 (dated 25/01/2005), 37000258 (dated 25/01/2005), 37000328 (dated 14/03/2006), 37000412 (dated 24/01/2007), 37000462 (dated 10/10/2007), 37000480 (dated 22/01/2008), 37001027 (dated 03/03/2011), 37001028 (dated 03/03/2011), 37001106 (dated 22/03/2011), all issued by CETESB (environmental authority in the State of Sao Paulo).

(42) Inspection report issued by CETESB (environmental authority in the State of Sao Paulo), dated 31/01/2012.

(43) Photograph and design drawing of cell 8-B to be implemented in the new future, without date.

(44) Solicitation for partial environmental licenses of cells 9A, 10A and 11A comprising of a total area of 18,515 m² and confirmed by CETESB (environmental authority in the State of Sao Paulo) on 10/08/2011.

Validation of changes from the project activity as described in the registered PDD (Notification) together with validation of the revised monitoring plan:

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Annex 2

Appointment Certificates



Industrie Service

CERTIFICATE OF APPOINTMENT

Mr Hetsch, Sebastian, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	23.03.11					

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		23.03.11	23.03.11	23.03.11		

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	23.03.11				
Financial Expertise					
Date	23.03.11				

Qualification in technical areas	
Technical Area	Date
14.1_Forestry	23.03.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH.

In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0006/00.

Date	Signature
23.03.11	<i>Thomas Klein</i>



Industrie Service

CERTIFICATE OF APPOINTMENT

Mr Agrafiotis, Georgios, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	22.03.11					

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		22.03.11	22.03.11			

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	22.03.11		31.03.11		
Financial Expertise					
Date	22.03.11				

Qualification in technical areas	
Technical Area	Date
13.1_Waste handling and disposal	22.03.11
1.2_Energy generation from renewable energy source	22.07.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH.

In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0002/03.

Date	Signature
22.03.11	<i>Thomas Kleise</i>
31.03.11	<i>Thomas Kleise</i>
22.03.11	<i>Thomas Kleise</i>

CERTIFICATE OF APPOINTMENT



Industrie Service

Mr Thaler, Johann, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	30.03.11					

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		30.03.11	30.03.11			

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	30.03.11	30.03.11			
Financial Expertise					
Date	30.03.11				

Qualification in technical areas	
Technical Area	Date
15.1_Agriculture	30.03.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH.

In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0032/00.

Date	Signature
30.03.11	<i>Thomas Klein</i>



Industrie Service

CERTIFICATE OF APPOINTMENT

Ms Nanda, Madhuri, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	30.03.11					

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		30.03.11	30.03.11	30.03.11	18.04.11	

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	30.03.11				
Financial Expertise					
Date	30.03.11				

Qualification in technical areas	
Technical Area	Date
13.1_Waste handling and disposal	12.04.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH.

In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0035/00.

Date	Signature
12.04.11	Thomas Kleis
18.04.11	Christoph



Industrie Service

CERTIFICATE OF APPOINTMENT

Mr Kleiser, Thomas, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	25.03.11					

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		25.03.11	25.03.11	25.03.11	25.03.11	

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	25.03.11				
Financial Expertise					
Date	25.03.11				

Qualification in technical areas	
Technical Area	Date
1.1_4.10_Thermal energy generation...	25.03.11
1.2_Energy generation from renewable energy source	25.03.11
4.1_Cement sector	25.03.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH.

In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0027/00.

Date	Signature
25.03.11	