DETERMINATION REPORT
RWE POWER AG

COGENERATION AND UTILIZATION OF WASTE HEAT AT UMAN GREENHOUSE COMBINATE

REPORT NO. UKRAINE/0102/2010

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DETERMINATION REPORT

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Client:	**Client ref.:**
RWE Power AG	Antonio Aguilera

Summary:

Bureau Veritas Certification has made the determination of the "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" project of RWE Power AG located in the towns Uman and Talne, Cherkasy oblast, Ukraine on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Executive Board, as well as the host country criteria.

The determination scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and 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 determination report and opinion. The overall determination, from Contract Review to Determination Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the determination process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology developed according the Guidance on Criteria for Baseline Setting and Monitoring and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.

Report No.:	Subject Group:
UKRAINE/0102/2010	JI

Project title:
"Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate"

Work carried out by:
Kateryna Zinevych – Team leader, Lead Verifier
Iuliia Pylnova – Team member, Verifier
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Work reviewed by:
Ivan Sokolov - Internal Technical Reviewer

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Indexing terms

Climate Change, Kyoto Protocol, JI, Emission Reductions, Verification

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Abbreviations

AIE	Accredited Independent Entity
CAR	Corrective Action Request
CL	Clarification Request
CO_2	Carbon Dioxide
DR	Document Review
ERU	Emission Reduction Unit
EIA	Environmental Impact Assessment
GHG	Green House Gas(es)
JI	Joint Implementation
I	Interview
IETA	International Emissions Trading Association
MoV	Means of Verification
MP	Monitoring Plan
NGO	Non Government Organization
PCF	Prototype Carbon Fund
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change

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1 INTRODUCTION

RWE Power AG has commissioned Bureau Veritas Certification to determinate its JI project “Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate” (hereafter called “the project”). The project is implemented at the PRAE “Uman Greenhouse Combinate” located in the towns Uman and Talne, Cherkasy oblast, Ukraine.

This report summarizes the findings of the determination 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

The determination serves as project design verification and is a requirement of all projects. The determination is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project’s compliance with relevant UNFCCC and host country criteria are determined in order to confirm that the project design, as documented, is sound and reasonable, and meet the stated requirements and identified criteria. Determination is a requirement for all JI projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reduction units (ERUs).

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 determination 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 determination is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 GHG Project Description

The project is aimed at reducing greenhouse gases emissions from natural gas combustion and grid electricity consumption at Uman Greenhouse Combinate (UGC), located in Cherkasy oblast, Ukraine.

UGC is one of the biggest producers of fresh vegetables in Ukraine representing up to 7 % share of the market. Its main products are tomatoes and cucumbers cultivated in the Company’s greenhouses, which

are located in three places: Uman, Talne, and Khrystynivka (for simplification purposes, the Company's greenhouses sites in Uman are called "Uman", those in Talne – "Talne", site in Khrystynivka is not included in the Project boundaries). The total greenhouses area of the company in 2006, when the decision about the project implementation was made, was 18.3 hm², which allowed production of 8162 tonnes of tomatoes and cucumbers per annum. The products of the company are produced and packed at UGS and then distributed through Ukrainian supermarket retail chains, up to 40% are exported.

According to UGC development plan in 2012 the production capacity is to be increased to reach 24500 tonnes of vegetables. It involves enlargement of the greenhouses area for 27.3 hm² to reach 45.6 hm² of total UGC greenhouses area in 2012. This will increase overall energy demand of the Enterprise.
Electricity is used for operational activities and for additional lighting in greenhouses. Natural gas is combusted for the purposes of heating and to enrich the air within the greenhouses with CO_2 in order to increase the plants' bioproductivity.

Before project implementation heat energy was generated by water boilers with natural gas combustion to satisfy UGC's demand in heat. Electricity demand has been covered by purchasing electricity from the national grid as there were no electricity generating capacities on site.

The baseline scenario was assumed as continuation of the current practice of purchasing electricity from national power grid and producing heat by natural gas combustion in water boilers.

The JI project activity involves installation of:

- three Caterpillar G3520C cogeneration units in Uman to produce heat, electricity and CO_2 for the plants in the greenhouses;
- two heat utilizers TUV-16 to utilize the waste heat at the Talne Gas Compressor Station "Talne", a part of Ukrtransgas Affiliated Company Naftogaz of Ukraine, which is located 1.5 km away from UGS's greenhouses in Talne.

The anthropogenic emissions of GHGs will be reduced by the proposed JI project through offsetting the use of state grid electricity and displacing the heat produced by gas-fired water boilers.

Substituting the carbon-intensive national grid electricity produced by traditional power plants with electricity locally generated by gas-fired cogeneration units leads to GHGs emission reductions and will also avoid electricity transportation losses during the delivery to the Enterprise. Generated heat will be directed for heating the greenhouses of the company, which will offset the heat previously produced by natural gas-

fired water boilers. CO_2 produced by cogeneration units and purified in exhaust gases' purification system would be enough to satisfy the CO_2 demand for greenhouse air enrichment in Uman, therefore, it will substitute the CO_2 previously generated in boilers.

Besides, the energy utilized at Gas Compressor Station "Talne" will be used to heat the company's Talne greenhouses, offsetting the heat previously produced by natural gas combustion.

The overall project investments are UAH 38.6 million financed by the bank loan and UGC internal investment. The decision on the project implementation was made in the beginning of 2006. While the decision-making the JI component was assumed as significant incentive to launch the project. The project investment period began in December 2006 and its operational phase started in November 2009. Without JI revenues the project activity could not have happened as it would be prevented by number of financial, organizational, technological and other barriers.

The implementation of the project activity will be socially and environmentally beneficial. Two of the cogeneration units installed will be equipped with the system for exhaust gases purification, which will lead to overall decrease in the air pollution on the site and improve health and safety conditions for the UGC workers. Heat utilizers will reduce the heat pollution currently caused by Talne Gas Compressor Station and affecting the local ecosystem by changing its microclimate and impacting the local biodiversity.

1.4 Determination team

The determination team consists of the following personnel:

Kateryna Zinevych,
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

Denis Pischalov,
Bureau Veritas Certification, Team member, Financial Specialist

The determination report was reviewed by:
Ivan Sokokov
Bureau Veritas Certification, Internal Technical Reviewer

2 METHODOLOGY

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

In order to ensure transparency, a determination protocol was customized for the project, according to the Determination and Verification Manual (IETA/PCF). The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from determining the identified criteria. The determination protocol serves the following purposes:

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

The determination protocol consists of four tables. The different columns in these tables are described in Figure 1.

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The completed determination protocol is enclosed in Appendix A to this report.			
Determination Protocol Table 1: Mandatory Requirements			
Requirement	**Reference**	**Conclusion**	**Cross reference**
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** or a **Clarification Request (CL)** of risk or non-compliance with stated requirements. The CAR's and CL's are numbered and presented to the client in the Determination Report.	Used to refer to the relevant protocol questions in Tables 2, 3 and 4 to show how the specific requirement is determined. This is to ensure a transparent determination process.

Determination Protocol Table 2: Requirements checklist				
Checklist Question	**Reference**	**Means of verification (MoV)**	**Comment**	**Draft and/or Final Conclusion**
The various requirements in Table 1 are linked to checklist questions the project should meet. The various requirements of baseline and monitoring methodologies should be met. The checklist is organized in several sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question. (See below). **Clarification Request (CL)** is used when the determination team has identified a need for further clarification.

Determination Protocol Table 3: Legal requirements				
Checklist Question	**Reference**	**Means of verification (MoV)**	**Comment**	**Draft and/or Final Conclusion**
The national legal requirements the project must meet.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question. (See below). **Clarification Request (CL)** is used when the determination team has identified a need for further clarification.

Determination Protocol Table 4: Resolution of Corrective Action and Clarification Requests			
Report clarifications and corrective action requests	**Ref. to checklist question in tables 2/3**	**Summary of project owner response**	**Determination conclusion**
If the conclusions from the Determination are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Tables 2, 3 and 4 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the determination team should be summarized in this section.	This section should summarize the determination team's responses and final conclusions. The conclusions should also be included in Tables 2, 3 and 4, under "Final Conclusion".

Figure 1 Determination protocol tables

2.1 Review of Documents

The Project Design Document (PDD version 1.1 dated 20.12.09) was submitted by "KT-Energy" 20/08/2010 together with supporting documentation in terms of calculation of GHG emission. PDD Version 1.1 and supporting documentation as well as additional background documents related to the project design, baseline, and monitoring plan, such as Kyoto Protocol, host Country laws and regulations, JI guidelines, JISC Guidance on criteria for baseline setting and monitoring, and

Guidelines for users of the JI PDD Form were reviewed. PDD Version 1.1 was made publicly available for comments from 20 August 2010.

The first deliverable of the document review was the Draft Determination Report with 43 CAR's and 18 CL.
To address Bureau Veritas Certification corrective action and clarification requests, LLC "KT-Energy", revised the PDD and as the latest response issued PDD version 02.5 dated 11/11/2010 and resubmitted it on 11/11/2010.
The determination findings presented in this report relate to the project as described in the PDD version 1.1, 2.1, 2.2, 02.3, 02.4, 02.5.

2.2 Follow-up Interviews

On 14/09/2010 Bureau Veritas Certification performed interviews with project stakeholders during site visit to confirm selected information and to resolve issues identified in the document review. Representatives of LLC "KT-Energy" and PRAE "Uman Greenhouse Combinate" were interviewed (see References). The main topics of the interviews are summarized in Table1.

Table 1 Interview topics

Interviewed organization	Interview topics
PRAE "Uman Greenhouse Combinate"	➢ Organizational structure. ➢ Responsibilities and authorities. ➢ Training of personnel. ➢ Quality management procedures and technology. ➢ Rehabilitation/Implementation of equipment (records). ➢ Metering equipment control. ➢ Metering record keeping system, database. ➢ Local stakeholder's response.
LLC "KT-Energy"	➢ Baseline methodology. ➢ Monitoring plan.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the determination 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 project design.

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

3 DETERMINATION FINDINGS

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

1) The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Determination Protocol in Appendix A.
2) Where Bureau Veritas Certification had identified issues that needed clarification or that represented a risk to the fulfillment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Determination Protocol in Appendix A. The determination of the Project resulted in 43 Corrective Action Requests and 18 Clarification Requests.
3) The conclusions for determination subject are presented.

3.1 Project Design

Bureau Veritas Certification recognizes that this Project is helping the host country fulfill its goals of promoting sustainable development. The project is expected to be in line with the host-country specific JI requirements.

The Project Scenario is considered additional in comparison to the baseline scenario, and therefore eligible to receive Emissions Reductions Units (ERUs) under the JI, based on an analysis, presented by the PDD, of investment, technological and other barriers, and prevailing practice.
The project design is sound and the geographical (located in the towns Uman and Talne, Cherkasy oblast, Ukraine) and temporal (11 years and 2 month or 134 months) boundaries of the project are clearly defined.

CARs (CAR 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 26, 27) and CLs (CL 01, 02, 03, 04, 05, 06) their resolution/conclusion applicable to project design are listed in the APPENDIX A: DETERMINATION PROTOCOL (Table 4) below.

The project has no approvals by the Parties involved, therefore CAR 01 remains pending. CAR 01 will be closed after report finalizing.

3.2 Baseline and Additionality

In course of development of the project “Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate”, JI specific approach was used that is partly similar to Approved baseline methodology AM0014 “Natural gas-based package cogeneration” (Version 04) (for site in Uman) and Approved consolidated baseline and monitoring methodology

ACM0012 “Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects” (Version 03.2) (for site in Talne).
Basic assumptions of the baseline methodology in the context of project activity are the following:

- Heat generation by the cogeneration units Caterpillar G3520C and heat-utilizers TUV-16 within the project activity refers to heat generation by natural-gas fired boilers in the baseline.
- Electricity generation by the cogeneration units in the project scenario will substitute electricity generation by the power plants of national grid in the baseline.
- Heat energy and electricity demand of the Enterprise in the baseline and project scenarios is equal.

Baseline emissions are proportional to the amount of baseline fuel consumption that is offset by heat and electricity supplied by the natural gas cogeneration system.
Due to the similar nature of the effect resulting from the employment of heat-exchange technology, namely the substitution of the heat energy, which in the absence of the project activity would have to be produced by natural gas-fired water boilers, the similar approach for baseline emissions calculation as in the Approved baseline methodology AM0014 “Natural gas-based package cogeneration” (Version 04) for this technology was used.

The analysis performed allowed Bureau Veritas Certification to conclude that the baseline has been chosen according to the requirements and the project activity is additional to any that would otherwise occur

Application of the approach chosen
Step 1. Identification of alternatives to the project activity consistent with current laws and regulations

In considering options for heat and electricity supply and the ongoing management of the facility, UGC and its investors sought reliability, regular supply, simplicity of operation and minimal capital outlay.
Options for project site in Uman
1. Project owner continues to operate with equipment replacement as needed with no change in equipment efficiency (The frozen-efficiency scenario).
2. Project owner continues to operate with improved efficiency new equipment at the time of equipment replacement using a less carbon intensive fuel.
3. Project owner upgrades the thermal energy generating equipment and therefore increases the efficiency of boiler(s) immediately.
4. The heat and or electricity demand of the project owner is reduced through improvements in end-use efficiency.
5. Installation of a cogeneration system owned by the project owner.

6. Installation of a package cogeneration system owned by a company other than the project owner.
7. Installation of a cogeneration system by a third party.

Options for project site in Talne :
1. On-site or off-site existing/new renewable energy based cogeneration plant;
2. On-site or off-site existing/new fossil fuel based cogeneration plant;
3. An existing or new fossil fuel based boilers;
4. An existing or new renewable energy based boilers;
5. Any other source such as district heat;
6. Other heat generation technologies (e.g. heat pump or solar energy);
7. Steam/Process heat generation from waste energy, but with lower efficiency;
8. Cogeneration with waste energy, but at a lower efficiency;
9. Implementation of the project activity without ERU revenue.
All of the options are consistent with current Ukrainian legislation.

Step 2. Investment analysis

To demonstrate that the proposed project activity was not the most financially attractive the investment comparison analysis was performed (Option II, sub-step 2a of the Tool for demonstration and assessment of additionality (Version 05.2). The indicator chosen is net present value (NPV).
Financial calculations have shown that for the project scenario without ERU sales net present value (NPV) of the project scenario was UAH 9 million greater than the same indicator in the baseline scenario, while NPV of project scenario with ERU sales was more than UAH 10 million lower. Thus, the project scenario without revenues from ERUs sale is not the most financially favorable.

Step 3. Barrier analysis

In addition to financial barriers analyzed before, the project faced significant technological, organizational and prevailing practice barriers. Technological barriers included lack of skilled and properly trained personnel to operate and maintain the cogeneration units in Uman and heat-utilizers in Talne. For UGC the technological barriers existing for cogeneration in Ukraine are even more serious due to the need to ensure exhaust gases purity to be able to supply the part of them – the pure CO2 – to the greenhouses. It makes cogeneration units with air purification equipment unique installations in Ukraine.
The heat-utilizers installed by UGC at Gas Compressor Station “Talne” are the “first of its kind”: they are the only 16 MW capable heat-utilizers installed at gas compressor station in Ukraine. Another project of this type was realized in Novopskovsk, Luhansk oblast, where two 8MW capable

heat-utilizers were mounted at gas compressor station operated by Donbastransgas. This allows stating the existence of the barrier due to prevailing practice. Finally, this project intervention faces serious organizational barrier: Gas Compressor Station “Talne”, a part of Ukrtransgas – the affiliated company of Naftogaz of Ukraine, is a strategic entity with limited access. Installation of heat utilizers there, their operation and maintenance raises a number of legal, organizational and financial issues that need to be overcame in order to make the heat utilization possible.
Additionally, power generation projects have to obtain the license for power generation activity, which is reported as one of the serious administrative barriers for the business development in Ukraine. According to the study provided by the International Financial Corporation, around 64% of the companies that are subject to obtain permits or licenses considered the licensing process as a difficult one.

The barriers identified do not exist for the baseline scenario which is the continuation of the current practice of purchasing national grid electricity and heat generation by natural gas consumption in gas-fired water boilers.

Step 4. Common practice analysis

According to the information obtained from Ukrainian Greenhouse Association, cogeneration is not common for greenhouse complexes in Ukraine. Prevailing practice is heat generation by non-renewable fuel combustion and purchase of electricity from national power grid. Heat generation in gas fired boilers is common practice in Ukraine given the easy availability of gas, its relatively low price in recent years and the need for high quality, reliable heat. In addition, natural gas combustion in boilers produces CO_2 of sufficient purity which allows its direct supplying to the greenhouses with no need for introduction of any emission purification systems.

Therefore, the chosen project scenario faced significant financial, technological, organizational and prevailing practice barriers which in the absence of JI mechanism would prevent the implementation of the project activity.

CARs (14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 28, 29, 30, 32, 37) and CLs (CL 07, 08, 09, 10) and their resolution/conclusion applicable to baseline and additionality are listed in the APPENDIX A: DETERMINATION PROTOCOL (Table 4) below.

3.3 Monitoring Plan

For monitoring of GHGs emissions a JI specific approach with elements of the approved baseline and monitoring methodology AM0014 “Natural gas-based package cogeneration” (Version 04) has been used. Monitoring plan is established in accordance with Host Party regulations, namely in accordance with Decree of Cabinet of Ministers of Ukraine #206 dated 22.02.2006 ‘On Approval of the Procedure of Drafting, Review, Approval and Implementation of Projects Aimed at Reduction of Anthropogenic Emissions of Greenhouse Gases’ and “Requirements for the Joint Implementation Projects preparation” approved by National Environmental Investment Agency of Ukraine (Order #33 from 25th of June, 2008).

Monitoring plan has also been established in accordance with Appendix B of the JI guidelines and taking into account Guidance on criteria for baseline setting and monitoring developed by JISC. The formulae applied correspond to those proposed by the approved baseline and monitoring methodology AM0014 “Natural gas-based package cogeneration” (Version 04).

The approved baseline and monitoring methodology AM0014 cannot be used in full as it implies no excess electricity to be supplied to the power grid. Since electricity supply to the national grid is foreseen within project boundaries, baseline CO_2 emissions from electricity supply to electricity grid, that are offset by electricity supplied from cogeneration system, should be taken into account. To estimate above mentioned CO_2 emissions cogeneration electricity supply to the national grid will be monitored and multiplied by relevant emission factor for electricity from public supply.

Besides, the monitoring methodology AM0014 will be used for the monitoring of the following sources of emissions:

- CO_2 emissions from the combustion of natural gas for heat generation in the baseline and heat and electricity generation in the project;
- CH_4 emissions from natural gas production, processing and distribution leaks.

Monitoring of CH_4 and N_2O emissions from natural gas combustion excluded as they do not exceed 1% of annual average anthropogenic emissions by sources of GHGs, and therefore were considered negligible.

CARs (CAR 33, 34, 35, 36) and CLs (CL 11, 12, 13) and their resolution/conclusion applicable to monitoring plan are listed in the APPENDIX A: DETERMINATION PROTOCOL (Table 4) below.

3.4 Calculation of GHG Emissions

Project emissions comprise the following components:

- Carbon dioxide (CO_2) emissions from natural gas combustion in cogeneration system;
- Methane (CH_4) emissions from leakages at natural gas production, transportation, distribution and consumption.

(1) $$PE_y = PE_{cs} + PE_{equiv\ fug},$$

where

PE_y – total project GHG-s emissions, tonnes CO_2e/year;

PE_{cs} – project carbon dioxide emissions from natural gas combustion in the cogeneration system, tonnes CO_2/year;

$PE_{equiv\ fug}$ – project methane emissions from natural gas production and leakage in transport and distribution, corresponding to heat supply, tonnes CO_2e/year;

Project carbon dioxide emissions from each of the sources are proportional to annual energy consumption of natural gas in cogeneration system which is calculated as follows:

(1.0.) $$AEC_{NG} = CEC \times AOH_{CS} \times FCR_{NG},$$

where:

AEC_{NG} – annual energy consumption of natural gas in cogeneration system, GJ/year;

CEC – cogeneration electricity capacity, MW

AOH_{CS} – annual operating hours of cogeneration system, hours per year;

FCR_{NG} – cogeneration system fuel consumption rate, GJ/MWh.

(1.1.) $$PE_{cs} = AEC_{NG} \times EF_{NG},$$

where:

PE_{cs} – project carbon dioxide emissions from natural gas combustion in the cogeneration system, tonnes CO_2/year;

AEC_{NG} – annual energy consumption of natural gas in cogeneration system, GJ/year;

EF_{NG} – CO_2 emission factor of natural gas (lower heating value basis), tonnes CO_2/GJ.

IPCC default value for EF_{NG} is 0,056 tonnes CO_2/GJ, [*1996 IPCC Guidelines for National Greenhouse Gas Inventories*: Workbook, Module 1: Energy, Table 1-2 Carbon emission factors (CEF). CEF has been converted to CO_2 emission factor through multiplying CEF by 44/12 and carbon oxidation factor 1.]

(1.2.) $$PE_{equiv\ fug} = AEC_{NG} \times MLR \times GWP\ (CH_4) \times 10^{-3},$$

where:

$PE_{equiv\ fug}$ – project methane emissions from natural gas production and leakage in transport and distribution, corresponding to consumption of natural gas in cogeneration system, tonnes CO_{2e}/year;
AEC_{NG} – annual energy consumption of natural gas in cogeneration system, GJ/year;
MLR - Methane Leakage Rate in natural gas production, transport and distribution leakage, including leaks at the industrial site (lower heating value basis), kg CH_4/GJ natural gas energy consumption;
GWP (CH_4) - global warming potential of methane = 21.

Default value for *MLR* corresponds to*1996 IPCC Guidelines for National Greenhouse Gas: Reference Manual, Chapter 1: Eastern Europe and Fromer USSR – Emission Factors:.*
- 0,218 kg CH_4/GJ of methane emissions at natural gas production [Table 1-61, page 1.129.55];
- 0,340 kg CH_4/GJ of methane emissions at natural gas processing, transport, and distribution.

Baseline emissions comprise three components:

- CO_2 emissions corresponding to the combustion of natural gas that would have been used to generate heat for satisfying UGC's demand in the absence of proposed project activity;
- CH_4 emissions from natural gas production and leaks in the transport and distribution pipeline supplying the plant and leaks in the gas distribution piping within the plant, associated with the natural gas consumption;
- CO_2 emissions associated with the electricity that would have to be purchased from the power grid if the cogeneration system did not provide electricity to the plant.

Total baseline scenario GHGs emissions are estimated using the formula below:

(2) $$BE_y = BE_{th} + BE_{th\ equiv\ fug} + BE_{elec\ own} + BE_{elec\ grid},$$

where
BE_y – total baseline GHG-s emissions, tonnes CO_2e/year;
BE_{th} – baseline CO_2e emissions from combustion of baseline fuel for heat supply, tonnes CO_2e /year;
$BE_{th\ equiv\ fug}$ – baseline methane emissions from natural gas production and leakage in transport and distribution, corresponding to heat supply, tonnes CO_2e/year;
$BE_{elec\ own}$ – baseline emissions of CO_2 from electricity supply to industrial plant that is offset by electricity supplied from cogeneration system, tonnes CO_2e/year;

$BE_{elec\ grid}$ – baseline emissions of CO_2 from electricity supply to electricity grid that is offset by electricity supplied from cogeneration system, tonnes CO_2e/year.

(2.1.) $BE_{th} = ABEC_{BF} \times EF_{BF}$,

where:

BE_{th} – baseline CO_2 emissions from combustion of baseline fuel for heat supply, tonnes CO_2e/year;

$ABEC_{BF}$ - annual energy consumption for heat supply at baseline plant, GJ/year;

EF_{BF} - CO_2 emission factor of the fuel used to generate heat, tonnes CO_2/GJ.

(2.2.) $BE_{th\ equiv\ fug} = ABEC_{BF} \times MLR \times GWP\ (CH_4) \times 10^{-3}$,

where:

$BE_{th\ equiv\ fug}$ – baseline methane emissions from natural gas production and leakage in transport and distribution, corresponding to heat supply, tonnes CO_2e/year;

$ABEC_{BF}$ - annual energy consumption for heat supply at baseline plant, GJ/year;

MLR - Methane Leakage Rate in natural gas production, transport and distribution leakage, including leaks at the industrial site (lower heating value basis), kg CH_4/GJ natural gas energy consumption;

GWP (CH_4) - global warming potential of methane = 21.

(2.3.) $BE_{elec\ own} = CEO_{IP} \times EF_{red\_elec\ grid} \times 10^{-3}$,

where:

$BE_{elec\ own}$ – baseline emissions of CO_2 from electricity supply to industrial plant that is offset by electricity supplied from cogeneration system, tonnes CO_2e/year;

CEO_{IP} – cogeneration electricity supplied to industrial plant, MWh;

$EF_{red\_elec\ grid}$ – baseline CO_2 emissions factor for electricity from public supply, kg CO_2/MWh [*Carbon B.V. "Standardized emission factors for Ukrainian electricity grid"* are to be used (see Annex 4)].

(2.4.) $BE_{elec\ grid} = CEO_{EG} \times EF_{prod\_elec\ grid} \times 10^{-3}$,

where:

$BE_{elec\ grid}$ – baseline emissions of CO_2 from electricity supply to electricity grid that is offset by electricity supplied from cogeneration system, tonnes CO_2e/year;

CEO_{EG} – cogeneration electricity supplied to electricity grid, MWh;

$EF_{prod\_elec\ grid}$ – baseline CO_2 emissions factor for electricity from public supply, kg CO_2/MWh.

Difference between baseline emissions and project emissions represents emission reductions.
The estimated annual average of approximately 55 245 tCO_2e over the crediting period of emission reduction represents a reasonable estimation using the assumptions given by the project.

CARs (CAR 31, 38) and CLs (CL 14, 15, 16) and their resolution/conclusion applicable to calculations of GHG emissions are listed in the APPENDIX A: DETERMINATION PROTOCOL (Table 4) below.

3.5 Environmental Impacts

The project has been subject to a formal environmental impact assessment (EIA) undertaken in accordance with the applicable legislation and regulations of Ukraine. These include: the Laws of Ukraine "On Protection of Environment", "On Ecological Expertise", "On Protection of Atmospheric Air", "On Ensuring Sanitary and Epidemic Welfare of the Population", and "On Local Councils and Local Government", as well as the applicable Water Code, Land Code, and Forest Code.

Before the start of the project implementation the Enterprise received all the required conclusions of the state ecological expertise. Permit #7110800000-45 on Polluting Substances' Emissions into the Atmospheric Air by Stationary Sources has been issued to UGC by State Department for Environmental Protection in Chercasy Oblast. It is valid from August 14th, 2009, until August 15th, 2014. Also the License # 469980 has been issued to the UGC by the National Electricity Regulatory Commission of Ukraine on October 29th, 2009. The License is valid from October 29th, 2009, until October 28th, 2012.

Main environmental impacts of the project are caused be exhaust gases emitted by cogeneration system; NO_x, CO, THC, HC (non-methane). They are subjects to regulation by existing Ukrainian legislation. The gases emitted from the cogeneration system are monitored and reported in compliance with the requirements of the State environmental monitoring service of the Committee on natural resources in Cherkasy oblast through official quaterly statistical form 2-tp (air) Data on protection of atmospheric air, which contains information on amounts of trapped and neutralized atmospheric pollutants, itemized emissions of specific pollutants, number of emission sources, measures on reduction of emissions into the atmosphere, emissions from particular groups of pollution sources. Two of the cogeneration units installed will be equipped with the system for exhaust gases purification, which will lead to overall decrease in the air pollution on the site and improve health and safety conditions for the UGC workers in comparison to baseline scenario.

According to the EIA, only local environmental impact can be stated, thus no transboundary environmental effects are expected.

Toxic waste of the Enterprise including the waste related to the project activity (used engine oil, oil containers etc.) is utilized by “Dobrobut Eco-Ukraina”, which has all the necessary state licenses.

Heat-utilizers will reduce the heat pollution currently caused by Talne Gas Compressor Station and affecting the local ecosystem by changing its microclimate and impacting the local biodiversity.

Project territory does not belong to natural reserve territory. There are no fauna and flora species mentioned on Red Lists present on the area of the project location. The project will be located totally within the land boundary of the Enterprise territory and will not require any additional land. Cogeneration units and heat utilizers are not water pollution source.

CARs (CAR 39, 40, 41, 43), CLs (CL 17, 18) and its resolution/conclusion applicable to environmental impacts are listed in the APPENDIX A: DETERMINATION PROTOCOL (Table 4) below.

3.6 Comments by Local Stakeholders

No stakeholder consultation process for the JI projects is required by the Host Party. Stakeholder comments will be collected after the publication of this document on UNFCCC web-page during the determination procedure.

However, at the stage of EIA of the project the statement of intention and the statement of environmental implications have been published in local newspaper. No stakeholder comments were received.

CAR 42 and its resolution/conclusion applicable to environmental impacts are listed in the APPENDIX A: DETERMINATION PROTOCOL (Table 4) below.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOs

According to the modalities for the Determination of JI projects, the AIE shall make publicly available the project design document and receive, within 30 days, comments from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available.
Bureau Veritas Certification published the project documents on the website (http://www.bureauveritas.com.ua) on 20 of August 2010 and

invited comments by Parties, stakeholders and non-governmental organizations. There are no comments from stakeholders.

5 DETERMINATION OPINION

Bureau Veritas Certification has performed a determination of the "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate" located in the towns Uman and Talne, Cherkasy oblast, Ukraine. The determination was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

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

Project participant/s used the latest tool for demonstration of the additionality. In line with this tool, the PDD provides analysis of investment and other barriers to determine that the project activity itself is not the baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions.
Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The review of the project design documentation and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria.
The determination revealed one pending issue related to the current determination stage of the project: the issue of the written approvals of the Parties involved (the host Party and sponsor Party). If the written approval and the authorization by the host Party are awarded, it is our opinion that the project as described in the Project Design Document version 02.5 meets all the relevant UNFCCC requirements for the JI and the relevant host country criteria.

The determination is based on the information made available to us and the engagement conditions detailed in this report.

6 REFERENCES

Category 1 Documents:
Documents that relate directly to the GHG components of the project.

/1/ PDD "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate", ver. 1.1, dated 20.12.09.

/2/ PDD “Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate”, ver. 2.1, dated 20.10.10.

/3/ PDD “Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate”, ver. 2.2, dated 20.10.10.

/4/ PDD “Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate”, ver. 02.3, dated 9.11.10.

/5/ PDD “Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate”, ver. 02.4, dated 9.11.10.

/6/ PDD “Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate”, ver. 02.5, dated 11.11.10.

/7/ Guidelines for users of the JI SSC PDD form and the form for submission of bundled JI SSC projects (version 04).

/8/ Glossary of JI terms, ver. 03, JISC.

/9/ Guidance on criteria for baseline setting and monitoring, ver. 02.

/10/ Tool for the demonstration and assessment of additionality, ver. 05.2.

/11/ Approved baseline methodology AM0014 “Natural gas-based package cogeneration”, ver. 04, dated 10.08.2007.

/12/ Approved consolidated baseline and monitoring methodology ACM0012 “Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects”, ver. 03.2, dated 16.08.2008.

/13/ JISC “Clarification regarding the public availability of documents under the verification procedure under the Joint Implementation Supervisory Committee.”, ver. 03.

/14/ Letter of Endorsement № 516/23/7 dated 15.05.2009 issued by the National Environmental Investments Agency of Ukraine.

Category 2 Documents:

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

/1/ Extract from minutes of the government authorities of PRAE "Uman Greenhouse Combinate" dated 24 January 2006.

/2/ Statement on inspection board for taking into operation a constructed facility. Heat recovery station at CS. 29 December 2008.

/3/ Permit #399 on construction works for building heat recovery system at GCS "Talne" dated 26 November 2007.

/4/ Statement of readiness to operation. Construction (arrangement) of the cogeneration units at the boiler house of PRAE "Uman Greenhouse Combinate". 30 November 2009.

/5/ Certificate #2300000447 on compliance of constructed facility with project documentation, requirements of state standards, building regulations dated 28.12.2009.

/6/ Licence for supply electricity according to nonregulated tariff. Series AB, №469980. Term of validity: 29.10.2009 -28.10.2012.

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/7/ Statement on licence issuance for supply of electroenergy according to nonregulated tariff dated 07 October 2009.

/8/ Certificate on state registration of legal body. Series AOO, #650208. 02 February 1993.

/9/ State comission decision on taking into operation of heat recovery system at CS "Talne".

/10/ Report on taking into operation GZN00610 dated 14.10.2009.

/11/ Report on taking into operation GZN00702 dated 16.10.2009.

/12/ Report on taking into operation GZN00611 dated 15.10.2009.

/13/ Technical passport of cogeneration units on the base of gas reciprocating electricity station Caterpillar G3520.

/14/ Technical specification of gas reciprocating engine G3520C.

/15/ Working project. Reconstruction of electrical industries at the boiler house with cogeneration units installation PRAE "Uman Greenhouse Combinate". Environmental impact assessment. 32-2008-EIA.

/16/ Licence for construction activity. Series AB, #117062. Validity term of licence: 28 April 2006 - 28 April 2011.

/17/ Statement of environmental effects, the aim of which is installation of gas reciprocating electricity station for technological needs of greenhouses. 2008.

/18/ Statement of intention. Technical and technological data: three cogeneration units on the base of gas reciprocating generators G3520C with electrical capacity 2,07 MW and thermal capacity 2,73 MW.

/19/ Volume I. Book 1. Working project. Explanatory note. Heat recovery station at CS "Talne". 2007.

/20/ Limits for waste production and disposal for 2010 dated 10 September 2009.

/21/ Permit for the start of hazardous work #2824.09.2009.30-01.12.0. Validity term of permit: 28.09.2009 - 28.09.2012.

/22/ Resolution on issuance of permit for emissions into the atmosphere by stationary sources dated 14.08.2009 #7124010100-15 for the boiler house in Talne town, Polova str.

/23/ Permit #7124010100-15 for the emissions into the atmosphere by stationary sources dated 14.08.2009.

/24/ Opinion of state sanitary-epidemiological expertise dated 10.06.2009. #05.03.02-07/34294.

/25/ Protocol of state sanitary-epidemiological expertise dated 10.06.2009. #03/1-1845.

/26/ Newspaper "Ear". Statement of intention to receive the permit for emissions into the atmosphere by stationary sources dated 12 June 2009.

/27/ Permit #7110800000-45 for emissions into the atmosphere by stationary sources. Date of permit issuance: 14.08.2009.

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/28/ Opinion of the state sanitary-epidemiological expertise dated 10.06.2009 #05.02-07/34292.

/29/ Protocol of state sanitary-epidemiological expertise dated 10.06.2009. #03/1-1844.

/30/ Opinion of state of environmental expertise #23/09.06.09-019 dated 30 June 2009.

/31/ Technical specifications #426/2008 on connection of cogeneration units PRAE "Uman Greenhouse Combinate" to electricity networks OJSC "Cherkasyoblenergo" dated 07 November 2008.

/32/ Agreement #1on waste acceptance and storage dated 1 January 2008.

/33/ Agreement #613 on waste acceptance and storage dated 30 December 2009.

/34/ Maximum permissible discharge (MPD) in water body with return water. MPD approved 19 April 2005 for the period until 31 December 2007.

/35/ Permit for special water use dated 19 April 2005. Validity term of permit is extended until 31 December 2010.

/36/ Conclusion on special water use 3/283 dated 2005.

/37/ Acceptance certificate. Meter "Energy-9",ser. #50115. Date of the last verification 29.11.08.

/38/ Acceptance certificate. Meter "Energy-9",ser. #50107. Date of the last verification 05.11.09.

/39/ Acceptance certificate. Meter "Energy-9",ser. #50101. Date of the last verification 05.11.09.

/40/ Acceptance certificate. Meter "Energy-9",ser. #53294. Date of the last verification 26.05.2010.

/41/ Acceptance certificate. Meter "Energy-9",ser. #49969. Date of the last verification 05.11.2009.

/42/ Acceptance certificate. Meter "Energy-9",ser. #52449. Date of the last verification 02.07.2010.

/43/ Acceptance certificate. Meter "Energy-9",ser. #53288. Date of the last verification 26.05.2010.

/44/ Certificate #02/03-1220 on measuring equipment calibration. Current transformer. Valid to 06.08.2013.

/45/ Certificate #94/205 on measuring equipment calibration. Voltage transformer. Valid to 11.11.2013.

/46/ Certificate #94/205 on measuring equipment calibration. Valid to 11.11.2013.

/47/ Certificate #02/03-1222 on measuring equipment calibration. Current transformer. Valid to 06.08.2013.

/48/ Certificate #230/401 on measuring equipment calibration. Current transformer. Valid to 23.05.2012.

/49/ Certificate #230/393 on measuring equipment calibration. Current transformer. Valid to 23.06.2012.

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/50/ Certificate #230/394 on measuring equipment calibration. Current transformer. Valid to 23.06.2012.

/51/ Certificate #230/011 on measuring equipment calibration. Current transformer. Valid to 16.01.2012.

/52/ Certificate #230/012 on measuring equipment calibration. Current transformer. Valid to 16.01.2012.

/53/ Certificate #230/013 on measuring equipment calibration. Current transformer. Valid to 16.01.2012.

/54/ Certificate #230/010 on measuring equipment calibration. Current transformer. Valid to 16.01.2012.

/55/ Passport physical-chemical parameters of natural gas delivered by Haisynskyi LVUMG and accepted by PRAE "Uman Greenhouse Combinate" of gas pipeline "Soyuz" for August 2010.

/56/ Amount of sold electricity for January 2010.

/57/ Statement on electricity production at PRAE "Uman Greenhouse Combinate" for December 2009.

/58/ Passport. Meter for hot water consumption СВТУ-10М. М1 and М2. №16298.

/59/ Working project. Reconstruction of commercial unit of heat distribution from heat boiler CS "Talne" for PRAE "Uman Greenhouse Combinate" in urban-type settlement Talne, 2010.

/60/ Statement of measuring the internal diameter of the pipeline of flowmeter, installed in commercial unit of heat distribution from heat boiler CS "Talne" for PRAE "Uman Greenhouse Combinate".

/61/ Statement on personnel training for operation of cogeneration units on the base of Caterpillar G3520C.

/62/ List of staff of PRAE "Uman Greenhouse Combinate" who have been familiar with operation of cogeneration units on the base of Caterpillar G3520C.

/63/ Statement on putting into operation of the gas engine generator plant Caterpillar G3520C with heat recovery system.

/64/ Statement on equipment acceptance Caterpillar dated 18.12.2009.

/65/ Protocol on putting the cogeneration unit into operation, 15.10.2009.

/66/ Passport. Heat meter СПТ961 (mod. 961.1, 961.2). Passport. Date of the latest verification: 8.01.2009.

/67/ General information on the product and certificate of acceptance and calibration. Sapfir DD 2420, ser. #997451. 10.04.02.

/68/ Heat meter СПТ961 (mod. 961.1, 961.2). Instruction manual. РАЖГ.421412.025РЭ.

/69/ Passport for parameters and characteristics of the environment. Differential pressure sensor Sapfir-22 ДД 2420. Verification date: 30.11.09.

/70/ Statement of acceptance-transferring of natural gas dated 31.05.2010.

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/71/ Statement of acceptance-transferring of natural gas according to the contract #03/02-Г dated 18 January 2010.

/72/ Statement of acceptance-transferring of natural gas for needs of industrial users dated 31.05.2010.

/73/ Statement of acceptance-transferring of natural gas transportation services dated 31.05.2010.

/74/ Statement of acceptance-transferring of natural gas dated 01.06.2010.

/75/ Contract on purchase and sale #PS/C/44-08 dated 16 May 2008.

/76/ Statement on acceptance of assembling and preparation works dated 2008.

/77/ Contract #323-07 dated 18.05.2007.

/78/ Contract #15-11929/10 on natural gas transportation through pipelines to the customer who receives gas directly from gas transportation system dated 01 December 2010.

/79/ Photo. Unit Caterpillar 0467.

/80/ Photo. Computer control system. Terberg Control Systems. Engines survey.

/81/ Photo. Meter СПГ761.

/82/ Photo. Boiler АПВ-3, reg. #1835.

/83/ Photo. Block of automatic control. Альфа-М.

/84/ Photo. Boiler АПВ-3, reg. #1836.

/85/ Photo. Boiler АПВ-3, reg. #13.

/86/ Photo. Boiler АВ-3, reg. #14.

/87/ Photo. Boiler АВ-3, reg. #15.

/88/ Photo. Boiler АВ-3, reg. #16.

/89/ Photo. Boiler АВ-3, reg. #17.

/90/ Photo. Meter Actaris. Fab.#2782301106/CI/2008.

/91/ СНР. ТП-265 ШУ-1 II section AZ-2.

/92/ СНР. ТП-265 ШУ-1 I section AZ-1.

/93/ Photo. Meter NIK 2301 AK1.

/94/ Photo. Meter for thermal energy and hot water. Січ Узв.

/95/ Photo. Meter СПТ961.

/96/ Greenhouses and greenhouse farming. Shyshko, 1993. thermotechnical calculation for greenhouses (design parameters of outer air).

/97/ Terberg Control System. Power organiser. Instruction and description. Version 1.1.

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/98/ Test certificate of KCVF 594, 28.08.2008.

/99/ Caterpillar. Description for gas-reciprocating generator set G3520C.

Persons interviewed:

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

/1/ M.V. Gordiy - director of PRAE "Uman Greenhouse Combinate"

/2/ K.M. Zozulia - deputy director for technical re-equipment of PRAE "Uman Greenhouse Combinate"

/3/ V.I. Petyk - head of the boiler house

/4/ V.I.Koroban - head of accounting service

/5/ I.P. Leleka - foreman of electric shop

/6/ Y.M. Gorbachenko - engineer of Talne department

/7/ O.O. Shchyt - deputy director of HCS

/8/ K. O. Tomlyak – director of LLC “KT-Energy”

/9/ K.D. Levyk – chief specialist of LLC “KT-Energy”

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APPENDIX A: COMPANY JI PROJECT DETERMINATION PROTOCOL

Table 1 Mandatory Requirements for Joint Implementation (JI) Projects

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
1. The project shall have the approval of the Parties involved	Kyoto Protocol Article 6.1 (a)	Corrective Action Request (CAR) 01 The project has no approval of the host Party and the sponsor Party. After finishing project determination report, the PDD and Determination Report will be presented to National Environmental Investment Agency of Ukraine for receiving the Letter of Approval. The Letter of Approval from the country -	Table 2, Section A.5

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
		investor will be provided after approval of project by Ukraine.	
2. Emission reductions, or an enhancement of removal by sinks, shall be additional to any that would otherwise occur	Kyoto Protocol Article 6.1 (b)	OK	Table 2, Section B
3. The sponsor Party shall not acquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7	Kyoto Protocol Article 6.1 (c)	OK	N/A
4. The acquisition of emission reduction units shall be supplemental to domestic actions for the purpose of meeting commitments under Article 3	Kyoto Protocol Article 6.1 (d)	OK	N/A
5. Parties participating in JI shall designate national focal points for approving JI projects and have in place national guidelines and procedures for the approval of JI projects	Marrakech Accords, JI Modalities, §20	Both countries have designated their Focal Points. National guidelines and procedures for approving JI projects have been published.	

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
		Contact data in Ukraine: National Environmental Investment Agency of Ukraine 35 Urytsky Str., Kyiv, P.O. 03035 Email: info.neia@gmail.com Mr. Sergiy Orlenko Head of National Environmental Investment Agency of Ukraine Phone: +380445949111 Fax: +380445949115 Contact data in Germany:	

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
		Federal Environment Agency German Emissions Trading Authority PO Box 33 00 22 14191 Berlin Germany Email: german.dna.dfp@uba.de Dr. Enno Harders Head of Department E 1 Phone: +49 30 8903 5050 Fax: +49 30 8903 5103 Email: german.dna.dfp@uba.de Dr. Wolfgang Seidel	

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
		Head of Division E 1.5 Phone: +49 30 8903 5050 Fax: +49 30 8903 5103 Email: german.dna.dfp@uba.de	
6. The host Party shall be a Party to the Kyoto Protocol	Marrakech Accords, JI Modalities, §21(a)/24	The Ukraine is a Party (Annex I Party) to the Kyoto Protocol and has ratified the Kyoto Protocol at April 12th, 2004.	
7. The host Party's assigned amount shall have been calculated and recorded in accordance with the modalities for the accounting of assigned amounts	Marrakech Accords, JI Modalities, §21(b)/24	In the Initial Report submitted by Ukraine on 29. Dec. 2006 the AAUs are quantified with: 925 362 174.39 (x 5) = 4 626 810 872 tCO2-e	
8. The host Party shall have in place a national registry in accordance with Article 7, paragraph	Marrakech Accords,	The designed system of the national registry	

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
4	JI Modalities, §21(d)/24	has been described in the Initial Report mentioned above.	
9. Project participants shall submit to the independent entity a project design document that contains all information needed for the determination	Marrakech Accords, JI Modalities, §31	RWE Power AG has submitted the PDD to Bureau Veritas Certification, which contains information needed for determination.	
10. The project design document shall be made publicly available and Parties, stakeholders and UNFCCC accredited observers shall be invited to, within 30 days, provide comments	Marrakech Accords, JI Modalities, §32	The PDD was made publicly available trough AIE website from 20/08/2010 till 18/09/2010.	
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, in accordance with procedures as determined by the host Party shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out	Marrakech Accords, JI Modalities, §33(d)	OK	Table 2, Section F

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
12. The baseline for a JI project shall be the scenario that reasonably represents the GHG emissions or removal by sources that would occur in absence of the proposed project	Marrakech Accords, JI Modalities, Appendix B	OK	Table 2, Section B
13. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, JI Modalities, Appendix B	OK	Table 2, Section B
14. The baseline methodology shall exclude to earn ERUs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, JI Modalities, Appendix B	OK	Table 2, Section B
15. The project shall have an appropriate monitoring plan	Marrakech Accords, JI Modalities, §33(c)	OK	Table 2, Section D
16. A project participant may be: (a) A Party involved in the JI project; or (b) A legal entity authorized by a Party involved to participate in the JI project.	JISC "Modalities of communication of Project Participants with	Conclusion is pending until Letters of Approval authorizing the project participants by Parties involved will be issued (see CAR 01).	Table 2, Section A

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
	the JISC" Version 01, Clause A.3		

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
A. General Description of the project					
A.1 Title of the project					
A.1.1. Is the title of the project presented?	1,2, 3,4, 5,6	DR	The title of the project is indicated: "Cogeneration and Utilization of Waste Heat at Uman Greenhouse Combinate". Corrective Action Request (CAR) 02 Sectoral scope #15 is not appropriate. Please, revise sectoral scope of this project.	CAR 02	OK
A.1.2. Is the current version number of the document presented?	1,6	DR	The current version of the project is indicated. See section A.1.	OK	OK
A.1.3. Is the date when the document was completed presented?	1,6	DR	The date of completeness of the current version 1.1 of the project design document is 20/12/2009.	OK	OK

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
A.2. Description of the project					
A.2.1. Is the purpose of the project included?	1,6	DR I	The project is aimed at reducing greenhouse gases emissions from natural gas combustion and grid electricity consumption at Uman Greenhouse Combinate (UGC), located in Cherkasy oblast, Ukraine. Clarification Request (CL) 01 Please, justify that the proposed project is not a debundled component of a large project.	CL 01	OK
A.2.2. Is it explained how the proposed project reduces greenhouse gas emissions?	1,6	DR	The anthropogenic emissions of GHGs will be reduced by the proposed JI project through offsetting the use of state grid electricity and displacing the heat produced by gas-fired water boilers. Corrective Action Request (CAR) 03 Please, briefly describe the	CAR 03	OK

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
			situation existing prior to the starting date of the project. Corrective Action Request (CAR) 04 Please, briefly summarize the history of the SSC project (including its JI component).	CAR 04	OK
A.3. Project participants					
A.3.1. Are project participants and Party(ies) involved in the project listed?	1,6	DR	Project participants and parties involved are listed in the Table in section A.3. of PDD version 1.1. Party A is Ukraine (Host Party). Legal entity for Party A is Private-Rent Agricultural Enterprise "Uman Greenhouse Combinate (UGC)". Party B is RWE Power AG.	OK	OK
A.3.2. Are project participants authorized by a Party involved?	6	DR	See CAR01. Conclusion is pending until Letters	See CAR	Pending

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
			of Approval authorizing the project participants by Parties involved will be issued.	01	
A.3.3. The data of the project participants are presented in tabular format?	1,2, 3,4, 5,6	DR	Information on the project participants is presented in the correct order (see section A.3. of the PDD). <u>Corrective Action Request (CAR) 05</u> Please, preserve the format of the table in section A.3. as per *Guidelines for users of the JI SSC PDD form and the F-JI-SSC-Bundle ver. 04.*	CAR 05	OK
A.3.4. Is contact information provided in annex 1 of the PDD?	1,6	DR	Contact information on the project participants is provided in Annex 1 of the PDD, version 1.1, dated 20.12.2009.	OK	OK
A.3.5. Is it indicated, if it is the case, if the Party involved is a host Party?	1,6	DR	Party involved Ukraine is indicated as a Host Party.	OK	OK

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
A.4. Technical description of the project					
A.4.1. Location of the project activity					
A.4.1.1. Host Party(ies)	1	DR	Ukraine is a Host Party.	OK	OK
A.4.1.2. Region/State/Province etc.	1	DR	Cherkasy oblast.	OK	OK
A.4.1.3. City/Town/Community etc.	1	DR	Town Uman and town Talne.	OK	OK
A.4.1.4. Detail of the physical location, including information allowing the unique identification of the project. (This section should not exceed one page)	1,2, 3,4, 5,6	DR	The details of the physical location of the project are presented in section A.4.1.4. Corrective Action Request (CAR) 06 Section A.4.1.4 should not exceed one page. Please, provide in section A.4.1.4 briefer description of physical location.	CAR 06	OK
A.4.2. Technology(ies) to be employed, or measures, operations or actions to be implemented by the project					
A.4.2.1. Does the project design engineering reflect current good practices?	1,6	DR	The proposed JI project activity comprises the increase in the		

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
			efficiency of energy carrier consumption resulting from two project interventions: -installation of three cogeneration units “Caterpillar G3520C” with “FRERK” exhaust-heat modules for combined heat and power generation in Uman. - installation of two heat utilizers TUV-16 for the utilization of waste heat from natural gas combustion at Talne Gas Compressor Station “Talne”, a part of Ukrtransgas – the Affiliate of Naftogaz of Ukraine. <u>Corrective Action Request (CAR) 07</u> Please, preserve the format of the heading of PDD section A.4.4 as per JI PDD Form for Small-Scale Projects ver.01.1.	CAR 07	OK

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
			Corrective Action Request (CAR) 08 Please, in section A.4.3 present the implementation schedule of measures or other project activities.	CAR 08	OK
			Corrective Action Request (CAR) 09 Please, give references to the data that presented in A 4-7 table in section A.4.3 of the PDD.	CAR 09	OK
A.4.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	1,6	DR	Clarification Request (CL) 02 Please, clarify in section A.4 of the PDD if the project uses state of the art technology or the technology would result in a significantly better performance than any commonly used technologies in the host country.	CL 02	OK

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
A.4.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1,6	DR	Clarification Request (CL) 03 Please, clearly indicate in the section A.4 whether the project technology is likely to be substituted by other or more efficient technologies within the project period or not.	CL 03	OK
A.4.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	1,6	DR	Clarification Request (CL) 04 The determination team has found that extensive trainings required by the project were conducted. Please, state in section A.4.3 of the PDD that the project requires extensive initial training and maintenance efforts.	CL 04	OK
A.4.2.5. Does the project make provisions for meeting training and maintenance needs?	1,6	DR	Clarification Request (CL) 05 Please, clarify in section A.4.3 of the PDD, are additional provisions for meeting training and maintenance needs envisaged.	CL 05	OK

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
A.4.3. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances					
A.4.3.1. Is it stated how anthropogenic GHG emission reductions are to be achieved? (This section should not exceed one page)	1,2, 3,4, 5,6	DR	Reduction of GHG emissions under the JI project in comparison with the baseline scenario is ensured by the following: - overall increase in the efficiency of energy carrier use due to the combined heat and power generation; - on site electricity production which has lower emission factor than electricity produced by power plants of the national electricity grid and also leads to the decrease in electricity transmission losses;		

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
			- waste heat utilization to cover part of the Enterprise's thermal requirements which eliminates the need for natural gas combustion. Corrective Action Request (CAR) 10 Please, preserve the format of the headings of the PDD sections A.4.4 and A.4.5 as per JI PDD Form for Small-Scale Projects ver.01.1.	CAR 10	OK
A.4.3.2. Is it provided the estimation of emission reductions over the crediting period?	1,2, 3,4, 5,6, 7	DR	The provided estimation of emission reductions over the crediting period 2009-2020 is 616 901 t CO_2 equivalent. Corrective Action Request (CAR) 11 Estimated annual emission reductions for the year 2009 and total amount of emission reductions over the crediting	CAR 11	OK

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
			period are not correct. Please, recalculate and made amendments first in the Excel file table, than in the table A.4.4.1 of the PDD version 1.1.		
A.4.3.3. Is it provided the estimated annual reduction for the chosen credit period in tCO_2e?	1,6, 7	DR	The estimated annual reduction for the chosen credit period in tCO_2e is provided in the table of section A.4.4.1. of the PDD version 1.1. <u>Corrective Action Request (CAR) 12</u> Please, preserve the format of the table in section A.4.4.1. as per *Guidelines for users of the JI SSC PDD form and the F-JI-SSC-Bundle ver. 04.*	CAR 12	OK
A.4.3.4. Are the data from questions A.4.3.2 to A.4.3.4 above presented in tabular format?	1,7	DR	Yes, the data about emission reduction calculation is presented in tabular format (see Table in the PDD section A.4.4.1).	OK	OK

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
A.5. Project approval by the Parties involved					
A.5.1. Are written project approvals by the Parties involved attached?	1,7, 14	DR, I	The Project Idea Note had been submitted for review of the National Environment Investment Agency of Ukraine. The National Environment Investment Agency issued a Letter of Endorsement for this project. Corrective Action Request (CAR) 13 Please, correct the name of the National Focal Point in Ukraine (in the section A.5. of the PDD). Clarification Request (CL) 06 Please, state in the PDD number of the Letter of Endorsement issued by the National Environment Investment Agency. After finishing the Project	CAR 13 CL 06	OK OK

CHECKLIST QUESTION	Ref	MoV	COMMENTS	Draft Conclusion	Final Conclusion
			determination procedure, Letters of Approval will be received. See CAR 01.	See CAR 01	Pending
B. Baseline					
B.1. Description and justification of the baseline chosen					
B.1.1. Is the chosen baseline described?	1,6, 7,9	DR	JI specific approach with combination of approved CDM methodologies was used for the proposed project baseline and monitoring setting. Justification of the baseline chosen was performed using the alternatives to the project activity proposed by the following methodologies: Approved baseline methodology AM0014 “Natural gas-based package cogeneration” (Version 04) (for site in Uman) and Approved consolidated		