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Verification Report

Carbon-TF B.V.

1st Periodic Verification of the

CMM utilisation on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company “GOAO Shakhtoupravlenye Donbass”

project under JI Track 2

UNFCCC UA2000015 / JI0077

Monitoring period 1: 01-01-2008 to 31-03-2010

Report No. **600500455**

01 February 2011

TÜV SÜD Industrie Service GmbH
Carbon Management Service
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600500455	06 of October 2010	5	01 February 2011	21
Subject:			1st Verification under JI Track 2	
Executing Operational Unit:				
TÜV SÜD Industrie Service GmbH, Carbon Management Service Westendstrasse 199 - 80686 Munich, Federal Republic of Germany				
Project Participants:				
Carbon-TF B.V. (client) Horsterweg 217 Venlo 5928 ND Netherlands State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbass" Budenovsky Rayon 83059 Donetsk Ukraine				
Registration number / Project Title			Project UA2000015: CMM utilisation on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbass"	
Monitoring period:			Period in total from 01-01-2008 till 31-03-2010 with the following sub periods: 01-01-2008 to 31-12-2008 01-01-2009 to 31-12-2009 01-01-2010 to 31-03-2010	
First Monitoring Report (version/date)			Version 1a / 15-04-2010	
Final Monitoring Report (version/date)			Version 7 / 21-01-2011	

Summary:

TÜV SÜD Industrie Service GmbH has performed the 1st periodic verification of the approved JI project (Track 2): CMM utilisation on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbass" registered at UNFCCC under UA2000015 / JI0077. The project comprises the use of CMM for the production of heat, the generation of electricity and for flaring.
Carbon-TF as project participant is responsible for the preparation of the GHG emission data and the reported GHG emission reductions.
A document review, followed by a site visit was conducted to verify the information submitted by the project participant regarding the present verification period. By doing so results of the previous verification conducted for the purpose of Greening AAUs were considered.
Based on the assessment carried out, the verifier confirms:

- the implementation of the following project activities in accordance to the timeline presented in the approved PDD (version 7 from 06-08-2009, registered on 08-12-2009):
  - upgrade of the two previously coal-fired winter boilers;
  - upgrade of the two previously coal-fired summer boilers;
  - installation of the ventilation air heater;
  - installation of the first flare;
  - upgrade of the previously diesel oil fired emergency generator for methane utilization;
  - installation of one cogeneration unit with 3.750 MW firing, 1.35 MW_{el}, 0.93 MW_{th};
- the installation of the second flare is delayed, what is caused by the financial crises as per information received from the coal mine; this was accepted by the TÜV SÜD, since the project participants have confirmed their efforts to implement the project fully in accordance with the PDD;
- the implemented part of the project has been operated in accordance with the description given in the registered PDD (Version 7 from 06-08-2009, registered on 08-12-2009);
- there are following deviations to the approved monitoring plan of the registered PDD:
  - for the winter boilers and the VAH mainly handwritten data stored in utilization journals and Excel sheets were available; an electronic measurement system as per the registered PDD was installed in December 2009 – January 2010 and started operation at 24/02/2010;
  - the electronic measurement and data storage monitoring system as per the PDD has not been installed during the monitoring period for two summer boilers and for the emergency power generator; instead of that the handwritten journals were used for monitoring;
  - the heat generation of the boilers and the power amount produced by the emergency power generator have not been measured but calculated using the utilized methane amount;
- the quality of the handwritten data and the applied calculation procedure for the parameters estimation of heat generation for the boilers and of power generation for the emergency generator have been verified by the audit team and is finally accepted by TÜV SÜD;
- the monitored data are conservatively considered in the calculation of the emission reductions;
- the installed equipment essential for generating emission reductions runs reliably and the meters are calibrated appropriately; the project is generating emission reductions.

The verifier can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion refers to the project GHG emissions and resulting GHG emission reductions reported, determined using the valid and registered project baseline, its monitoring plan and its associated documents.

Based on the information we have seen and evaluated, we confirm that due to the implementation of the project following emission reductions were achieved:

82,128 t CO_{2e} from 01/01/2008 till 31/12/2008
94,507 t CO_{2e} from 01/01/2009 till 31/12/2009
35,556 t CO_{2e} from 01/01/2010 till 31/03/2010

The total GHG emission reduction for the monitoring period 01/01/2008 till 31/03/2010 is **212,191 t CO_{2e}**.

The emission reductions are significantly lower than the presented in the registered PDD related to the same period. The reason is locally very low CH_4 concentration in the coal mine gas.

Assessment Team Leader: Thomas Kleiser	**Veto Person:** Javier Castro
Assessment Team Members: Dr. Albert Geiger Dr. Volodymyr Ilchenko	**Certification Body responsible:** Rachel Zhang

Abbreviations

ACM	Approved Consolidated Methodology
AIE	Accredited Independent Entity
BM	Build Margin
CAR	Corrective Action Request
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CO_{2e}	Carbon dioxide equivalent
CAR	Corrective action request
CR	Clarification Request
DFP	Designated Focal Point
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
EUR	Emission Reduction Units
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
JI	Joint Implementation
KP	Kyoto Protocol
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-Governmental Organisation
OM	Operational Margin
PDD	Project Design Document
PP	Project Participant
QA/QC	Quality assurance/quality control
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
DVM	Determination and Verification Manual

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Main Documents (referred to in this report)

Methodology (name / version)	ACM0008, Version 03	
Scope	8,10	
Technical Area	8.1; 10.3	
Registered PDD:	Version 07, dated 06-08-2009	
Revised Monitoring Plan:	n.a.	
	Version	Date
Published Monitoring Report	1a	15-04-2010
Revised Monitoring Report	7	21-01-2011
Project documentation link:	http://ji.unfccc.int/JIITLProject/DB/U6NWCBA3KIYIH1E39JXDZJLJTHOMOR/details	

Table of Contents **Page**

1 INTRODUCTION

1.1 Objective

Carbon-TF has commissioned (contract from 17-02-2010) an independent verification by TÜV SÜD Industrie Service GmbH (TÜV SÜD) of its registered JI project:

CMM utilisation on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbass" (registration number JI0077)

This report summarizes the findings of the 1st JI verification (Track 2) of the period January 1st, 2008, to March 31th, 2010.

The objective of the verification work is the systematic, independent and documented evaluation of greenhouse gas emission reductions against JI requirements (Track 2) as well as specific regulations as set by the national guidelines and procedures for approving of JI projects in Ukraine. According to this assessment TÜV SÜD shall:

- ensure that the project activity has been implemented and operated as per the final PDD "CMM utilisation on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbass" (Version 07, date 06-08-2009), and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place;
- ensure that the final MR (IRL6) and other supporting documents provided are complete, verifiable and in accordance with applicable JI requirements;
- ensure that the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan;
- evaluate the data recorded and stored.

1.2 Scope

The verification scope encompasses an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the Accredited Independent Entity.

The verification is based on the submitted monitoring report, the final and approved determination report and the previous verification reports (if any). These documents are reviewed against the approved project design document including its monitoring plan, the requirements of the Kyoto Protocol, the JI Guidelines as well as related rules and guidance by the CMP and JISC and specific national requirements (if any).

In the past - for the verification purpose - TÜV SÜD applied detailed (project/methodology(-ies) specific) protocols, which incorporated requirements of the CDM Validation and Verification Manual (VVM) (IRL72) issued in November, 2008 - alternatively also in JI - as no JI DVM was available at that time. In December 2009 the JI Determination and Verification Manual (DVM) (IRL71) in its first version was published. Although the question list of the DVM is not obligatory and the questions are already covered by the former question list to a large extent TÜV SÜD has elaborated - for transparency reasons - the issues presented in the DVM and involved them in the verification process in form of an additional DVM verification protocol. These questions are put in front – in Annex 1 – to the following meth specific question list for the verification of the respective project.

Based on the requirements in the DVM, TÜV SÜD has applied a rule-based approach for the verification of the project. The principles of accuracy, completeness, relevance, reliability and credibility were combined with a conservative approach to establish a traceable and transparent verification opinion.

The verification considers both quantitative and qualitative information on emission reductions. The verification is not meant to provide any consultancy towards the client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the monitoring activities.

1.3 GHG Project Description

Project activity:	CMM utilisation on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company “GOAO Shakhtoupravlenye Donbass”
UNFCCC registration number:	UA2000015
Project Participants:	Carbon-TF State Holding Joint-Stock Company “GOAO Shakhtoupravlenye Donbass”
Location of the project:	Donetsk Oblast, Ukraine WKS84 coordinates are: 47°03’45’’ N, 37°51’55’’ E
Date of registration:	08-12-2009
Starting date of the crediting period:	01-01-2008

The purpose of this project is the avoidance of methane emissions into the atmosphere at the coal mine Shcheglovskaya-Glubokaya.
Coal Mine Methane, drained and recovered from operating mine works, is used for the following purposes:

- heat generation
- electricity production
- flaring

Following project activities have been implemented in accordance to the timeline presented in the approved PDD:

- upgrade of the two previously coal-fired winter boilers
- upgrade of the two previously coal-fired summer boilers
- installation of the ventilation air heater
- installation of the flare
- upgrade of the previously diesel oil fired emergency generator
- installation of the cogeneration unit

The installation of the second flare is delayed, what is caused by the financial crises as per the statement of the coal mine. This was accepted by the TÜV SÜD, since the participants have demonstrated their efforts to implement the project fully in accordance with the PDD and where able to demonstrate that the delays did not affect the additionality of the project by providing the financial analysis on the basis of actual costs (IRL91).

2 METHODOLOGY

2.1 Verification Process

The verification process is based on the approach depicted in the Determination and Verification Manual (DVM) issued by JISC in 2009 (IRL71).
Standard auditing techniques have been adopted for the verification process. The verification team performs first a desk review, followed by an on-site visit, which results in the completion of a protocol that includes all the findings. The next steps involve the evaluation of the findings through direct communication with the PPs and the preparation of the verification report. Afterwards the verification report and other supporting documents undergo an internal quality control by the CB "climate and energy" before submission to the JISC.

2.2 Verification Team

The appointment of the verification team takes into account the technical area(s), sectoral scope(s) and relevant host country experience required amongst team members for verifying the ER achieved by the project activity in the relevant monitoring period for this verification.

The verification team consisted of the following members:

Name	Qualification	Coverage of scope	Coverage of technical area	Host country experience
Thomas Kleiser	**ATL**	☑	☑	☑
Dr. Albert Geiger	GHG-A	☑	☑	☑
Dr. Volodymyr Ilchenko	GHG-A	☑		☑

Thomas Kleiser is the Assessment Team Leader of the project with a background in physics and meteorology. Till 31st of December 2008 he was head of the division CDM and JI at TÜV SÜD Industrie Service GmbH conducting more than 110 validations and verifications of CDM and JI projects and around 25 projects under diverse voluntary schemes. Since 1st of January 2009 he is Head of the "Certification Body" of TÜV SÜD. In this position he is responsible for validation/determination, verification and certification processes for GHG mitigation projects as well as trainings for internal auditors.

Dr. Albert Geiger is a GHG verifier for CO_2-emission reduction projects of the scopes 8, 10 and 13 at the department "Environmental Service" of TÜV SÜD. He has done more than 15 CDM and JI projects and holds a PhD in geological sciences and worked in envitonemental services in soil and water protection as well as waste management at TÜV SÜD since 1999.

Dr. Volodymyr Ilchenko is a GHG verifier for CO_2-emission reduction projects at the department "TÜV Carbon Management Service" in the head office of TÜV SÜD Industrie Service GmbH in Munich, Germany. He holds a M.Sc. degree in electrical engineering and has a PhD in mechanical engineering. He has received training on the contents and objectives of GHG auditing for climate change projects and is responsible in his current position for the validation/determination and verification audits for JI, CDM and VCS projects. Before joining TÜV SÜD he worked as development engineer in the field of heating systems.

2.3 Review of Documents

The Monitoring Report version 1a (IRL5) submitted by the PP was made publicly available on the UNFCCC website on the 20th of April 2010 before the verification activities started. The published MR was assessed based on all the relevant documents. The aims of the desk review were:

- verification of the data completeness and the information presented in the MR,
- check of the MR compliance with respect to the monitoring plan depicted in the approved PDD (frequency of measurements, the quality of the metering equipment including calibration; and QA/QC procedures),
- evaluation of the data management and QA/QC system in the context of their influence on the generation and reporting of emission reductions.

A complete list of all documents reviewed is available in annex 2 of this report.

2.4 On-site Assessment and follow-up Interviews

During 27/04/2010 to 28/04/2010, TÜV SÜD performed a physical site inspection including on-site interviews (IRL4) with the project participants (IRL3) to:

- confirm the implementation and operation of the project,
- review the data flow for generating, aggregating and reporting of the monitoring parameters,
- confirm the correct implementation of procedures for operation and data collection,
- cross-check the information provided in the MR with other sources,
- check the monitoring equipment against the monitoring plan presented in the PDD and the applied methodology, including calibrations, maintenance, etc.,
- review the calculations and assumptions used to obtain the GHG data and ER,
- check if the QC/QA procedures are in place for preventing and correcting of errors or/and omissions in the reported data.

A list of the persons interviewed during this verification activity is included in annex 2.

2.5 Quality of Evidence to Determine Emission Reductions

Among several evidences submitted, the following relevant and reliable evidence material has been used by the audit team during the verification process (see Annex 2):

- Licenses
- Raw data
- Data from cross-checking instruments
- Handwritten Journals
- Analysis
- Calibration documents
- Quality assurance and quality control documents (Monitoring Manual)

Sufficient evidences and data covering the full verification period in the required frequency is available to validate the figures stated in the final MR (IRL6). The source of the evidences and data will be discussed in chapter 3 of this report. The protocol gives a clear reference to sources assessed and is the basis for the conclusions of the audit team.

Specific cross-checks have been done in cases when further sources were available. The monitoring report figures were checked by the audit team against the raw data. It can be confirmed that the above mentioned deviations in the data collection system to the approved monitoring plan do not influence the quality of the emission reductions estimation.

2.6 Resolution of Clarification, Corrective Action and Forward Action Requests

The objective of this phase of the verification process is to resolve any outstanding issues, which require clarification for TÜV SÜD’s conclusion on the reported GHG emission reduction. The findings raised as Forward Action Requests (FARs) (if any) indicated in previous reports (determination/verification) were discussed and resolved during this phase through communication between the PP and TÜV SÜD.

Concerns raised during the desk review, the on-site audit assessment and the follow-up interviews are documented together with the according responses provided by the project participants in Annex 1 (verification protocol) to guarantee the transparency of the verification process.

A Corrective Action Request (CAR) is raised where TÜV SÜD identifies:

- non-conformities in monitoring and/or reporting with the monitoring plan and/or methodology;
- that the evidence provided is not sufficient to prove conformity;
- mistakes in assumptions, data or calculations that impair the ER calculations;
- FARs raised during determination or previous verifications that are not solved until the on-site visit.

A Clarification Request is raised where TÜV SÜD does not have enough information or the information is not transparent in order to confirm a statement or data.

A Forward Action Request is raised where TÜV SÜD identifies that monitoring and/or reporting require special attention or adjustments for the next verification period.

Information or clarifications provided as a response to a CAR, CR or FAR can also lead to a new request.

2.7 Internal Quality Control

As a final step of the verification process, the verification documents including the verification report and the annexes have to undergo an internal quality control by the Certification Body (CB) “climate and energy”, i.e. each report has to be finally approved either by the Head of the CB or the Deputy (a Veto person can be used). In case one of these two persons is part of the assessment team, the approval can only be given by the person who is not a part of the assessment team. If the documents have been satisfactorily approved, the Request for Issuance is submitted to the JISC along with the relevant documents.

3 VERIFICATION RESULTS

In the following sections, the results of the verification are stated. The verification results relate to the project performance as documented and described in the approved PDD and the final Monitoring Report (28/12/2010, version 5) (IRL6). The verification findings for each verification subject are presented below.

3.1 FARs from Validation / Previous Verification

8 FARs have been raised during the previous verification (initial and first) conducted for the purpose of Greening AAUs for the period of 06/11/2006- 31/12/2007. These FARs are listed in chapter 5 of the attached protocol (annex 1).
All FARs have been solved prior to starting this verification.

3.2 Project Implementation in accordance with the registered Project Design Document

The following project activities have been implemented according to the timeline and description presented in the registered PDD:

- upgrade of the two previously coal-fired winter boilers;
- upgrade of the two previously coal-fired summer boilers;
- installation of the ventilation air heater
- installation of the first flare
- upgrade of the previously diesel oil fired emergency generator
- installation of one cogeneration unit

The project as described above is completely operational that was confirmed during on-site visit. The installation of the second flare, which was planned for September 2009, is delayed. Because of the incomplete project implementation the Joint State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbass" was asked by TÜV SÜD about the new implementation date for the installation of the second flare. In response to this request PP provided an official response, in which the implementation of the whole project has been confirmed and for the installation of the second flare the summer period of the year 2011 has been fixed. According to the company, the delay in the installation of the second flare is caused by the lack of financial resources due to the global financial crisis. In 2008 and 2009 the production figures and the income dropped significantly which could be cross checked during the on-site visit. The new installation date for the second flare is presented in the Chapter A.7 of the MR (IRL6).
Furthermore, on request of TÜV SÜD a revised investment calculation has been presented by Carbon-TF with the purpose to demonstrate that even with the delayed installation of the second flare the project remains additional. This new analysis considers the new installation date and the actual costs (IRL91). According to this new analysis, which was done according to the analysis presented in the registered PDD, the NPV fulfills the benchmark criteria of the registered PDD (NPV < 0). Hence, the project is still additional and thus there are no doubts that the project is qualified as JI project.
Furthermore, taking into account the "Procedures regarding changes during project implementation", issued JISC (IRL92), TÜV SÜD confirms that the conditions defined by paragraph 33 of the JI guidelines are still met for the project, and that the changes do not alter the original determination opinion for the project. Specifically, TÜV SÜD confirms that:
(a) The physical location of the project has not changed;
(b) The emission sources have not changed;

(c) Baseline scenario has not changed.
(d) The changes are consistent with the applied methodology.

3.3 Compliance of the Monitoring System with the Monitoring Plan

In the data collecting and storage systems following deviations to the approved monitoring plan of the registered PDD (as published on UNFCCC JI website) have been detected:

- for the winter boilers and the VAH mainly handwritten data stored in utilization journals and Excel sheets were available (IRL87, 88); an electronic measurement system as per the registered PDD was installed in December 2009 – January 2010 and started operation at 24/02/2010;
- the electronic measurement and data storage monitoring system as per the PDD has not been installed during the monitoring period for two summer boilers and for the emergency power generator; instead of that the handwritten journals were used for monitoring (IRL87);
- the heat generation of the summer boilers and the power amount produced by the emergency power generator have not been measured but calculated using the utilized methane amount.

Audit team has assessed the quality of the handwritten data as well as the applied calculation procedure for the parameters estimation. TÜV SÜD confirms that the parameters to be monitored have been accurately measured and correctly estimated.

Hereby following parameters have been verified (meter specific details see chapter 2.2. of the protocol):

Winter Boilers

Data / Parameter:	MM_{HEAT}
Data unit:	tCH_4
Description:	Methane sent to the boilers
Source of data used:	Calculated from normalized flow data and methane concentration
Means of verification/Comments:	Check of the handwritten journals and electronic records
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Data / Parameter:	$HEAT_y$
Data unit:	GJ
Description:	Heat generation by the project
Source of data used:	Calculated data based on the methane amount and the boiler efficiency, Monitored data since 03/03/2010
Means of verification/Comments:	Check of the handwritten journals and electronic data
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Summer Boilers

Data / Parameter:	MM_{HEAT}
Data unit:	tCH_4
Description:	Methane sent to the boilers

Source of data used:	Calculated from normalized flow data and methane concentration
Means of verification/Comments:	Check of the handwritten journals
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Data / Parameter:	$HEAT_y$
Data unit:	GJ
Description:	Heat generation by project
Source of data used:	Calculated data based on methane amount and boiler efficiency
Means of verification/Comments:	Check of the handwritten journals
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Flare

Data / Parameter:	MM_{Fl}
Data unit:	tCH_4
Description:	Methane sent to flare
Source of data used:	Calculated from normalized flow data and methane concentration
Means of verification/Comments:	Check of the handwritten journals
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Data / Parameter:	EFF_{Fl}
Data unit:	%
Description:	Efficiency of methane destruction through flaring
Source of data used:	IPCC 1996
Means of verification/Comments:	Check of the IPCC 1996 Tool
Cross-check	N/A

Cogeneration Unit

Data / Parameter:	MM_{ELEC}
Data unit:	tCH_4
Description:	Methane sent to the cogeneration unit
Source of data used:	Calculated from normalized flow data and methane concentration
Means of verification/Comments:	Check of the handwritten journals
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Data / Parameter:	GEN_y
Data unit:	MWh
Description:	Electricity generation by project
Source of data used:	Monitored data

Means of verification/Comments:	Check of the handwritten journals
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Emergency Generator

Data / Parameter:	MM_{ELEC}
Data unit:	tCH_4
Description:	Methane sent to the emergency generator
Source of data used:	Calculated from normalized flow data and methane concentration
Means of verification/Comments:	Check of the handwritten journals
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Ventilation Air Heater

Data / Parameter:	MM_{HEAT}
Data unit:	tCH_4
Description:	Methane sent to VAH
Source of data used:	Calculated from normalized flow data and methane concentration
Means of verification/Comments:	Check of the handwritten journals
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Data / Parameter:	$HEAT_y$
Data unit:	GJ
Description:	Heat generation by project
Source of data used:	Calculated data based on the methane amount and efficiency of the VAH
Means of verification/Comments:	Check of the handwritten journals or/and electronic data
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Miscellaneous Parameters

Data / Parameter:	$CONS_{ELEC}$
Data unit:	MWh
Description:	Additional electricity consumption by the project
Source of data used:	Monitored data (calculated using operation hours of the flare)
Means of verification/Comments:	Check of the handwritten journals
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Data / Parameter:	PC_{CH4}
Data unit:	%
Description:	Concentration (in mass) of methane in extracted gas (%), measured on wet

	basis
Source of data used:	IR measurements
Means of verification/Comments:	Check of the handwritten journals
Cross-check	The cross-check has shown no inconsistencies of the raw data with the figures used for the calculation of emission reduction

Data / Parameter:	PC_{NMHC}
Data unit:	%
Description:	NMHC concentration (in mass) in extracted gas
Source of data used:	Chemical Analysis by the Respirator Institute.
Means of verification/Comments:	Check of the accreditation certificate.
Cross-check	NA

The monitoring activities are strictly organised and written down in the Monitoring Manual (IRL90). The responsibilities are determined and quality assurance measures are implemented on-site. The clear distribution of the monitoring duties has been demonstrated by the staff during the on-site visit. The monitoring procedures have been punctually updated, if required, since last verification. The separate monitoring procedures and work instructions were summarized in a single document and on the 05/08/2010 the first clearly structured Monitoring Manual was issued (IRL90).

The personal gets regular training on monitoring procedures (see IRL70). The last training was held on 12th of October 2009.

3.4 Assessment of Data and Calculation of Greenhouse Gas Emission Reductions

All information nedeed of the assessment of data and calculation of greenhous gas emission reductions was available.

The quality of the handwritten raw data (IRL87) has been verified by checking of the monitoring procedures and by comparison with the electronically recorded data (IRL89). The maximum errors of both data acquisition procedures estimated through thorough error analysis (IRL27, 28) were considered in the calculations of emission reductions (IRL7) by applying respective most conservative discounts.

TÜV SÜD has assessed the calculation procedure for the estimation of the parameter $HEAT_{y.}$ TÜV SÜD confirms that the applied formulas are correct and that the estimation of the parameter is done in a conservative manner. This was proven by checking the respective error analyses provided by the project participants. Furthermore, the applied efficiencies for the winter and summer boilers are applied in a conservative manner. To explain this: in the PDD values of 96% and 89% for the upgraded winter and summer boilers are given. The value for winter boiler seemed to be too high, so that a reduced value of 90% according to an efficiency determination performed by the coal mine together with Donbassvugleavtomatyka an accredited company has been firstly taken into account. At the same time measurements of the boilers at other coal mines have shown real efficiencies in the range of 65-80%, so that an additionally deduction of 15% have been taken into account for the winter and summer boilers. The resulting values are 75% for the winter boilers and 74% for the summer boilers were finally considered as appropriate and conservative for the boilers of this mine (considering their age and status) in the calculation of the emission reductions. Therefore, the applied approach has been finally accepted by the TÜV SÜD.

The NMHC have been analyzed regularly by a certified laboratory (Accreditation Certificate, IRL54). The analyzed contents were always less than 1%. Hence, in accordance with the Methodology and the PDD the NMHCs were not considered in the calculations.
The input data of the calculations have been checked against the raw data. The verifier confirms that there are no deviations between raw data and input data. The data were consistent and no errors have been found.
Furthermore, all formulae used in the calculations have been checked against the approved PDD. The formulae comply fully with the formulae of the registered PDD. No deviations have been found.
All the emission factors and default values are explicitly mentioned in the monitoring report. The values comply fully with the defaults in the registered PDD. The manual transfer of data was cross checked. No mistakes have been detected.
TÜV SÜD confirms that:

- data sources used for calculating emission reductions are clearly identified, reliable and transparent;
- that the raw data used in calculation of the emission reductions (IRL7) are conservative because the possible errors are considered;
- that the input data are viable and consistent with raw data;
- the methods and formulae used to obtain the baseline, project and leakage emissions are appropriate and without any mistakes;
- the calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.

The emission reductions are significantly lower than the presented in the registered PDD related to the same period. The reason is locally very low CH_4 concentration in the coal mine gas.

4 SUMMARY OF FINDINGS

The verifier can confirm that the published MR and related documents are complete and verifiable in accordance with the JI requirements. All the findings raised by the verification team, the responses by the PPs and the conclusion of the audit team are presented in Annex 1.

The means of verification and resulting changes in the MR or related documents are summarized in the table below:

Corrective Action Request 1:
Please present the answers and the corresponding documentation to FARs 1 till 8.
CAR 1, means of verification
Review of the presented documents
CAR 1, changes in the MR or related documents
See Annex 1 for details
Corrective Action Request 2:
Please explain the delay in the installation of the second flares and show that the project remains additional by means of financial analysis on the basis of actual costs.
CAR 1, means of verification
Review of the presented documents
CAR 1, changes in the MR or related documents
Revision of the MR and update of the financial analysis
Clarification Request 1:
Please present the mining licence of the period before 20/06/2009
CR 1, means of verification
Review of the presented document
CR 1, changes in the MR or related documents
No changes in MR
Clarification Request 2:
Please describe the different methods of determining $HEAT_y$ (calculation and metering) in the MR (A.8.) emphasizing the differences in monitoring (e.g. data recording etc.). Please show that calculating the heat from the methane amount is more conservative.
CR 2, means of verification
Check of the error analysis presented by Carbon-TF
CR 2, changes in the MR or related documents
Revision of the MR
Clarification Request 3:
Please show that the lower frequency of the handwritten data has been considered conservative in the calculation of emission reductions.
CR 3, means of verification
Check of the provided error analysis
CR 3, changes in the MR or related documents
No changes in the MR
Clarification Request 4:
Please send the calibration protocols of the meters ID: 5b and 5c for the monitored period.
CR 4, means of verification

Review of the presented documents
CR 4, changes in the MR or related documents
No changes in the MR
Clarification Request 5: Please correct the name of the meter ID 5d in the MR.
CR 5, means of verification
On-site findings, meter documents
CR5, changes in the MR or related documents
Revision of the MR
Clarification Request 6: Please correct the serial number of meter 5e in the MR.
CR 6, means of verification
On-site findings, meter documents
CR 6, changes in the MR or related documents
Revision of the MR
Clarification Request 7: Please describe the measurement ranges of the used meters in the MR.
CR 7, means of verification
Calibration protocolls, passports
CR 7, changes in the MR or related documents
Revision of the MR
Clarification Request 8: Please provide the calibration protocols of the meters ID: 11.1, 11.3 and 11.4.
CR 8, means of verification
Check of the documents
CR8, changes in the MR or related documents
No changes in the MR
Clarification Request 9: The calibrations are not done by Sumystandartmetrology. Please correct in the MR.
CR 9, means of verification
Findings of the on-site visit, calibration protocols
CR 9, changes in the MR or related documents
Revision of the MR
Clarification Request 10: The accuracy of the difference pressure meter and the thermometers are not correct in the MR. Please revise.
CR 10, means of verification
Calibration documents, passports
CR 10, changes in the MR or related documents
Revision of the MR
Clarification Request 11: Period 27.05.09 – ca. 23.07.09: Please explain the inconsistencies in data and show that the chosen values are plausible.

CR 11, means of verification
Check of the electronic and handwritten data
CR 11, changes in the MR or related documents
Revision of the MR
Clarification Request 12: Please describe the archiving of the raw data, the data protection measures, the data transfer and the protection of input data for calculations.
CR 12, means of verification
Monitoring Manual
CR 12, changes in the MR or related documents
The description has been inserted into the MR.
Clarification Request 13: Please provide the calibration protocol of the e-meter and show the uncertainty level.
CR 13, means of verification
Chek of the documents
CR 13, changes in the MR or related documents
No changes in the MR
Clarification Request 14: Please describe the sampling point and the uncertainty level in the MR.
CR 14, means of verification
On-site findings
CR 14, changes in the MR or related documents
Revision of the protocol

All these CRs and CARs have been properly solved during the verification process.

5 VERIFICATION STATEMENT

TÜV SÜD Industrie Service GmbH has performed the 1st periodic verification of the registered JI project (Track 2): CMM utilisation on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbass". The project comprises the use of CMM for the production of heat, the generation of electricity and for flaring.

Carbon-TF is responsible for the preparation of the GHG emission data and the reported GHG emission reductions.
A document review, followed by a site visit was conducted to verify the information submitted by the project participant regarding the present verification period. Based on the assessment carried out, the verifying AIE confirms the following:

- implementation of the following project activities in accordance to timeline presented in the approved PDD:
  - upgrade of the two previously coal-fired winter boilers;
  - upgrade of the two previously coal-fired summer boilers;
  - installation of the ventilation air heater
  - installation of the flare
  - upgrade of the previously diesel oil fired emergency generator
  - installation of the cogeneration unit
- the installation of the second flare is delayed, what is caused by the financial crises as per the coal mine; this was accepted by the TÜV SÜD, since the project participants have confirmed their efforts to implement the project fully in accordance with the PDD;
- the implemented part of the project has been operated in accordance with the description given in the registered PDD (Version 04, 10-09-2008, registered on 25-08-2008);
- there are the following inconsistencies to the approved monitoring plan of the registered PDD:
  - for the winter boilers and the VAH mainly handwritten data stored in utilization journals and Excel sheets were available; an electronic measurement system as per the registered PDD was installed in December 2009 – January 2010 and started operation at 24/02/2010;
  - the electronic measurement and data storage monitoring system as per the PDD has not been installed during the monitoring period for two summer boilers and for the emergency power generator; instead of that the handwritten journals were used for monitoring;
  - the heat generation of the boilers and the power amount produced by the emergency power generator have not been measured but calculated using the utilized methane amount;
- the quality of the handwritten data and the applied calculation procedure for the parameters estimation have been verified by the audit team and finally accepted by TÜV SÜD;
- the data are conservatively considered in the calculation of the emission reductions.
- the installed equipment essential for generating emission reductions runs reliably and the meters are calibrated appropriately; the project is generating emission reductions.

Our opinion is based on the project GHG emissions and resulting GHG emission reductions reported, which have been determined through the approved project baseline, monitoring plan and associated documents. The emission reductions are significantly lower than the presented in the registered PDD related to the same period. The reason is locally very low CH_4 concentration in the coal mine gas.

Based on the information we have checked and evaluated, we confirm the following statement:

Reporting period:
From 01-01-2008 to 31-03-2010

Verified emissions:

Period 01-01-2008 to 31-12-2008:

Baseline emissions:	92,851	t CO_{2e}
Project emissions:	10,723	t CO_{2e}
Leakage emission:	N/A	t CO_{2e}
Emission reductions:	**82,128**	**t CO_{2e}**

Period 01-01-2009 to 31-12-2009:

Baseline emissions:	107,581	t CO_{2e}
Project emissions:	13,074	t CO_{2e}
Leakage emission:	N/A	t CO_{2e}
Emission reductions:	**94,507**	**t CO_{2e}**

Period 01-01-2010 to 31-03-2010:

Baseline emissions:	40,238	t CO_{2e}
Project emissions:	4,682	t CO_{2e}
Leakage emission:	N/A	t CO_{2e}
Emission reductions:	**35,556**	**t CO_{2e}**

Total Emission Reductions: 212,191 t CO_{2e}

Munich, 01-02-2011

Rachel Zhang
Certification Body "climate and energy"
TÜV SÜD Industrie Service GmbH

Munich, 01-02-2011

Thomas Kleiser
Assessment Team Leader

Annex 1: DVM and TÜV SÜD Verification Protocols

DVM Verification Protocol

Project Title: 1st Periodic Verification of the JI Project (Track 2)

"CMM utilisation on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company ",

Period 01/01/2008 – 31/03/2010

Date of Completion: 01.02.2011

Number of Pages: 11

Industrie Service

DVM paragraph	Check item	Initial finding	Action requested to project participants (incl. CAR, CR or FAR)	Review of project participants. action	Conclusion
Project approvals by Parties involved					
90	Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	n/a	n/a	n/a	☑
91	Are all the written project approvals by Parties involved unconditional?	n/a	n/a	n/a	☑
Project implementation					
92	Has the project been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	The project is almost fully implemented yet. The installation of the second flare is delayed due to the financial crisis.	See TÜV verification protocol, annex 1	See TÜV verification protocol, annex 1 and verification report	☑
93	What is the status of operation of the project during the monitoring period?	During the monitoring the following facilities were in operation:	n/a	See TÜV verification protocol, annex 1 and verification report	☑

		- 3 winter boilers - 2 summer boilers - 1 flare - 1 cogeneration unit - 1 emergency generator - 1 VAH 1 flare is missing compared with the PDD			
Compliance with monitoring plan					
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	Most of the data were read and recorded manually. The errors of the manually data have been determined and have been considered in the calculations thus guaranteeing full conservativeness. (See also chapter 2 of the verification checklist, annex 1). Furthermore, the pa-	See TÜV verification protocol, annex 1	See TÜV verification protocol, annex 1 and the TÜV verification report, chapter 3.4	☑

		rameter $HEAT_y$ has not been measured but calculated from the methane amount in the period from 01/01/2008 till 03/03/2010, the net caloric value of methane and the boiler efficiency. TÜV SÜD confirms that the applied formulas are correct and that the estimation of $HEAT_y$ is done in a conservative manner.			
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	When calculating the emission reductions all key factors, e.g. those listed in 23 (b) (i)-(vii), have been considered.	See TÜV verification protocol, annex 1	See TÜV verification protocol, annex 1	☑

95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	All data sources have been identified by the audit team during the on-site audit (data journals, data excel sheets). The transferred data have been cross checked with the raw data. TÜV SÜD confirms that the checked data are reliable and transparent.	See TÜV verification protocol, annex 1	See TÜV verification protocol, annex 1	☑
95 (c)	Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	n/a	n/a	n/a	☑
95 (d)	Is the calculation of emission reductions or enhancements of net removals calculated based on conservative assumptions and the most plausible scenarios in a transparent manner?	The calculations are based on the monitored data gained by calibrated meters. Special cases were treated taking into account principle of conservativeness. The calculations are	See TÜV verification protocol, annex 1	See TÜV verification protocol, annex 1	☑

		transparently conducted in the Excel workbook. Assessment team can confirm that, the calculations are correct, conservative and transparently presented.			
	Applicable to JI SSC projects only				
96	Is the relevant threshold to be classified as JI SSC project not exceeded during the monitoring period on an annual average basis?	n/a	n/a	n/a	n/a
96	*If the threshold is exceeded, is the maximum emission reduction level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?*	n/a	n/a	n/a	n/a
	Applicable to bundled JI SSC projects only				
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSC- BUNDLE?	n/a	n/a	n/a	n/a
97 (b)	*If the determination was conducted on the* project participants submitted a common monitoring report?	n/a	n/a	n/a	n/a

98	*If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods,* are the monitoring periods per component of the project clearly specified in the monitoring report?	n/a	n/a	n/a	n/a
98	*If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, d*o the monitoring periods not overlap with those for which verifications were already deemed final in the past?	n/a	n/a	n/a	n/a
Revision of monitoring plan					
	Applicable only if monitoring plan is revised by project participants				
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	n/a	n/a	n/a	n/a
99 (b)	Does the proposed revision improve the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	n/a	n/a	n/a	n/a

Data management					
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	The data collection procedures, the quality control and the quality assurance procedures have been written down in a monitoring manual. TÜV SÜD confirms that these procedures are in accordance with the registered monitoring plan.	n/a	See IRL, annex 2	☑
101 (b)	Is the function of the monitoring equipment, including its calibration status, in order?	The audit team has controlled all monitoring meters and associated calibration protocols. TÜV SÜD confirms that all meters including their calibration status were in order.	n/a	See TÜV verification protocol, annex 1	☑
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	Yes, the evidence and records used for the monitoring maintained in a traceable manner. The documents and data	n/a	See IRL, annex 2	☑

		records of the monitoring provided by the project proponents are archived on pdf- and excel files at TÜV SÜD.			
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	See 94 above			☑
Verification regarding programmes of activities (additional elements for assessment)					
102	Is any JPA that has not been added to the JI PoA not verified?	n/a	n/a	n/a	n/a
103	Is the verification based on the monitoring reports of all JPAs to be verified?	n/a	n/a	n/a	n/a
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	n/a	n/a	n/a	n/a
104	Does the monitoring period not overlap with previous monitoring periods?	n/a	n/a	n/a	n/a
105	*If the AIE learns of an erroneously included JPA, has the AIE informed the JISC of its findings in writing?*	n/a	n/a	n/a	n/a

	Applicable to sample-based approach only				
106	Does the sampling plan prepared by the AIE: a) Describe its sample selection, taking into account that: (i) For each verification that uses a sample-based approach, the sample selection shall be sufficiently representative of the JPAs in the JI PoA such extrapolation to all JPAs identified for that verification is reasonable, taking into account differences among the characteristics of JPAs, such as: − The types of JPAs; − The complexity of the applicable technologies and/or measures used; − The geographical location of each JPA; − The amounts of expected emission reductions of the JPAs being verified; − The number of JPAs for which emission reductions are being verified; − The length of monitoring periods of the JPAs being verified; and − The samples selected for prior	n/a	n/a	n/a	n/a

	verifications, if any?				
106	(ii) If, in its sample selection, the AIE does not identify and take into account such differences among JPAs, then (does the sampling plan) provide a reasonable explanation and justification for not doing so?	n/a	n/a	n/a	n/a
106	(b) Provide a list of JPAs selected for site inspections, based on a statistically sound selection of sites for inspection in accordance with the criteria listed in (a) (i) above?	n/a	n/a	n/a	n/a
107	Is the sampling plan ready for publication through the secretariat along with the verification report and supporting documentation?	n/a	n/a	n/a	n/a
108	Has the AIE made site inspections of at least the square root of the number of total JPAs, rounded to the upper whole number? If the AIE makes no site inspections or fewer site inspections than the square root of the number of total JPAs, rounded to the upper whole number, then does the AIE provide a reasonable explanation and justification?	n/a	n/a	n/a	n/a

109	Is the sampling plan available for submission to the secretariat for the JISC.s ex ante assessment? (Optional)	n/a	n/a	n/a	n/a
	Applicable to both sample based and non-sample based approaches	n/a	n/a	n/a	n/a
110	*If the AIE learns of a fraudulently included JPA, a fraudulently monitored JPA or an inflated number of emission reductions claimed in a JI PoA,* has the AIE informed the JISC of the fraud in writing?	n/a	n/a	n/a	n/a

Verification Protocol

Project Title: CMM utilization on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company “GOAO Shakhtoupravlenye Donbass”, Verification Period 01/01/2008 – 31/03/2010

Date of Completion: 01.02.2011

Number of Pages: 92

Table of Contents

1 Project Activity Implementation

1.1 Technology

Location (s)			
	PDD Description	Verified Situation	Conclusion and IRL
Description / Address:	Coal mine Shcheglovskaya-Glubokaya, Makeyevka, Donetsk Oblast, Ukraine	Coal mine Shcheglovskaya-Glubokaya, Makeyevka, Donetsk Oblast, Ukraine	☑
GSP coordinates:	n/a	n/a	☑
Technical Equipment – Main Components			
	PDD Description	Verified Situation	Conclusion and IRL
Description	Usage of methane for heat and power generation and flaring - 3 upgraded winter boilers - 2 upgraded summer boilers - 2 flares - 1 cogeneration unit - 1 emergency generator - 1 ventilation air heater with 4 modules	Usage of methane for heat and power generation and flaring - 3 upgraded boilers Type DKV-10-13 (winter boilers) - 2 upgraded boilers Type E-1,0-0,9G-3 (summer boilers) - 1 flare - 1 cogeneration unit - 1 emergency generator - 1 ventilation air heater with 4 modules	☑

Component 1: Technical Features	3 Winter Boilers Type DKV-10/13, No. 1, 3 and 4 Hot water boilers Installed firing capacity: 7,600 kW Manufacturer: Biysk Boiler Plant Commissioning dates: Boiler 1: October 2008 Boiler 3: October 2007 Boiler 4: October 2006 Serial numbers: no information	3 Winter Boilers Type DKV-10/13, No. 1, 3 and 4 Hot water boilers Installed firing capacity: 7,600 kW Manufacturer: Biysk Boiler Plant Commissioning date: Boiler 1: October 2008 Boiler 3: October 2007 Boiler 4: October 2006 Boiler 1: Inventory no. 227655 Boiler 3: Inventory no. 227654 Boiler 4: Inventory no. 227652	☑
Component 2: Technical Features	2 Summer Boilers Type E-1/9 Heat capacity: 1 t/h steam Manufacturer: Biysk Boiler Plant Commissioning date: Summer 2006 Serial numbers: not visible Inventory no: no information	2 Boilers Type E-1,0-0,9G-3 Heat capacity: Hot water, 0,7 MW Manufacturer: Biysk Boiler Plant Commissioning date: Summer 2006 Inventory no.: 227656 and 227657	☑
Component 3: Technical Features	2 Flares Type KGUU 5/8 Capacity: 5 MW Manufacturer: Pro2 Anlagentechnik GmbH	1 Flare Type KGUU 5/8 Capacity: 5 MW Manufacturer: Pro2 Anlagentechnik GmbH	**CAR 2** The difference is due to delay caused by

	Commissioning date: 03/2009 Serial number: no information Max. Methane: 503 m^3/h	Commissioning date: 31/07/2008 Serial number: 142401 Max. Methane: 503 m^3/h: **Corrective Action Request 2:** Please explain the delay in the installation of the second flares and show that the project remains additional by means of financial analysis on the basis of actual costs.	the financial crisis (IRL 6). The provided financial analysis clearly shows that the project remains additional (IRL 91). ☑
Component 4: Technical Features	Cogeneration unit Type: Deutz TD 620K16 gas engine Capacity: 1,350 kW Manufacturer: Deutz, Germany Commissioning date: 06/2009 Serial number: no information Max. Methane consumption: 376 m^3/h	Cogeneration unit Type: Deutz TD 620K16 gas engine Capacity: 1,350 kW Manufacturer: Deutz, Germany Commissioning date: 16/09/2009 Serial number: Max. Methane consumption: 376 m^3/h	☑
Component 5: Technical Features	Emergency generator Type: BGZHCHN 25-34 Firing capacity: 1,111 kW Manufacturer: Pervomaysk Diesel Factory Commissioning date: 07/2006 Serial number: no information	Emergency generator Type: BGZHCHN 25-34 Firing capacity: 1,111 kW Manufacturer: Pervomaysk Diesel Factory Commissioning date: 22/07/2006 Serial number: IFYUYA 1440000103 TU	☑

	Max. Methane consumption: 44 m^3/h	Max. Methane consumption: 44 m^3/h	
Component 6: Technical Features	4 Ventilation air heater modules WGS1.0 Capacity: 1 MW Manufacturer: Kamensk Plant Commissioning date: 11/2006 Serial numbers: no information	4 Ventilation air heater WGS1.0 Capacity: 1 MW Manufacturer: Kamensk Plant Commissioning date: 11/2006 Serial numbers: 3,4,8,10	☑
Operation Status during verification			
	Verified Situation		Conclusion and IRL
Approvals / Licenses	The mining license (20/06/2009 – 20/06/2014) and the permission of methane usage (02/09/2004 and 01/12/2008 – 09/2024) by the Ministry of Environment have been presented. **Clarification Request 1:** Please present the mining licence of the period before 20/06/2009		**CR 1**
Actual Operation Status	Start date of operation (each site if applicable): Under construction ☐ In operation ☒ Out of operation ☐ Reason and date (if out of operation):		☑
Remarks to Special Operational Status During the Verification Period	Phased implementation: n/a Special cases: n/a		☑

1.2 Organization

Project Participant (s)

	Verified Situation	Conclusion and IRL
Entity / Responsible person:	State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbass: Mr. Victor Orlov Coal Mine Shcheglovskaya-Glubokaya: Alexander Rybalko (Chief engineer) Carbon-TF B.V.: Dr. Jürgen Meyer	☑
JI Project management:	State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbass: Mr. Victor Orlov	☑

1.3 Quality Management System

General aspects of the Quality Management System		
	Verified Situation	Conclusion and IRL
Quality Management Manual:	See FARs below	☑
Responsibilities:	Coal Mine Shcheglovskaya-Glubokaya: Mr. Oleg Rutskiy (Heat technician) Eco-Alliance: Ms. Olga Samus Carbon-TF B.V.: Mr. Adam Hadulla (Director Business Development)	☑
Qualification and Training:	Training of the Eco-Alliance by the manufactures (Pro2 and A-Tec). Training of the coal mine staff by Eco-Alliance	☑
Implementation of QM-system	See FAR above	☑

1.4 Remaining FARs from previous Verifications (or forwarded issues of validation report)

Remaining Requests from Previous Verifications	Summary of project owner response	Audit team Conclusion and IRL
Forward action request No. 1: A Monitoring Manual containing all relevant monitoring and QM procedures should be worked out. Procedures for periodic internal verification of data as well as cross-checking should be included.		The responses have not been delivered in the submission of the monitoring report for publishing. **Corrective Action Request 1:** Please present the answers and the corresponding documentation to FARs 1 till 8.
Forward action request No. 2: Back-up procedures in case of meter failures or unexpected events (breakdown of electricity supply, computer trouble, failure of meters, etc.) should be worked out and described in the Monitoring Manual.		**See CAR 1 above**
Forward action request No. 3: A description of the data reading and data transfer processes should be included into the Montioring Manual.		**See CAR 1 above**
Forward action request No. 4: Please put identification numbers on meters without identification.		**See CAR 1 above**

Remaining Requests from Previous Verifications	Summary of project owner response	Audit team Conclusion and IRL
Forward action request No. 5: Test and documentation of the IT system used for GHG monitoring as well as data protection measures have to be demonstrated to the audit team during the next verification audit.		**See CAR 1 above**
Forward action request No. 6: Test and documentation of the IT system used for GHG monitoring as well as data protection measures have to be demonstrated to the audit team during the next verification audit.		**See CAR 1 above**
Forward action request No. 7: All unexpected events should be recorded in a log book		**See CAR 1 above**
Forward action request No. 8: The confirmation of the Ukrainian National Environmental Investment Agency concerning the availability of greening AAUs has to be provided.		**See CAR 1 above**

2 Monitoring Plan Implementation

2.1 Parameters

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
$TH_{BL,y}$	n/a	n/a	n/a	n/a	☑
d_k^{max}	n/a	n/a	n/a	n/a	☑
$CBM_{BL,i,y}$	n/a	n/a	n/a	n/a	☑
$CBM_{BL,i}$	n/a	n/a	n/a	n/a	☑
$PMM_{BL,i}$	n/a	n/a	n/a	n/a	☑
$VAM_{BLi,y}$	n/a	n/a	n/a	n/a	☑
$CBMe_{i,y}$	n/a	n/a	n/a	n/a	☑
$CBM_{BL,i,y}$	n/a	n/a	n/a	n/a	☑
$CMM_{BL,i,y}$	n/a	n/a	n/a	n/a	☑
$VAM_{BL,i,y}$	n/a	n/a	n/a	n/a	☑
$PMM_{BL,i,y}$	n/a	n/a	n/a	n/a	☑
$CONS\text{-}_{ELEC,pj}$	$CONS_{ELEC,pj}$	$CONS_{ELEC,pj}$	Table 7 of MR	Compliance Meth, PDD and MR.	☑
$CONS_{HEAT,PJ}$	n/a	n/a	n/a	n/a	☑

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
$CONS_{Foss-Fuel,PJ}$	n/a	n/a	n/a	n/a	☑
$CEF_{ELEC,PJ}$	$CEF_{ELEC,PJ}$	$CEF_{ELEC,PJ}$ = default value	Table 6 of MR	Compliance Meth, PDD and MR.	☑
CEF_{HEAT}	n/a	n/a	n/a	n/a	☑
$CEF_{FossFuel}$	n/a	n/a	n/a	n/a	☑
MM_{FL}	MM_{FL}	n/a	n/a	n/a	☑
$VAM_{flow,rate,y}$	n/a	n/a	n/a	n/a	☑
$time_y$	n/a	n/a	n/a	n/a	☑
$D_{CH4,corr,inflow}$	n/a	n/a	n/a	n/a	☑
$D_{CH4,corr,exh}$	n/a	n/a	n/a	n/a	☑
$P_{VAMinflow}$	n/a	n/a	n/a	n/a	☑
$T_{VAMinflow}$	n/a	n/a	n/a	n/a	☑
$P_{VAMexhaust}$	n/a	n/a	n/a	n/a	☑
$T_{VAMexhaust}$	n/a	n/a	n/a	n/a	☑
MM_{ELEC}	MM_{ELEC}	MM_{ELEC}	Table 7 of MR	Compliance Meth, PDD and MR.	☑
Eff_{ELEC}	Eff_{ELEC}	Eff_{ELEC} = default value	Table 6 of MR	Compliance Meth, PDD and MR.	☑

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
MM_{HEAT}	MM_{HEAT}	MM_{HEAT}	Table 7 of MR	Compliance Meth, PDD and MR.	☑
Eff_{HEAT}	Eff_{HEAT}	Eff_{HEAT} = default value	Table 6 of MR	Compliance Meth, PDD and MR.	☑
CEF_{CH4}	CEF_{CH4}	CEF_{CH4} = default value	Table 6 of MR	Compliance Meth, PDD and MR.	☑
MM_{GAS}	n/a	n/a	n/a	n/a	☑
Eff_{GAS}	n/a	n/a	n/a	n/a	☑
CEF_{NMHC}	CEF_{NMHC}	CEF_{NMHC}	Table 7 of MR	Compliance Meth, PDD and MR.	☑
PC_{CH4}	PC_{CH4}	PC_{CH4}	Table 7 of MR	Compliance with Meth and PDD	☑
PC_{NMHC}	PC_{NMHC}	PC_{NMHC}	Table 7 of MR	Compliance with Meth and PDD	☑
$PC_{CH4,VAM}$	n/a	n/a	n/a	n/a	☑
$PC_{CH4,exhaust}$	n/a	n/a	n/a	n/a	☑
MM_i	MM_{FL}	MM_{FL}	Table 7 of MR	Compliance Meth, PDD and MR.	☑
Eff_i	Eff_{FL}	Eff_{FL} = default value dependent from flare temperature	Table 6 of MR	Compliance Meth, PDD and MR.	☑

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
PE_{Mvent}	n/a	n/a	n/a	n/a	☑
$Me_{i,y}$	n/a	n/a	n/a	n/a	☑
$CMM_{Pj,i,y}$	$CMM_{Pj,y}$	$CMM_{Pj,y}$	Table 9 of MR	Compliance with Meth and PDD.	☑
$VAM_{PJ,i,y}$	n/a	n/a	n/a	n/a	☑
$PMM_{Pj,i,y}$	n/a	n/a	n/a	n/a	☑
GWP_{CH4}	GWP_{CH4}	GWP_{CH4}	Table 6 of MR	Default Value 21 tCO2/tCH4 is in compliance with the Meth and the PDD.	☑
CEF_{CH4}	n/a	n/a	n/a	n/a	☑
R	n/a	n/a	n/a	n/a	☑
V_w	n/a	n/a	n/a	n/a	☑
T	n/a	n/a	n/a	n/a	☑
ρ_{coal}	n/a	n/a	n/a	n/a	☑
g_{coal}	n/a	n/a	n/a	n/a	☑
n	n/a	n/a	n/a	n/a	☑
V_a	n/a	n/a	n/a	n/a	☑
V_c	n/a	n/a	n/a	n/a	☑
N	n/a	n/a	n/a	n/a	☑
Coordi-	n/a	n/a	n/a	n/a	☑

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
nates of wells					
Coordi-nates well profile	n/a	n/a	n/a	n/a	☑
Well depth	n/a	n/a	n/a	n/a	☑
t	n/a	n/a	n/a	n/a	☑
ES_t	n/a	n/a	n/a	n/a	☑
ES_h	n/a	n/a	n/a	n/a	☑
ES_V	n/a	n/a	n/a	n/a	☑
AO_w	n/a	n/a	n/a	n/a	☑
AT_w	n/a	n/a	n/a	n/a	☑
w	n/a	n/a	n/a	n/a	☑
$ED_{CBMw,y}$	n/a	n/a	n/a	n/a	☑
$ED_{CBMz,y}$	n/a	n/a	n/a	n/a	☑
$ED_{CPMM,y}$	n/a	n/a	n/a	n/a	☑
$CBM_{w,y}$	n/a	n/a	n/a	n/a	☑
$CBM_{z,y}$	n/a	n/a	n/a	n/a	☑

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
$CBM_{x,y}$	n/a	n/a	n/a	n/a	☑
$PBE_{Use,y}$	n/a	n/a	n/a	n/a	☑
GENy	GENy	GENy	Table 7 of the MR	Compliance Meth, PDD and MR.	☑
$HEAT_y$	$HEAT_y$	$HEAT_y$	Table 7 of the MR	**Winter Boilers:** Period: 01/01/2008 – 03/03/2010: Calculated from the methane amount, the net caloric value of methane and the boiler efficiency. This procedure is not described in the registered PDD. Period since 03/03/2010: Metering with a heat meter as described in the registered PDD **Summer Boilers:** Calculated from the methane amount, the net caloric value of methane and the boiler efficiency. This procedure is not described in the registered PDD. **Ventilation Air Heater:** Calculated from the methane amount, the	**CR 2**

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
				net caloric value of methane and the boiler efficiency. This procedure is not described in the registered PDD. **Clarification Request 2:** Please describe the different methods of determining $HEAT_y$ (calculation and metering) in the MR (A.8.) emphasizing the differences in monitoring (e.g. data recording etc.). Please show that calculating the heat from the methane amount is more conservative.	
$VFUEL_y$	n/a	n/a	n/a	n/a	☑
EF_{Elec}	EF_{Elec}	n/a	n/a	n/a	☑
$EF_{OM,y}$	n/a	n/a	n/a	n/a	☑
$EF_{BM,y}$	n/a	n/a	n/a	n/a	☑
$F_{i,j,y}$	n/a	n/a	n/a	n/a	☑
$COEF_{i,k}$	n/a	n/a	n/a	n/a	☑
$GEN_{j,y}$	$GEN_{CHP,y}$	n/a	n/a	n/a	☑
$EF_{CO2,i}$	$EF_{CO2,coal}$	$EF_{CO2,coal}$ = default value	Table 6 of MR	Compliance Meth, PDD and MR.	☑

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
$Eff_{captive}$	n/a	n/a	n/a	n/a	☑
Eff_{heat}	Eff_{heat}	Eff_{heat} = default value	Table 6 of MR	Compliance Meth, PDD and MR.	☑
EF_v	n/a	n/a	n/a	n/a	☑
ME_k	n/a	n/a	n/a	n/a	☑
$MM_{ELEC,k}$	n/a	n/a	n/a	n/a	☑
$MM_{HEAT,k}$	n/a	n/a	n/a	n/a	☑
$MM_{FL,k}$	n/a	n/a	n/a	n/a	☑

2.2 Parameters measured directly with instruments

Tables 1: Winter Boiler inventory no. 227652, 227654 and 227655 - MM_{HEAT}

Parameter and instrumentation Information:					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	MM_{HEAT}	MM_{HEAT}	MM_{HEAT}	Consistent	☑
Parameter ID (if available)	P18	n/a	P18	consistent	☑
Data Unit	t	t	t	consistent	☑
Monitoring frequency (reading)	Every 15 minutes	Continuously	01.01.2008 -03.03.2010 Method 1 - Handwritten data (Every 6 hours) Continuously 03.03.2010- dato: Method 2 - Electronic data Continuously (every 15 minutes)	**Clarification Request 3:** Please show that the handwritten data can be considered as continuous.	**CR 3**
Monitoring frequency (recording)	Every 15 minutes	At least hourly	Method 1: Every 6 hours	**See CR 3 above**	

			Method 2: Every 15 minutes		
Calibration requirements	According to the requirements of the manufacturer		Method 1: Flow: Pitot tube (ID: 1a): Calibration procedures according Donbasvugleavtomatyka Pressure difference meters (ID:1b): Calibration procedures according Donbasvugleavtomatyka Pressure (ID: 1c): n/a Temperature (ID: 1d): n /a Barometer (ID: 1e): Calibration procedures according Donbasvugleavtomatyka Concentration (ID: 2): Calibration procedures according Donbasvugleavtomatyka Method 2: Flow:	Method 1: Flow: Pitot tube (ID: 1a): 24/10/07, 22/10/08, 16/10/09 Pressure difference meters (ID:1b): 29/10/07 22/10/08, 16/10/09 Pressure (ID: 1c): n/a Temperature (ID: 1d): n/a Barometer (ID: 1e) 29/10/07 22/10/08, 16/10/09 Concentration (ID: 2): S/n: 5897:	**CR 4**

			Standard Orifice meter (ID: 5a) Pressure difference meter (ID: 5b): Temperature (ID: 5d): Pressure (ID: 5c) Concentration (ID: 5e): Calibration procedures of all parameters according to Sumystandartmetrology	20/09/06, 15/08/08, 27/08/09 S/n: 7596: 18/07/06, 27/08/09 S/n: 481 20/06/08,15/09/09 S/n: 6560: 22/08/07, 20/06/08, Method 2: Flow: Standard Orifice meter (ID: 5a): n/a Pressure difference meter (ID: 5b): 31/03/2010 Temperature (ID: 5d): Pressure (ID: 5c) Concentration (ID: 5e): **Clarification Request 4:** Please send the calibration	

				protocols of the meters ID: 5a till 5c for the monitoring period.	
Uncertainty level	Only levels defined		Method 1: Flow: Pitot tube (ID: 1a): n/a Pressure difference meters (ID:1b): 0,33 % according to error analysis Pressure (ID: 1c): 0,25 % according to error analysis Temperature (ID: 1d): 2,5 % Barometer (ID: 1e): 1 % Concentration (ID: 2): 2,5 % according to calibration protocol Method 2: Flow: Standard Orifice meter (ID: 5a): 0,74 % according DIN	Method 1: Flow: Pitot tube (ID: 1a): n/a Pressure difference meters (ID:1b): 0,33 % according to error analysis Pressure (ID: 1c): 0,25 % according to error analysis Temperature (ID: 1d): 2,5 % Barometer (ID: 1e) 1 % Concentration (ID: 2): 2,5 % according to calibration protocol	☑

			Pressure difference meter (ID: 5b): 0,038 % Temperature (ID: 5d): 0,5 % Pressure (ID: 5c) 0,2 % Concentration (ID: 5e): 1,5 %	Method 2: Flow: Standard Orifice meter (ID: 5a): 0,74 % according DIN Pressure difference meter (ID: 5b): 0,038 % Temperature (ID: 5d): 0,5 % Pressure (ID: 5c) 0,2 % Concentration (ID: 5e): 1,5 %	
Measurement Principle (if applicable)	n/a	n/a	See below	See below	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Method 1: Flow: Pitot tube (ID: 1a) Pressure difference meters (Mikromanometr MMN-240, ID:1b) Pressure (mercury filled U-tube, ID: 1c) Temperature: Liquid Thermometer (ID: 1d) Barometer: Gidrometrpribor MD-49-2 (ID: 1e)				**CR 5**

	Concentration: 4 Infrared gas analysers GVT (ID: 2) Method 2: Flow: Standard Orifice meter Himpe AG (ID: 5a) Pressure difference meter: Honeywell ST 3000 (ID: 5b): 09W33 C3180872001001 Temperature: Resistance thermometer JUMO dTRANS T01 Typ 90.2820/10 (ID: 5d) Pressure: Siemens SITRANS P Serie Z MF1564 (ID: 5c) Concentration: Siemens ULTRAMAT 23 (ID: 5e) **Clarification Request 5:** Please correct the name of the meter ID 5d in the MR	
Serial Number:	Flow: Pitot tube (ID: 1a): n/a Pressure difference meters (Mikromanometr MMN-240, ID:1b): 4471 Pressure (mercury filled U-tube, ID: 1c): n/a Temperature: Liquid Thermometer (ID: 1d): n/a Barometer: Gidrometrpribor MD-49-2 (ID: 1e): 31020 Concentration: 4 Infrared gas analysers GVT (ID: 2): 481, 6560, 7596, 5897 Method 2:	**CR 6**

	Flow: Standard Orifice meter Himpe AG (ID: 5a): n/a Pressure difference meter: Honeywell ST 3000 (ID: 5b): 09W33 C3180872001001 Temperature: Resistance thermometer JUMO dTRANS T01 Typ 90.2820/10 (ID: 5d): 00515987 Pressure: Siemens SITRANS P Serie Z MF1564 (ID: 5c): AZB/X1110844) Concentration: Siemens ULTRAMAT 23 (ID: 5e): F-Nr-N1-WN-925 **Clarification Request 6:** Please correct the serial number of meter 5e in the MR.	
Manufacturer Model Nr.:	See above	☑
Specific Location:	Method 1: Flow: Boiler House Concentration: Pump Station Method 2: Flow and concentration: Boiler House	☑
Measurement Range:	Method 1 Flow: Pitot tube (ID: 1a): unlimited Pressure difference meters (Mikromanometr MMN-240, ID:1b): 0-300 mm H_2O Pressure (mercury filled U-tube, ID: 1c): 0-360 mm Hg Temperature: Liquid Thermometer (ID: 1d): 0 till 100 °C Barometer: Gidrometrpribor MD-49-2 (ID: 1e): 600 till 800 mm Hg	**CR 7**

	Concentration: 4 Infrared gas analysers GVT (ID: 2): 0 till 100 % Method 2: Flow: Standard Orifice meter Himpe AG (ID: 5a): 8000 m^3/h at standard state conditions Pressure difference meter: Honeywell ST 3000 (ID: 5b): 09W33 C3180872001001: 0-100 mbar Temperature: Resistance thermometer JUMO dTRANS T01 Typ 90.2820/10 (ID: 5d): -40 - +120 °C Pressure: Siemens SITRANS P Serie Z MF1564 (ID: 5c): 0-1,6 bar abs. Concentration: Siemens ULTRAMAT 23 (ID: 5e): 0-100 % **Clarification Request 7:** Please describe the measurement ranges of the used meters in the MR.	
Gaps in operating time of instrument :	Period: No gaps	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: Method 1: Manual reading and writing from the meters	☑

	Method 2: Electronic data	
	Procedures: Method 1: see MR, chapter A3.2, page 30 Method 2: Automatic procedures	☑
	Implementation of procedure: Implemented by training	☑
	Responsibility: Monitoring staff	☑
Archiving of raw data and protection measures	Method 1: Handwritten Journals Method 2: Computer	☑
Data transfer and protection of input data for calculations	Method 1: Manual transfer to excel sheet and automatic calculation Method 2: Automatic transfer of the data to internet based data base.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The data have been checked and the completeness of the data has been proved.	☑
Data verification	Consistency of raw data with calculation tool:	
	Consistency of calculation tool with monitoring report:	
Crosscheck (if available)	n/a	☑

Table 2: Winter Boiler inventory no. 227652, 227654 and 227655 - $HEAT_y$

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	$HEAT_y$	$HEAT_y$	Calculated from steam amount, steam pressure and steam temperature	01/01/2008 – 03/03/2010: Calculated from the methane amount, the net caloric value of methane and the boiler efficiency (see 2.1). Since 03/03/2010: Metering with heat meter as described in the registered PDD See CR 2 in 2.1	**CR 2 above**
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	GJ	GJ	GJ	consistent	☑
Monitoring frequency (reading)	continuously	continuously	Electronic data Continuously	consistent	☑
Monitoring frequency (recording)	continuously	continuously	Every 15 minutes	consistent	☑

Calibration requirements	According to the requirements of the manufacturer		Calibration according procedures of Sumystandartmetrology Yearly calibration	**Boiler inventory no. 227652:** Standard orifice: n/a Pressure difference meter DM3583M: 12/10/2009 Indicator KSD-023: 12/10/2009 Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: Calibrated by manufacturer Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: Calibrated by manufacturer **Boiler inventory no. 227654:** Standard orifice: n/a Pressure difference meter DM3583M: 12/10/2009 Indicator KSD-023: 12/10/2009	**CR 8 and CR 9**

				Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: Calibrated by manufacturer Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: Calibrated by manufacturer **Boiler inventory no. 227655:** Standard orifice: n/a Pressure difference meter DM3583M: 14/10/2009 Indicator KSD-023: 14/10/2009 Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: Calibrated by manufacturer Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: Calibrated by	

				manufacturer **Clarification Request 8:** Please provide the calibration protocols of the meters ID 11. **Clarification Request 9:** The calibrations are not done by Sumystandartmetrology. Please correct in the MR	
Uncertainty level	Only levels defined	Not defined	Standard orifice: 1,5 % Pressure difference meter DM3583M: 1,0 % Indicator KSD-023: 1 % Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: 2.5 % Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: 2.5 %	Standard orifice: n/a Pressure difference meter DM3583M: 1,5 % Indicator KSD-023: 1 % Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: 0,5 % Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: 0,5 % Values from the calibra-	**CR 10**

				tion protocols **Clarification Request 10:** The accuracy of the difference pressure meter and the thermometers are not correct in the MR. Please revise.	
Measurement Principle (if applicable)	See above	See above	See above	See above	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	**Boiler inventory no. 227652:** Water flow by Lvivpribor consisting of: Standard orifice (ID: 11.4a), pressure difference meter DM3583M (ID: 11.4b) and indicator KSD-023 (ID: 11.4c) Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11a) Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11.4d) **Boiler inventory no. 227654:** Water flow by Lvivpribor consisting of: Standard orifice (ID: 11.3a), pressure difference meter DM3583M (ID: 11.3b) and indicator KSD-023 (ID: 11.3c) Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11a) Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11.3d)				☑

	Boiler inventory no. 227655: Water flow by Lvivpribor consisting of: Standard orifice (ID: 11.1a), pressure difference meter DM3583M (ID: 11.1b) and indicator KSD-023 (ID: 11.1c) Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11a) Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11.1d)	
Serial Number:	**Boiler inventory no. 227652:** Water flow by Lvivpribor consisting of: Standard orifice (ID: 11.4a): 4 Pressure difference meter DM3583M (ID: 11.4b): 19 Indicator KSD-023 (ID: 11.4c): 9056848 Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11a): 09456 Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11.4d): 09444 **Boiler inventory no. 227654:** Standard orifice (ID: 11.3a),: 3 Pressure difference meter DM3583M (ID: 11.3b): 71329 Indicator KSD-023 (ID: 11.3c): 4014777 Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11a): 09456 Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11.3d): 09448 **Boiler inventory no. 227655:**	☑

	Standard orifice (ID: 11.1a): 1 Pressure difference meter DM3583M (ID: 11.1b): Inventory no. 101503 Indicator KSD-023 (ID: 11.1c): 8087123 Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11a) : 09456 Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100 (ID: 11.1d) : 09451	
Manufacturer Model Nr.:	See above	☑
Specific Location:	Boiler House	☑
Measurement Range:	**Boiler inventory no. 227652:** Standard orifice: 0-200 m^3/h Pressure difference meter DM3583M: 25 kPa Indicator KSD-023: 0-200 m^3/h Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100:-50 – +250°C Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: -50 – +250°C **Boiler inventory no. 227654:** Standard orifice: 3 Standard orifice: 0-250 m^3/h Pressure difference meter DM3583M: 25 kPa Indicator KSD-023: 0-250 m^3/h Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100:-50 – +250°C Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: -50 – +250°C	**See CR 7 above**

	Boiler inventory no. 227655: Standard orifice: 0-320m^3/h Pressure difference meter DM3583M: 25 kPa Indicator KSD-023: 0-320 m^3/h Inlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100:-50 – +250°C Outlet temperature: Resistance thermometer AOZT "Terra" TSP U 1-3 PT-100: -50 – +250°C **See CR 7 above**	
Gaps in operating time of instrument :	Period: Only values during operation are considered	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	
Source of data	Type: Method 1: Manual reading and writing from the meters Method 2: Electronic data	☑
	Procedures: Method 1: see MR, chapter A3.2, page 30 Method 2: Automatic procedures	☑
	Implementation of procedure: Implemented by training	☑
	Responsibility: Monitoring staff	☑

Archiving of raw data and protection measures	Method 1: Handwritten Journals Method 2: Computer	☑
Data transfer and protection of input data for calculations	Method 1: Manual transfer to excel sheet and automatic calculation Method 2: Automatic transfer of the data to internet based data base.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The data have been checked and the completeness has been proved.	☑
Data verification	Consistency of raw data with calculation tool: The data in the calculation tool are consistent with the raw data.	☑
	Consistency of calculation tool with monitoring report:	
Crosscheck (if available)	n/a	☑

Table 3: Summer Boiler inventory no. 227656 and 227657 - MM_{HEAT}

Parameter and instrumentation Information:					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	MM_{HEAT}	MM_{HEAT}	MM_{HEAT}	Consistent	☑
Parameter ID (if available)	P18	n/a	P18	consistent	☑
Data Unit	t	t	t	consistent	☑
Monitoring frequency (reading)	Continuously	Continuously	Every 6 hours	**See CR 3 in table 1**	**See CR 3 in table 1**
Monitoring frequency (recording)	Every 15 minutes	At least hourly	Every 6 hours	**See CR in table 1**	**See CR 3 in table 1**
Calibration requirements			Flow: Pitot tube (ID: 1a): Calibration procedures according Donbasvugleavtomatyka Pressure difference meters (ID:1b): Calibration procedures according Donbasvugleavtomatyka Pressure (ID: 1c): n/a Temperature (ID: 1d): n	Flow: Pitot tube (ID: 1a): 24/10/07, 22/10/08, 16/10/09 Pressure difference meters (ID:1b): 29/10/07 22/10/08, 16/10/09 Pressure (ID: 1c):	☑

			/a Barometer (ID: 1e): Calibration procedures according Donbas-vugleavtomatyka Concentration (ID: 2): Calibration procedures according Donbas-vugleavtomatyka	n/a Temperature (ID: 1d): n/a Barometer (ID: 1e) 29/10/07 22/10/08, 16/10/09 Concentration (ID: 2): S/n: 5897: 20/09/06, 15/08/08, 27/08/09 S/n: 7596: 18/07/06, 27/08/09 S/n: 481 20/06/08,15/09/09 S/n: 6560: 22/08/07, 20/06/08	
Uncertainty level			Flow: Pitot tube (ID: 1a): n/a Pressure difference meters (ID:1b): 0.33 % according to error analysis Pressure (ID: 1c):	Flow: Pitot tube (ID: 1a): n/a Pressure difference meters (ID:1b): 0.33 % according to	☑

			0.25 % according to error analysis Temperature (ID: 1d): 2.5 % Barometer (ID: 1e): 1 % Concentration (ID: 2): 2.5 % according to calibration protocol	error analysis Pressure (ID: 1c): 0.25 % according to error analysis Temperature (ID: 1d): 2.5 % Barometer (ID: 1e) 1 % Concentration (ID: 2): 2.5 % according to calibration protocol	
Measurement Principle (if applicable)				See below	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Flow: Pitot tube (ID: 1a) Pressure difference meters (Mikromanometr MMN-240, ID:1b) Pressure (mercury filled U-tube, ID: 1c) Temperature: Liquid Thermometer (ID: 1d) Barometer: Gidrometrpribor MD-49-2 (ID: 1e) Concentration: 4 Infrared gas analysers GVT (ID: 2)				☑
Serial Number:	Flow:				☑

	Pitot tube (ID: 1a): n/a Pressure difference meters (Mikromanometr MMN-240, ID:1b): 4471 Pressure (mercury filled U-tube, ID: 1c): n/a Temperature: Liquid Thermometer (ID: 1d): n/a Barometer: Gidrometrpribor MD-49-2 (ID: 1e): 31020 Concentration: 4 Infrared gas analysers GVT (ID: 2): 481, 6560, 7596, 5897	
Manufacturer Model Nr.:	See above	☑
Specific Location:	House of Summer Boilers	☑
Measurement Range:	Flow: Pitot tube (ID: 1a): unlimited Pressure difference meters (Mikromanometr MMN-240, ID:1b): 0-300 mm H_2O Pressure (mercury filled U-tube, ID: 1c): 0-360 mm Hg Temperature: Liquid Thermometer (ID: 1d): 0 till 100 °C Barometer: Gidrometrpribor MD-49-2 (ID: 1e): 600 till 800 mm Hg Concentration: 4 Infrared gas analysers GVT (ID: 2): 0 till 100 %	☑
Gaps in operating time of instrument :	Period: No gaps	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion

		and IRL
Source of data	Type: Manual reading and writing	☑
	Procedures: see MR, chapter A3.2, page 30	☑
	Implementation of procedure: Training of staff	☑
	Responsibility: Monitoring staff	☑
Archiving of raw data and protection measures	Handwritten Journals	☑
Data transfer and protection of input data for calculations	Manual transfer to excel sheet and automatic calculation	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	Complete	☑
Data verification	Consistency of raw data with calculation tool:	
	Consistency of calculation tool with monitoring report:	
Crosscheck (if available)	n/a	☑

Table 4: Summer Boiler inventory no. 227656 and 227657 - $HEAT_y$

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	$HEAT_y$	$HEAT_y$	Calculated from-methane amount, heating value of methane and efficiency of boilers	Calculated from-methane amount, heating value of methane and efficiency of boilers	The table is not applicable because $HEAT_y$ is-calculated using methane amount, heating value of methane and efficiency of boilers (see 2.1 above)
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	GJ	GJ	GJ	consistent	☑
Monitoring frequency (reading)	n/a	n/a	n/a	n/a	☑
Monitoring frequency (recording)	n/a	n/a	n/a	n/a	☑

Calibration requirements	n/a	n/a	n/a	n/a	☑
Uncertainty level	n/a	n/a	n/a	n/a	☑
Measurement Principle (if applicable)	n/a	n/a	n/a	n/a	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	´n/a				
Serial Number:	n/a				☑
Manufacturer Model Nr.:	n/a				☑
Specific Location:	n/a				☑
Measurement Range:	n/a				☑
Gaps in operating time of instrument :	Period: n/a				☑
	Default value used: n/a				☑
	Justification: n/a				☑
	QA/QC aspects				
Source of data	Type*:* n/a				☑
	Procedures: n/a				☑
	Implementation of procedure: n/a				☑
	Responsibility: n/a				☑

Archiving of raw data and protection measures	n/a	☑
Data transfer and protection of input data for calculations	n/a	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	n/a	☑
Data verification	Consistency of raw data with calculation tool: n/a	☑
	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

Table 5: Flare - MM_{FL}

Parameter and instrumentation Information:					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	MM_{FL}	MM_{FL}	MM_{FL}	Consistent	☑
Parameter ID (if available)	P12	n/a	P12	consistent	☑
Data Unit	t	t	t	consistent	☑
Monitoring frequency (reading)	Continuously	Continuously	Continuously	Continuously	☑
Monitoring frequency (recording)	Every 15 minutes	At least hourly	Every 15 minutes	Every 15 minutes	☑
Calibration requirements			Flow: All parameters according to the requirements of the manufactures Concentration: According to the requirements of Sumystandart-metrology	Flow: Standard Orifice meter Himpe AG: n/a Pressure difference: Honeywell STD-3000: 30/04/2008 by manufacturer, 31/03/2010 Temperature: Resistance JUMO PT-100 DIN: Initial by manufacturer,	☑

				Second: 31/03/2010 Pressure: Noeding P121 E02-311: Initial by manufacturer, Second: 31/03/2010 Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100: Initial by manufacturer, Second: 31/03/2010	
Uncertainty level			Flow: Standard Orifice meter Himpe AG: 0.56 and 0.75 % Pressure difference: Honeywell STD-3000: 0.0375 Temperature: Resistance JUMO PT-100 DIN: 0.3+0.005T Pressure: Noeding P121 E02-311:0.2 %	Flow: Standard Orifice meter Himpe AG: 0.56 and 0.75 % Pressure difference: Honeywell STD-3000: 0.0375 Temperature: Resistance JUMO PT-100 DIN: 0.3+0.005T Pressure: Noeding	☑

			Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100:1.5	P121 E02-311:0.2 % Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100:1.5	
Measurement Principle (if applicable)				See below	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Flow: Standard Orifice meter Himpe AG (ID: 7a) Pressure difference: Honeywell STD-3000 (ID: 7b) Temperature: Resistance JUMO PT-100 DIN (ID: 7d) Pressure: Noeding P121 E02-311 (ID: 7c) Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100 (ID: 7e)				☑
Serial Number:	Flow: Standard Orifice meter Himpe AG: n/a Pressure difference: Honeywell STD-3000: C3149127001001 Temperature: Resistance JUMO PT-100 DIN: 45710508 Pressure: Noeding P121 E02-311: EX812126966				☑

	Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100: 120482003017	
Manufacturer Model Nr.:	See above	☑
Specific Location:	Flare Container	☑
Measurement Range:	Flow: Standard Orifice meter Himpe AG: till 13/11/2009: 1550 m^3/h at standard state conditions; since 13/11/2009: 2500 m^3/h at standard state conditions; Pressure difference: Honeywell STD-3000: 0-100 mbar Temperature: Resistance JUMO PT-100 DIN: -40 - +120°C Pressure: Noeding P121 E02-311: 0-250 mbar rel. Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100: 0 -100 %	☑
Gaps in operating time of instrument :	Period: no gaps	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: Electronic data and manual data	☑
	Procedures: Automatic procedures	☑
	Implementation of procedure: Implemented	☑
	Responsibility: Eco-Alliance	☑

Archiving of raw data and protection measures	Automatic by computer with back up	☑
Data transfer and protection of input data for calculations	Data transfer by GSM to Kuhse GmbH and further on to Carbon-TF with back up	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	There are two periods: 27.05.09 – ca. 23.06.09 Inconsistencies between handwritten and electronic data 24.06.09 – 31-03.10 Consistent data **Clarification Request 11:** Period 27.05.09 – ca. 23.06.09: Please explain the inconsistencies in data and show that the chosen values are plausible.	**CR 11**
Data verification	Consistency of raw data with calculation tool: see CR above	☑
	Consistency of calculation tool with monitoring report: see CR above	☑
Crosscheck (if available)	Manual Data	☑

Table 6: Flare - Eff_{FL}

Parameter and instrumentation Information:					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	**Eff_{FL}**	**Eff_{FL}**	**Eff_{FL}**	Consistent	☑
Parameter ID (if available)	P13	n/a	P13	consistent	☑
Data Unit	%	%	%	consistent	☑
Monitoring frequency (reading)	Continuously	Continuously	Continuously	Continuously	☑
Monitoring frequency (recording)	15 minutes cycle	hourly	every 15 minutes	consistent	☑
Calibration requirements	According to the requirements of the manufacturer	Change every year	Change every year	consistent	☑
Uncertainty level	Low	No specifications	± 0.25 %	Class 2 according to DIN 43733	☑
Measurement Principle (if applicable)	No specifications	No specifications	See below	See below	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Thermocouple Herth GmbH Type S (ID: 9)				☑
Serial Number:	Till 11/10/2009: 66503 Since 11/10/2009: 71089				☑

Manufacturer Model Nr.:	See above	☑
Specific Location:	Flare	☑
Measurement Range:	0-1,700°C	☑
Gaps in operating time of instrument :	Period: No gaps	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: Electronic data and handwritten data (reading every 6 hours)	☑
	Procedures: Automatic procedures	☑
	Implementation of procedure: Implemented	☑
	Responsibility: Eco-Alliance	☑
Archiving of raw data and protection measures	Automatic by computer with back up	☑
Data transfer and protection of input data for calculations	Data transfer by GSM to Kuhse GmbH and further on to Carbon-TF with back up	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	Between 27/05/2009 – ca. 23/06/2009: Inconsistencies between electronic and hand-	**See CR 11**

	written data. Since 23/06/2009 consistent data. **See CR 11 in table 5**	**in table 5**
Data verification	Consistency of raw data with calculation tool: The data in the calculation tool are consistence with the raw data.	☑
	Consistency of calculation tool with monitoring report:	
Crosscheck (if available)	Handwritten data	☑

Table 7: Cogeneration Unit – MM_{ELEC}

Parameter and instrumentation Information:					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	**MM_{ELEC}**	**MM_{ELEC}**	**MM_{ELEC}**	Consistent	☑
Parameter ID (if available)	P15	n/a	P15	consistent	☑
Data Unit	t	t	t	consistent	☑
Monitoring frequency (reading)	Continuously	Continuously	Continuously	Continuously	☑
Monitoring frequency (recording)	Every 15 minutes	At least hourly	Every 15 minutes	Every 15 minutes	☑
Calibration requirements	According to the manufacturers specifications	According to the industry standards	Flow: All parameters according to the requirements of the manufactures Concentration: According to the requirements of Sumystandart-metrology	Flow: Standard Orifice meter Himpe AG: n/a Pressure difference: Honeywell STD-3000: Initial by manufacturer Temperature: Resistance JUMO PT-100 DIN: Initial by manufacturer, Pressure: Noeding	☑

				P121 E02-311: Initial by manufacturer, Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100: Initial by manufacturer, Second: 31/03/2010	
Uncertainty level	Low -medium	No specifications	Flow: Standard Orifice meter Himpe AG: 0.56 % Pressure difference: Honeywell STD-3000: 0.0375 Temperature: Resistance JUMO PT-100 DIN: 0.3+0.005T Pressure: Noeding P121 E02-311:0.2 % Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100:1.5	Flow: Standard Orifice meter Himpe AG: 0.56 % Pressure difference: Honeywell STD-3000: 0.0375 Temperature: Resistance JUMO PT-100 DIN: 0.3+0.005T Pressure: Noeding P121 E02-311:0.2 % Concentration: In-	☑

				frared analyser Pro 2 Anlagentechnik GmbH BINOS 100:1.5	
Measurement Principle (if applicable)	No specifications	No specifications	No specifications	See below	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Flow: Standard Orifice meter Himpe AG (ID: 8a) Pressure difference: Honeywell STD-3000 (ID: 8b) Temperature: Resistance JUMO PT-100 DIN (ID: 8d) Pressure: Noeding P121 E02-311 (ID: 8c) Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100 (ID: 7e)				☑
Serial Number:	Flow: Standard Orifice meter Himpe AG (ID: 8a): n/a Pressure difference: Honeywell STD-3000 (ID: 8b): 08W18 C3059154001002 Temperature: Resistance JUMO PT-100 DIN (ID: 8d): 00515988 Pressure: Noeding P121 E02-311 (ID: 8c): EX812127132 Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100 (ID: 7e): 120482003017				☑
Manufacturer Model Nr.:	See above				☑

Specific Location:	Cogeneration unit	☑
Measurement Range:	Flow: Standard Orifice meter Himpe AG: till 13/11/2009: 1,200 m^3/h at standard state conditions; since 13/11/2009: 2500 m^3/h at standard state conditions; Pressure difference: Honeywell STD-3000: 0-100 mbar Temperature: Resistance JUMO PT-100 DIN: -40 - +120°C Pressure: Noeding P121 E02-311: 0-250 mbar rel. Concentration: Infrared analyser Pro 2 Anlagentechnik GmbH BINOS 100: 0 -100 %	
Gaps in operating time of instrument :	Period: no gaps	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: Automatic measurements	☑
	Procedures: Automatic	☑
	Implementation of procedure: Implemented	☑
	Responsibility: Eco Alliance	☑
Archiving of raw data and protection measures	**Clarification Request 12:** Please describe the archiving of the raw data, the data protection measures, the data transfer and the protection of input data for calculations.	**CR 12**

Data transfer and protection of input data for calculations	**See CR 12 above**	
	Quality of evidence	Conclusion and IRL
Completeness of data	Complete	☑
Data verification	Consistency of raw data with calculation tool:	
	Consistency of calculation tool with monitoring report:	
Crosscheck (if available)	n/a	☑

Table 8: Cogeneration Unit - GEN_y

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	GEN_y	GEN_y	GEN_y	consistent	☑
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	MWh	MWh	MWh	consistent	☑
Monitoring frequency (reading)	continuously	continuously	continuously	continuously	☑
Monitoring frequency (recording)	monthly	monthly	monthly	monthly	☑
Calibration requirements	According to the manufacturers specifications, every 2 years	According to the industry standards		Calibration by the manufacturer **Clarification Request 13:** Please provide the calibration protocol of the e-meter and show the uncertainty level.	**CR 13**
Uncertainty level	low	*No specifications*		**See CR 13 above**	
Measurement Principle (if applicable)				Mechanical and electronical	☑

		Conclusion and IRL
Instrument Type	ID10: Mechanical E-meter NZR Electronic E-meter KMU 45B (exchange, the 02/02/2010)	☑
Serial Number	NZR: 475072 KMU 45B: old: 49500; new: 82365	☑
Manufacturer Model Nr.	See above	☑
Specific Location	CHP Unit	☑
Measurement Range	n/a	☑
Gaps in operating time of instrument	Period: No gaps	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: Electronic data	☑
	Procedures: Automatic recording	☑
	Implementation of procedure: Implemented	☑
	Responsibility: Eco-Alliance	☑
Archiving of raw data and protection	Handwritten data in Journal, reading every day	☑

measures		
Data transfer and protection of input data for calculations	Scanned document and excel sheet send by Email to Carbon-TF	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	Complete	☑
Data verification	Consistency of raw data with calculation tool:	
	Consistency of calculation tool with monitoring report:	
Crosscheck (if available)	n/a	☑

Table 9: Emergency generator – MM_{ELEC}

Parameter and instrumentation Information:					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	**MM_{ELEC}**	**MM_{ELEC}**	**MM_{ELEC}**	Consistent	☑
Parameter ID (if available)	P15	n/a	P15	consistent	☑
Data Unit	t	t	t		☑
Monitoring frequency (reading)	Every 15 minutes	Continuously	Continuously	consistent	☑
Monitoring frequency (recording)	Every 15 minutes	At least hourly	Every 6 hours	consistent	☑
Calibration requirements			Flow: Pitot tube (ID: 4a): Calibration procedures according Donbasvugleavtomatyka Pressure difference meters (ID:4b): Calibration procedures according Donbasvugleavtomatyka Pressure (ID: 4c): n/a Temperature (ID: 4d): n /a	Flow: Pitot tube (ID: 4a): 24/10/07, 22/10/08, 16/10/09 Pressure difference meters (ID: 4b): 29/10/07 22/10/08, 16/10/09 Pressure (ID: 4c): n/a	☑

			Barometer (ID: 1e): Calibration procedures according Donbas-vugleavtomatyka Concentration (ID: 2): Calibration procedures according Donbas-vugleavtomatyka	Temperature (ID: 4d): n/a Barometer (ID: 1e): 29/10/07 22/10/08, 16/10/09 Concentration (ID: 2): S/n: 5897: 20/09/06, 15/08/08, 27/08/09 S/n: 7596: 18/07/06, 27/08/09 S/n: 481 20/06/08,15/09/09 S/n: 6560: 22/08/07, 20/06/08,	
Uncertainty level			Flow: Pitot tube (ID: 4a): n/a Pressure difference meters (ID: 4b): 0.33% Pressure (ID: 4c): 0.25 % Temperature (ID: 4d):	Flow: Pitot tube (ID: 4a): n/a Pressure difference meters (ID: 4b): 0.33% Pressure (ID: 4c): 0.25 %	☑

			2.5 % Barometer (ID: 1e): 1 % Concentration (ID: 2): 2.5 %	Temperature (ID: 4d): 2.5 % Barometer (ID: 1e): 1 % Concentration (ID: 2): 2.5 %	
Measurement Principle (if applicable)				See below	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Flow: Pitot tube (ID: 4a) Pressure difference meters (Mikromanometr MMN-240, ID:4b) Pressure (mercury filled U-tube, ID: 4c) Temperature: Liquid Thermometer (ID: 4d) Barometer: Gidrometrpribor MD-49-2 (ID: 1e) Concentration: 4 Infrared gas analysers GVT (ID: 2)				☑
Serial Number:	Flow: Pitot tube (ID: 4a): 071				☑

	Pressure difference meters (Mikromanometr MMN-240, ID:4b): 2909 Pressure (mercury filled U-tube, ID: 4c): n/a Temperature: Liquid Thermometer (ID: 4d): n/a Barometer: Gidrometrpribor MD-49-2 (ID: 1e): 31020 Concentration: 4 Infrared gas analysers GVT (ID: 2): 481, 6560, 7596, 5897	
Manufacturer Model Nr.:	See above	☑
Specific Location:	Emergency Generator House	☑
Measurement Range:	Flow: Pitot tube (ID: 4a): n/a Pressure difference meters (Mikromanometr MMN-240, ID:4b): 0-300 mm H_2O Pressure (mercury filled U-tube, ID: 4c): 0-360 mm Hg Temperature: Liquid Thermometer (ID: 4d): 0-300°C Barometer: Gidrometrpribor MD-49-2 (ID: 1e): 600 – 800 mm Hg Concentration: 4 Infrared gas analysers GVT (ID: 2): 0-100 %	☑
Gaps in operating time of instrument :	Period: No gaps	☑
	Default value used: n/a	☑
	Justification: n/a	☑

	QA/QC aspects	Conclusion and IRL
Source of data	Type: Manual reading and writing	☑
	Procedures: see MR, chapter A3.2, page 30	☑
	Implementation of procedure: Training of staff	☑
	Responsibility: Monitoring staff	☑
Archiving of raw data and protection measures	Handwritten Journals	☑
Data transfer and protection of input data for calculations	Manual transfer to excel sheet and automatic calculation	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	Complete	☑
Data verification	Consistency of raw data with calculation tool:	
	Consistency of calculation tool with monitoring report:	
Crosscheck (if available)	n/a	☑

Table 10: Ventilation Air Heater – MM_{HEAT}

Parameter and instrumentation Information:					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	**MM_{HEAT}**	**MM_{HEAT}**	**MM_{HEAT}**	Consistent	☑
Parameter ID (if available)	P18	n/a	P18	consistent	☑
Data Unit	t	t	t		☑
Monitoring frequency (reading)	Every 15 minutes	Continuously	Method 1: Continuously Method 2: Continuously	consistent	☑
Monitoring frequency (recording)	Every 15 minutes	At least hourly	Method 1: Every 6 hours Method 2: Every 15 minutes	consistent	☑
Calibration requirements	According to the manufacturer	According to the industry standard	Method 1: Flow: Pitot tube (ID: 4a): Calibration procedures according Donbasvugleav-	Method 1: Flow: Pitot tube (ID: 4a): 24/10/07, 22/10/08,	☑

			tomatyka Pressure difference meters (ID:4b): Calibration procedures according Donbasvugleavtomatyka Pressure (ID: 4c): n/a Temperature (ID: 4d): n /a Barometer (ID: 1e): Calibration procedures according Donbas-vugleavtomatyka Concentration (ID: 2): Calibration procedures according Donbas-vugleavtomatyka Method 2: Flow: Standard Orifice meter (ID: 6a) Pressure difference meter (ID: 6b): Temperature (ID: 6d): Pressure (ID: 6c)	16/10/09 Pressure difference meters (ID: 4b): 29/10/07 22/10/08, 16/10/09 Pressure (ID: 4c): n/a Temperature (ID: 4d): n/a Barometer (ID: 1e): 29/10/07 22/10/08, 16/10/09 Concentration (ID: 2): S/n: 5897: 20/09/06, 15/08/08, 27/08/09 S/n: 7596: 18/07/06, 27/08/09 S/n: 481 20/06/08,15/09/09 S/n: 6560: 22/08/07, 20/06/08,	

			Concentration (ID: 6e): Calibration procedures of all parameters according to Sumystandartmetrology	Method 2: Flow: Standard Orifice meter (ID: 6a): Calibration by manufacturer Pressure difference meter (ID: 6b): Calibration by manufacturer Temperature (ID: 6d): Calibration by manufacturer Pressure (ID: 6c) Concentration: Siemens ULTRAMAT 23 (ID: 5e): Calibration by manufacturer	
Uncertainty level	Low till medium	Low till medium	Method 1: Flow: Pitot tube (ID: 4a): n/a Pressure difference meters (ID: 4b): 0.33%	Method 1: Flow: Pitot tube (ID: 4a): n/a Pressure difference	☑

			Pressure (ID: 4c): 0.25 % Temperature (ID: 4d): 2.5 % Barometer (ID: 1e): 1 % Concentration (ID: 2): 2,5 % Method 2: Flow: Standard Orifice meter Himpe AG (ID: 6a): 0.54 % Pressure difference meter: Honeywell ST 3000 (ID: 6b): 0.0375% Temperature (ID: 6d): 0.3+0.005T Pressure (ID: 6c): 0.2 % Concentration: Siemens ULTRAMAT 23 (ID: 5e): 1.5 %	meters (ID: 4b): 0.33% Pressure (ID: 4c): 0.25 % Temperature (ID: 4d): 2.5 % Barometer (ID: 1e): 1 % Concentration (ID: 2): 2,5 % Method 2: Flow: Standard Orifice meter Himpe AG (ID: 6a): 0.54 % Pressure difference meter: Honeywell ST 3000 (ID: 6b): 0.0375% Temperature (ID: 6d): 0.3+0.005T Pressure (ID: 6c): 0.2 % Concentration: Siemens UL-	

				TRAMAT 23 (ID: 5e): 1.5 %	
Measurement Principle (if applicable)	No specifications	No specifications	No specifications	See below	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Method 1: Flow: Pitot tube (ID: 4a) Pressure difference meters (Mikromanometr MMN-240, ID:4b) Pressure (mercury filled U-tube, ID: 4c) Temperature: Liquid Thermometer (ID: 4d) Barometer: Gidrometrpribor MD-49-2 (ID: 1e) Concentration: 4 Infrared gas analysers GVT (ID: 2) Method 2: Flow: Standard Orifice meter Himpe AG (ID: 6a) Pressure difference meter: Honeywell ST 3000 (ID: 6b): Temperature: Resistance thermometer JUMO dTRANS T01 Typ 90.2820/10 (ID: 6d) Pressure: Siemens SITRANS P Serie Z MF1564 (ID: 6c) Concentration: Siemens ULTRAMAT 23 (ID: 5e)				☑

Serial Number:	Method 1: Flow: Pitot tube (ID: 4a): 071 Pressure difference meters (Mikromanometr MMN-240, ID:4b): 2909 Pressure (mercury filled U-tube, ID: 4c): n/a Temperature: Liquid Thermometer (ID: 4d): n/a Barometer: Gidrometrpribor MD-49-2 (ID: 1e): 31020 Concentration: 4 Infrared gas analysers GVT (ID: 2): 481, 6560, 7596, 5897 Method 2: Flow: Standard Orifice meter Himpe AG (ID: 6a): n/a Pressure difference meter: Honeywell ST 3000 (ID: 6b): 09W12 C3149127001001 Temperature: Resistance thermometer JUMO dTRANS T01 Typ 90.2820/10 (ID: 6d): 00515987 Pressure: Siemens SITRANS P Serie Z MF1564 (ID: 6c): AZB/X1110845 Concentration: Siemens ULTRAMAT 23 (ID: 5e): F-Nr-N1-WN-925	☑
Manufacturer Model Nr.:	See above	☑
Specific Location:	House of Air Heaters	
Measurement Range:	Method 1:	☑

	Flow: Pitot tube (ID: 4a): n/a Pressure difference meters (Mikromanometr MMN-240, ID:4b): 0-300 mm H_2O Pressure (mercury filled U-tube, ID: 4c): 0-360 mm Hg Temperature: Liquid Thermometer (ID: 4d): 0-300°C Barometer: Gidrometrpribor MD-49-2 (ID: 1e): 600 – 800 mm Hg Concentration: 4 Infrared gas analysers GVT (ID: 2): 0-100 % Method 2: Flow: Standard Orifice meter Himpe AG (ID: 6a): 1200 m^3/h at standard state Pressure difference meter: Honeywell ST 3000 (ID: 6b): 0-100 mbar Temperature: Resistance thermometer JUMO dTRANS T01 Typ 90.2820/10 (ID: 6d): -40 - +120°C Pressure: Siemens SITRANS P Serie Z MF1564 (ID: 6c): 0-1,6 bar abs. Concentration: Siemens ULTRAMAT 23 (ID: 5e): 0-100 %	
Gaps in operating time of instrument :	Period: No gaps	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion

		and IRL
Source of data	Type: Method 1: Manual reading and writing Method 2: Electronic data	☑
	Procedures: Method 1: see MR, chapter A3.2, page 30 Method 2: Automatic procedures	☑
	Implementation of procedure: Training of staff	☑
	Responsibility: Monitoring staff	☑
Archiving of raw data and protection measures	Method 1: Handwritten Journals Method 2: Computer	☑
Data transfer and protection of input data for calculations	Method 1: Manual transfer to excel sheet and automatic calculation Method 2: Automatic transfer of the data to internet based data base.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	Complete	☑
Data verification	Consistency of raw data with calculation tool:	
	Consistency of calculation tool with monitoring report:	
Crosscheck (if available)	n/a	☑

Table 11: Ventilation Air Heater- HEATy

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	$HEAT_y$	$HEAT_y$	Calculated from-methane amount, heating value of methane and efficiency of boilers	Calculated from-methane amount, heating value of methane and efficiency of boilers	The table is not applicable because $HEAT_y$ is-calculated using methane amount, heating value of methane and efficiency of boilers (see 2.1 above) for the whole verification period
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑

Data Unit	GJ	GJ	GJ	consistent	☑
Monitoring frequency (reading)	n/a	n/a	n/a	n/a	☑
Monitoring frequency (recording)	n/a	n/a	n/a	n/a	☑
Calibration requirements	n/a	n/a	n/a	n/a	☑
Uncertainty level	n/a	n/a	n/a	n/a	☑
Measurement Principle (if applicable)	n/a	n/a	n/a	n/a	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	n/a				☑
Serial Number:	n/a				☑
Manufacturer Model Nr.:	n/a				☑
Specific Location:	n/a				☑
Measurement Range:	n/a				☑
Gaps in operating time of instrument :	Period: n/a				☑
	Default value used: n/a				☑
	Justification: n/a				☑
	QA/QC aspects				
Source of data	Type: n/a				☑

	Procedures: n/a	☑
	Implementation of procedure: n/a	☑
	Responsibility: n/a	☑
Archiving of raw data and protection measures	n/a	☑
Data transfer and protection of input data for calculations	n/a	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	n/a	
Data verification	Consistency of raw data with calculation tool: n/a	☑
	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

Table 12: PC_{CH4}

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	PC_{CH4}	PC_{CH4}	PC_{CH4}	consistent	☑
Parameter ID (if available)	P25	n/a	P25	consistent	☑
Data Unit	%	%	%	consistent	☑
Monitoring frequency (reading)	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
Monitoring frequency (recording)	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
Calibration requirements	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑

Uncertainty level	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
Measurement Principle (if applicable)	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
Instrument Type:	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑
Serial Number:	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑
Manufacturer Model Nr.:	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑
Specific Location:	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑
Measurement Range:	See analysers in tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑
Gaps in operating time of instrument :	Period: See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑
	Default value used: See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑
	Justification: See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑
	QA/QC aspects				
Source of data	Type: See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑
	Procedures: See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})				☑

	Implementation of procedure: See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
	Responsibility: See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
Archiving of raw data and protection measures	See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
Data transfer and protection of input data for calculations	See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
	Quality of evidence	
Completeness of data	See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
Data verification	Consistency of raw data with calculation tool: See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
	Consistency of calculation tool with monitoring report: See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑
Crosscheck (if available)	See tables above (MM_{HEAT}, MM_{ELEC}, MM_{FLARE})	☑

2.3 Parameters measured through sampling

Table 1

Sampling information: Gas Sample Analysis					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	PC_{NMHC}	PC_{NMHC}	PC_{NMHC}	consistent	☑
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	%	%	%	consistent	☑
Sampling frequency	Yearly	Yearly	Yearly	consistent	☑
Sampling point	No specifications	No specifications	No specifications	**Clarification Request 14:** Please describe the sampling point and the uncertainty level in the MR.	**CR 14**
Uncertainty level	low	No specifications	No specifications	See CR above	
	Technical aspects				Conclusion and IRL
Sampling Principle:	Airbag				☑
Methodology of Sampling:	Airbag				☑

Sample Analysed by:	Respirator Institute, Donetsk	☑
Certification of Analyser/ Laboratory:	Certified	☑
Methodology of Sample Analysis (if applicable)	According to certification	☑
Measurement Range:	According to certification	☑
Gaps in sampling frequency	Period: no	☑
	Default value used: no	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: Chemical Analysis	☑
	Procedures: see Monitoring Manual	☑
	Implementation of procedure: implemented	☑
	Responsibility: Monitoring team	☑
	Representativeness: n/a	☑
	Reproducibility: n/a	☑
Archiving of raw data and protection measures	Hard copy of the analysis protocol	☑
Data transfer and protection of input data for calculations	No input into calculations	☑

	Quality of evidence	Conclusion and IRL
Completeness of data	Complete	
Data verification	Consistency of raw data with calculation tool: n/a because NMHC < 1	☑
	Consistency of calculation tool with monitoring report: n/a because NMHC < 1	☑
Crosscheck (if available)	n/a	☑

2.4 Parameters obtained through external sources and accounting data

External sources and accounting information *use a separate table for each single parameter*					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	n/a	n/a	n/a	n/a	☑
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	n/a	n/a	n/a	n/a	☑
	Technical aspects				Conclusion and IRL
Description of Data / Data Refers to:	n/a				☑

Date of Data:	n/a	☑
Gaps in data	Period: n/a	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: n/a	☑
	Responsibility: n/a	☑
	Representativeness: n/a	☑
Reliability of Data Source:	n/a	☑
Is the Data up-to-date?	n/a	☑
Archiving of raw data and protection measures	n/a	☑
Data transfer and protection of input data for calculations	n/a	☑
	Quality of evidence	☑
Completeness of data		☑
Data verification	Consistency of raw data with calculation tool: n/a	☑

	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

2.5 Other parameters not included in the methodology/tool but included in the PDD

Other information				
	PDD	MR	Verified	Conclusion and IRL
Parameter title	n/a	n/a	n/a	☑
Parameter ID (if available)	n/a	n/a	n/a	☑
Data Unit	n/a	n/a	n/a	☑
	Technical aspects			Conclusion and IRL
Description of Data / Data Refers to:	n/a			☑
Date of Data:	n/a			☑
Gaps in data	Period: n/a			☑
	Default value used: n/a			☑
	Justification: n/a			☑

	QA/QC aspects	Conclusion and IRL
Source of data	Type*:* n/a	☑
	Responsibility: n/a	☑
	Representativeness: n/a	☑
Reliability of Data Source:	n/a	☑
Archiving of raw data and protection measures	n/a	☑
Data transfer and protection of input data for calculations	n/a	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	n/a	☑
Data verification	Consistency of raw data with calculation tool: n/a	☑
	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

3 Data Processing and ER calculation

Description of data processing from transferred data to final results in the calculation tool		
Step	Description	Conclusion and IRL
Consistency	See tables above	☑
Calculation Tool description	The calculation steps are described and implemented in a transparent manner	☑
Elimination of not plausible data (if applicable)	Not plausible data were not considered in the calculation. Moreover, the amount of not plausible data was only minor (See also CR11).	See CR11 ☑
Transformation from useable data to input data for further calculation (if applicalbe)	Transformation of the useable data to the input data was performed with taking into account error propagation by considering all possible sources of errors. Therefore, the used input data can be considered as conservative.	☑
Ex-ante data	n/a	☑
Default parameter	See 2.1	☑
Formulae check	In case of the calculated input data: See CR2 In case of the measured input data: The formulae in the calculation tool comply with the formulae of the registered PDD.	See CR2 ☑
Rounding functions	n/a	
Calculation tool changes and pro-	n/a	

tection measures		
Reported data	n/a	

4 Additional assessment

4.1 Internal Review

Description and performance of internal review		
	Description	Conclusion and IRL
Procedure	n/a	☑
Documentation	n/a	☑
Responsibilities	n/a	☑

4.2 Peculiarities

Description of Peculiarities and unexpected Daily Events during the verification period		
	Description	Conclusion and IRL
Performance	n/a	☑
Documentation	n/a	☑
Measures	n/a	☑

4.3 Further additional requirements

Description of additional requirements to be checked		
	Description	Conclusion and IRL
	n/a	☑
	n/a	☑

4.4 Data Reporting

Description of the Monitoring Report		
	Comments and Results	Conclusion and IRL
Compliance with UNFCCC regulations	The MR complies with the UNFCCC regulations.	☑
Completeness and Transparency	See CRs above	☑
Correctness	See CRs above	☑

5 Remaining FARs from previous Verifications (or forwarded issues of validation report)

Remaining Requests from Previous Verifications	Summary of project owner response	Audit team Conclusion and IRL
Forward action request No. 1: A Monitoring Manual containing all relevant monitoring and QM procedures should be worked out. Procedures for periodic internal verification of data as well as cross-checking should be included.	The FARs 1 till 8 have been answered.	A Monitoring Manual (MM) for the project has been developed. Excerpts from this manual have been provided. According to the presented parts the MM contains all necessary descriptions concerning the metering including emergency procedures.
Forward action request No. 2: Back-up procedures in case of meter failures or unexpected events (breakdown of electricity supply, computer trouble, failure of meters, etc.) should be worked out and described in the Monitoring Manual.	All data have been cross-checked for plausibility using different approaches. The heat amount produced by the boilers has been calculated using the utilised CH_4 amount and measured boiler efficiency. Multiple meters for CH4 concentration and produced power exist. Additionally the coal mine personnel record the data in hand written journals. This information is included in the monitoring manual.	According to the on-site findings back-up procedures like data recording in handwritten journals have been implemented. Hence, FAR 2 is considered to be solved. ☑
Forward action request No. 3: A description of the data reading and data transfer processes should be included into the Monitoring Manual.	The description is included in the monitoring manual.	The description of the data reading and the data transfer has been included into the MM. Hence, FAR 3 is considered to be solved.

Remaining Requests from Previous Verifications	Summary of project owner response	Audit team Conclusion and IRL
		☑
Forward action request No. 4: Please put identification numbers on meters without identification.	All meters and units have been labelled with unique numbers.	According to the onsite visit all meters are clearly identified by numbers. Hence, this issue is considered to be solved. ☑
Forward action request No. 5: Test and documentation of the IT system used for GHG monitoring as well as data protection measures have to be demonstrated to the audit team during the next verification audit.	Test and documentation of the IT system have been demonstrated to the audit team during the verification audit.	The IT system has been demonstrated to the audit team. Hence, FAR 5 is considered to be solved. ☑
Forward action request No. 6: Test and documentation of the IT system used for GHG monitoring as well as data protection measures have to be demonstrated to the audit team during the next verification audit.	Test and documentation of the IT system have been demonstrated to the audit team during the verification audit.	See FAR 5 above ☑
Forward action request No. 7: All unexpected events should be re-	All unexpected events are recorded in a log book.	The record of unexpected events has been demonstrated to the audit team during the

Remaining Requests from Previous Verifications	Summary of project owner response	Audit team Conclusion and IRL
corded in a log book		on-site visit. Hence, FAR 7 is considered to be solved. ☑
Forward action request No. 8: The confirmation of the Ukrainian National Environmental Investment Agency concerning the availability of greening AAUs has to be provided.	NEIA provides this information in their official brochure. A scan of the relevant pages has been provided to TÜV Süd.	The issue is closed. ☑

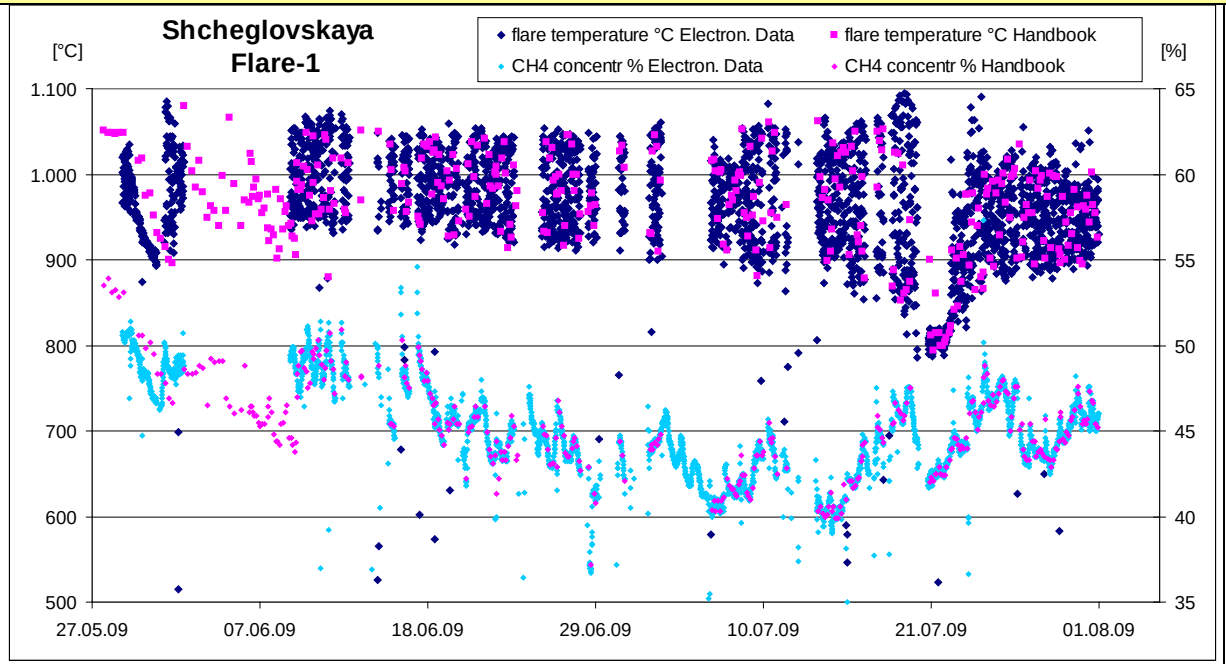
6 Compilation and Resolutions of CARs, CRs and FARs

Corrective Action Requests by audit team			
	Comments and Results	Ref	Conclusion and IRL
Issue	**Corrective Action Request 1:** Please present the answers and the corresponding documentation to FARs 1 till 8.	1.4	☑
Response	The FAR's 1 till 8 have been answered.		
Assessment	See FAR´s above		
Issue	**Corrective Action Request 2:** Please explain the delay in the installation of the second flares and show that the project remains additional by means of financial analysis on the basis of actual costs.	1.1	☑
Response	See MR and financial analysis		
Assessment	The difference is due to delay caused by the financial crisis (IRL 6). The provided financial analysis clearly shows that the project remains additional (IRL 91).		
Clarification Requests by audit team			
	Comments and Results	Ref	Conclusion and IRL
Issue	**Clarification Request 1:** Please present the mining licence of the period before 20/06/2009	1.1	☑
Response	The mining licence has been provided to the verifier.		

Corrective Action Requests by audit team			
Assessment	The provision of the licence can be confirmed. Hence, this issue is considered to be solved.		
Issue	**Clarification Request 2:** Please describe the different methods of determining $HEAT_y$ (calculation and metering) in the MR (A.8.) emphasizing the differences in monitoring (e.g. data recording etc.). Please show that calculating the heat from the methane amount is more conservative.	2.1	☑
Response	The heat meters were not in operation during the monitoring period. The heat amount has not been measured but calculated using the utilised CH4 amount and the boiler efficiencies. See Annex A3.2 for detailed explanations. In the PDD a value of 96% for the upgraded winter boiler is given. This value seems to be too high, so that a reduced value of 90%, according to an efficiency determination performed by the coal mine together with Donbassvugleavtomatyka has been taken into account.		
Assessment	A description of how $HEAT_y$ was determined has been provided. The description is in accordance with the on-site findings. Hence, this issue is considered to be solved.		
Issue	**Clarification Request 3:** Please show that the lower frequency of the handwritten data has been conservatively considered in the calculation of emission reductions.	2.2 Table 1	☑
Response	See explanations in <Possible Source of Error.doc>		
Assessment	The conducted error analysis has proven that the handwritten data are conservatively considered in the calculation of the emission reductions.		
Issue	**Clarification Request 4:** Please send the calibration protocols of the meters ID: 5b and 5c for the monitored period.	2.2 Table 1	☑
Response	The documents have been provided.		
Assessment	The issue is closed.		

Corrective Action Requests by audit team			
Issue	**Clarification Request 5:** Please correct the name of the meter ID 5d in the MR.	2.2 Table 1	☑
Response	The name has been corrected.		
Assessment	The name has been corrected according to the on-site finding (correct name: JUMO). Hence, this issue is considered to be solved.		
Issue	**Clarification Request 6:** Please correct the serial number of meter 5e in the MR.	2.2 Table 1	☑
Response	The serial number has been corrected.		
Assessment	The serial number has been corrected according to the on-site finding (correct number: 525). Hence, this issue is considered to be solved.		
Issue	**Clarification Request 7:** Please describe the measurement ranges of the used meters in the MR.	2.2 Table 1	☑
Response	The measurement ranges are now given in the MR.		
Assessment	The ranges have been included in Table-4 of the MR. The correctness of the data have been checked randomly by comparing them with the information given in the passports. No errors have been found. Hence, the issue is considered to be solved.		
Issue	**Clarification Request 8:** Please provide the calibration protocols of the meters ID: 11.1, 11.3 and 11.4.	2.2 Table 2	☑
Response	The calibration protocols for the older equipment have been provided to the verifier. For the new installed equipment only manufacturer's calibration are available. This is stated by a remark and a stamp in the meter pass.		
Assessment	The issue is closed.		
Issue	**Clarification Request 9:** The calibrations are not done by Sumystandartmetrology. Please correct in the MR.	2.2	☑

Corrective Action Requests by audit team			
Response	The MR has been corrected.	Table 2	
Assessment	The MR has been revised. The calibrations were done by Donbassvugleavtomatyka which is evidenced by the calibration protocols.		
Issue	**Clarification Request 10:** The accuracy of the difference pressure meter and the thermometers are not correct in the MR. Please revise.	2.2 Table 2	☑
Response	The MR has been corrected.		
Assessment	The uncertainty levels of the difference pressure meters and the thermometers have been included in the latest version of the PDD. The taken values are evidenced by the relating documents. Hence, this issue is considered to be solved.		
Issue	**Clarification Request 11:** Period 27.05.09 – ca. 23.07.09: Please explain the inconsistencies in data and show that the chosen values are plausible.	2.2 Table 5	☑
Response	In the period from 27/05/2009 to 20/07/2009 several system drop outs, bug-fixes and re-starts led to missing data and caused some time stamp shifts in the electronically data. In principle the electronically recorded data and hand written journal are matching very well to each other and plausibility is given. See figure below. Due to the numerous failures in the electronically system, the hand written data have been taken for calculation of the methane amount utilised. Starting with 20/07/2009 the time stamps are in tune and no obvious differences can be found. Since then only electronically data are taken.		

Corrective Action Requests by audit team			
			
Assessment	Plausible explanations which comply with the facts have been provided by the PP. Hence, this issue is considered to be solved.		
Issue	**Clarification Request 12:** Please describe the archiving of the raw data, the data protection measures, the data transfer and the protection of input data for calculations.	2.2 Table 7	☑
Response	Data processing and archiving procedures are given under B3. in the MR.		
Assessment	The data and archiving procedures have been described in detail in the latest MR. The de-		

Corrective Action Requests by audit team			
	scription complies with the on-site findings. Hence, CR 12 is considered to be solved.		
Issue	**Clarification Request 13:** Please provide the calibration protocol of the e-meter and show the uncertainty level.	2.2 Table 8	☑
Response	There is no calibration protocol available. The calibration has been provided in Germany according to the German Calibration Act. The calibration is manifested by a test badge (Eichmarke) fixed to the unit and valid for 8 years. The uncertainty level has been specified as Class 1 IEC1036.		
Assessment	The issue is closed.		
Issue	**Clarification Request 14:** Please describe the sampling point and the uncertainty level in the MR.	2.3 Table 1	☑
Response	The sampling point is a nozzle in the vacuum pump station. The uncertainty is 2.5% and has been included in the MR.		
Assessment	The sampling point has been demonstrated on-site to the validation team. The uncertainty level of 2.5% has been evidenced by the accreditation certificate of the Laboratory. Hence, this issue is considered to be solved.		

Annex 2: Information Reference List

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
1	06/08/2009	PDD "CMM utilisation on the coal mine Shcheglovskaya-Glubokaya of the State Holding Joint-Stock Company "GOAO Shakhtoupravlenye Donbas", Version 7, project no. JI 0077 , UNFCCC website: http://ji.unfccc.int/JI_Projects/DB/PYQSXU6BW4J575X0VBZ8LNYNTNTYGI/Determination/DNV-CUK1227774526.4/viewDeterminationReport.html	Carbon TF B.V.	PDD Registered
2	22/12/2006	Approved consolidated baseline and monitoring methodology ACM0008 Version 03 "Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power (electrical and motive) and heat and/or destruction by flaring"	UNFCCC	
3	27 till 28/04/2010	Participant list of on-site interviews	TÜV SÜD	
4	27 till 28/04/2010	On-site interviews conducted by TÜV SÜD. **Validation Team:** Dr. Albert Geiger Dr. Volodymyr Ilchenko (only 28/04/2010) **Interviewed persons:**	TÜV SÜD	

Name	*Function*	*Organisation*
Mr. Adam Hadulla	Consultant	Carbon TF
Mr. Karl Wöste	Consultant	Carbon TF
Dr. Albert Geiger	Auditor	TÜV SÜD
Dr. Volodymyr Ilchenko	Regional Manager	TÜV SÜD
Mr. E. Shlepkin	Chief power engineer	Coal Mine

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
		Mr. O. Rutskiy — Heat engineer — Coal Mine Ms. Olga Samus — Monitoring engineer — Eco Aliance Mr. Viktor Avtonomov — Monitoring engineer — Eco Aliance Mr. Pavel Sheleheda — Deputy Director — Coal Mine Mr. Aleksandr Didenko — Service Manager — Coal Mine		
5	15/04/2010	JI Monitoring Report Version 1a	Carbon-TF B.V.	
6	21/01/2011	JI Monitoring Report Version 7	Carbon-TF B.V.	
7	21/01/2010	Excel spread sheets with the calculation of the emission reductions Version 7	Carbon-TF B.V.	
8	02/09/2004	Special permission for the use of natural resources (valid for 20 years)	State committee of natural recourses	
9	11/02/2001	Permission for the building works for "Donbassugleavtomatika", 04/08/2006-04/08/2011	Ministry for building, architecture and housing and communal services	
10	undated	Confirmation on the coal production for the period 01/2008-03/2010	Coal mine Shcheglovskaya-Glubokaya (SG)	
11	01/02/2010	Degasification scheme	SG	
12	02/01/2008	Degasification scheme	SG	
13	undated	Confirmation on the amount of the methane extraction for the period 01/2008-04/2010	SG	

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
14	12/92	Passport of vacuum pump HB-50 No. 595	Rutchenkovskiy Rudoremontnyj plant	
15	undated	List of vacuum pumps	SG	
16	31/07/2008	Commissioning protocol for flare compression facilities	Pro2 Anlagentechnik GmbH	
17	27/05/2009	Commissioning protocol for flare compression facilities	SG	
18	16/09/2009	Work instruction for the placing into operation of the gas motors	Pro2 Anlagentechnik GmbH	
19	17/09/2009	Declaration of conformity	Pro2 Anlagentechnik GmbH	
20	16/09/2009	Facility commissioning protocol	Pro2 Anlagentechnik GmbH	
21	30/10/2009	Service journal	Eco-Alliance	
22	29/05/2009	Service journal	Eco-Alliance	
23	04/11/2009	Technical report for calibration and adjustment of water consumption meters for the boilers N 1,3,4	Donbassugleavtom atika	
24	undated	Data sheet for devices КСД2	Lvivpribor	

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
25	9/10/2008	Act on the readiness of the coal mine for the work in the period autumn-winter 2008-2009	SG	
26	undated	Flare operation journal	SG	
27	05/08/2010	Analysis of the possible sources of error	Carbon-TF	
28	05/08/2010	Excel sheet propagation of uncertainty	Carbon-TF	
29	03/08/2008	Measures for the preparation of the coal mine for the period autumn-winter 2008-2009	SG	
30	03/04/2009	Measures for the preparation of the coal mine for the period autumn-winter 2009-2010	SG	
31	undated	SAU operation journal	SG	
32	14/04/2010	Notice on the air content measurements on the coal mine vacuum pump station on: 01/11/2006 02/01/2007 04/10/2008 13/04/2009 07/04/2010	SG	
33	 31/03/2010 31/03/2010	Orifice check protocols: 501029 501871	Sumystandard-metrologya	
34	 27/08/2009 27/08/2009 15/09/2009 15/08/2008 20/06/2008 20/06/2008	Calibrations of gas analysers: 5897 7596 481 5897 481 6560	Donbassugleavtomatika	Interval in accordance with the PDD

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
35	05/2007	Short instructions for pressure transmitter Sitrans P Series Z, Type 7MF1564	Siemens	
36	17/03/2008	Technical report on the commissioning of air heaters ВГС-1 on the coal mine	Teploenergoavto-matika	
37	31/03/2010 31/03/2010	Calibration of PT-100 resistance thermometers: 98023 4571/1	Sumystandard-metrologya	
38	14/10/2009	Calibration flow meter (boiler 1)	Donbassugle-avtomatika	
39	12/10/2009	Calibration flow meter (boiler 3)	Donbassuglea-vtomatika	
40	12/10/2009	Calibration flow meter (boiler 4)	Donbassugle-avtomatika	
41	11/1999	Handbook difference pressure meter	Honeywell	
42	08/04/2008 07/09/2009 07/09/2009 22/09/2009 05/01/2009	Calculation sheet of the flow factors of the flare orifices: 10789 11636 11637 11656 11329	Himpe AG	
43	undated	Data sheet of pressure transmitter P 121	Nöding Meßtechnik	
44	undated	Datasheet 90.2002 for the resistance thermometer	Jumo Gmbh & Co. KG	
45	undated	Ring chamber orifice plate measuring arrangement according to the DIN 19205	Himpe AG	
46	02/02/2009	Ring chamber orifice plate: drawing, throat calculation, certificate: Ref. number 24512-113-09	Himpe AG	

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
	16/09/2009	Ref. number 25225-112-09		
47	28/10/2007 22/10/2008 16/10/2009 29/10/2007 22/10/2008 16/10/2009	Calibration certificates of the pitot tube: No. 070 No. 071	Donbassugle-avtomatika	
48	29/10/2007 22/10/2008 16/10/2009	Calibration certificates of the micro manometers: 3278, 4471, 2909	Donbassugle-avtomatika	
49	28/10/2007 22/10/2008 16/10/2009	Calibration protocol Barometer: Gidrometrpribor MD-49-2: s/n 31020	Donbassugle-avtomatika	
50	1983	Passport barometer MD-49-2: s/n 31020	Gidrometrpribor	
51	1980	Passport micro manometer s/n 3278	unknown	
52	20/10/2007	Gas analyzer passport s/n 7596	Vyruskiy plant of the gas analyzers	
53	14/10/2009	Calibration chromatograph s/n 75	Donetskstandart-metrologiya	
54	01/12/2009	Accreditation license of the MakNDI	National accreditation agency of Ukraine	
55	07/11/2006	Attestation certificate of the MakNDI	Donetskstandart-metrologiya	

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
56	1973	Passport pitot tube s/n 071	unknown	
57	 15/09/2009 15/09/2009 30/04/2008 12/04/2010 30/04/2008 12/04/2010	Calibration pressure transmitter s/n C3180872001001 s/n C3149127001001 s/n C3059154001002 s/n C3059154001003	A. Hock MSR- u. Electronic Service GmbH Honeywell Sumystandard Metrologya Honeywell Sumystandard metrologya	
58	02/2008	Data sheet pressure transmitter ST 3000	Honeywell	
59	11/2002	Data sheet gas analyzer Ultramat 23	Siemens	
60	09/2001	Data sheet gas analyzer BINOS 100/100M	Emerson	
61	19/12/2009 13/11/2009 11/10/2009 25/09/2009 15/09/2009 12/08/2009 27/07/2009 15/07/2009 11/07/2009 08/07/2009 06/07/2009	Service journals for the facility N 142401	Eco-Alliance OOO	

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
	02/07/2009 24/06/2009 20/06/2009 17/06/2009 15/06/2009 13/06/2009 12/06/2009 10/06/2009 09/06/2009 08/06/2009 06/01/2009 05/06/2009 04/06/2010 01/06/2009 25/05/2009			
62	14/04/2008 01/09/2009	Calibration thermocouples: 66503 71089	Herth	
63	05/2005	Data sheet three-phase meter IGZ	NZR	
64	10/05/2010	Data sheet measuring transformer ASK 105.6	MBS AG	
65	12/2009	Passport resistance thermometer s/n 09452-09456, 09434-09438, 09439-09451,	Tera	
66	11/03/2001	Licence Teploenergoavtomatika	State department of Ukraine for the industrial safety	
67	23/09/2004	Safety permission for the coal mine	State department	

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
			of Ukraine for the industrial safety	
68	undated	Work Instruction Monitoring	Eco-Alliance	
69	16/02/2009	Protocol on the safety training	Coal Mine	
70	31/10/2007 10/10/2008 12/10/2009	Trainings protocols	Eco-Alliance	
71	04/12/2009	Joint Implementation Determination and Verification Manual	UNFCCC / JISC	
72	28/11/2008	Clean Development Mechanism Validation and Verification Manual	UNFCCC / CDM-EB	
73	2007	Monitoring procedure – formulae and instruction – new system for the boilers and VAH beginning with November 2007, prepared by the coal mine	Coal Mine	
74	undated	Confirmation from MAKNII about the correctness of the monitoring procedures SG-19a	MAKNII	
75	2007	English translation of SG-19a	Eco-Alliance	
76	2007	German translation of SG-19a	Eco-Alliance	
77	04/08/2006	Licence Donbassugleavtomatika to calibrate its meters 2006 - 2011	State department of Ukraine for the industrial safety	
78	08/10/2009	AKT about the maintenance of the heating system 2009-2010	SU Donbass	
79	30/10/2006	Proof of competence for internal trainings-Rutskiy	Teploenergoavto-matika	
80	27/01/2009	Operation and safety trainings for CHP-Unit, Pro2	Pro2	

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Infor-mation
81	undated	Calibration methodology - MAKNII gas chromatograph, belongs to ID-3	MAKNII	
82	undated	Operation manual SAS1 gas analysis	Pro2	
83	31/03/2010	Calibration (Passport) Binos 100	Sumystandart metrologia	
84	31/03/2010	Calibration (Certificate) Noeding P121	Sumystandart metrologia	
84	undated	Data sheet thermocouple Herth	Herth	
86	undated	Operation Handbook KMU45 power meter	Kuhse	
87	01/01/2008-31/03/2010	Handwritten data journals	SG	
88	01/01/2008-31/03/2010	Excel data sheets with monitored parameters	Carbon-TF	
89	24/02/2010-31/03/2010	Electronic data with monitored parameters	Carbon-TF	
90	05/08/2010	Monitoring manual, Version 1	Eco-Alliance Carbon-TF	
91	08/2010	Financial analysis with actual costs for the additionality prove	Carbon-TF	
92	16/06/2010	JISC22, Annex 2: Procedures regarding changes during project implementation	JISC	