

VERIFICATION REPORT RWE POWER AG

VERIFICATION OF THE COGENERATION AND UTILIZATION OF WASTE HEAT AT UMAN GREENHOUSE COMBINATE

INITIAL AND FIRST PERIODIC (01/12/2009 – 30/04/2011)

REPORT NO. UKRAINE-VER/0281/2011 REVISION NO. 02

BUREAU VERITAS CERTIFICATION



VERIFICATION REPORT

Date of first issue: 21/06/2011	Organizational unit: Bureau Veritas C	ertification Holding SAS]
Client: RWE Power AG	Client ref.: Antonio Aguilera		-
Summary: Bureau Veritas Certification has made Utilization of Waste Heat at Uman Green Uman and Talne, Cherkasy oblast, UNFCCC criteria for the JI, as well as crit reporting. UNFCCC criteria refer to Art subsequent decisions by the JI Superviso	nouse Combinate", Ukraine, and app eria given to provid icle 6 of the Kyoto	UA1000260, project of R lying the JI specific ap e for consistent project o p Protocol, the JI rules	WE Power AG located in proach, on the basis of perations, monitoring and and modalities and the
The verification scope is defined as a peri Entity of the monitored reductions in GH following three phases: i) desk review of interviews with project stakeholders; iii verification report and opinion. The overa was conducted using Bureau Veritas Cert The first output of the verification proce Actions Requests (CR, CAR and FAR), pr	G emissions during the project design a) resolution of our Il verification, from ification internal pro- ess is a list of Cla	defined verification per and the baseline and mo standing issues and th Contract Review to Verif peedures. rification, Corrective Ac	iod, and consisted of the nitoring plan; ii) follow-up ne issuance of the final ication Report & Opinion,
In summary, Bureau Veritas Certification Installed equipment being essential fo appropriately. The monitoring system is in GHG emission reduction is calculated acc the ERUs issued totalize 52 228 tons of C of CO2eq for the period 01/12/2009 – 31/12/2010, and 17 881 tons of CO2eq for	r generating emis n place and the pro- curately and without CO2eq for the monit 31/12/2009, 31 55 r the period 01/01/2	sion reduction runs re oject is generating GHG material errors, omission oring period 01/12/2009 58 tons of CO2eq for t 011 – 31/04/2011).	eniably and is calibrated emission reductions. The ns, or misstatements, and – 31/04/2011 (2 789 tons the period 01/01/2010 –
Our opinion relates to the project's GH related to the approved project baseline a			
Report No.: Subject Group: UKRAINE-ver/0281/2011 JI			
Project title: Cogeneration and Utilization of Waste He Greenhouse Combinate	at at Uman		
Work carried out by: Oleg Skoblyk – Team leader, Lead Ve Iuliia Pylnova – Team member, Verifie Svitlana Gariyenchyk – Team membe Work reviewed by: Ivan Sokolov - Internal Technical Revi	er r, Verifier		norminaion from the
Pavlo Rosen – Technical Specialist	Atomis I	No distribution without Client or responsible of	
Flavio Gomes – Operational Manager Date of this revision: Rev. No.: Number	of pages:	Limited distribution	
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1 INTRODUCTION

RWE Power AG has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" (hereafter called "the project") located in the towns Uman and Talne, Cherkasy oblast, Ukraine.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

Verification is the periodic independent review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions during defined verification period.

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

UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

1.2 Scope

The verification scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Verification Team

The verification team consists of the following personnel:

Oleg Skoblyk

Bureau Veritas Certification Team Leader, Climate Change Lead Verifier

Iuliia Pylnova Bureau Veritas Certification Team Member, Climate Change Verifier

Svitlana Gariyenchyk

Bureau Veritas Certification Team Member, Climate Change Verifier



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This verification report was reviewed by:

Ivan Sokolov Bureau Veritas Certification, Internal Technical Reviewer

Pavlo Rosen Bureau Veritas Certification, Technical Specialist

2 METHODOLOGY

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a verification protocol was customized for the project, according to the version 01 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

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

The completed verification protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Monitoring Report (MR) submitted by LLC "KT-Energy" and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Approved CDM methodology (if applicable) and/or Guidance on criteria for baseline setting and monitoring, Host party criteria, Kyoto Protocol, Clarifications on Verification Requirements to be Checked by an Accredited Independent Entity were reviewed.

The verification findings presented in this report relate to the Monitoring Report versions 1.0, 1.1, 1.2 and project as described in the determined PDD.

2.2 Follow-up Interviews

On 24/05/2011 Bureau Veritas Certification performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of LLC "KT-



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Energy" and PRAE "Uman Greenhouse Combinate" were interviewed (see References). The main topics of the interviews are summarized in Table 1.

 Table 1
 Interview topics

Interviewed organization	Interview topics
PRAE "Uman	Organizational structure
Greenhouse	Responsibilities and authorities
Combinate"	Roles and responsibilities for data collection and processing
	Installation of equipment
	Data logging, archiving and reporting
	Metering equipment control
	Metering record keeping system, database
	IT management
	Training of personnel
	Quality management procedures and technology
	Internal audits and check-ups
LLC "KT-Energy"	Baseline methodology
	Revised monitoring plan
	Monitoring report

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

If the Verification Team, in assessing the monitoring report and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to the monitoring requirements, it should raise these issues and inform the project participants of these issues in the form of:

(a) Corrective action request (CAR), requesting the project participants to correct a mistake that is not in accordance with the monitoring plan;

(b) Clarification request (CL), requesting the project participants to provide additional information for the AIE to assess compliance with the monitoring plan;



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(c) Forward action request (FAR), informing the project participants of an issue, relating to the monitoring that needs to be reviewed during the next verification period.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

3 VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 08 Corrective Action Requests, 08 Clarification Requests, and 01 Forward Action Requests.

The number between brackets at the end of each section corresponds to the DVM paragraph.

3.1 Remaining issues and FARs from previous verifications

There are no remaining issues from previous determination/verification.

3.2 **Project approval by Parties involved (90-91)**

Written project approval by Germany (letter of approval for the project "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated 07.04.2011) has been issued by Federal Environment Agency, German Emissions Trading Authority, when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest.

The abovementioned written approval is unconditional.

3.3 Project implementation (92-93)

Status of project implementation: operation phase began in November 2009, when three Caterpillar G3520C cogeneration units in Uman were put into operation; in December 2009 one heat-utilizer TUV-16 started to operate, the other TUV-16 is expected to be put into operation in December 2011.

Start of the crediting period for the project activity is 01/11/2009.



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3.4 Compliance of the monitoring plan with the monitoring methodology (94-98)

The monitoring occurred in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and revisions to the monitoring plan which was positively determined in course of the current verification.

For calculating the emission reductions, key factors influencing the baseline emissions and the activity level of the project and the emissions as well as risks associated with the project were taken into account, as appropriate.

Data sources used for calculating emission reductions, such as calibrated measuring equipment, the study of standardized emission factors for the Ukrainian electricity grid, IPCC guidelines are clearly identified, reliable and transparent.

Emission factors, including default emission factors, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.

The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.

The relevant threshold to be classified as JI SSC project was not exceeded during any monitoring period on an annual average basis.

3.5 Revision of monitoring plan (99-100)

In the course of the monitoring period (01/12/2009 - 30/04/2011) the original monitoring plan described in the final version (02.5) of the PDD was modified by the project participants. The project participants provided an appropriate justification for the proposed revision which was caused by a set of reasons: separate estimation of leakages (according to the paragraph 2 of the Annex 2 "Calculation of emission reductions or enhancements of net removals of "Guidance on criteria for baseline setting and monitoring (Version 02) to improve accuracy of the monitoring of emission reductions; change of the reference for global warming potential of CH₄ according to 1995 IPCC Second Assessment Report in order to improve the accuracy of the reference for global warming potential of CH₄; revision of using emission factors for electricity to ensure more accurate estimation of emission reductions; and detailed elaboration of cross-checking procedures to ensure double archiving of data monitored and improve accuracy.

The proposed revision improves the accuracy and applicability of information collected compared to the original monitoring plan without



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changing conformity with the relevant rules and regulations for the establishment of monitoring plans.

The monitoring of the project is complete, effective and reliable. All relevant emission sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently. All pertinent parameters were monitored and determined as prescribed. The collected data were stored during the whole monitoring period. The monitoring methodologies and supporting records were sufficient to enable verification of emission reductions. During the verification process, no significant lacks of evidence were detected.

3.6 Data management (101)

The data and their sources, provided in monitoring report, are clearly identified, reliable and transparent.

The implementation of data collection procedures is in accordance with the monitoring plan, including the quality control and quality assurance procedures.

In order to ensure accurate recording of the monitoring data the special Monitoring Procedure was introduced at the Enterprise. The Procedure was approved by the Director of PRAE "Uman Greenhouse Combinate", Gordiy M.V. Under the Procedure the Deputy Director for Technical Modernization is responsible for the supervising and archiving of the monitoring data. According to the paragraph 6 of the Procedure, Deputy Director for Technical Modernization is responsible for keeping of the monitoring data for at least two years after the last transfer of ERUs for the current joint implementation project.

The Procedure clearly points out the distribution of powers and duties. Monitoring data are daily recorded by the operators of cogeneration units and heat engineer of Talne department respectively. On the basis of the data recorded boiler-house manager and electrical engineer are responsible for providing monthly reports to the Deputy Director for Technical Modernization. In the Monitoring Procedure monitoring parameter, its unit, recording frequency, way of archiving, calibration frequency is indicated so to ensure proper data metering, recording and archiving.

Within Monitoring Procedure cross-checking procedures are also foreseen. A particular cross-checking procedure for estimating and/or measuring of each monitoring parameter was developed in details to assure accuracy of emission reductions estimation.

Deputy Director for Technical Modernization is responsible for the performance to LLC "KT-Energy" all monitoring data that is necessary for GHGs emission reduction calculations. The specialists of LLC "KT-



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Energy" provide calculation of actual emission reductions according to the monitoring plan implemented.

The names of the personnel involved for this monitoring period are following:

- 1. Deputy Director for Technical Modernization, Zozulya Kostyantyn
- 2. Chief heat engineer, Kolomiets Mykola
- 3. Boiler-house manager, Petyk Vasyl
- 4. Electrical engineer, Koroban Volodymyr
- 5. Heat engineer of Talne department, Gorbachenko Yuriy

To ensure proper operating and maintenance of the cogeneration units in Uman and heat-utilizers in Talne initial trainings of the personnel were conducted. The trainings have been provided by technical consultant of Power Units Department of Zeppelin Ukraine LLC on December 18th, 2009. According to the Act on Conducting the Trainings boiler-house manager, electrical engineers, cogeneration units operators have successfully passed the training course on general principles of functioning and the rules of operation of the installed equipment as well as were acquainted with the specific characteristics of the CHPs and safety regulation. As it was mentioned before, the special Monitoring Procedure was introduced at the Enterprise. According to the Act on Conducting the Trainings for Monitoring Parameters for Calculation of Emission Reduction from 20th of October, 2009, the stuff involved in the monitoring of parameters was also acquainted with the Procedure.

The function of the monitoring equipment, including its calibration status, is in order.

The evidence and records used for the monitoring are maintained in a traceable manner.

The data collection and management system for the project is in accordance with the monitoring plan.

3.7 Verification regarding programmes of activities (102-110)

Not applicable.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the initial and 1st periodic verification of the "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" project in Ukraine, which applies JI specific approach. The verification was performed on the basis of UNFCCC criteria



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and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of PRAE "Uman Greenhouse Combinate" is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring and Verification Plan indicated in the final PDD version 02.5 and in the revisions to the monitoring plan which was positively determined in course of the current verification. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Report version 1.2 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reduction is accurately calculated and is free of material errors, omissions, or misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the approved project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm, with a reasonable level of assurance, the following statement:

Reporting period: From 01/12/2009 to 31/12/2009

Baseline emissions	: 4 263 t CO ₂ equivalents.
Project emissions	: 1 219 t CO ₂ equivalents.
Leakages	: 255 t CO2 equivalents.
Emission Reductions	: 2 789 t CO ₂ equivalents.

Reporting period: From	01/01/2010 to 31/12/2010
Baseline emissions	: 45 963 t CO ₂ equivalents.
Project emissions	: 11 914 t CO ₂ equivalents.
Leakages	: 2 491 t CO ₂ equivalents.
Emission Reductions	: 31 558 t CO ₂ equivalents.



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Reporting period: From 01/01/2011 to 30/04/2011

Baseline emissions: 25 774 t CO2 equivalents.Project emissions: 6 528 t CO2 equivalents.Leakages: 1 365 t CO2 equivalents.Emission Reductions: 17 881 t CO2 equivalents.

For the monitoring period (01/12/2009 - 30/04/2011), total amount of emission reductions is 52 228 CO₂ equivalents.



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5 REFERENCES

Category 1 Documents:

Documents provided by LLC "KT-Energy" that relate directly to the GHG components of the project.

- /1/ PDD "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" version 02.5 dated 11/11/2010.
- /2/ Monitoring Report "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate", version 1.0 dated 12.05.2011.
- /3/ Monitoring Report "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate", version 1.1 dated 07.06.2011.
- /4/ Monitoring Report "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate", version 1.2 dated 08.06.2011.
- /5/ Excel-file "Uman_Actual ERUs_12 09-4 11_V1.1" dated 07.06.2011.
- /6/ Letter of Endorsement № 516/23/7 dated 15.05.2009 issued by the National Environmental Investments Agency of Ukraine.
- /7/ Letter of Approval #463/23/7 for the project "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" issued by National Environmental Investment Agency of Ukraine dated 02.03.2011.
- /8/ Letter of Approval for the project "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" issued by Federal Environment Agency, German Emissions Trading Authority, dated 07/04/2001.

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

- /1/ Glossary of JI terms, version 03, JISC.
- /2/ Guidance on Criteria for Baseline Setting and Monitoring, version 02, JISC.
- /3/ JISC "Clarification regarding the public availability of documents under the verification procedure under the Joint Implementation Supervisory Committee." Version 03.
- /4/ Statement of state entrance commission on putting into operation unit after its construction dated 29.12.2008.
- /5/ Contract #323-07 on making, supply, installing, and putting into operation heat-recovery unit dated 18.05.2007.
- /6/ Technical assignment on development of working project on system for heat recovery on CS "Тальное" dated 13.11.2006.
- /7/ Permit on construction work performance #399 dated 26 November 2007.
- /8/ Statement on unit preparedness for putting into commission #1 dated 30.11.2009.



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- /9/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated December 2009.
- /10/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated January 2010.
- /11/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated February 2010.
- /12/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated March 2010.
- /13/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated May 2010.
- /14/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated June 2010.
- /15/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated July 2010.
- /16/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated August 2010.
- /17/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated September 2010.
- /18/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated October 2010.
- /19/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated November 2010.
- /20/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate"



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dated December 2010.

- /21/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated January 2011.
- /22/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated February 2011.
- /23/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated March 2011.
- /24/ Report on parameters monitoring results for calculation of emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated April 2011.
- /25/ Order #640 on appointment of people responsible for parameters monitoring conducting (for emission reductions calculation) dated 10 September 2009.
- /26/ Procedure for monitoring greenhouse emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate", version 1.0 dated 10.09.2009.
- /27/ Form #1. Parameters for monitoring of greenhouse emission reductions.
- /28/ Procedure for monitoring greenhouse emission reductions within JI project implementation "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate", version 1.1 dated 22.11.2010.
- /29/ Certificate on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated December 2008.
- /30/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated January 2010.
- /31/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated February 2010.
- /32/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated March 2010.
- /33/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated April 2010.
- /34/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз"



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dated May 2010.

- /35/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated June 2010.
- /36/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated July 2010.
- /37/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated August 2010.
- /38/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated September 2010.
- /39/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated October 2010.
- /40/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated November 2010.
- /41/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated December 2010.
- /42/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated January 2011.
- /43/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated February 2011.
- /44/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated March 2011.
- /45/ Passport on physical-chemical parameters of natural gas accepted by PRAE "Uman Greenhouse Combinate" gas pipeline "Союз" dated April 2011.
- /46/ Statement on installing heat water meter CBTУ 10 M for accounting of heat produced by heat utilizer TУB 16 on CS "Тальное".
- /47/ Report on putting into operation. G3520C. GZN00611. 15.10.2009.
- /48/ Report on putting into operation. G3520C. GZN00702. 16.10.2009.
- /49/ Report on putting into operation. G3520C. GZN00610. 14.10.2009.
- /50/ Photo. Meter Actaris. Ser. #1174907003/8/2006.
- /51/ Photo. Meter Actaris. Ser. #2949107002/C/2008.
- /52/ Passport for the meter "Энергия-9" ser. #50107. Date of the last calibration: 05.11.2009.
- /53/ Passport for the meter "Энергия-9" ser. #50101. Date of the last calibration: 05.11.2009.
- /54/ Passport for the meter "Энергия-9" ser. #50099. Date of the last





calibration: 05.11.2009.

- /55/ Passport for the meter "Энергия-9" ser. #49969. Date of the last calibration: 05.11.2009.
- /56/ Passport for heat control unit CΠT961.1 ser. #14693. Date of the last calibration: 08.01.2008.
- /57/ Passport. Sensor of pressure difference. Сапфір-22М ДД 2420. Date of the last calibration: 30.11.2009.
- /58/ Passport. Thermoelement. Date of the last calibration: 30.11.2009.
- /59/ Passport for gas volume corrector B25. Ser. #08158.
- /60/ Passport for corrector CΠT961 ser. #12897. Date of the last calibration: 05.06.2009.
- /61/ Statement of commission of experts of unit for accounting heat energy dated 23.06.2009.
- /62/ Statement on inspection of equipment in heat recovery system of GCS in Talne dated 24.11.2009.
- /63/ Passport for thermoelement of temperature difference resistance TCΠP-0490. Date of the last calibration: 05.06.2009.
- /64/ Calibration schedule for gas meters.
- /65/ Passport for heat water meter CBTY-10M. №16298.
- /66/ Statement on putting into operation unit or accounting heat energy dated 22.11.2010.
- /67/ Photo. Heat water meter CBTY-10M.
- /68/ Statement on conducting staff training for operation of cogeneration units on the basis of CATERPILLAR G3520C dated 18.12.2009.
- /69/ Statement on putting into operation gas piston electric power station CATERPILLAR G3520C with heat recovery system.
- /70/ Contract #37/2011 on supply of equipment, software, performance of installing and putting into operation works of making automated control system of parameters for gas consumption and heat production at PRAE "Uman Greenhouse Combinate" dated 06.04.2011.
- /71/ Photo. Meter "Энергия-9". #50099.
- /72/ Certificate on calibration of measuring working equipment. Heat water meter CBTY-10M(M2) dated 20.01.2010.
- /73/ Passport for the meter "Энергия-9" ser. #50115. Date of the last calibration: 05.11.2009.
- /74/ Contractor agreement #36/2011 on supply of equipment, software, performance of installing and putting into operation works of making units for accounting gas consumption by divisions #1, 2, 3, 4 and heat production by electic boiler department at the central department of PRAE "Uman Greenhouse Combinate".
- /75/ Passport for the meter "Энергия-9" ser. #50099. Date of the last calibration: 05.11.2009.
- /76/ Passport for the meter "Энергия-9" ser. #50114. Date of the last calibration: 05.11.2009.



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Persons interviewed:

List persons interviewed during the verification or persons that contributed with other information that are not included in the documents listed above.

- /1/ K.M. Zozulia deputy director for technical re-equipment of PRAE "Uman Greenhouse Combinate"
- /2/ V.I. Petyk head of the boiler house
- /3/ V.I.Koroban head of accounting service
- /4/ I.P. Leleka foreman of electric shop
- /5/ Y.M. Gorbachenko engineer of Talne department
- /6/ O.O. Shchyt deputy director of HCS
- /7/ K. O. Tomlyak director of LLC "KT-Energy"
- /8/ K.D. Levyk chief specialist of LLC "KT-Energy"



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APPENDIX A: VERIFICATION PROTOCOL

Check list f	or verifica	tion, according	j to	the	JOINT	IMPLEMENTATION	DETERMINATION	AND
VERIFICATION	I MANUAL (Version 01)						

DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on
Project a	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?	which is not the host country) has issued a written project approval (letter of approval for the project "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" dated		
		CAR 01. Please, include in the Monitoring Report the detailed information on letters of approval issued by Parties involved.	CAR 01	ОК
91	Are all the written project approvals by Parties involved unconditional?		ОК	ОК
Project i	implementation			
92	Has the project been implemented in accordance with the PDD regarding which the determination has been deemed	accordance with the PDD listed on the		
	final and is so listed on the	CAR 02. In the section A.2 of the	CAR 02	OK



VERIFICATION REPORT

DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on
	UNFCCC JI website?	Monitoring Report, registration number of the JI project is not indicated because of its absence; but now, the JI registration reference number is already assigned to the project. Please, indicate JI reference registration number in the Monitoring Report.		
93	What is the status of operation of the project during the monitoring period?	Operation phase began in November 2009, when three Caterpillar G3520C cogeneration units in Uman were put into operation. In December 2009 one heat- utilizer TUV-16 started to operate, the other TUV-16 is expected to be put into operation in 2011. CL 01. Please, give more detailed information concerning the expected time	CL 01	ОК
		of the second TUV-16 putting into operation (please, specify the month of putting into operation).		
-	nce with monitoring plan			
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the	The monitoring does not occur fully in accordance with the monitoring plan included in the PDD.		
	0 0	CAR 03. Please, correct section A.6 of the	CAR 03	ОК

VERIFICATION REPORT

Report No: UKRAINE-ver/0281/2011



VERITAS

on

OK

OK

DVM Check Item Initial finding Draft Final Conclusi Conclusi Paragr aph on final and is so listed on the Monitoring Report since the revisions described in this section are connected not **UNFCCC JI website?** to the PDD, but to the Monitoring plan. **CAR 04** CAR 04. Please, take into account that improvement and detailed elaboration of cross-checking monitoring procedures should also be considered as revisions to the Monitoring plan determined in the PDD of the final version. Please, revise the present Monitoring plan taking into consideration abovementioned the changes. 95 (a) For calculating the emission For calculating the emission reductions, OK reductions or enhancements of key factors influencing the baseline and net removals, were key factors, project emissions as well as risks e.g. those listed in 23 (b) (i)-(vii) associated with the project are taken into above, influencing the baseline account. 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? 95 (b) Are data sources for Data sources used for calculating emission used calculating emission reductions reductions reliable auite and are



VERIFICATI	ON REPORT			B U R E A U VERITAS
DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on
	or enhancements of net removals clearly identified, reliable and transparent?	transparent. CL 02. Please, indicate the types and serial numbers of three additional gas meters (used for cross-checking method of measuring and collecting of natural gas consumption) mentioned in the section B.3 of the PDD.	CL 02	ОК
		CL 03. Please, justify that CH_4 and N_2O emissions from natural gas combustion do not exceed 1% of annual average anthropogenic emissions by sources of GHGs as it is stated in the section A.5.2 of the Monitoring Report.	CL 03	ОК
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?	Emission factors used for calculating the emission reductions are selected by carefully balancing accuracy and reasonableness.	CAR 05	ОК

VERIFICATION REPORT



				VERITAS
DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on
		that emission factor for electricity will be monitored and evaluated according to published researches, and as soon as any other developed emission factor of the Ukrainian electricity grid will be approved, the project developer will make appropriate modifications of emission reduction calculations at the stage of monitoring report development.		
95 (d)	Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?	CL 04. Please, clarify (in the Monitoring Report) whether the calculation of emission reductions is based on conservative assumptions or not. If yes, please, indicate this information in the Monitoring Report.	CL 04	ОК
		CAR 06. Please, pay attention to the value of emission reductions for the period 01/01/2011 – 30/04/2011. The value stated in the Monitoring Report is not accurate mathematical difference between the baseline emissions and project and leakage emissions. Please, taking this into consideration, make necessary amendments.	CAR 06	ОК
Applicab	le to JI SSC projects only			



VERIFICATI	ON REPORT			B U R E A U VE R I T A S
DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on
96	Is the relevant threshold to be classified as JI SSC project not exceeded during the monitoring period on an annual average basis? 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?	The relevant threshold to be classified as JI SSC project is not exceeded during the monitoring period on an annual average basis.	ОК	ОК
Applicat	le to bundled JI SSC projects onl	у		
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	N/A	N/A	N/A
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	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	N/A	N/A	N/A



VERIFICATI	ON REPORT			B U R E A U VE R I T A S
DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on
	report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?			
	of monitoring plan			
99 (a)	Die only if monitoring plan is revise Did the project participants provide an appropriate justification for the proposed revision?	The project participants partly provided an appropriate justification for the proposed	CL 05	ок
		CL 06. Please, give clear reference to the Guidance on criteria for baseline setting and monitoring in the section A.6 of the Monitoring Report.	CL 06	ОК
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	CAR 07. Please, prove that all the proposed revisions improve the accuracy	CAR 07	ОК



VERIFICATI	ON REPORT			B U R E A U V E R I T A S
DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on
	the establishment of monitoring plans?	and/or applicability of monitoring information collected.		
Data ma	nagement			
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	See CAR 03 of the table.		
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	The function of the monitoring equipment and its calibration status is in order. The passports on monitoring equipment were examined during the verification site-visit and found satisfactory. However, the calibration schedule for monitoring equipment is not set up in the proper way. FAR 01 . Please, set up the calibration schedule (at least till the next verification) for the monitoring equipment and keep it in proper way. The issue will be checked during the next verification.	FAR 01	Pending
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable	appropriate document in the Monitoring	CAR 08	ОК



VERIFICATION REPORT

DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on
	manner?	information on documented Monitoring Procedure) the fact that data monitored and required are to kept for two years after the last transfer of ERUs for the project.		
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	In the section C.2 of the Monitoring Report, it is stated that Deputy Director for Technical Modernization is responsible for the provisions of internal audits.		
		CL 07 . Please, indicate in the Monitoring Report the date of conducting internal audits (during this monitoring period) and the presence of the reports on internal audits.	CL 07	ОК
		CL 08. Please, indicate in the Monitoring Report information concerning trainings of the stuff (if any trainings were conducted during the monitoring period) and qualification of the personnel.	CL 08	ОК
		ies (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
103	Is the verification based on the monitoring reports of all JPAs to	N/A	N/A	N/A



VERIFICATI	ON REPORT		VERITAS
DVM Paragr aph	Check Item	Initial finding Draft Conclusi on	Final Conclusi on
	be verified?		
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
104	Does the monitoring period not overlap with previous monitoring periods?	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
Applical	ole to sample-based approach only	У	
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	N/A N/A	N/A

VERIFICATION REPORT



VERIFICATIO	ON REPORT			B U R E A U V E R I T A S
DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on
	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 verifications, if any?			
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



VERIFICATION REPORT					
DVM Paragr aph	Check Item	Initial finding	Draft Conclusi on	Final Conclusi on	
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	
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	
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	



VERIFICATION REPORT

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	_	Summary of project participant response	Verification team conclusion
CAR 01. Please, include in the Monitoring Report the detailed information on letters of approval issued by Parties involved.	90	The information on the approval of Parties involved has been included to the Section A.3 of the Monitoring Report.	Based on the information added to the Monitoring Report, CAR 01 is closed.
CAR 02. In the section A.2 of the Monitoring Report, registration number of the JI project is not indicated because of its absence; but now, the JI registration reference number is already assigned to the project. Please, indicate JI reference registration number in the Monitoring Report.	92	Registration number UA1000260 has been indicated in the Section A.2 of the Monitoring Report.	Due to the amendments made in the Monitoring Report, the issue is closed.
CAR 03. Please, correct section A.6 of the Monitoring Report since the revisions described in this section are connected not to the PDD, but to the Monitoring plan.	94	Section A.6 of the Monitoring Plan has been corrected.	Based on the corrections made in the Monitoring Report, CAR 03 is closed.



VERIFICATION REPORT			B U R E A U V E R I T A S
CAR 04. Please, take into account that improvement and detailed elaboration of cross-checking monitoring procedures should also be considered as revisions to the Monitoring plan determined in the PDD of the final version. Please, revise the present Monitoring plan taking into consideration the abovementioned changes.	94	Detailed development of cross- checking procedures has been considered as a revision to the Monitoring Plan. Section A.6 of the Monitoring Report has been accordingly revised.	the amendments made in
CAR 05 . Please, consider emission factor for electricity of Ukrainian grid as parameters that should be monitored, and represent this in the table in section B.2.3 of the Monitoring Report. And in the revised monitoring plan, please, indicate that emission factor for electricity will be monitored and evaluated according to published researches, and as soon as any other developed emission factor of the Ukrainian electricity grid will be approved, the project developer will make appropriate modifications of emission reduction calculations at the stage of monitoring report development.	95 (c)	All necessary amendments to the current Monitoring Report have been made. See sections A.6 and B.2.3.	



VERIFICATION REPORT					B U R E A U V E R I T A S
CAR 06. Please, pay attention to the value of emission reductions for the period 01/01/2011 – 30/04/2011. The value stated in the Monitoring Report is not accurate mathematical difference between the baseline emissions and project and leakage emissions. Please, taking this into consideration, make necessary amendments.	00 (0)	Necessary been made.	corrections	have	The issue is closed based on the corrections made.



VERIFICATION REPORT			B U R E A U V E R I T A S
CAR 07. Please, prove that all the proposed revisions improve the accuracy and/or applicability of monitoring information collected.	99 (b)	Response #1 Proposed revisions have been justified. See Section A.6 of the Monitoring Report.	Conclusion on response #1 Please, justify in full the revision #3 to the Monitoring plan (please, take into consideration that it is also necessary to explain why the emission factor for electricity should be monitored, and what it can improves).
		Response #2 Emission factors for electricity will be monitored to ensure more accurate estimation of emission reductions. The accuracy of data will be improved due to the use of up- to-date researches as they will reflect the latest changes of GHGs emissions from electricity generation in Ukraine. Only properly approved data will be applied to assure the correctness of its use.	<u>Conclusion on response</u> <u>#2</u> Based on the amendments made, the issue is closed.



VERIFICATION REPORT			B U R E A U V E R I T A S
CAR 08. Please, prove by indicating appropriate document in the Monitoring Report (please, give more detailed information on documented Monitoring Procedure) the fact that data monitored and required are to kept for two years after the last transfer of ERUs for the project.	101 (c)	All necessary information has been indicated in the Section C.1 of the Monitoring Report.	Based on the information added to the Monitoring Report, CAR 08 is closed.
CL 01. Please, give more detailed information concerning the expected time of the second TUV-16 putting into operation (please, specify the month of putting into operation).	93	The second TUV-16 is expected to be put into operation in December 2011. This information is now indicated in Section A.4 of the Monitoring Report.	
CL 02. Please, indicate the types and serial numbers of three additional gas meters (used for cross-checking method of measuring and collecting of natural gas consumption) mentioned in the section B.3 of the PDD.	95 (b)	The required information now is indicated in Section B.3 of the Monitoring Report.	



VERIFICATION REPORT			<u>BUREAU</u> VERITAS
CL 03. Please, justify that CH ₄ and N ₂ O emissions from natural gas combustion do not exceed 1% of annual average anthropogenic emissions by sources of GHGs as it is stated in the section A.5.2 of the Monitoring Report.	95 (b)	To justify that CH_4 and N_2O emissions from natural gas combustion do not exceed 1% of annual average anthropogenic emissions by sources of GHGs, CH_4 and N_2O emissions from natural gas combustion have been calculated according to formulae of the approved baseline and monitoring methodology AM0014 "Natural gas-based package cogeneration" (Version 04) and monitoring data. Calculation has been provided to the verification team.	The issue is closed due to the explanation provided.
CL 04. Please, clarify (in the Monitoring Report) whether the calculation of emission reductions is based on conservative assumptions or not. If yes, please, indicate this information in the Monitoring Report.	95 (d)	Calculation of emission reductions is based on conservative assumptions.	Based on the amendments made in the Monitoring Report, CL 04 is closed.
CL 05. Please, give sufficient justification for all the proposed revisions to the Monitoring Plan.	99 (a)	All the proposed revisions have been justified. See Section A.6 of the Monitoring Report.	The issue (CL 05) is closed.



VERIFICATION REPORT			B U R E A U V E R I T A S
CL 06. Please, give clear reference to the Guidance on criteria for baseline setting and monitoring in the section A.6 of the Monitoring Report.	99 (a)	Response #1 The reference has been provided. See Section A.6 of the Monitoring Report.	<u>Conclusion on response</u> <u>#1</u> Required corrections are not completely corrected.
			Please, give clear reference to the sections of Guidance on criteria for baseline setting and monitoring and to the methodology AM0014 which are mentioned in the section A.6 of the Monitoring Report.
		References to paragraphs and formulae of Guidance on criteria for baseline setting and monitoring and to the methodology AM0014 have been provided in the section A.6 of the Monitoring Report.	Conclusion on response #2 CL 07 is closed due to the amendments made in the Monitoring Report.
CL 07 . Please, indicate in the Monitoring Report the date of conducting internal audits (during this monitoring period) and the presence of the reports on internal audits.	101 (d)	Control measures on collection, recording and archiving of data monitored have been indicated on Section C.2 of the Monitoring Report.	The issue is closed due to the amendments made in the Monitoring Report.



VERIFICATION REPORT			B U R E A U V E R I T A S
CL 08. Please, indicate in the Monitoring Report information concerning trainings of the stuff (if any trainings were conducted during the monitoring period) and qualification of the personnel.		The required information has been indicated in the Section C.1 of the Monitoring Report.	
FAR 01 . Please, set up the calibration schedule (at least till the next verification) for the monitoring equipment and keep it in proper way.	101 (b)	Calibration schedule will be set up till the next verification.	Pending