



**VALIDATION
of
GEOTHERMAL ENERGY IN ORADEA-
AREA II AND BEIUS, ROMANIA
UNQUALIFIED VALIDATION REPORT**

SGS Climate Change Programme

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|---|--|
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| Approved by: | Organisational unit: SGS Climate Change Programme |
| Client: Danish Environmental Protection Agency | Client ref.: |

Summary:

This report presents the findings of the validation of the Geothermal Energy Project, Romania against the requirements of the Danish Environmental Protection Agency, Decisions 16 and 17 CP7 of the Marrakech Accords and Article 6 of the Kyoto protocol.

The report is based on the findings of document reviews, consultations with experts, the stakeholder consultation process and responses from Grue & Hornstrup for the findings raised in this report.

The report and the annexed validation protocol highlight 14 findings (detailed below) and the steps taken to close out ten of those findings. Three Observations remain outstanding. On the basis of these findings, this report provides the justification for the recommendation of an Unqualified Validation Opinion.

The report describes a total of fourteen findings which include:

- 4 MAJOR Corrective Action Requests;
- 6 MINOR Corrective Action Requests; and
- 4 Observations.

The Validation Opinion is based on the DEPA guidelines and the current and emerging rules surrounding Article 6 of the Kyoto Protocol. Attention is drawn to the fact the JI Supervisory Committee may yet issue guidance on the choice of baseline methodology and such guidance may have a bearing upon this validation opinion. Consequently, SGS offers no guarantee that the issuance of an Unqualified Validation Opinion against the current rules will result in the successful registration of the Geothermal Energy Project as a JI project, nor that the project will generate ERUs.

The Validation Report and Opinion will remain valid subject to on-going compliance with stated criteria. In the event that the JI Supervisory Committee registers the project, the verifier will assess on-going compliance.

| | | |
|--|----------------|------------------------|
| Report No.: Unqualified Validation Report | Subject Group: | |
| Report title: Validation of Geothermal Energy in Oradea-Area II and Neius, Romania, Unqualified Validation Report | | |
| Work carried out by: Marco van der Linden/Irma Lubrecht | | |
| Work verified by: To be reviewed by Gareth Rhillips | | |
| Date of this revision: 24 th December 2004 | Rev. No.: 2 | Number of pages: 23 |

Indexing terms

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- Limited distribution
- Unrestricted distribution

This report should not be read without reference to the annexed Validation Protocol.



Abbreviations

The following abbreviations have been used in this report:

| | |
|------|----------------------------------|
| CAR | Corrective Action Request |
| CDM | Clean Development Mechanism |
| EIA | Environmental Impact Assessment |
| ERUs | Emission Reductions Units |
| JI | Joint Implementation |
| PDD | Project Design Document |
| SGS | Société Générale de Surveillance |

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1. Introduction

1.1 Objective

The Danish Government wishes to purchase Emission Reduction Units from selected JI projects. Candidate projects are required to undergo validation against Decision 16 (and under the twin track approach, Decision 17/CP 7 of the Marrakech Accords) and Article 6 of the Kyoto Protocol.

Validation of projects is to be undertaken by recognised third parties who have established competence and independence to issue such opinions. SGS is one such party with competence based on training and experience and independence ensured through organisational structure, documented procedures, business practices and a code of ethics. SGS has been accredited for scopes 4,5,6,7,10,11,12 and is actively pursuing accreditation for all remaining scopes.

1.2 Scope

The scope of this assignment is to assess the project documents against the defined criteria. The project documents include the Project Design Document which incorporates the baseline study and the monitoring plan, supported by further references in the baseline study.

The criteria for the assessment are defined in the Marrakech Accords, to which the Validator can add or subtract requirements based on emerging issues within the framework of the Kyoto Protocol. The Validation Protocol used for this project is attached to this report.

Publicly Available Documents to Review as Part of Scope

- Project Design Document for Geothermal Energy in Oradea-Area II and Beius, Romania.

1.3 GHG Project Description

The project consists of upgrading of existing district heating systems in in Oradea Area II and Beius by introducing new technology to substitute the use of fossil fuels (lignite, oil and natural gas) in the district heating systems with geothermal energy resources in the towns of Oradea (Area II) and Beius.

Baseline Scenario: The baseline is continuation of the current situation including conversion to gas of some boilers in Oradea. Baseline is based on existing actual or historical emissions. Baseline alternatives have been discussed but are not reflected in the PDD. Business as usual is considered as follows: Energy has become expensive in comparison to development in income. Lesser demand is observed. In Oradea the secondary network has been rehabilitated and consequently losses are reduced and energy supply lowered.

With-project scenario: Under the with-project scenario, the district heating systems of Area II in Oradea and Beius will be provided by geothermal energy and will replace the use of fossil fuels. In Oradea the project aims to establish a new geothermal heating plant and rehabilitation of the existing district heating system in Area II.

Leakage: Leakage has been identified as energy consumption by the shaft pumps and extra electricity required from the grid to compensate for the decrease in electricity production at CET. The energy consumption by the shaft pumps can be ignored and the extra electricity needed on the grid is calculated.

Environmental and social impacts: The project will decrease emissions from fossil fuel boilers and, assuming proper installation and operation, is not expected to have negative environmental effects. The project expects to decrease the amount of CO₂, SO₂, NOx and particles.

The geothermal water in Beius will be discharged into the river after utilisation. If the water temperature is above 40 °C this will result in negative environmental effects which cannot be allowed. The water temperature has to remain below 40 °C to minimise effects. Modifications of the geothermal loop are considered to keep the discharge temperature below the limit value. Discharge of the water can also be regarded as mining the resources. Although the Government has approved this, reinjection would introduce a perspective of sustainability and make the energy resource renewable. This environmental impact would be long term.

Monitoring plan: Monitoring methodology is based on the calculations of the baseline, which is based on historic data. Monitoring provisions in the monitoring methodology are consistent with the project boundaries

Emissions avoided: Based on the assumptions made in the baseline and the predicted electricity output, the project expects to reduce CO₂ emissions by approximately 238,536 tonnes over the 10-year crediting period.

2. Methodology

2.1 Assessment

The Validation is performed primarily as a document review of the publicly available project documents. The information presented in these documents is assessed against Decisions 16 and 17 CP/7 and Article 6 of the Kyoto Protocol. The assessment is performed by trained assessors using a Validation Protocol developed by SGS. The Validation Protocol serves the following purposes:

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation.

Where additional information is required to complete the validation, this may be obtained through telephone and face-to-face interviews with key stakeholders (including the project developers and Government and NGO representatives in the host country). These may be undertaken by the local SGS affiliate.

The completed Validation Protocol is enclosed in Annex 1 to this report.

2.2 Report of findings

Three different types of Corrective Action Requests are defined:

- **MAJOR CAR:** the validation is suspended or denied until the corrective action has been proven to be completed satisfactory;

- MINOR CAR: the validation is granted under the condition that the corrective action will be properly executed or implemented;
- Observation: the corrective action needs to be executed or implemented as a condition for future verification of monitoring reports.

Corrective Action Requests (CARs) and Observations are raised in the draft report and the Project Developer given the opportunity to “close” outstanding CARs and respond to Clarifications and Observations. Normally a time frame is attached to a CAR that reflects the importance of it. MAJOR CARs must be closed out before an unconditional validation report and opinion can be issued. MINOR CARs may be closed out during the project implementation and verified during the first verification or surveillance visit. Observations must be addressed by the project developer prior to the first verification of avoided emissions. CARs may be closed out on the basis of documentation which will be verified during the first field visit. Once a deadline for closure of a CAR has been passed, it may be escalated to a higher level – an outstanding MAJOR CAR may lead to suspension of the validation opinion; a MINOR CAR may be raised to a MAJOR CAR etc. and an Observation may be raised to a CAR. Outstanding Observations and CARs should be considered by the verification team at each subsequent verification assessment.

The completed Validation Protocol is enclosed in Annex 1 to this report.

2.3 Finalising the report

Following submission of the draft Validation Protocol, the project developer has the opportunity to address any of the findings, with the main objective of closing out the MAJOR CARs.

3. Validation Team

The Validation Team was led by Marco van der Linden. Marco is project manager and Assessor of the SGS Climate Change Programme. Marco was assisted by:

- Irma Lubrecht is a Lead Assessor of the Climate Change Programme and currently acts as Manager of the Technical Competence Centre.
- Experts were consulted to discuss assumptions on geothermal energy.
- Gareth Philips acts as the technical reviewer of this project to ensure quality control. He is Global Product Manager of the SGS Climate Change Programme and experienced in the validation and verification of emission reduction and sequestration projects in the energy, industry and land use change sectors, for both voluntary and potentially Kyoto compliant projects.

4. Conclusions

The conclusions regarding the findings of the validation are summarised in this section. Further details of the findings are presented in Section 7 (Corrective Action Requests) and Annex 1 (Validation Protocol).

4.1 Participation Requirement

SGS Climate Change Programme

The project developer has not provided the validator with a Letter of Approval from the host government. Consequently a MAJOR CAR (01) was raised.

The project developer has submitted a Memorandum of Understanding between Romania and Denmark and a Project Agreement. According to the focal point in Romania and Denmark the Project Agreement substitutes the Letter of Approval and both governments consider the project agreement sufficient for future transfer of the achieved emission reductions. MAJOR CAR 1 has been closed out.

Romania has ratified the Kyoto Protocol in 2001.

4.2 Local Stakeholder Consultation

Stakeholder comments have been invited via the DEPA website, the website of the Ministry of Agriculture, Waters, Forest and Environment in Romania and by advertisement at the mayor's office in Oradea, Romania. The public hearings in Denmark and Romania were closed 27th November 2003 and 5th December 2003 respectively and no comments were received. MAJOR CAR 10 has been closed out.

4.3 Additionality and leakage

There is no national framework to exploit the geothermal resources in Romania. Several projects have started but due to problems with the local economy, only three new geothermal projects have been completed. Investment costs are considerable from a Romanian point of view. The financial analysis in the PDD does not provide enough feedback to prove that this project would not be feasible without the sale of ERUs.

Response project developer: *The financial analysis indicates that the project is feasible but this was also proven in former financial analysis made by German and Icelandic consulting companies several years ago. However, the fact is that the geothermal project in Area II (Iosia area) was developed and implemented when the JI - Mechanism was introduced. Besides it is doubtful if Transgex actually could obtain the commercial loans without receiving upfront payment from trading of greenhouse gases even though the financial analysis show high economical viability.*

The project developer has applied the CDM Additionality Tool (CDM EB 16). SGS confirms that the additionality tool had been applied correctly and from the detailed information provided in the section on Barrier Analysis it could be concluded that the project is additional.

MINOR CAR 4 has been closed out.

4.4 Environmental Impact Assessment and Transboundary Impact

The project will decrease emissions from fossil fuel boilers and, assuming proper operation, is not expected to have adverse environmental effects.

In Beius the geothermal water will be discharged into the river. If the water temperature is higher than 40°C this will have negative environmental effects. If the water temperature stays below 40°C the effect is considered to be minimal (Observation)

Discharge of the water can be seen as mining the resources. Although the Government has approved this, reinjection would introduce a perspective of sustainability and make the energy resource renewable (Observation).

According to Romanian legislation environmental impact assessment (EIA) is required but no transboundary impact assessment. UNFCCC Focal Point in Bucharest is discussing to what extend and according to what standard an extended EIA shall be elaborated. EPA will be responsible for elaboration of the EIA.

4.5 Monitoring Plan

A monitoring plan has been prepared describing the collection of data for the project scenario. The MP provides for monitoring of the operation of the peak load boilers at the geothermal plant based on fuel consumption and calorific value.

Several procedures regarding maintenance of metering equipment, data handling are lacking and incomplete and have to be included in the revised version of the PDD. A new version of the PDD has been submitted and was found to be satisfactory.

5. Projected Emission Reductions arising from the project

The assessment team has reviewed the methodology for quantifying the projections of emission reductions and based on the evidence provided found the assumptions to be complete and transparent.

This review does not amount to a guarantee of the number of credits that the project may be expected to earn.

6. Comments received from stakeholders

Project Design Documents are published on the DEPA website. SGS received no stakeholder comments through DEPA on this project.



7. Corrective Action Requests

CORRECTIVE ACTION REQUEST (CAR)

MAJOR CAR 1

| | | | | | |
|---|--------------|-----------------------------|---|--------------------------------------|---|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 1 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / OTHER (describe) | | | | | |
| DETAILS OF NON-CONFORMANCE: Letter of Approval is not available. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: Memorandum of Understanding and Project Agreement have been submitted to validator. | | | | | |
| SIGNED: Sören Jelleso | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: 18 October 2004 | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: MoU and PG have been accepted by both Parties for future transfer of ERUs. MAJOR CAR 1 has been closed out. | | | | | |
| SIGNED | | | | | |
| AUDITOR: Irma Lubrecht | | | | DATE: 24 th December 2004 | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

MINOR CAR 2

| | | | | | |
|---|--------------|-----------------------------|---|---------------------------------|--|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 2 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / PROJECT BOUNDARIES | | | | | |
| DETAILS OF NON-CONFORMANCE: Project boundaries are unclear due to numbering mistakes in tables and incomplete information regarding Beius. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: There is a numbering mistake in the tables mentioned. The PDD will be revised. Spatial boundaries of Oradea include substations 510, 511, 512, 513 and 514. Maps in Annex IV will be updated. List of public buildings connected to the network in Beius has been provided. SIGNED: Lars Grue COMPANY REPRESENTATIVE DATE: December 2003 | | | | | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: Minor CAR 2 has been closed out. | | | | | |
| SIGNED | | DATE: January 2004 | | | |
| AUDITOR: Marco van der Linden | | | | | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

MINOR CAR 3

| | | | | | |
|---|--------------|-----------------------------|---|---------------------------------|--|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 3 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / BASELINE | | | | | |
| DETAILS OF NON-CONFORMANCE: Choice of baseline methodology has not been motivated nor are other options discussed. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: Baseline alternatives have been discussed but are not reflected in the PDD. BAU: Energy has become expensive in comparison to development in income. Lesser demand is observed. In Oradea the secondary network has been rehabilitated and consequently losses are reduced and energy supply lowered. SIGNED: Lars Grue COMPANY REPRESENTATIVE DATE: December 2003 | | | | | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: MINOR CAR 3 has been closed out. | | | | | |
| SIGNED | | DATE: January 2004 | | | |
| AUDITOR: Marco van der Linden | | | | | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

MINOR CAR 4

| | | | | | |
|---|--------------------------|--------------------------------------|---|---------------------------------|--|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 4 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / OTHER (describe) | | | | | |
| DETAILS OF NON-CONFORMANCE: Financial analysis provides no indication that the project would not be feasible without the sale of ERUs. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: The financial analysis indicates that the project is feasible but this was also proved in former financial analysis made by German- and Icelandic consulting companies several years ago. However, the fact is that the geothermal project in Area II (Iosia area) was developed and implemented when the JI - Mechanism was introduced. Besides it is doubtful if Transgex actually could obtain the commercial loans without receiving upfront payment from trading of greenhouse gases even though the financial analyses show high economical viability. The project developer has applied the CDM Additionality Tool. SGS SIGNED: Søren Jellesø COMPANY REPRESENTATIVE DATE: October 2004 | | | | | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: The project developer has applied the CDM Additionality Tool (CDM EB 16). The additionality tool has been applied correctly and it proved that the project is additional. MINOR CAR 4 has been closed out. | | | | | |
| SIGNED | | DATE: 24 th December 2004 | | | |
| AUDITOR: Irma Lubrecht | | | | | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED NOTIFICATION | CLOSE OUT | RECOMMENDED NOTIFICATION | CLOSE OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |





CORRECTIVE ACTION REQUEST (CAR)

MAJOR CAR 5

| | | | | | |
|---|--------------|-----------------------------|---|-------------------------------------|--|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 5 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / OTHER (describe) | | | | | |
| DETAILS OF NON-CONFORMANCE: No clear provisions exist how the handle errors, uncertainties or missing data. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: | | | | | |
| These provisions will be detailed in the revised PDD. Missing data will be replaced by estimated data and actual data will be compared with these data for quality control purposes. Two methods of estimation are used for missing data and quality control have been provided | | | | | |
| SIGNED: Lars Grue | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: December 2003 | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: | | | | | |
| Final PDD has been submitted and was found to be satisfactory. MAJOR CAR 5 has been closed out. | | | | | |
| SIGNED | | | | | |
| AUDITOR: Irma Lubrecht | | | | DATE: 29 th October 2004 | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

MINOR CAR 6

| | | | | | |
|---|--------------|-----------------------------|---|---------------------------------|--|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 6 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / OTHER (describe) | | | | | |
| DETAILS OF NON-CONFORMANCE: The MP does not provide for monitoring of the discharged water temperature in Beius for if this exceeds 40°C it will have direct negative environmental impact. Also no provision for monitoring of long term effects of water discharge on the sustainability of the energy source has been described. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: | | | | | |
| The discharge temperature will be included in the monitoring plan. | | | | | |
| SIGNED: Lars Grue | | | | | |
| COMPANY REPRESENTATIVE | | | DATE: December 2003 | | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: | | | | | |
| Final PDD has been submitted and was found to be satisfactory. MINOR CAR 6 has been closed out. | | | | | |
| SIGNED | | | | | |
| AUDITOR: Irma Lubrecht | | | DATE: 29 th October 2004 | | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

MINOR CAR 7

| | | | | | |
|---|--------------------------|-----------------------------|---|---------------------------------|--|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 7 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / OTHER (describe) | | | | | |
| DETAILS OF NON-CONFORMANCE: Procedures are incomplete/lacking regarding occurrence of emergencies, maintenance of monitoring equipment, data handling. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: | | | | | |
| Emissions generated originate from the CHP plant which is controlled by a separate organisation and therefore the staff and organisation responsible for implementation and running of the geothermal based heat supply does not have any influence on the operation conditions at the CHP plant. | | | | | |
| Maintenance of monitoring equipment has been limited to heat meters as the remaining parts of the monitoring and emission calculations depend on calculations based on heat meter readings and utilisation of general running data from the CHP plant where the emissions occur. The emission calculations depending on the running conditions on CET will reflect the actual fuel consumption. | | | | | |
| The project will use standardised West European heat meters, manufactured in accordance with relevant EU norms and standards like EN 1434. The meters will be supplied with a verification certificate. If further verification is needed during the crediting period this will be a part of the final instruction. | | | | | |
| SIGNED: Lars Grue | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: December 2003 | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: | | | | | |
| MINOR CAR 7 has been closed out. | | | | | |
| SIGNED | | | | | |
| AUDITOR: Marco van der Linden | | | | DATE: January 2004 | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED NOTIFICATION | CLOSE OUT | RECOMMENDED NOTIFICATION | CLOSE OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ | 2 Weeks | 1 Month | 3 Month | | |
| RENEWAL | | | | | |



CORRECTIVE ACTION REQUEST (CAR)

MAJOR CAR 8

| | | | | | |
|--|--------------------------|-----------------------------|---|-------------------------------------|--|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 8 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / PROJECT EMISSIONS | | | | | |
| DETAILS OF NON-CONFORMANCE: It remains unclear how the peak load boilers emissions are calculated. There is no analysis on the operation of the boilers (Will they be switched off or operate constantly and how many days of the year can they be expected to operate). | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY REPRESENTATIVE: | | PROPOSED | | AUDITOR: Marco vd Linden | |
| | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: Peak load boiler emission – In annex IV calculation of emission from the Natural gas fired peak load boiler is performed. The schematic is missing a column containing data about the monthly gas consumption which will be counted on the gas meter supplied by the Natural Gas Company. Natural gas boilers will only be operated if/when the geothermal resources can not cover the heat demand and/or if maintenance on the geothermal system will be needed in the heating season. When- and for how many hours the peak load boiler will operate will be a decision taken by the operation staff. When calculating the expected emission reduction the numbers of running hours for the peak load boilers have been estimated from a conservative point of view; i.e. the numbers of running hours are expected to be less than what calculated in the PDD. | | | | | |
| SIGNED: Søren Jellesø | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: October 2004 | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: MAJOR CAR 8 has been closed out. | | | | | |
| SIGNED | | | | | |
| AUDITOR: Irma Lubrecht | | | | DATE: 29 th October 2004 | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED NOTIFICATION | CLOSE OUT | RECOMMENDED NOTIFICATION | CLOSE OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ | 2 Weeks | 1 Month | 3 Month | | |
| RENEWAL | | | | | |





CORRECTIVE ACTION REQUEST (CAR)

MINOR CAR 9

| | | | | | |
|---|--------------|-----------------------------|---|---------------------------------|--|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 9 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / OTHER (describe) | | | | | |
| DETAILS OF NON-CONFORMANCE: According to Romanian legislation environmental impact assessment (EIA) is required but no but no transboundary impact assessment. Environmental approval had still to be obtained. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: | | | | | |
| UNFCCC Focal Point in Bucharest is discussing to what extend and according to what standard an extended EIA shall be elaborated. EPA will be responsible for elaboration of the EIA. | | | | | |
| SIGNED: Lars Grue | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: December 2003 | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: | | | | | |
| MINOR CAR 9 has been closed out. | | | | | |
| SIGNED | | | | | |
| AUDITOR: Marco van der Linden | | | | DATE: January 2004 | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

MAJOR CAR 10

| | | | | | |
|--|--------------|----------------------|---|---------------------------------|---|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 10 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / PROJECT MANAGEMENT PLANNING | | | | | |
| DETAILS OF NON-CONFORMANCE: Project is still in the process of inviting comments. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: ASAP | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: The PDD has been published for consultation on the DEPA website in Denmark. on the website of the Ministry of Agriculture, Waters, Forest and Environment in Bucharest and by advertisement at the mayors office in Oradea. The public hearings in Denmark and Romania were closed 27th November 2003 and 5th December 2003 respectively and no comments were received. | | | | | |
| SIGNED: Lars Grue | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: December 2003 | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: MAJOR CAR 10 has been closed out. | | | | | |
| SIGNED | | | | | |
| AUDITOR: Marco van der Linden | | | | DATE: January 2004 | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

OBSERVATION 11

| | | | | | |
|---|--------------|------------------------------------|---|-------------------------------------|--|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 11 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / PROJECT MANAGEMENT PLANNING | | | | | |
| DETAILS OF NON-CONFORMANCE: The local utilities are responsible for management and operation of the DH and for implementation of the management system and monitoring plan. No key persons within the utilities are identified at this stage. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: First verification | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: The agreement between the municipality of Oradea and Transgex and the Emission Reduction Purchasing Agreement define the responsibilities concerning operation of the new utility company Geoterm, but no specific person including name is mentioned in the agreement. However, Transgex will perform the monitoring procedures and elaborate monitoring plans, and one person responsible for these activities has been employed by Transgex. | | | | | |
| SIGNED: Søren Jellesø | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: 18-10-2004 | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: Observation 11 has been closed out. | | | | | |
| SIGNED | | | | | |
| AUDITOR: Irma Lubrecht | | | | DATE: 29 th October 2004 | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

OBSERVATION 12

| | | | | | |
|--|--------------|------------------------------------|---|-------------------------------------|---|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 12 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / PROJECT MANAGEMENT PLANNING | | | | | |
| DETAILS OF NON-CONFORMANCE: It is suggested that the local EPA in Romania will be responsible for auditing the procedures but no formal agreement has been reached on this. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: First verification | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: The agreement between the municipality of Oradea and Transgex and the Emission Reduction Purchasing Agreement define the responsibilities concerning operation of the new utility company Geoterm, but no specific person including name is mentioned in the agreement. However, Transgex will perform the monitoring procedures and elaborate monitoring plans, and one person responsible for these activities has been employed by Transgex | | | | | |
| SIGNED: Søren Jellesø | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: 18-10-2004 | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: Observation 12 has been closed out. | | | | | |
| SIGNED | | | | | |
| AUDITOR: Irma Lubrecht | | | | DATE: 29 th October 2004 | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

OBSERVATION 13

| | | | | | |
|---|--------------|------------------------------------|---|---------------------------------|---|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 13 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / PROJECT MANAGEMENT PLANNING | | | | | |
| DETAILS OF NON-CONFORMANCE: In Beius the geothermal water will be discharged into the river. If the water temperature is higher than 40°C this will have negative environmental effects which is not allowed. If the water temperature stays below 40°C the effect is considered to be minimal. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: First verification | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: | | | | | |
| SIGNED: | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: | | | | | |
| SIGNED | | | | | |
| AUDITOR: | | | | DATE: | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |



CORRECTIVE ACTION REQUEST (CAR)

OBSERVATION 14

| | | | | | |
|--|--------------|------------------------------------|---|---------------------------------|---|
| PROJECT DEVELOPER: Grue & Hornstrup | | | | | |
| JOB NO: 6853-DK Geothermal Energy | | VISIT NO: - | | CAR NO: 14 OF 14 | |
| AUDITOR: Marco van der Linden | | | ASSESSMENT DATE: December 2003-February 2004 | | |
| COMPANY REPRESENTATIVE: Lars Grue (Grue & Hornstrup) | | | | | |
| AREA: PARTICIPATION REQUIREMENTS / STAKEHOLDER CONSULTATION / ADDITIONALITY / LEAKAGE / EIA / TRANSBOUNDARY EFFECTS / MONITORING / PROJECT MANAGEMENT PLANNING | | | | | |
| DETAILS OF NON-CONFORMANCE: Discharge of the water can be seen as mining the resources. Although the Government has approved this, reinjection would introduce a perspective of sustainability and make the energy resource renewable. | | | | | |
| SIGNED | | CAR | | SIGNED | |
| COMPANY | | PROPOSED | | AUDITOR: Marco vd Linden | |
| REPRESENTATIVE: Lars Grue | | CLOSE OUT DATE: First verification | | | |
| CORRECTIVE ACTION TAKEN TO PREVENT RECURRENCE: | | | | | |
| SIGNED: | | | | | |
| COMPANY REPRESENTATIVE | | | | DATE: | |
| ACCEPTANCE OF CORRECTIVE ACTION/COMMENTS: | | | | | |
| SIGNED | | | | | |
| AUDITOR: | | | | DATE: | |
| | MAJOR CAR | | MINOR CAR | | Observation Prior to first verification |
| | RECOMMENDED | CLOSE | RECOMMENDED | CLOSE | |
| | NOTIFICATION | OUT | NOTIFICATION | OUT Next | |
| ASSESSMENT | 1 Months | 2 Months | 3 Months | Surveillance visit | |
| SURVEILLANCE/ RENEWAL | 2 Weeks | 1 Month | 3 Month | | |