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# Verification Report

## The World Bank
## Prototype Carbon Fund

## Umbrella of Climate Change Projects in the Czech Republic

**Period of District Heating Projects:** 01/04/2004 – 31/03/2006
**Period of Small Hydro Bundle-1:** 01/04/2002 – 31/12/2004
**Period of Small Hydro Bundle-2:** 01/03/2003 – 31/12/2005

**Report No. 645780, Version 01**

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TÜV SÜD Industrie Service GmbH
Carbon Management Service
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| **Subject:** | Verification of a JI Project |
| **Executing Operational Unit:** | TÜV SÜD Industrie Service GmbH<br>Carbon Management Service<br>Westendstr. 199 – 80684 Munich - GERMANY |
| **Client:** | The World Bank<br>1818 H Street N.W.<br>Washington, D.C. 20433<br>USA |
| **Contract approved by:** | Werner Betzenbichler |
| **Report Title:** | Umbrella of Climate Change Projects in the Czech Republic<br>Period of District Heating Projects: 01/04/2004 – 31/03/2006<br>Period of Small Hydro Bundle-1: 01/04/2002 – 31/12/2004<br>Period of Small Hydro Bundle-2: 01/03/2003 – 31/12/2005 |
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Summary:

The Prototype Carbon Fund of The World Bank has commissioned the cerification body "Climate and Energy" of TÜV SÜD Industrie Service GmbH (TÜV SÜD) to verify a series of early Joint Implementation (JI) projects in the Czech Republic. The verification includes the initial verification of small hydro power (SHP) projects, their first periodic verification and the 2nd periodic verification of two the district heating (DH) projects in Rozmital and Decin. The DH projects of Decin and Rozmital had been verified in 2004 already. The umbrella of projects in the Czech Republic (CZ) can be divided in two groups: DH and SHP.

Those two groups are characterized that in the first group the emission reduction is realized by a fuel switch from coal to gas and in the second group of SHP by the renewable production of electricity which is fed into the national grid. Hence, each group is using its own baseline approach.

The verifier confirms that all sub-projects are implemented as planned and described in project design documents. Installed equipment essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is ready to generate GHG emission reductions.

The verifier also confirms that the GHG emission reduction for the whole monitoring period is calculated without material misstatements. Our opinion regards the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring plan, and its associated documents. Based on the information we have seen and evaluated we confirm the following statement:

| | | |
|---|---|---|
| Decin: | 01/04/2004 – 31/03/2005: | 23 070 t $CO_{2\text{-eq}}$ |
| Decin: | 01/04/2005 – 31/03/2006: | 22 523 t $CO_{2\text{-eq}}$ |
| Rozmital: | 01/04/2004 – 31/03/2005: | 1 249 t $CO_{2\text{-eq}}$ |
| Rozmital: | 01/04/2005 – 31/03/2006: | 1 294 t $CO_{2\text{-eq}}$ |

In total the monitoring of that renewable energy projects resulted in a emission reduction between:

| | | |
|---|---|---|
| Period of Small Hydro Bundle-1: | 01/04/2002 – 31/12/2004 | 26 819 t $CO_{2\text{-eq}}$ and |
| Period of Small Hydro Bundle-2: | 01/03/2003 – 31/12/2005 | 26 064 t $CO_{2\text{-eq}}$ |

Although the two periods are overlapping each other there is no double counting.

| Work carried out by: | Internal Quality Control by: |
|---|---|
| Markus Knödlseder (Project manager, GHG lead auditor)<br>Eva Aligerova (Lead Auditor Environmental Management Systems (ISO 14001), Local expert) | Werner Betzenbichler |

## Abbreviations

| | |
|---|---|
| CAR | Corrective Action Request |
| CDM | Clean Development Mechanism |
| CR | Clarification Request |
| CZ | Czech Republic |
| DH | District Heating () |
| DNA | Designated National Authority |
| DOE | Designated Operational Entity |
| EB | Executive Board |
| EIA / EA | Environmental Impact Assessment / Environmental Assessment |
| ER | Emission Reduction () |
| ER | Emission reduction |
| FAR | Forward Action Request |
| GHG | Greenhouse gas(es) |
| JI | Joint Implementation |
| KP | Kyoto Protocol |
| MP | Monitoring Plan |
| NGO | Non Governmental Organisation |
| PCF | Prototype Carbon Fund |
| PDD | Project Design Document |
| SHP | Small Hydro Power () |
| TÜV SÜD | TÜV SÜD Industrie Service GmbH |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VER | Verified Emission Reduction |
| VVM | Validation and Verification Manual |

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# 1 INTRODUCTION

## 1.1 Objective

The client (the Prototype Carbon Fund of The World Bank) has commissioned an independent verification by TÜV SÜD Industrie Service GmbH of series of early Joint Implementation (JI) projects in the Czech Republic. Verification is the periodic independent review and ex post determination by the Designated Operational Entity / Independent Entity of the monitored reductions in GHG emissions during the defined verification period.

The objective of verification can be divided in Initial Verification and Periodic Verification:

**Initial Verification**: The objective of an initial verification is to verify that the project is implemented as planned, to confirm that the monitoring system is in place and fully functional, and to assure that the project will generate verifiable emission reductions. A separate initial verification prior to the project entering into regular operations is not a mandatory requirement.

**Periodic Verification**: The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures de-scribed in the monitoring plan; further more the periodic verification evaluates the GHG emission reduction data and express a conclusion with a high, but not absolute, level of assurance about whether the reported GHG emission reduction data is “free” of material misstatements; and verifies the reported GHG emission data is sufficiently supported by evidence, i.e. monitoring records. If no prior initial verification has been carried out, the objective of the first periodic verification also includes the objectives of the initial verification.

The verification shall consider both quantitative and qualitative information on emission reductions. Quantitative data comprises the monitoring reports submitted to the verifier by the project entity. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

Although early credits for proposed JI activities underlie no international regulation the verification follows UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

The portfolio project is characterized by an increasing number of participating sub-projects. Sub-projects that are the first time in the verification process have to pass above mentioned Initial Verification and in case of the first periodic verification as well. For all involved sub-projects that have passed an initial verification in the past already this verification is a standard periodic verification.

## 1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Designated Operational Entity / Independent Entity of the monitored reductions in GHG emissions. The verification is based on validated project design document including baseline. These documents are reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has, based on the recommendations in the Validation and Veri-

fication Manual employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of CERs/ERUs.

The verification 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.

The Czech Energy Agency (CEA) has provided four emission reduction reports. Two about the DH projects and two about the SHP, in detail:

- The Emissions Reduction Report, 1st Payment_SHPs, summarizes the emission reductions from 01-04-2002 to 31-12-2004 and includes the sites of:
    - Hydro Františkov
    - Hydro Pátek
    - Hydro Benátky nad Jizerou
    - Hydro Smržovka-Kamenice
    - Hydro Černýš-Perštýn nad Ohří
    - Hydro Čerčany
    - Hydro Týnec nad Sázavou-Brodce

- The second report “Emissions Reduction Report, 2nd Payment_SHPs” summarizes the emission reductions from 01-01-2005 to 31-12-2005 and includes the sites of:
    - Hydro Františkov
    - Hydro Pátek
    - Hydro Benátky nad Jizerou
    - Hydro Smržovka-Kamenice
    - Hydro Černýš-Perštýn nad Ohří
    - Hydro Čerčany
    - Hydro Týnec nad Sázavou-Brodce

    and for the period of 01-04-2003 to 31-12-2005 the sites:
    - Hydro Libochovice
    - Hydro Koštice nad Ohří
    - Hydro Horky nad Jizerou
    - Hydro Děčín-Staré Město
    - Hydro Olše-Třinec

So, double counting is excluded. In parallel the site of 2006-06-28 Hydro Libočany has been verified initially.

For the two DH projects in Rožmitál and Děčín, CEA has submitted the monitored data in a Excel-file and the belonging reports:

- Emissions Reduction Report (for DH Decin & Rozmital) *2nd Monitoring period April 1st, 2004 – March 31st 2005, and*
- Emissions Reduction Report (for DH Decin & Rozmital) *3rd Monitoring period April 1st, 2005 – March 31st, 2006*

Studying the existing documentation belonging to this project, it was obvious that the competence and capability of the validation team has to cover at least the following aspects; according to these requirements TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV certification body “climate and energy”:

- Knowledge of Kyoto Protocol and the Marrakech Accords (Knödlseder)
- Environmental and Social Impact Assessment (Knödlseder)
- Skills in environmental auditing (Knödlseder/Aligerova)

- Quality assurance (Knödlseder/Aligerova)
- Technical aspects of biomass utilization for energy production and district heating (Knödlseder)
- Monitoring concepts (Knödlseder)
- Political, economical and technical random conditions in host country (Aligerova)

In order to have an internal quality control of the project, a team of the following persons has been composed by the certification body “climate and energy”:

Werner Betzenbichler (head certification body “climate and energy”)

## 1.3 GHG Project Description

The Prototype Carbon Fund (PCF) signed a Host Country Agreement and an Emissions Purchase Agreement with the Czech Republic in 2003 to formalize the terms under which carbon emission reductions will be purchased. The thrust of the PCF umbrella project is to add carbon-based support to projects that are currently being considered by the Czech Energy Agency (CEA) and the State Environmental Fund (SEF).

The Umbrella Project Idea is use the network of those agencies for screening and aggregating of projects that individually would lie below practical PCF limits of discovery. The PCF project for the Czech Republic has narrowed its focus to district heating, renewable energy and hospital efficiency projects.

The flagship projects are the Rozmital and Decin district heating projects. Generalized baselines for district heating projects and campus energy efficiency projects have also been prepared to provide replicable methodology for other comparable projects. Hence, the two flagship projects have been verified in 2004 already. According to the umbrella idea the above hydro projects entered the portfolio at different times depending on their implementation.

The district heating projects are characterized by a fuel switch from carbon intensive fuels like coal to less carbon intensive fuels like natural gas. The switch of technology came along with an improved efficiency as well. Both effects result in a reduction of carbon dioxide.

The hydro power projects are characterized by a refurbishment of old small hydro power plants. Some power plant could raise their capacity and efficiency a little bit or the old partly broken equipment was replaced for generating renewable electricity. According to the elaborated baseline study for determining a grid factor, the produced electricity substitutes electricity from conventional power plants.

For all types of projects the PCF developed individual baseline studies and calculation approaches that have been determined by Det Norske Veritas (DNV).

# 2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual (for further information see www.vvmanual.info), an initiative of Designated Operational Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a verification protocol was customised for the project, according to the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM/JI project is expected to meet;
- It ensures a transparent validation process where the verifier will document how a particular requirement has been proved and the result of the verification.

The verification protocol consists of four tables. The different columns in these tables are described in Figure 1. The checklist for initial Verification has been used as well for increasing transparency.

The completed protocol is enclosed in Annex 1 to this report.

| Initial Verification Checklist – table 1 | | | |
|---|---|---|---|
| OBJECTIVE | Ref. | COMMENTS | Concl.(incl FARs/CARs) |
| The requirements the project must meet. | Gives reference to the legislation or agreement where the requirement is found. | Description of circumstances and further commendation to the conclusion. | This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications |

| Periodic Verification Checklist<br>Table 1: Data Management System/Controls | | |
|---|---|---|
| Expectations for GHG data management system/controls | Score | Verifiers Comments (including Forward Action Requests) |
| The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table. | A score is assigned as follows:<br>Full — all best-practice expectations are implemented.<br>Partial — a proportion of the best practice expectations is implemented<br>Limited — this should be given if little or none of the system component is in place. | Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications |

| Periodic Verification Checklist<br>Table 2: GHG calculation procedures and management control testing |
|---|

| Identification of potential reporting risk | Identification, assessment and testing of management controls | Areas of residual risks |
|---|---|---|
| Identification of potential reporting risks based on an assessment of the emission estimation procedures.<br>Identification of key source data. Focus on those risks that impact the accuracy, completeness and consistency of the reported data. | Identification of the key controls for each area with potential reporting risks. Assessment of adequacy of the key controls and eventually test that the key controls are actually in operation.<br>Internal controls include, Understanding of responsibilities and roles,<br>Reporting, reviewing and formal management approval of data;<br>Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc. | Identification of areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks<br>Areas where data accuracy, completeness and consistency could be improved are highlighted. |

| Periodic Verification Checklist<br>Table 3: Detailed audit testing of residual risk areas and random testing | | |
|---|---|---|
| Areas of residual risks | Additional verification testing performed | Conclusions and Areas Requiring Improvement (including FARs) |
| List of residual areas of risks of Periodic Verification Checklist Table 2 where detailed audit testing is necessary.<br>In addition, other material areas may be selected for detailed audit testing. | The additional verification testing performed is described. Testing may include:<br>Sample cross checking of manual transfers of data<br>Recalculation<br>Spreadsheet 'walk throughs' to check links and equations<br>Inspection of calibration and maintenance records for key equipment<br>Check sampling analysis results<br>Discussions with process engineers who have detailed knowledge of process uncertainty/error bands. | Having investigated the residual risks, the conclusions are noted here. Errors and uncertainties are highlighted. |

Figure 1 Verification Protocol Tables

## 2.1 Review of Documents

The project design document submitted by the Client and additional background documents related to the project design and baseline were reviewed. A complete list of all documents reviewed is attached as annex 2 to this report.

## 2.2 Follow-up Interviews

In the period of June 21 to July 7, 2006 TÜV SÜD performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of subproject owners and CEA were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

| Interviewed organisation | Interview topics |
|---|---|
| CEA | Project design<br>Technical equipment and operation<br>Crediting period<br>Monitoring plan<br>Monitored data<br>Implementation of management system<br>Environmental impacts<br>Compliance with national laws and regulations |
| Project sites | Technical equipment and operation<br>Monitored data<br>Sustainable development issues<br>Environmental impacts<br>Compliance with national laws and regulations |

## 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which needed to be clarified for TÜV SÜD`s positive conclusion on the project design. The Corrective Action Requests, Clarification Requests and raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. Forward Action Requests are indicated issues which do not effect the generation of emission reduction in the verified period, but shall be improved in order to ensure the reliability of future data. To guarantee the transparency of the verification process, the concerns raised and responses that have been given are summarised in chapter 3 below and documented in more detail in the verification protocol in annex 1.

# 3 VERIFICATION FINDINGS

In the following sections the findings of the verification are stated. The verification findings for each verification subject are presented as follows:

- The findings from the desk review of the final project design document and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Verification Protocol in annex 1.
- Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in annex 1. The verification of the project resulted in Corrective Action Request (CAR) a/o Clarification Requests (CR).
- Where Clarification or Corrective Action Requests have been issued, the exchanges between the Client and TÜV SÜD to resolve these Clarification or Corrective Action Requests are summarised.

In the context of Forward Action Requests (FAR), risks have been identified, which may endanger the delivery of high quality CERs in the future, i.e. by deviations from standard procedures as defined by the MP. As a consequence, such aspects should receive a special focus during the next consecutive verification. A FAR may originate from lack of data sustaining claimed emission reductions. Forward Action Requests are understood as recommendation for future project monitoring; they are stated, where applicable, in the following sections and are further documented in the Verification Protocol in annex 1. The verification of the project resulted in five Forward Action Requests.

The final conclusions for verification subject are presented.

The verification findings relate to the project design as documented and described in the final project design documentation.

# 4 INITIAL VERIFICATION FINDINGS

Since the hydro power plants have been verified the first time chapter 4 of this report is focussing initial verification aspects also.

## 4.1 Open issues indicated in determination report

### 4.1.1 Discussion

DNV performed in 2003 several determinations: on the one hand DNV assessed the general baseline and monitoring studies for the different types of projects, on the other hand DNV assessed each project specific baseline study. No missing steps can be identified. Furthermore there is no intension at the project participants to register the projects under JI track two.

### 4.1.2 Finding

Clarification Request 1:

As far as the used methodology for determining the grid factor in the SHP projects is not explicitly accepted by the host country and investor country and underlying data are not evidenced clearly and transparently verification is not possible. The acceptance should refer clearly to the approach, to the used electronic workbook and to if two different grid factors shall be used.

### 4.1.3 Conclusion

*Based on the given confirmation from the PCF no risks are identifiable.* Further quantitative verifications will be based on that confirmation.

## 4.2 Implementation of the project

### 4.2.1 Discussion

Regarding the SHP the team visited all sites to be sure that the hydro plants have been installed. The project boundaries are in compliance with validated PDD and baseline studies.

Required monitoring equipments have been installed and operated appropriately. Needed data are based on gauged meters which are also relevant for economic and for tax reasons. Therefore the verification team considers that data requirements are resulting in high quality data and therefore uncertainties should be of a negligible scale. Quality assurance and calibration of relevant meters are in compliance with national law. All equipments are sealed. Furthermore, at the SHP projects the meters belong to electricity distribution companies who buy the electricity. As long as following this legal requirements it can be expected for future operation that no significant findings will be occur.

Regarding the SHP projects the data acquisition is based on the invoices from CEZ following the monitoring plan, only. The Czech grid factor is calculated by CEA according to elaborated and validated methodology.

At the SHP projects the only responsible person is the project owner itself. Against the background of those it seems not to be necessary to implement documented instructions, since all duties are ruled in the contract between CEA and participating owners.

### 4.2.2 Finding

Corrective Action Request 1:

The submitted emission reduction report repeats only given statements of the Baseline Studies; however the onsite visit identified that the real installation is different regarding capacities. The emission reduction report has to be adjusted according to the real situation.

### 4.2.3 Conclusion

The originally submitted emission reduction reports have been updated and reflect the reality.

## 4.3 Internal Data

As mentioned above internal data in SHP projects is only the purchased electricity. The source is the issued invoice of the distribution companies.

In the project of Rozmital following the monitoring plan internal data is:

- natural gas consumption
- heat supply ex plant
- heat consumption of all customers

All parameters are measured directly by calibrated meters.

In the district heating project of Decin acquired data are measured directly and continuously. Factors for determination of baseline emissions are fixed and validated.

### 4.3.1 Finding

None

### 4.3.2 Conclusion

The measuring equipment is calibrated regularly and the data is secured very frequently. The different measurements are connected by some physical relationship which can be used to reproduce missing or faulty data. The audit did not identify a need for recalculation of the customers heat invoice. Nevertheless, that aspect should be considered, because an identified reporting risk could be the correction of heat consumption for single users and their annual recalculation of the heat invoice at the end of the year.

The relevant internal data that have to be used are only view and well documented. The verification team can not identify general significant risks of using those.

## 4.4 External Data

The district heating projects do not need external data.

However the determination of the grid factor can be considered as an external data. For determination of the Czech grid factor a baseline study was established. The verification team confirms the correct application of the methodology, but the verification team points out serious concerns regarding the methodology. The concerns are based on the fact that

- the used methodology has not been approved,
- only coal and gas power plants seems to be considered,

- grid losses are considered in a non retraceable manner,
- electricity from renewable sources seems not to be considered,
- imports and exports are not considered regarding their specific emissions,
- the grid factor according to the official nominated institute for the national grid factor is significantly lower.

Regarding the use and handling external data a special need for emergency procedures can not be identified so far.

### 4.4.1 Finding

Clarification Request 1:

As far as the used methodology for determining the grid factor in the SHP projects is not explicitly accepted by the host country and investor country and underlying data are not evidenced clearly and transparently verification is not possible. The acceptance should refer clearly to the approach, to the used electronic workbook and to if two different grid factors shall be used.

Clarification Request 2

The access to the data which are necessary for determination of the grid factor is given. However, CEA shall document the way of data gathering.

Clarification Request 3:

In case that the chosen approach is accepted by all parties, CEA is requested to estimate the total conservative uncertainty of the approach considering the used raw data.

### 4.4.2 Conclusion

Due to given confirmation from PCF /Ref. 28/ clarification Request 1, 3 are considered as solved.

The access to relevant data requested for clearance above was described in an interview on October 24, 2006 at CEA office with Mr. Fiala. He gets the required data directly from mentioned source. The sources it self the approach of use is described in each SHP workbook at the beginning. No further clarification seems to be needed.

Regarding the open issue the verification would like recommend following

Forward Action Request 1:

The grid factor is calculated by Mr. Fiala using the elaborated workbook. However, no quality assurance system could be identified. The verification team recommends a data management and processing system. Such system shall also include double check procedures. All procedures have to be documented clearly and submitted to the verification team before closing this verification.

## 4.5 Environmental and Social Indicators

### 4.5.1 Discussion

The district heating projects have no adverse environmental or social effects.

At the SHP projects were built in places where old hydro plants had already existed before. Hence, the implementations seem not cause adverse impacts. The issued licences demonstrate that the projects are also in line with national environmental regulations.

### 4.5.2 Findings

None

### 4.5.3 Conclusion

CEA refers to the operational licences which include an environmental assessment by the responsible authority. Although the verification team agrees in that argument unexpected situations of adverse environmental or social impacts could occur without recognition of responsible authorities. Hence, it shall be part of verification to check that criteria.

## 4.6 Management and Operational System

### 4.6.1 Discussion

On the level of the sub-projects the operational system and management system is either documented in an appropriate manner or structures a quite simple.

However, given the amount of sub-projects that have to be handled and the determination of the grid factors it seems to be necessary to establish a structured and documented system. As mentioned above the documentation of quality assurance issues are not developed at CEA. Procedures have to be elaborated and established.

### 4.6.2 Findings

Regarding operational and management system no serious findings could be identified in that verification. As far as above system has not been implemented the verification team reasons that the projects have a potential risk in producing not valuable ERs.

### 4.6.3 Conclusion

Forward Action Request 2

Beyond already mentioned missing documentation regarding grid factor determination, CEA shall establish a quality assurance system to ensure high quality project management of all sub-projects. The beginning of the umbrella project managing only two sites (Rozmital and Decin) was quite simple, however managing up to 17 sites is more challenging, hence the verification team request to establish documented project management and quality assurance system.

At the moment only Mr. Fiala is responsible at CEA. He is involved from the beginning and his qualification is sufficient. However, the requested documentation in 7.1 should include the aspects of:

- qualification and training,
- responsibilities
- emergency procedures
- data archiving
- monitoring reporting

- project internal audits and reviews

Such reviews have to be documented like already requested by DNV.

## 4.7 Verification Opinion: Initial Verification

The acceptance of used approach of determining the Czech grid factor by all involved parties is clear to the verification team. This verification and future verification will be based on the developed baseline and monitoring methodology which have been agreed by involved project participants.

Potential inherent uncertainties resulting from used data source are considered as zero for determining the grid factor is considered as reliable and consistent.

In combination with the implementation of an environmental or social monitoring system the verification team recommends the implementation of a quality assurance system as have been demanded already in the previous determination.

# 5 PERIODIC VERIFICATION FINDINGS

The chapter of periodic verification findings includes the DH projects as well as the SHP projects. This part considers more the concrete data gathering and ER calculation.

## 5.1 Remaining Issues / FARs from Previous Verification

### 5.1.1 Discussion

The SHP projects have been verified the first time, so there is no open FAR from previous verifications.

In contrary to them the two DH projects have been verified the second time, now.

- In the previous verification the verification team recommended to document relevant procedures at Decin district heating project. The project owner submitted within this verification the completed instruction being documented in special CO2-manual. At Decin Themo s.r.o the responsibilities are defined within the elaborated manual and company internal structure. Hence, the FAR can be considered as solved.
- At Rozmital the verification team had recommended to implement instructions regarding reporting, data processing and responsibilities. The involved staffs seems to be well experienced, instructions are given directly by the responsible major.

  However, during last verification of the district heating project of Rozmital the verification team identified a lack of information about responsibilities. Since this issue has not been solved yet, the mentioned FAR is converted to a CAR of this verification.
- For Decin DH the verification team in the previous verification identified the risk about electricity measurement:

  "…Decin monitoring plan addresses in chapter 3.2, page 5, that a special calculation has to be done in cases where electricity production is less than 90% of electric use. Given that the operator uses just a meter that measures only net production or net consumption, it is not possible to identify the trigger barrier."

  Since this issue has not been solved yet, the mentioned FAR is converted to a CAR of this verification.

### 5.1.2 Finding

Corrective Action Request 2

Neither in a submitted emission reduction report nor during the onsite visit the responsibilities are documented. Since this issue was already requested in the previous verification as a Forward Action Request the project coordinator (CEA) is asked to close that open issue within this verification.

Clarification Request 4:

The project coordinator of CEA is requested to demonstrate that the risk about electricity measurement expressed as FAR is solved.

### 5.1.3 Conclusion

The requested documentation of responsibilities of Rozmital has been submitted.

The last three years indicate that the risk of more consumption than produced electricity over a whole year by the co-generators is more theoretical. However monthly reported data indicates that Termo Decin s.r.o. is able to address such consumption, its correct consideration in the emission reduction calculation is in the responsibility of CEA. Based on the experience from the last years the concern addressed as a FAR in the first verification is not reasonable. It is considered as resolved.

## 5.2 Project Implementation / changes

### 5.2.1 Discussion

The physical components of the both heating project at Decin and Rozmital had been assessed and confirmed during the previous verification. Hence, for those teams the team confirms referring to the interviews with responsible person that no changes have been performed. Regarding the sub-projects that had been verified already like Rozmital and Decin district heating changes in the monitoring plan are not identified.

### 5.2.2 Findings

Beyond CAR 1 mentioned in chapter 4.2.2 no further findings could be identified.

### 5.2.3 Conclusion

The originally submitted emission reduction reports have been updated and reflect the reality.

## 5.3 Completeness of Monitoring

### 5.3.1 Discussion

Monitoring of data covers all aspects of data measuring, processing and collecting. The focus is on completeness, accuracy and consistency. The accuracy and calibration has been checked onsite at the meters. According to check law the calibration is valid for 4 years. A calibration stamp on each meter addressing the year of calibration serves as an evidence of calibration.

Furthermore the Czech law requires the use of metering equipment with an accuracy class of 2 meaning an accuracy of +- 2%.

For the DH projects the verification team confirms that the used method follows the validated method considering the real heat production.

Reported relevant GHG key parameters are subject of different cross checks in the company. The manual transfer to the electronic workbook for GHG reporting is checked by the verification team. The produced electricity was checked by invoices as well.

The agreement between the Czech Republic and the PCF is based on that assessment saying that for all SHP the baseline situation is the not-production due to different circumstances. The determination performed and documented by DNV assessed the additionality and baseline.

Based on the confirmation from PCF the methodology shall not consider historic baseline production of electricity in the SHPs. Furthermore and according to common agreed monitoring plan at the SHPs only sold and invoiced electricity has to be considered, any potential electricity consumption (that is usually about 0,3 % of produced) shall not be considered.

The identification of key parameters is not considered as critical in the sub-projects of Rozmital and SHPs.

### 5.3.2 Findings

None

### 5.3.3 Conclusion

This approach has been applied correctly.

## 5.4 Accuracy of Emission Reduction Calculations

### 5.4.1 Discussion

For the DH projects the key parameters of project emissions are measured. Used default data are clearly validated by DNV.

For SHPs see above in chapter 4 (CR3): Regarding the SHP projects the main estimate is related to the grid factor. As mentioned above the estimation is based on the used methodology and the raw input data. On the one hand the project participants expressed their acceptance of the used approach, since the verification team concerns that the methodology result in an over-estimation, on the other hand the source of the raw data used to estimate the grid factor are referenced.

At the DH projects on the level of the sub-projects are several review procedures implemented. Regarding the SHP projects the need for exhausting reviews can be limited since the only relevant parameter comes from the invoices of sold electricity. However on the level of CEA and as mentioned already in the initial verification protocol above there is a need to implement a system for internal checks and reviews, see FAR 1 & 2 in chapter 4 above.

The performance of internal validations and verifications is in the responsibility of CEA as the central project coordinator. As stated above and in the initial verification protocol the implementation of such procedures will improved the reliability of reported data significantly, see FAR 2 in chapter 4 above.

Special data protection systems seem not be necessary. All data are available at the level of sub-projects as a hardcopy. The central IT system for reporting are MS-Excel based workbooks for the sub-projects and also CEA is using MS-Office software.

Decin DH is using obviously power plant control software to gather their data. In opposite to that professional approach Rozmital is using Excel as well for managing their heat purchase and heat production and gas consumption monitoring. Since DH Rozmital is much smaller than DH Decin the chosen approach is appropriate. At the SHP sites there is actually no IT system necessary, because the only relevant data is from the invoice of the distribution company that buys the electricity.

### 5.4.2 Findings

Further findings beyond those that have been mentioned already in above paragraphs are not identified.

### 5.4.3 Conclusion

As described and agreed above the methodology refers to invoiced electricity and potential inherent uncertainties from the data sources for determining the grid factor shall not be considered. Based on that simplification and considering that calibration of all relevant meters has been performed by Czech official institution the verification team can confirm that reported data re without material misstatements.

## 5.5 Quality of Evidence to Determine Emission Reductions

### 5.5.1 Discussion

As indicated several times in previous paragraphs the quality assurance and quality of submitted data that come from the level of sub-projects are characterized by a high quality.

### 5.5.2 Findings

Further findings beyond those that have been mentioned already in above paragraphs are not identified.

### 5.5.3 Conclusion

A final conclusion regarding the “Quality of Evidence to Determine Emission Reductions” can not be addressed as far as open aspects are not closed.

## 5.6 Management System and Quality Assurance

### 5.6.1 Discussion

The Management System at the level of CEA has to be improved significantly until the next verification addressed in the FARs 1 and 2.

### 5.6.2 Findings

None

### 5.6.3 Conclusion

Recommendations improving the quality management system are given in above paragraphs. Repeated here:

Forward Action Request 1:

The grid factor is calculated by Mr. Fiala using the elaborated workbook. However, no quality assurance system could be identified. The verification team recommends a data management and processing system. Such system shall also include double check procedures. All procedures have to be documented clearly and submitted to the verification team before closing this verification.

Forward Action Request 2

Beyond already mentioned missing documentation regarding grid factor determination, CEA shall establish a quality assurance system to ensure high quality project management of all sub-projects. The beginning of the umbrella project managing only two sites (Rozmital and Decin) was quite simple, however managing up to 17 sites is more challenging, hence the verification team request to establish documented project management and quality assurance system.

At the moment only Mr. Fiala is responsible at CEA. He is involved from the beginning and his qualification is well. However, the requested documentation in 7.1 should include the aspects of:

- qualification and training,
- responsibilities

- emergency procedures
- data archiving
- monitoring reporting
- project internal audits and reviews

Such reviews have to be documented like already requested by DNV.

## 5.7 Verification Opinion: Periodic Verification

The acceptance of used approach of determining the Czech grid factor by all involved parties is clear to the verification team. Based on the acceptance of the approach and the inherent uncertainties the verification team can confirm the correct application of agreed methodologies.

Potential inherent uncertainties resulting from used data source are considered as zero for determining the grid factor is considered as reliable and consistent. Submitted reports are without material misstatements.

In combination with the implementation of an environmental or social monitoring system the verification team recommends the implementation of a quality assurance system as have been demanded already in the previous determination.

# 6 PROJECT SCORECARD

| Risk Areas | | Conclusions | | | Summary of findings and comments |
|---|---|---|---|---|---|
| | | Baseline Emissions | Project Emissions | Emission Reductions | |
| Completeness | Source coverage/ boundary definition | ☑ | ☑ | ☑ | Agreed sources have been considered correctly. |
| Accuracy | Physical Measurement and Analysis | ☑ | ☑ | ☑ | Can be confirmed |
| | Data calculations | ☑ | ☑ | ☑ | The agreed methodology and following calculations have been used correctly |
| | Data management & reporting | (▼) | (▼) | (▼) | The data management & reporting system needs to be improved at the level of CEA as demanded in the stated FARs 1 and 2. |
| Consistency | Changes in the project | ☑ | ☑ | ☑ | The updated emission reduction reports do consider projects changes correctly. |

Industrie Service

# 7 VERIFICATION OPINION

The Prototype Carbon Fund of The World Bank has commissioned the cerification body "Climate and Energy" of TÜV SÜD Industrie Service GmbH (TÜV SÜD) to verify a series of early Joint Implementation (JI) projects in the Czech Republic. The verification includes the initial verification of small hydro power (SHP) projects, their first periodic verification and the 2nd periodic verification of two the district heating (DH) projects in Rozmital and Decin. The DH projects of Decin and Rozmital had been verified in 2004 already. The umbrella of projects in the Czech Republic (CZ) can be divided in two groups: DH and SHP.

The verifier confirms that the project is implemented as planned and described in validated and registered project design documents. Deviations in installed capacities are not significant. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately.

An eligible monitoring system is in place and the project is ready to generate GHG emission reductions. Further quality assurance procedures shall be elaborated and implemented; further details are addressed in the report and its annexes.

Possible negative as well as positive environmental and social impacts are not addressed detailed in the report, however significant negative impacts are not identifiable.

Those two groups are characterized that in the first group the emission reduction is realized by a fuel switch from coal to gas and in the second group of SHP by the renewable production of electricity which fed into the national grid.

The verifier also confirms that the GHG emission reduction for the whole monitoring period is calculated without material misstatements. Our opinion regards the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring plan, and its associated documents. Based on the information we have seen and evaluated we confirm the following statement:

Decin 01/04/2004 – 31/03/2005: 23 070 t $CO_{2\text{-eq}}$

Decin 01/04/2005 – 31/03/2006: 22 523 t $CO_{2\text{-eq}}$

Rozmital 01/04/2004 – 31/03/2005: 1 249 t $CO_{2\text{-eq}}$

Rozmital 01/04/2005 – 31/03/2006: 1 294 t $CO_{2\text{-eq}}$

In total the monitoring of that renewable energy projects resulted in a emission reduction between:

Period of Small Hydro Bundle-1: 01/04/2002 – 31/12/2004 26 819 t $CO_{2\text{-eq}}$ and

Period of Small Hydro Bundle-2: 01/03/2003 – 31/12/2005 26 064 t $CO_{2\text{-eq}}$

Although the two periods are overlapping each other there is no double counting.

Munich, 28/11/2006

Werner Betzenbichler

Head of certification body "climate and energy"

Munich, 28/11/2006

Markus Knödlseder

Project Manager

Industrie Service

# Annex 1: Verification Protocol

# 1 INITIAL VERIFICATION CHECKLIST – TABLE 1

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| **1. Opening Session** | | | |
| **1.1. Introduction to audits** | 1, 2 | The audits were conducted onsite covering locations as following:<br>2006-06-22 Hydro Libochovice<br>2006-06-22 Hydro Pátek<br>2006-06-22 Hydro Koštice nad Ohří<br>2006-06-23 District Heating Rožmitál<br>2006-06-23 Hydro Františkov<br>2006-06-26 Hydro Benátky nad Jizerou<br>2006-06-26 Hydro Horky nad Jizerou<br>2006-06-27 Hydro Smržovka-Kamenice<br>2006-06-27 District Heating Děčín<br>2006-06-28 Hydro Děčín-Staré Město | ☑ |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| | | 2006-06-28 Hydro Černýš-Perštýn nad Ohří<br>2006-06-28 Hydro Libočany (initial.)<br>2006-06-29 Hydro Čerčany<br>2006-07-11 Hydro Olše-Třinec<br>2006-07-16 Hydro Týnec nad Sázavou-Brodce | |
| **1.2. Clarification of access to data archives, records, plans, drawings etc.** | 1, 2 | At all sites as mentioned above allowed unlimited access to the facilities and necessary documents. | ☑ |
| **1.3. Contractors for equipment and installation works** | 1, 2, 19, 20 | General developers regarding the small hydro projects are the owners itself as listed in annex 4. The electricity meters belong to the Czech electricity and distribution company ČEZ a.s.<br>General developer for the Decin district heat project is MVV Energie CZ and Termo Decin a.s.<br>In the district heat project the contractual situation is equal to the first verification:<br>Maintenance Company: Regotherm from Rokycany<br>Automatic controls: Pihera from Chomutov<br>Operator and owner: Municipality of Rožmitál pod Třemšinem | ☑ |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| **1.4. Actual status of installation works** | 2 | The verification team confirms that at the time of onsite visits all installations were installed properly and able for full operation. | ☑ |
| ***2. Open issues indicated in validation report*** | | | |
| **2.1. Missing steps to final approval** | 3 - 6 | Based on the validation report the verification team identified no missing steps.<br>Against the background that an international registry for JI-projects and the JI-Supervisory Board has not been installed yet, no missing steps can be identified. | ☑ |
| ***3. Implementation of the project*** | | | |
| **3.1. Physical components** | 2 | The physical components of the both heating project at Decin and Rozmital had been assessed and confirmed during the previous verification. Hence, for those teams the team confirms referring to the interviews with responsible person that no changes have been performed.<br>Regarding the SHP the team visited all sites to be sure that the hydro plants have been installed.<br>During onsite visits identified the need to correct the submitted Monitoring report: | ☑ |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| | | Corrective Action Request 1:<br>The submitted emission reduction report repeats only given statements of the baseline Study; however the onsite visit identified that the real installation is different regarding installed capacities. The emission reduction report has to be adjusted according to the real situation.<br>An Updated emission reports have been submitted, hence the issue is considered as solved. | |
| **3.2. Project boundaries** | 2, 21 | The project boundaries are in compliance with validated PDD and baseline studies. | ☑ |
| **3.3. Monitoring and metering systems** | 2 | Required monitoring equipments have been installed and operated appropriately. | ☑ |
| **3.4. Data uncertainty** | 2, 19 | Needed data are based on gauged meters which are also relevant for economic and for tax reasons. Therefore the verification team considers that data requirements are resulting in high quality data and therefore uncertainties should be of a negligible scale. | ☑ |
| **3.5. Calibration and quality assurance** | 2, 19 | Quality assurance and calibration of relevant meters are in compliance with national law. All equipments are sealed. Furthermore, at the SHP projects the meters belong to CEZ who is buying the electricity.<br>As long as following this legal requirements it can be expected for future operation that no significant findings will be occur. | ☑ |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| **3.6. Data acquisition and data processing systems** | 2 | The data acquisition procedures in the district heating projects of Decin and Rozmital have not changed.<br>Regarding the SHP projects the data acquisition is based on the invoices from CEZ following the monitoring plan, only. | ☑ |
| **3.7. Reporting procedures** | 2 | The reporting procedures in the district heating projects have not changed.<br>For the SHP projects the reporting is based only on invoices. The Czech grid factor is calculated by CEA according to elaborated and validated methodology. | ☑ |
| **3.8. Documented instructions** | 2, 21 | In the previous verification the verification team recommended to document relevant procedures at Decin district heating project. The project owner submitted within this verification the completed instruction being documented in a special CO2-manual.<br>At Rozmital the verification team had recommended to implement instructions regarding reporting, data processing and responsibilities. The involved staff seems to be well experienced, instructions are given directly by the responsible major.<br>At the SHP projects the only responsible person is the project owner itself. Against the background of those it seems not to be necessary to implement documented instructions, since all duties are ruled in the contract between CEA and participating owners. | ☑ |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| **3.9. Qualification and training** | 2, 21 | The competences of involved staff and responsible persons ensure an appropriate quality of data.<br>At Rozmital the former verification team suggested to document trainings relating to the JI-project of staff. Since the employees have not changed since last verification and those person are familiar with procedures training has not been performed. | ☑ |
| **3.10. Responsibilities** | 2, 20, 21 | At Decin Themo s.r.o the responsibilities are defined within the elaborated manual and company internal structure. At the SHP projects the only involved and therefore responsible person is the hydro plant owner himself.<br>However, during last verification of the district heating project of Rozmital the verification team identified a lack of information about responsibilities.<br><u>Corrective Action Request 2</u><br>Neither in the submitted emission reduction report nor during the onsite visit the responsibilities are documented. Since this issue was already requested in the previous verification as a Forward Action Request the project owner (CEA) is asked to close that open issue within this verification.<br>The requested documentation of responsibilities has been submitted after the onsite visits additional, so the issue is considered as resolved finally. | ☑ |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| **3.11. Troubleshooting procedures** | 2, 21 | The submitted manual from Decin Thermo s.r.o describes trouble shooting procedures. Also, Rozmital has procedures that allow reproducing relevant data, as mentioned in previous verification.<br>At the SHP projects special trouble shooting procedures seems not to be relevant since the relevant source is the issued invoice from CEZ. | ☑ |
| ***4. Internal Data*** | | | |
| **4.1. Type and sources of internal data** | 2, 18, 19, 21 | As mentioned above internal data in SHP projects is only the purchased electricity. The source is the issued invoice of CEZ.<br>In the project of Rozmital following the monitoring plan internal data is::<br>• natural gas consumption<br>• heat supply ex plant<br>• heat consumption of all customers<br>All parameters are measured directly by calibrated meters.<br>In the district heating project of Decin acquired data are measured directly and continuously. Factors for determination of baseline emissions are fixed and validated. | ☑ |
| **4.2. Data collection** | 2, 21 | Internal data are gathered locally at the sub-projects and reported to CEA that prepares the final monitoring report. See also point 3.6. | ☑ |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| **4.3. Quality assurance** | 2, 21 | Information from sub-projects to CEA is provided by fix responsible persons, for instance the SHP owner. On demand CEA ask for sending invoices or further information. CEA conduct plausibility assessments based on its experience of energy auditing. | ☑ |
| **4.4. Significance and reporting risks** | | The measuring equipment is calibrated regularly and the data is secured very frequently. The different measurements are connected by some physical relationship which can be used to reproduce missing or faulty data.<br>The audit did not identify a need for recalculation of the customers heat invoice. Nevertheless, that aspect should be considered, because an identified reporting risk could be the correction of heat consumption for single users and their annual recalculation of the heat invoice at the end of the year. | ☑ |
| ***5. External Data*** | | | |
| **5.1. Type and sources of external data** | 3 - 13, 21, 24 - 27 | The district heating projects do not need external data.<br>However the determination of the grid factor can be considered as an external data. For determination of the Czech grid factor a baseline study was established. The verification team confirms the correct application of the methodology, but the verification team points out serious concerns regarding the methodology. The concerns are based on the fact that | ☑ |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| | | • the used methodology has not been approved,<br>• only coal and gas power plants seems to be considered,<br>• grid losses are considered in a non retraceable manner,<br>• electricity from renewable sources seems not to be considered,<br>• imports and exports are not considered regarding their specific emissions,<br>• the grid factor according to the official nominated institute for the national grid factor is significantly lower.<br>• Moreover, there seems to be a strong inconsistency between the SHP projects and the DH projects. For estimating the project and baseline emissions in the DH Decin project the factor of 0,38 t(CO2)/MWhel is fixed in a project specific baseline study, but for the SHP projects and following the established methodology for those the factor is about 1,1 t(CO2)/MWhel.<br><u>Clarification Request 1:</u><br>As far as the used methodology for determining the grid factor in the SHP projects is not explicitly accepted by the host country and investor country and underlying data are not evidenced clearly a transparently verification is not possible. The acceptance should refer clearly to the approach, to | |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| | | the used electronic workbook.<br>The PCF confirmed in its e-mail /Ref. 28/ the used approach. Based on the given confirmation the issue is considered as solved. | |
| **5.2. Access to external data** | 21 | Clarification Request 2<br>The access to the data which are necessary for determination of the grid factor is given. However, CEA shall document the way of data gathering.<br>Only sources as stated in appropriate workbooks (Ref. 21) has been used. The data are asked directly from them. Further documentation is given at each workbook. *The given introduction at each workbook is well documented, hence the CR is considered as solved.* | ☑ |
| **5.3. Quality assurance** | 21 | The grid factor is calculated by Mr. Fiala using the elaborated workbook. No documented quality assurance system could be identified.<br>Forward Action Request 1:<br>In case that all involved project participants agree to the chosen approach the verification team is convinced that a data management and processing system is required. Such system shall also include double check procedures. All procedure have to be documented clearly and submitted to the verification team before closing this verification | FAR 1 |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| **5.4. Data uncertainty** | 21, 3 - 13 | Clarification Request 3:<br>In case that the chosen approach is accepted by all parties (see CR 2), CEA is requested to estimate the total conservative uncertainty of the approach considering the used raw data.<br>The sources from where CEA gets relevant data to determine the grid factor can be considered as official. Based on the given confirmation from the PCF (Ref. 28), the PCF agrees with that. Thus such data has not to be validated or verified. From there external reported data as defined in the workbooks are considered without martial uncertainties that need to be considered in particular. | ☑ |
| **5.5. Emergency procedures** | 1, 2 | Regarding the use and handling external data a special need for emergency procedures can not be identified so far. | ☑ |
| ***6. Environmental and Social Indicators*** | | | |
| **6.1. Implementation of measures** | 2, 17 | The district heating projects have no adverse environmental or social effects.<br>At the SHP projects were built in places where old hydro plants had already existed before. Hence, the implementations seem not cause adverse impacts. The issued licences demonstrate that the projects are also | ☑ |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| | | in line with national environmental regulations. | |
| **6.2. Monitoring equipment** | 2 | Not applicable, see 6.1 | ☑ |
| **6.3. Quality assurance procedures** | 2 | Not applicable, see 6.1 | ☑ |
| **6.4. External data** | 2 | Not applicable, see 6.1 | ☑ |
| ***7. Management and Operational System*** | | | |
| **7.1. Documentation** | 21 | On the level of the sub-projects the operational system and management system is either documented in an appropriate manner or local sub-projects have a flat management.<br>However, given the amount of sub-projects that have to be handled and the determination of the grid factors it seems to be necessary to establish a structured and documented system.<br>As mentioned above the documentation of quality assurance issues are not developed at CEA. Procedures have to be elaborated and established.<br>Forward Action Request 2<br>Beyond already mentioned missing documentation regarding grid factor determination, CEA shall establish a quality assurance system to ensure high quality project management of all sub-projects. Current managing of | ☑<br>FAR 1<br>FAR 2 |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| | | up to 17 sites is more challenging, hence the verification team request to establish a documented project management and quality assurance system enhancing the liability of generated emission reductions. | |
| **7.2. Qualification and training** | 1 | At the moment only Mr. Fiala is responsible at CEA. He is involved from the beginning, so his qualification and competencies are well. However, the requested documentation in 7.1 should include the aspects of qualification and training as well.<br>Such documented management procedures shall enable the project to produce reliable emission reductions in the future in any case.<br>See chapter 7.1 of this checklist. | ☑ FAR 2 |
| **7.3. Allocation of responsibilities** | 1 | At the moment only Mr. Fiala is responsible at CEA. He is involved from the beginning, so his qualification and competencies are well. However, the requested documentation in 7.1 should include the aspects of responsibilities as well.<br>Such documented management procedures shall enable the project to produce reliable emission reductions in the future in any case.<br>See chapter 7.1 of this checklist. | ☑ FAR 2 |
| **7.4. Emergency procedures** | 1 | At the moment only Mr. Fiala is responsible at CEA. He is involved from the beginning, so his qualification and competencies are well. However, | ☑ FAR 2 |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| | | the requested documentation in 7.1 should include the aspects of emergency procedures as well.<br>Such documented management procedures shall enable the project to produce reliable emission reductions in the future in any case.<br>See chapter 7.1 of this checklist. | |
| **7.5. Data archiving** | 1 | At the moment only Mr. Fiala is responsible at CEA. He is involved from the beginning and his qualification is sufficient. However, the requested documentation in 7.1 should include the aspects of data archiving as well.<br>Such documented management procedures shall enable the project to produce reliable emission reductions in the future in any case.<br>See chapter 7.1 of this checklist. | FAR 2 |
| **7.6. Monitoring report** | 1 | At the moment only Mr. Fiala is responsible at CEA. He is involved from the beginning and his qualification is sufficient. However, the requested documentation in 7.1 should include the aspects of monitoring reporting as well.<br>Such documented management procedures shall enable the project to produce reliable emission reductions in the future in any case.<br>See chapter 7.1 of this checklist. | FAR 2 |

| OBJECTIVE | Ref. | COMMENTS | Concl. (incl FARs / CARs) |
|---|---|---|---|
| **7.7. Internal audits and management review** | 1 | Internal audits and interviews have not taken place, neither on the level of the sub-projects nor at the level of CEA.<br><br>At the moment only Mr. Fiala is responsible at CEA. He is involved from the beginning, so his qualification and competencies are well. However, the requested documentation in 7.1 should include procedures for project internal audits and reviews. Such reviews have to be documented. | ☑<br>FAR 2 |

# 2 PERIODIC VERIFICATION CHECKLIST

## 2.1 Table 1: Data Management System/Controls

The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table. A score is assigned as follows:

Full all best-practice expectations are implemented.

Partial a proportion of the best practice expectations is implemented

Limited this should be given if little or none of the system component is in place.

| Expectations for GHG data management system/controls | Score | Verifiers Comments (including *Forward Action Requests*) |
|---|---|---|
| **1. Defined organisational structure, responsibilities and competencies** | | |
| **1.1. Position and roles** | Full | The positions and roles are defined in the contracts. |
| **1.2. Responsibilities** | Full | The responsibilities of involved person are clear and documented in the contracts. See also evaluation in above discussion. |
| **1.3. Competencies needed** | Full | Involved persons have the appropriate competence to fulfil all required tasks with GHG reporting as mentioned above. |

| Expectations for GHG data management system/controls | Score | Verifiers Comments (including *Forward Action Requests*) |
|---|---|---|
| **2. Conformance with monitoring plan** | | |
| **2.1. Reporting procedures** | Full | Documented procedures do not exist as mentioned above. However, reporting procedures in the operation follows the established monitoring plan. |
| **2.2. Necessary Changes** | Full | Regarding the sub-projects that had been verified already like Rozmital and Decin district heating changes in the monitoring plan are not identified.<br>The monitoring plan established by the project participants and PCF for SHP projects focuses only on sold electricity. It does not consider the consumption of electricity either it does not consider if some facilities had produced electricity in the baseline scenario as well.<br>That aspect has been discussed with the PCF. Based on the e-mail /Ref.28/ the PCF confirmed that this approach is part of the applied methodology and project design. Considering that statement the verification team can not identify any changes of the monitoring plan. |
| **3. Application of GHG determination methods** | | |
| **3.1. Methods used** | Full | As described in 2.2 the used method has been approved by the project participants.<br>For the DH projects the verification team confirms that the used method follows the validated method considering the real heat production. |
| **3.2. Information/process flow** | Full | An information flow diagram is not developed. However, the contract between CEA and the sub-project owner rules the duties and rights of each. |

| Expectations for GHG data management system/controls | Score | Verifiers Comments (including *Forward Action Requests*) |
|---|---|---|
| **3.3. Data transfer** | Full | Reported relevant GHG key parameters are subject of different cross checks in the company. The manual transfer to the electronic workbook for GHG reporting is checked by the verification team. The produced electricity was checked by invoices as well. |
| **3.4. Data trails** | Full | All documents are physical available. |
| **4. Identification and maintenance of key process parameters** | | |
| **4.1. Identification of key parameters** | Partial | Regarding the other sub-projects like Rozmital and SHPs the identification of the of key parameters is not considered as critical.<br>At the SHP the key parameter is the grid factor and the sold electricity. The sold power is measured and documented well through the invoices to the distribution companies. The grid factor is updated annual by CEA according to reported data from defined and official sources.<br>At the DH projects the general key parameter is the produced heat at the heat power plant. That parameter is measured by well calibrated and maintained heat meters.<br>At DH Decin an additional parameter is relevant which is the consumed and in respective produced power. During previous 1st verification the team identified the risk about electricity measurement, since there is a kind of trigger function implemented: "*…Decin monitoring plan addresses in chapter 3.2, page 5, that a special calculation has to be done in cases where electricity production is less than 90% of electric use. Given that the operator uses just a meter that measures only net production or net consumption, it is not possible to identify the trigger barrier*." |

| Expectations for GHG data management system/controls | Score | Verifiers Comments (including *Forward Action Requests*) |
|---|---|---|
| | | Clarification Request 4:<br>The project owner like CEA is requested to demonstrate that this expressed forward action request is solved.<br>The last three years indicate that the risk of more consumption than produced electricity over a whole year by the co-generators is more theoretical. However monthly reported data indicates that Termo Decin s.r.o. is able to address such consumption, its correct consideration in the emission reduction calculation is in the responsibility of CEA. Based on the experience from the last years the concern addressed as a FAR in the first verification is not reasonable. It is considered as resolved. |
| **4.2. Calibration/maintenance** | Fully | All relevant meters are calibrated and sealed. |
| **5. GHG Calculations** | | |
| **5.1. Use of estimates and default data** | Partial | For the DH projects the key parameters of project emissions are measured. Used default data are validated by DNV.<br>The calculation of GHG reductions in the SHP is based on the reported data of energy in the Czech Republic from defined institutions. They are not considered as default values or estimates from project related participants. |
| **5.2. Guidance on checks and reviews** | Partial | At the DH projects on the level of the sub-projects are several review procedures implemented. Regarding the SHP projects the need for exhausting reviews can be limited since the only relevant parameter comes from the invoices of sold electricity.<br>(FAR 1 & 2): However on the level of CEA and as mentioned already in the initial verification protocol above there is a need to implement a system for internal checks and re- |

| Expectations for GHG data management system/controls | Score | Verifiers Comments (including *Forward Action Requests*) |
|---|---|---|
| | | views. |
| **5.3. Internal validation/ verification** | Limited | (FAR 2): The performance of internal validations and verifications is in the responsibility of CEA as the central project coordinator. As stated above in 5.2 and in the initial verification protocol the implementation of such procedures will improved the reliability of reported data. |
| **5.4. Data protection measures** | Full | Special data protection systems seem not be necessary. All data are available at the level of sub-projects as a hardcopy. |
| **5.5. IT systems** | Fully | The central IT system for reporting are MS-Excel based workbooks for the sub-projects and also CEA is using MS-Office software.<br>Decin DH is using obviously power plant control software to gather their data. In opposite to that professional approach Rozmital is using Excel as well for managing their heat purchase and heat production and gas consumption monitoring. Since DH Rozmital is much smaller than DH Decin the chosen approach is enough sufficient. At the SHP sites there is actually no IT system necessary, because the only relevant data is from the invoice of the distribution company that buys the electricity. |

## 2.2 Table 2: GHG calculation procedures and management control testing

| Identification of potential reporting risk | Identification, assessment and testing of management controls | Areas of residual risks |
|---|---|---|
| Potential risks regarding reported data could be based on measured data on the level of sub-projects. That includes the risk of metering as well as the risk of internal data transfer.<br>Following the data flow, such data is put into the given electronic Excel workbooks and sent to CEA for further reporting purposes. | The verification checked the relevant meters, their calibration documents and their seals in order to minimize potential risks from the meters.<br>All metered values are stored at the level of sub-projects. The SHP owners store their invoices of sold power. DH Decin keeps their data electronically and in hardcopy, and DH Rozmital keeps the data in databases and Excel tables. Such primary data has been compared with reported data that CEA has received and processed in the final monitoring reports. | The chosen approach to compare the primary raw data with the final reported data to CEA identified no misstatements or data losses. Areas of residual risks could not be identified. |
| The final reporting performed by CEA includes the use of several excel tools. Potential reporting risks might be based on unintentional application. That could include for instance the delete of necessary links, copy-and-past errors or the change of fixed factors. | The data processing is done by CEA and personally by Mr. Fiala. Mr. Fiala is involved in the emission reduction project from the beginning and followed also the development of these tools during project development. So, from the point of view of the verification team his knowledge and competence about the application is very high. | The application of that Excel tools and internal double check is performed by the same person. Due to missing internal double checking routines by a second person the risk of unintentional and not recognized errors was still there. |

## 2.3 Table 3: Detailed audit testing of residual risk areas and random testing

| Areas of residual risks | Additional verification testing performed | Conclusions and Areas Requiring Improvement |
|---|---|---|
| The application of that Excel tools and internal double check is performed by the same person. Due to missing internal double checking routines by a second person the risk of unintentional and not recognized errors was still there. | The original template Excel-sheets elaborated and validated and the applied Excel files for all sites have been sent to the verification team. The verification team compared the general structure of both and made several spot checks if the same links has been applied. In addition the concrete applied sheets have been checked against changed formulas.<br>At the DH projects where a previous verification has been performed already the electronic workbooks from then have been compared in addition to the current one. | *Based on scrutinized tools the verification team has no errors identified.*<br>*In order to better the reliability CEA is asked to implement a documented quality assurance system as noted in FAR 1 and 2 below Table 4.* |

## 2.4 Table 4: Forward Action Requests

| |
|---|
| Forward Action Request 1:<br><br>In case that all involved project participants agree to the chosen approach the verification team is convinced that a data management and processing system is required. Such system shall also include double check procedures. All procedure have to be documented clearly and submitted to the verification team before closing this verification |
| Forward Action Request 2<br><br>*Beyond already mentioned missing documentation regarding grid factor determination, CEA shall establish a quality assurance system to ensure high quality project management of all sub-projects. The beginning of the umbrella project managing only two sites (Rozmital and Decin) was quite simple, however managing up to 17 sites is more challenging, hence the verification team requests to establish a documented project management and quality assurance system at tier of CEA. Such a system shall include a four-eyes-principle. At the moment Mr. Fiala is checking his own work which does not reflect good quality assurance practise.* |

# Annex 2: Information Reference List

| Reference No. | Document or Type of Information |
|---|---|
| 1. | On-site interview at the offices of CEA in Prague with the project developer conducted by auditing team of TÜV SÜD on June 21, 2006, October 24 and 31, 2006<br>**Validation team on-site:**<br>Mr Markus Knödlseder TÜV SÜD Industrie Service GmbH<br>Ms Eva Aligerova free lancer in auditing ISO 14000 and EU-ETS Auditor<br>**Interviewed persons:**<br>Mr Martin Fiala CEA (Czech Energy Agency) |
| 2. | Inspection of involved sites in the period from June 21 to July 15, 2006 by auditing team of TÜV SÜD<br>**Validation team on-site:**<br>Mr Markus Knödlseder TÜV SÜD Industrie Service GmbH<br>Ms Eva Aligerova free lancer in auditing ISO 14000 and EU-ETS Auditor<br>**Visited sites and interviewed persons:**<br>Martin Fiala CEA<br>22/ 23.6.2006<br>Mr J. Kindle Operator / owner MVE Kostice<br>Mr Petr Kindle Operator / owner MVE Kostice<br>Mr Micheal Cerny Operator MVE Patek e<br>Mr Krivaner Miroslav Director MVE Patek<br>Mr Tlusty Operator EWA Libochovice |

| Reference No. | Document or Type of Information | | |
|---|---|---|---|
| | Mr Krivaner Miroslav | Diretor | EWA Libochovice |
| | Mr Vondrásek | major of Rozmital pod Tremsinem | Rozmital pod Tremsinem |
| | Ms Miluše Kolářová | Adimistartive assisstance | Rozmital pod Tremsinem |
| | Mr Stanislav Březina | Technical staff | Rozmital pod Tremsinem |
| | Mr František Fous | Technical staff | Rozmital pod Tremsinem |
| | Mr Lesek | Operator | MVE Frantiskov |
| | Mr Mandak | Owner | MVE Frantiskov |
| | 26. / 26.6.2006 | | |
| | Mr Frantisek Hlavacek | Operator | MVE Benatky nad Jizerou |
| | Mr Lukas Liska | Owner | MVE Benatky nad Jizerou |
| | Mr Ing. Jiri Langer | Partner | MVE Horky nad Jizerou |
| | Mr Stanislav Saidl | Operator | MVE Horky nad Jizerou |
| | Mr. Ing. Petr Simonik | Technical staff | Termo Decin s.r.o |
| | Mr. Michal Hyka | Technical staff | Termo Decin s.r.o |
| | 27./ 28.06.2006 | | |

| Reference No. | Document or Type of Information |
|---|---|
| | Mr Ing. Herbert Gärtner — Manager — MVE FOBOS s.r.o.<br>Mr Michal Vysin — Manager — MVE Decin-Stare Mesto<br>Mr Ivan Miskovsky — Operator — MVE Decin-Stare Mesto<br>Mr Miroslav Brada — Owner / Manager — MVE Cernys<br>Mr Josef Pavlik — Owner / Manager — MVE Cernys<br>Mr Rehor — Operator — MVE Libocany<br>Mr Pavel Dohnal — Manager — MVE Cercany<br>11.7.2006<br>Mr Zbynek Mrozek — Manager — MVE Trinec a.s<br>Mr Roman Prokop — Manager — MVE Trinec a.s<br>16.07.2006<br>Milan Matusovic — Owner — MVE Tynec nad Sazavou Brodce |
| 3. | Initial Verification Report: “Initial Verification of the Rozmital District Heating Project Czech Republic”, Report No. 565309-1, January 10th , 2005 |
| 4. | Periodic Verification Report: “1. Periodic Verification of the Rožmitál District Heating Project Czech Republic”, Report No. 565309-3, |

| Reference No. | Document or Type of Information |
|---|---|
| | January 10th , 2005 |
| 5. | Periodic Verification Report: "1. Periodic Verification of the Decin District Heating Project Czech Republic", Report No. 565309-4, January 10, 2005 |
| 6. | Initial Verification Report: "Initial Verification of the Decin District Heating Project Czech Republic", Report No. 565309-2, January 10, 2005 |
| 7. | Czech District Heating Projects Proposed Standard Baseline Final Report, published by PCF and performed by Power System Engineering Inc. dated Dec. 9th , 2002 |
| 8. | Decin District Heating Project Baseline Study Final Report, published by PCF and performed by Power System Engineering Inc. dated Aug. 21st , 2003 |
| 9. | The Prototype Carbon Fund monitoring Plan (MP) Decin District Heating Project, published by PCF dated Aug. 21st , 2003 |
| 10. | Determination Report: Determination of a Sector Baseline and Monitoring Plan for Joint Implementation projects in the Czech District Heating Sector, report-# 2002-1305, rev. 02, performed by DNV dated Nov. 16th , 2002 |
| 11. | Determination Report: Determination/validation of the Decin District Heating Project Czech Republic, report-# 2002-1235, rev. 02, performed by DNV dated May 30th , 2004 |
| 12. | Rozmital District Heating Project Baseline Study Final Report, published by PCF and performed by Power System Engineering Inc. on Dec. 16th , 2002 |
| 13. | The Prototype Carbon Fund Monitoring Plan (MP) Rozmital District Heating Project, published by PCF on May. 14th , 2002 |
| 14. | Determination Report: Determination of a Sector Baseline and Monitoring Plan for Joint Implementation projects in the Czech District Heating Sector, report-# 2002-1305, rev. 02, performed by DNV on Nov. 16th , 2002 |
| 15. | Determination Report: Determination/validation of the Rozmital District Heating Project Czech Republic, report-# 2002-1314, rev. 02, performed by DNV on Jan. 16th , 2003 |

| Reference No. | Document or Type of Information |
|---|---|
| 16. | Original emission reduction reports from all sites to CEA: covering appropriate monitoring period |
| 17. | Original operational licenses from all sites |
| 18. | Monitored heat production and energy consumptions at the thermal power plants |
| 19. | Invoices issued by SHPs to the electricity distribution companies |
| 20. | Contracts between SHPs and CEA |
| 21. | MS-Excel calculation and monitoring files:<br>• PCF_Decin_Monitoring_Tables_r1_SecondMPxls<br>• PCF_Decin_Monitoring_Tables_r1_ThirdMP.xls<br>• Workbook Decin 2nd MP_correctionbyMF.xls<br>• Workbook Decin 3rd MP.xls<br>• Workbook Rozmital 2nd MP.xls<br>• Workbook Rozmital 3rd MP.xls<br>• SHP Baseline Determination via MS-Excel (16.03.2005): BL_Frantiskov.xls; BL_Horky.xls; BL_Kostice.xls; BL_Les-Kralovstvi.xls; BL_Libocany.xls; BL_Libochovice.xls; BL_Olse.xls; BL_Patek.xls; BL_Smrzovka.xls; BL_.xls; BL_Tynec.xls; BL_Benatky.xls; BL_Bulhary.xls; BL_Celakovice.xls; BL_Cercany.xls; BL_Cerny.xls; BL_Decin.xls<br>• SHP Baseline Studies via MS-Excel (16.03.2005): BLS_Frantiskov.doc; BLS_Horky.doc; BLS_Kostice.doc; BLS_Les-Kralovstvi.doc; BLS_Libocany.doc; BLS_Libochovice.doc; BLS_Olse.doc; BLS_Patek.doc; |

| Reference No. | Document or Type of Information |
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| | BLS_Smrzovka.doc; BLS_.doc; BLS_Tynec.doc; BLS_Benatky.doc; BLS_Bulhary.doc; BLS_Celakovice.doc; BLS_Cercany.doc; BLS_Cerny.doc; BLS_Decin.doc |
| | • SHP Monitoring Plan via MS-Excel (14.03.2005): MP_Frantiskov.xls; MP_Horky.xls; MP_Kostice.xls; MP_Les-Kralovstvi.xls; MP_Libocany.xls; M _Libochovice.xls; MP_Olse.xls; MP_Patek.xls; MP_Smrzovka.xls; MP_Tynec.xls; MP_Benatky.xls; MP_Bulhary.xls; MP_Celakovice.xls; MP_Cercany.xls; MP_Cerny.xls; MP_Decin.xls |
| | • SHP Monitoring Plan via MS-Word (06.12.2005): MPL_Frantiskov.doc; MPL_Horky.doc; MPL_Kostice.doc; MPL_Les-Kralovstvi.doc; MPL_Libocany.doc; MPL_Libochovice.doc; BLS_Olse.doc; MPL_Patek.doc; MPL_Smrzovka.doc; MPL_Tynec.doc; MPL_Benatky.doc; MPL_Bulhary.doc; MPL_Celakovice.doc; MPL_Cercany.doc; MPL_Cerny.doc; MPL_Decin.doc |
| | • SHP Monitoring Workbooks 2004 via MS-Excel (19.05.2005): Benatky_Monitor_Workbook2004.xls; Cercany_Monitor_Workbook2004.xls; Cernys_Monitor_Workbook2004.xls; Frantiskov_Monitor_Workbook2004.xls; Patek_Monitor_Workbook2004.xls; Smrzovka_Monitor_Workbook2004.xls; Tynec_Monitor_Workbook2004.xls; |
| | • SHP Monitoring Workbooks 2004 via MS-Excel (19.05.2005): Benatky_Monitor_Workbook2005.xls; Cercany_Monitor_Workbook2005.xls; Cernys_Monitor_Workbook2005.xls; Frantiskov_Monitor_Workbook2005.xls; |

| Reference No. | Document or Type of Information |
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| | Patek_Monitor_Workbook2005.xls;<br>Smrzovka_Monitor_Workbook2005.xls;<br>Tynec_Monitor_Workbook2005.xls;<br>Decin_Monitor_Workbook2005.xls;<br>Horky_Monitor_Workbook2005.xls;<br>Kostice_Monitor_Workbook2005.xls;<br>Libochovice_Monitor_Workbook2005.xls;<br>Olse_Monitor_Workbook2005.xls; |
| 22. | Determination of Czech Electricity Sector Standardized Baseline Study and Monitoring Plan, REPORT NO. 2005-0731 REVISION NO. 0 DNV Certification, Climate Change Services |
| 23. | Determination Reports DNV Certification, Climate Change Services,<br>Determination of: Hydro JI_Determination_FinalReport_Benatky.doc; Hydro JI_Determination_FinalReport_Frantiskov.doc; Hydro JI_Determination_FinalReport_Horky.doc; Hydro JI_Determination_FinalReport_Kostice.doc; Hydro JI_Determination_FinalReport_Les-Kralovstvi.doc; Hydro JI_Determination_FinalReport_Libocany.doc; Hydro JI_Determination_FinalReport_Libochovice.doc; Hydro JI_Determination_FinalReport_Olse.doc; Hydro JI_Determination_FinalReport_Patek.doc; Hydro JI_Determination_FinalReport_Smrzovka.doc; Hydro JI_Determination_FinalReport_.doc; Hydro JI_Determination_FinalReport_Tynec.doc; Hydro JI_Determination_FinalReport_Benatky.doc; Hydro JI_Determination_FinalReport_Bulhary.doc; Hydro JI_Determination_FinalReport_Celakovice.doc; Hydro JI_Determination_FinalReport_Cercany.doc; Hydro JI_Determination_FinalReport_Cerny.doc; Hydro JI_Determination_FinalReport_Decin.doc |
| 24. | Emissions Reduction Report (for DH Decin & Rozmital) *2nd Monitoring period April 1st, 2004 – March 31st, 2005*, CEA 2006 |
| 25. | Emissions Reduction Report (for DH Decin & Rozmital) *3rd Monitoring period April 1st, 2005 – March 31st, 2006, CEA 2006* |
| 26. | Emissions Reduction Report, 1st Payment_SHPs, April 1st, 2002 – December 31st, 2004, CEA 2006 |

| Reference No. | Document or Type of Information |
|---|---|
| 27. | Emissions Reduction Report, 2nd Payment_SHPs, March, 2003 – December 31st, 2005, CEA 2006 |
| 28. | E-mail “Re: AW: AW: Draft Verification Report of Project Umbrella for CZ” from: jvayrynen@worldbank.org to Knödlseder, Markus and , Betzenbichler, Werner, on 31.10.2006 |