



VERIFICATION REPORT

LE “KRYMTEPLOCOMUNENERGO”

VERIFICATION OF THE REHABILITATION OF THE DISTRICT HEATING SYSTEM OF CRIMEA PERIODIC 2009

REPORT No. UKRAINE/0093/2010

REVISION No. 01

BUREAU VERITAS CERTIFICATION



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Date of first issue: 03/02/2010	Organizational unit: Bureau Veritas Certification Holding SAS
Client: ME "Krymteplocomunenergo"	Client ref.: Mr. Igor Vail

Summary:
 Bureau Veritas Certification has made the verification of the "Rehabilitation of the District Heating System of Crimea" project of LE "Krymteplocomunenergo" located in Crimea, Ukraine on the basis of UNFCCC criteria for the JI, as well as the host country criteria and criteria given to provide for consistent project operations, monitoring and reporting, as well as the host country criteria.

The verification scope is defined as a periodic independent review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the Monitoring Report, Project Design Document 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 overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures. The first output of the verification process is a list of Clarification Requests, Corrective Actions Requests, Forward Actions Requests (CL, CAR and FAR), presented in Appendix A.

The verification is based on the Monitoring Report, which covers period from January 1st 2009 till December 31st 2009, the Monitoring Plan, the determined PDD, and supporting documents made available to Bureau Veritas Certification by the project participant.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in the determined and registered project design documents. 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. The GHG emission reduction is calculated without material misstatements.

Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on information seen and evaluated we confirm that the implementation of the project has resulted in 135 752 t CO₂e reductions during period from 01/01/2009 up to 31/12/2009.

On behalf of verification team, Flavio Gomes, the Bureau Veritas Certification Holding SAS Global Product Manager for Climate Change, approved final version of the Verification Report and it is signed by Ivan Sokolov authorized Bureau Veritas Certification Holding SAS Local product manager for Climate Change in Ukraine.

Report No.: UKRAINE/0093/2010	Subject Group: JI
Project title: Rehabilitation of the District Heating System of Crimea	
Work carried out by: Team Leader, Lead Verifier: Nadiia Kaiun Team member, Verifier: Kateryna Zinevych Team member, Verifier: Oleg Skoblyk	
Work verified 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 change / add to the list as necessary

AIE	Accredited Independent Entity
BVCH	Bureau Veritas Certification Holding SAS
CAR	Corrective Action Request
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
DH	District Heating
FAR	Forward Action Request
GHG	Green House Gas(es)
IETA	International Emissions Trading Association
JI	Joint Implementation
JISC	JI Supervisory Committee
LE	Leasing Enterprise
MoV	Means of Verification
MP	Monitoring Plan
PCF	Prototype Carbon Fund
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



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1 INTRODUCTION

LE “Krymteplocomunenergo” has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “Rehabilitation of the District Heating System of Crimea” (hereafter called “the project”) in Crimea, Ukraine, UNFCCC JI Reference Number 0140.

This report summarizes the findings of the second periodic verification of the project, performed on the basis of criteria given to provide for consistent project operations, monitoring and reporting, and contains a statement for the verified emission reductions.

The order includes the second periodic verification of the project. Report is based on the Periodic Verification Report Template Version 3.0, December 2003, the Determination and Verification Manual (DVM).

Second periodic verification has been performed with the account of findings and conclusions of the periodic verification report for 2008 No. UKRAINE-VER#/0031/2009, version 01, dated 31/03/2009.

The results of the determination were documented by “Climate and Energy” of TÜV Süddeutschland in the report: “Determination of the “Rehabilitation of the District Heating System of Crimea” JI-Project, Ukraine”, Report No. 664242 dated 2005, September 30th. The changed monitoring plan was determined during initial verification (BVCH report No. UKRAINE/2008).

Project is approved by the Ministry of environmental protection in Ukraine and Ministry of Economical Affairs in Netherlands. (Letters of Approval are presented).

1.1 Objective

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

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

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



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Periodic Verification: The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; furthermore the periodic verification evaluates the GHG emission reduction data and express a conclusion with a high, but not absolute, level of assurance about whether the reported GHG emission reduction data is free of material misstatements; and verifies that the reported GHG emission data is sufficiently supported by evidence, i.e. monitoring records.

In general, the verification follows UNFCCC criteria referring to the Kyoto Protocol criteria, the JI/CDM rules and modalities, and the subsequent decisions by the JISC, as well as the host country criteria.

1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions. The verification is based on the submitted monitoring report and the determined project design document including 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. Bureau Veritas Certification has, based on the recommendations in the Determination and Verification Manual employed a risk-based approach in the verification, focusing on the identification of significant risks of the project implementation and the generation of ERUs.

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

The audit team has been provided with a Monitoring Report #0140/3, version 02, and underlying data records, covering the period 01 January 2009 to 31 December 2009 inclusive.

1.3 GHG Project Description

The project main goal is fuel consumption reduction, in particular reduction of natural gas (which is imported to Ukraine) and fuel oil consumption, by means of district heating system rehabilitation in the Autonomous Republic of Crimea (excluding the city of Sevastopol), including boiler and distribution network equipment replacement and rehabilitation, switching inefficient oil-fired boilers to gas, installation of combined heat and power production plants, heat exchangers replacement, frequency controllers installation and landfill gas recovery and utilization at chosen boiler house. Such reduction of fuel consumption



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will result in decrease of greenhouse gas emissions (CO₂ and N₂O). The purpose of the project is sustainable development of the region through implementation of energy saving technologies.

Crimea region's district heating (DH) utility (system of heat supply enterprises) supplies and sells heat energy in forms of heat, hot water and steam, to local consumers, namely households, municipal consumers and state-owned organizations. It is a natural monopolist of heat production in the region. Heat supply market in the region is stable for years.

The project "Rehabilitation of the District Heating System of Crimea" was initiated in 2004 to rehabilitate Crimea region's district heating system. It consists of two parts:

- rehabilitation of the district heating system of Crimea, which includes boiler and distribution network equipment replacement and rehabilitation with installation of combined heat and power production plants (CHP) at the boiler houses, heat exchangers at the central heating points replacement and frequency controllers installation;
- landfill gas extraction at Simferopol city landfill, which will allow to reduce methane emissions, and its further utilization at closest to the landfill boiler house.

Rehabilitation of the district heating system includes 188 boiler-houses with 709 boilers, 634 of which are in operation, and 516 km of heat distributing networks that belong to LE "Krymteplocomunenergo". This is the large part of Crimea regional DH system, and project may be expanded by including the other DH objects in the region. Project provide replacement of 398 boilers and rehabilitation of 91 boilers, installation of cogeneration units at 5 boiler houses (6 gas engines, 0.5 MW each) with total installed capacity 3 MW. Deutz TBG 616 V12 K machines are considered as potential candidate for installation. Landfill gas extraction at Simferopol city landfill will allow to capture 3700 ths. m³ of methane annually.

The project employs the increase in fuel consumption efficiency to reduce greenhouse gas emissions relative to current practice. Over 21 million m³ of natural gas and 15 thousand ton of fuel oil will be saved annually starting from 2010. Such reduction of fuel consumption is based on increase of the boiler efficiencies, reduction of heat losses in networks, installation of CHP units and replacement of natural gas consumption by landfill gas.

The following activities will ensure fuel saving:

- Replacement of old boilers by the new highly efficient boilers;
- Upgrading of boilers' burners for the combustion improvement;
- Switching of boiler-houses from fuel oil to natural gas;



- Improving of the network organization, application of the new insulation and the pre-insulated pipes;
- Installation of niche-flow burners;
- Installation of combined heat and power plants;
- Installation of heat-utilizers (contact heat-recovery gas-cleaning apparatuses) that provide utilization and recovery of flue gas heat as well as additional heat from steam condensation when temperature of flue gas falls below dew point;
- Replacement of heat exchangers at Central Heating Points;
- Installation of frequency controllers to electric drives of smoke exhausters, ventilators and network pumps;
- Landfill gas extraction at Simferopol city landfill and its further utilization at closest to the landfill boiler house at the address: 66th Glinki Street.

Estimated project annual reductions of GHG emissions, in particular CO₂, are from 5.8 thousand tons to 100.5 thousand tons in 2005 – 2009, and are over 150.5 thousand tons per year starting from 2010 comparing to business-as-usual or baseline scenario.

Implementation of the project will provide substantial economic, environmental, and social benefits to the Crimea region. Social impact of the project is positive since after project implementation heat supply service will be improved and tariffs for heat energy will not be raised to cover construction costs. Environmental impact of the project is expected to be very positive as an emission of the exhaust gases such as CO₂, NO_x, and CO will be reduced. Also due to better after-implementation service, some part of population will cease to use electric heaters thus reducing electricity consumption, which is related to power plants emissions of CO₂, SO_x, NO_x, CO and particulate matter.

Estimated project risks are limited and minimized. Ukraine has claimed district heating and municipal energy sector as a priority of the national energy-saving development.

2 METHODOLOGY

The verification is as a desk review and field visit including discussions and interviews with selected experts and stakeholders.

In order to ensure transparency, a verification protocol was customized for the project, according to the Determination and Verification Manual a verification protocol is used as part of the verification. 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:



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- It organises, details and clarifies the requirements the project is expected to meet; and
- 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 verification protocol consists of one table under Initial Verification checklist and four tables under Periodic verification checklist. The different columns in these tables are described in Figure 1.

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

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

Initial Verification Protocol Table 1			
Objective	Reference	Comments	Conclusion (CARs/FARs)
The requirements the project must meet	Gives reference to where the requirement is found.	Description of circumstances and further comments on the conclusion	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance of the stated requirements. Forward Action Request (FAR) indicates essential risks for further periodic verifications.

Periodic Verification Checklist Protocol Table 2: Data Management System/Controls		
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table.	A score is assigned as follows: <ul style="list-style-type: none"> • Full - all best-practice expectations are implemented. • Partial - a proportion of the best practice expectations is implemented • Limited - this should be given if little or none of the system component is in place. 	Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non compliance with stated requirements. The corrective action requests are numbered and presented to the client in the verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications.

Periodic Verification Protocol Table 3: GHG calculation procedures and management control testing
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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
<p>Identify and list potential reporting risks based on an assessment of the emission estimation procedures, i.e.</p> <ul style="list-style-type: none"> ➤ the calculation methods, ➤ raw data collection and sources of supporting documentation, ➤ reports/databases/information systems from which data is obtained. <p>Identify key source data. Examples of source data include metering records, process monitors, operational logs, laboratory/analytical data, accounting records, utility data and vendor data. Check appropriate calibration and maintenance of equipment, and assess the likely accuracy of data supplied.</p> <p>Focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may include:</p> <ul style="list-style-type: none"> ➤ manual transfer of data/manual calculations, ➤ unclear origins of data, ➤ accuracy due to technological limitations, ➤ lack of appropriate data protection measures? For example, protected calculation cells in spreadsheets and/or password restrictions. 	<p>Identify the key controls for each area with potential reporting risks. Assess the adequacy of the key controls and eventually test that the key controls are actually in operation.</p> <p>Internal controls include (not exhaustive):</p> <ul style="list-style-type: none"> ➤ Understanding of responsibilities and roles ➤ Reporting, reviewing and formal management approval of data; ➤ Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc. ➤ Controls to ensure the arithmetical accuracy of the GHG data generated and accounting records e.g. internal audits, and checking/ review procedures; ➤ Controls over the computer information systems; ➤ Review processes for identification and understanding of key process parameters and implementation of calibration maintenance regimes ➤ Comparing and analysing the GHG data with previous periods, targets and benchmarks. <p>When testing the specific internal controls, the following questions are considered:</p> <ol style="list-style-type: none"> 1. Is the control designed properly to ensure that it would either prevent or detect and correct any significant misstatements? 2. To what extent have the internal controls been implemented according to their design; 3. To what extent have the internal 	<p>Identify areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks</p> <p>Areas where data accuracy, completeness and consistency could be improved are highlighted.</p>



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	<p>controls (if existing) functioned properly (policies and procedures have been followed) throughout the period?</p> <p>4. How does management assess the internal control as reliable?</p>	
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Periodic Verification Protocol Table 4: Detailed audit testing of residual risk areas and random testing		
Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including Forward Action Requests)
<p>List the residual areas of risks (Table 2 where detailed audit testing is necessary. In addition, other material areas may be selected for detailed audit testing.</p>	<p>The additional verification testing performed is described. Testing may include:</p> <ol style="list-style-type: none"> 1. Sample cross checking of manual transfers of data 2. Recalculation 3. Spreadsheet 'walk throughs' to check links and equations 4. Inspection of calibration and maintenance records for key equipment <ul style="list-style-type: none"> ➤ Check sampling analysis results ➤ Discussions with process engineers who have detailed knowledge of process uncertainty/error bands. 	<p>Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties should be highlighted. Errors and uncertainty can be due to a number of reasons:</p> <ul style="list-style-type: none"> ➤ Calculation errors. These may be due to inaccurate manual transposition, use of inappropriate emission factors or assumptions etc. ➤ Lack of clarity in the monitoring plan. This could lead to inconsistent approaches to calculations or scope of reported data. ➤ Technological limitations. There may be inherent uncertainties (error bands) associated with the methods used to measure emissions e.g. use of particular equipment such as meters. ➤ Lack of source data. Data for some sources may not be cost effective or practical to collect. This may result in the use of default data which has been derived based on certain assumptions/conditions and which will therefore have varying applicability in different situations. <p>The second two categories are explored with the site personnel, based on their knowledge and experience of the processes. High risk process parameters or source data (i.e. those with a significant influence on the reported data, such as meters) are reviewed for these uncertainties.</p>

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Verification Protocol Table 5: 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	Verification conclusion
If the conclusions from the Verification 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 verification team should be summarized in this section.	This section should summarize the verification team's responses and final conclusions. The conclusions should also be included in Tables 2, 3 and 4, under "Final Conclusion".

Figure 1 Verification protocol tables**2.1 Review of Documents**

The Monitoring Report (MR) #0140/3 version 02, submitted by LE "Krymteplocomunenergo" and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD) version 04, Monitoring Plan, applied methodology, Kyoto Protocol, Clarifications on Verification Requirements to be checked were reviewed.

The verification findings presented in this report relate to the project as described in the PDD version 04 and Project Monitoring Report #0140/3 version 02 for the year 2009.

2.2 Follow-up Interviews

On 25/01/2010 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of LE „Krymteplocomunenergo" were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
LE „Krymteplocomunenergo"	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.
Consultant: Institute of Engineering Ecology	Baseline methodology. Monitoring plan. Monitoring report. Deviations from PDD.

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.

Corrective Action Requests (CAR) are issued, where:

- i) there is a clear deviation concerning the implementation of the project as defined by the PDD;
- ii) requirements set by the MP or qualifications in a verification opinion have not been met; or
- iii) there is a risk that the project would not be able to deliver (high quality) ERUs.

Forward Action Requests (FAR) are issued, where:

- iv) the actual status requires a special focus on this item for the next consecutive verification, or
- v) an adjustment of the MP is recommended.

The verification team may also use the term Clarification Request (CL), which would be where:

- vi) additional information is needed to fully clarify an issue.

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 FINDINGS

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

- 1) The findings from the desk review of the original project activity 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 Verification Protocol in Appendix A.



2) The conclusions for verification subject are presented.

The discussions and the conclusions that followed the preliminary verification report and possible corrective action requests are encapsulated in this section.

3.1 Remaining issues CAR's, FAR's from previous verification

One task of verification is to check the remaining issues from the previous periodic verification or issues which are clearly defined for assessment in the PDD. The periodic verification report for 2009, prepared by Bureau Veritas Certification Holding SAS, does not note any open issue.

3.2 Project Implementation

3.2.1 Discussion

The scrutiny of a proper implementation of a project is a key issue of Verification, in order to have a climate change project ready for successful operation. The project is implemented in the boiler-houses undertaking the JI project activities.

The project "Rehabilitation of the District Heating System of Crimea" was initiated in 2004 to rehabilitate Crimea region's district heating system. It consists of two parts:

- rehabilitation of the district heating system of Crimea, which includes boiler and distribution network equipment replacement and rehabilitation with installation of combined heat and power production plants (CHP) at the boiler houses, heat exchangers at the central heating points replacement and frequency controllers installation;
- landfill gas extraction at Simferopol city landfill, which will allow to reduce methane emissions, and its further utilization at closest to the landfill boiler house.

Rehabilitation of the district heating system includes 188 boiler-houses with 709 boilers, 634 of which are in operation, and 516 km of heat distributing networks that belong to LE "Krymteplocomunenergo". This is the large part of Crimea regional DH system, and project may be expanded by including the other DH objects in the region. Project provide replacement of 398 boilers and rehabilitation of 91 boilers, installation of cogeneration units at 5 boiler houses (6 gas engines, 0.5 MW each) with total installed capacity 3 MW. Deutz TBG 616 V12 K machines are considered as potential candidate for installation. Landfill gas extraction

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at Simferopol city landfill will allow to capture 3700 ths. m³ of methane annually.

The project employs the increase in fuel consumption efficiency to reduce greenhouse gas emissions relative to current practice. Over 21 million m³ of natural gas and 15 thousand ton of fuel oil will be saved annually starting from 2009. Such reduction of fuel consumption is based on increase of the boiler efficiencies, reduction of heat losses in networks, installation of CHP units and replacement of natural gas consumption by landfill gas.

The following activities will ensure fuel saving:

- Replacement of old boilers by the new highly efficient boilers;
- Upgrading of boilers' burners for the combustion improvement;
- Switching of boiler-houses from fuel oil to natural gas;
- Improving of the network organization, application of the new insulation and the pre-insulated pipes;
- Installation of niche-flow burners;
- Installation of combined heat and power plants;
- Installation of heat-utilizers (contact heat-recovery gas-cleaning apparatuses) that provide utilization and recovery of flue gas heat as well as additional heat from steam condensation when temperature of flue gas falls below dew point;
- Replacement of heat exchangers at Central Heating Points;
- Installation of frequency controllers to electric drives of smoke exhausters, ventilators and network pumps;
- Landfill gas extraction at Simferopol city landfill and its further utilization at closest to the landfill boiler house at the address: 66th Glinki Street.

Implementation of boiler houses rehabilitation and network rehabilitation are realized according to project plan with some slippage from time-table. None of the project stages has been finished yet. In several cases replacement of different (from planed before) diameters of network pipes takes place.

Landfill gas utilization was not provided because LE "Krymteplocomunenergo" did not get the corresponding letter of attorney from the owner of the Landfill.

Implemented energy saving measures are presented in the table below.



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Implemented energy saving measures	Volume of performed works (number of boilers, etc.) 2004-2008	Volume of performed works (number of boilers, etc.) 2009	Total
Boilers replacement	45	28	73
switch to gas	27	0	27
Replacement of boiler's burners	48	26	74
Installation of heat utilizers	2	0	2
Replacement by heat exchangers	39	3	42
Reconstruction of boilers	105	16	121
Installation of frequency controllers	6	8	14
Installation of gas correctors	8	0	8
Replacement of network pipes, m	15303,95	10845	26148,45

Measurement equipment is in place and calibrated. All required metering systems have been identified and checked on the sampling basis. The following meters are relevant for the calculation of emission reductions:

G1600ЛГ-K-200-1/30-0,63-1Ex	Produced by Ivano-Frankivsk plant JSC "Promprylad"
G650ЛГ-K-150-1/20-0,63-1Ex	Produced by Ivano-Frankivsk plant JSC "Promprylad"
Kurs - 0.1	Produced by Ivano-Frankivsk plant and "Kurs" Ltd.
LFK-200-100 ... 1000	Produced by Ivano-Frankivsk plant JSC "Promprylad"
LG-200	Produced by Ivano-Frankivsk plant JSC "Promprylad"
LG-K-150-400 ... 650	Produced by Ivano-Frankivsk plant JSC "Promprylad"
LG-K-200-1600-1,0-01-Eh	Produced by Ivano-Frankivsk plant JSC "Promprylad"
RG-100 ... 1000	Produced by Ivano-Frankivsk plant JSC "Promprylad"



RG-65	Produced by Ivano-Frankivsk plant JSC "Promprylad"
RGK-100 ... 1000	Produced by Ivano-Frankivsk plant JSC "Promprylad"
RG-K-100Eh ... 1000Eh	Produced by Ivano-Frankivsk plant JSC "Promprylad"
RG-K-40Eh	Produced by Ivano-Frankivsk plant JSC "Promprylad"
SU	Simferopol
SU-Sapfir	Ivano-Frankivsk
UNIVERSAL	Vinnitsa
ЛГ-K-80-G250	Produced by Ivano-Frankivsk plant JSC "Promprylad"
ЛГ-100-250-1,6-0,1	Produced by Ivano-Frankivsk plant JSC "Promprylad"
ЛГ-200-1600-1,6	Produced by Ivano-Frankivsk plant JSC "Promprylad"
РГ-к-1000-0,1-0,1-2-10Ex	Produced by Ivano-Frankivsk plant JSC "Promprylad"
РГ-к-250-0,1-0,1-10Ex	Produced by Ivano-Frankivsk plant JSC "Promprylad"
РГ-к-600-0,1-0,1-2-10	Produced by Ivano-Frankivsk plant JSC "Promprylad"
РЛ-6	Produced by Ivano-Frankivsk plant JSC "Promprylad"

Used meters are within their calibration period. They comply with the appropriate standards.

The Monitoring Plan defines the responsibilities to consolidate the data required for emission reduction calculations. Calculations are transparent and restricted to entering annually the production data into a predefined Excel spreadsheet.

3.2.2 Findings

CAR 1

The start and duration of landfill gas utilization and CHP units installation is not included into the Monitoring Report for 2009. Please explain the deviations of the implementation schedule and which stage of implementation the frequency controllers installation are being undergone. Please specify whether it was considered while calculating emissions for the year 2009.



Response

Landfill gas utilization was not provided because LE "Krymteplocomunenergo" didn't get the corresponding letter of attorney from the owner of the Landfill.

6 frequency controllers were installed in 2008 year, that is 42,86% from the planned amount and 8 frequency controllers were installed in 2009 year, that is 57,14% from the planned amount, thus under the PDD frequency controllers at LE " Krymteplocomunenergo " were installed in full.

The main part of installed frequency controllers were implemented at the summer period 2009 year. It was not considered while calculating emissions for the year 2009, because it is possibly to expect emissions reduction due to power saving only in 2010.

Implementation of CHP units at LE " Krymteplocomunenergo " is still at the project design stage. It is postponed because of significant increasing of natural gas price and corresponding shift of the priorities for implementation of the energy saving measures. This was considered while calculating emissions for the year 2009, including baseline calculations.

Conclusion of the verification team

Issue is closed.

CAR 2

The section A.9. of Monitoring Report for 2009 states that fuel and energy saving measures within this project at the LE "Krymteplocomunenergo" led to additional GHG emissions reduction.

Please specify what meant.

Response

During 2009 the following measures that led to additional emission reductions were implemented: replacement of old boilers by the new highly efficient boilers, reconstruction of boilers, replacement by heat exchangers, upgrading/replacement of boilers' burners, application of the new insulation and the pre-insulated pipes, installation of frequency controllers (see annex 2).

The main part of these fuel and energy saving measures were implemented at the summer period 2009 year and it is possibly to expect additional GHG emissions due to power saving only in 2010

Conclusion of the verification team

Issue is closed.



3.2.3 Conclusion

The project complies with the requirement.

3.3 Internal and External Data

3.3.1 Discussion

The 23 parameters should be monitored according to Monitoring Plan but considering that implementation of CHP units at LE “Krymteplocomunenergo” and landfill gas extraction at Simferopol city landfill have not been finished yet. The CO₂ emissions reduction due to power production was excluded according to the principle of conservatism. So six parameters presented in the table below have not been monitored and were excluded.

18	Scheduled electric power production
19	Scheduled heat energy production
20	Power consumption
21	Average methane fraction of the landfill gas
22	LFG temperature
23	LFG pressure

In fact 17 parameters are monitored within the projects but only one of them (volume of natural gas consumption) is measured directly. The remaining monitoring parameters used in calculation of the baseline and project line emissions are taken as statistic data.

The following parameters need to be obtained according to the monitoring plan:

1. Fuel consumption at boiler-houses (for natural gas and heavy oil in 1000 m³, manually recorded every day)
2. Average annual Heating Value of fuel (MJ/m³ for natural gas, MJ/t for heavy oil , data are provided by natural gas suppliers usually monthly, quality certificate is given by heavy oil supplier's for every consignment)
3. Average outside temperature during the heating season (0C (K), recorded every day of heating season)
4. Average inside temperature during the heating season (0C (K), recorded once per heating season)
5. Number of Customers (Customers update the contracts for hot water supply service with balance-owners (ZhEK) once per year. ZhEK give to LE “Krymteplocomunenergo” personal



- accounts of customers once per month. Contracts with organizations and legal entities are concluded directly with LE "Krymteplocomunenergo", they are updated once per year)
6. Heating area (total, m² the information is collected at the sales departments of district heating productive units of LE "Krymteplocomunenergo" in every town by the certificates of owners or balance-owners (ZhEK) in accordance with technical passport of building. Total area with balconies and stairs and Heating area are displayed in the special journal.)
 7. Average heat transfer factor of heated buildings in the base year (W/m²*K, heat transfer factor is recorded ones per year at recording of connection or disconnection of any heating area to boiler-houses included in project)
 8. Heating area of buildings (previously existed in the base year) with the renewed (improved) thermal insulation in the reported year (m², once per year)
 9. Heating area of newly connected buildings (assumed with the new (improved) thermal insulation) in the reported year (m² , once per year)
 10. Heat transfer factor of buildings with the new thermal insulation (W/m²*K)
 11. Duration of the heating period (hours, once per year)
 12. Duration of the hot water supply period (hours, once per day)
 13. Maximum connected load to the boiler-house, that is required for heating (MW, once per year)
 14. Connected load to the boiler-house, that is required for hot water supply service (MW, once per year)
 15. Standard specific discharge of hot water per personal account (kWh/h, once per year)
 16. Carbon emission factor (for natural gas and heavy oil kt CO₂/TJ once per year)
 17. Recalculating factor for average load during heating period (once per year).

The records are maintained on daily and annually basis, the boiler operation is statutory, so the chances of misstatement in the records are hereby low. In fact records are taken every 2 hours (manually) or semi-continuously where correctors are present (electronically), and after that manual daily summarizing record is performed. In both cases (manual or semi-continuous) monitoring is within the PDD where records are required every 2 hours.

The general director of LE "Krymteplocomunenergo", Mr. Igor Vayl', appointed a responsible person, Mr. Mihaylo Sheyman, the Chief



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Engineer, for the implementation and management of the monitoring process at the LE “Krymteplocomunenergo”. Mr. Mihaylo Sheyman is responsible for supervising data collection, measurements, calibration, data recording and storage.

Dr. Vladimir Gomon, Managing Engineer of European Institute for safety, security, insurance and environmental techniques, is responsible for baseline and monitoring methodology development.

Dr. Dmitri Paderno, vice director of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development.

Ms. Marina Denysyuk, engineer of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development and data processing.

The external data used are following:

Average annual Heating Value of Natural Gas – used values are presented in the table below for every town.

Town	Average lower heating value of Natural gas, MJ/t
	2009
City of Simferopol	36,74
Alushta district	34,16
Dzhankoj district	35,75
Evpatoria district	37,76
Kerch district	35,6
Rozdolne district	36,71
Feodosia district	37,38
Jalta district	37,05

Average annual Heating Value of Heavy oil is by Lower Heating Value the values are presented in the table below for every town.

Town	Average lower heating value of Heavy oil,

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	MJ/t
	2009
City of Simferopol	40.15
Alushta district	-
Dzhankoj district	40.15
Evpatoria district	36.75
Kerch district	39.93
Lenino v.	41.68
Feodosia district	41.03
Jalta district	39.86-45.19

Daily outside temperature is taken by dispatcher of LE "Krymteplocomunenergo" from Crimea Meteorological Centre every day of heating season. The information is sent to district heating productive units of LE "Krymteplocomunenergo" located in different towns.

Town	Inside temperature, o C	
	2003	2009
Simferopol	16	18
Vuzlova	15	18
Alushta district	17	18
Dzhankoj district	15	18
Evpatoria district	15	18
Kerch district	16	18
Rozdolne district	17	18
Feodosia district	13	18
Jalta district	17	18

For calculation of Heat transfer factor of buildings for every boiler-house, the method of Weighted average value was used, that depends on heating area of existing buildings and heating area of the new buildings. Values of the heat transfer factor for existing buildings were taken from SNiP 2-3-79 (1998) - not higher than 0.83. Values of the heat transfer factor of new buildings were taken according to State Buildings Norms (B.2.6-31:2006) - not higher than 0.36.



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Heat transfer factor of new buildings and buildings with new thermal insulation - Not higher than 0.36, according to State Buildings Norms (B.2.6-31:2006)

Standard specific discharge of hot water per personal account - standard specific discharges of hot water per personal account for different types of consumers are presented in "KTM 204 Ukraine 244-941".

Carbon emission factor for different fuels, which is determined in PDD and is confirmed in the Monitoring Report #0140/3 for the year 2009 without deviations.

- Cef (natural gas) = 0.0561 ktCO₂/TJ
- Cef (fuel oil) = 0.0774 ktCO₂/TJ; (taken as "Residual fuel oil").

3.3.2 Findings

CAR 3

The information on project description provided in section A.3 of the Monitoring Report regarding number of boiler in the Crimea DH system included in the project, number of boilers to be replaced and renewed, amount of fuel to be saved due to project implementation does not comply with registered PDD. Please correct or explain the deviations.

Response

The information on project description provided in section A.3 of the Monitoring Report version 01 regarding number of boiler in the Crimea DH system included in the project, number of boilers to be replaced and renewed, amount of fuel to be saved due to project implementation is corrected in Version 02 of the Monitoring Report #0140/3.

Conclusion of the verification team

Issue is closed.

CAR 4

In section B.3 of the Monitoring Report it is stated that the scheme of data collection is described on Figure 5, while Figure 5 presents a photo of paper journal for natural gas consumption registration. Please provide a correct reference.



Response

The reference is corrected in Version 02 of the Monitoring Report #0140/3.

Conclusion of the verification team

Issue is closed.

3.3.3 Conclusion

The project complies with the requirements.

3.4 Environmental and Social Indicators

3.4.1 Discussion

No environmental and social indicators are defined in the monitoring plan. Implementation of the project “Rehabilitation of the District Heating System of Crimea” has a positive effect on environment. Following points give detailed information on environmental benefits.

1. Project implementation allowed to save over 69,4 million m³ of natural gas and over 13,5 thousand ton of fuel oil during 2009.
2. Due to fuel economy and new environmentally friendlier technologies of fuel combustion, project implementation reduced emissions of SO_x, NO_x, CO and particulate matter (co-products of combustion). There are no negative social impacts associated with the project.

The auditor team on site met a sample of local stakeholders. They expressed their deep appreciations for the project. As per them the project has brought sustainable development in to the Crimea Region through implementation of energy saving technologies, as well as improving of living comfort through improving of heat and hot water supply service quality and reliability.

3.4.2 Findings

None

3.4.3. Conclusion

The project complies with the JI requirements as well as with the local requirements.

3.5 Management and Operational System

3.5.1 Discussion



In order to ensure a successful operation of a Client project and the credibility and verifiability of the emissions reductions achieved, the project must have a well defined management and operational system. The LE “Krymteplocomunenergo” complies with all legal and statutory requirements of the Ukrainian Government and the same were made available to the verification team. Appropriate procedures reflect commitment in management and operational control. Job descriptions, technological instructions are in place. Calibration and maintenance procedures are followed according statutory requirements of Ukraine.

3.5.2 Findings

None

3.5.3 Conclusion

The Monitoring Report and the Management and Operational Systems are eligible for reliable project monitoring.

3.6 Completeness of Monitoring

3.6.1 Discussion

The reporting procedures reflect the monitoring plan completely. It is confirmed that the monitoring report does comply with the monitoring methodology and PDD.

The 23 parameters should be monitored according to Monitoring Plan but considering that implementation of CHP units at LE “Krymteplocomunenergo” and landfill gas extraction at Simferopol city landfill have not been finished yet CO₂ emissions reduction calculations by power production was not carried out according to the principle of conservatism. So six parameters presented in the table below have not been monitored.

18	Scheduled electric power production (was not take into consideration)
19	Scheduled heat energy production (was not take into consideration)
20	Power consumption (was not take into consideration)
21	Average methane fraction of the landfill gas (was not take into consideration)
22	LFG temperature (was not take into consideration)
23	LFG pressure (was not take into consideration)

All parameters were determined as prescribed. The complete data is stored electronically and documented. The necessary procedures have been defined in internal procedures and additional internal documents

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relevant for the determination of the 17 parameters listed in the monitoring plan.

Project participants provided necessary documents for the verification – Project Design Document version 4 (PDD) and Monitoring Report (MR) #0140/3 version 02. Emission reductions for monitoring period 2009 were expected to be 100483.7 t CO₂e. According to the Monitoring Report the emission reductions achieved 135752 t CO₂e. (Table 1)

Baseline emissions according to MR	Factual project emissions according to MR	Project emission reductions according to MR	Project emission reductions according to PDD
553271	417519	135752	100483.7

Hence, verified emission reductions in the year 2009 is above forecasted ones in the PDD for this year. (Table 2)

Year	Project emission reductions according to PDD	Project emission reductions according to MR
2004	0	
2005	5 839,5	59181,7
2006	9664,4	118817,3
2007	13335,7	37675,1
2008	20076,7	148013,6
2009	100483,7	135752
2010	150464,2	
2011	155141,2	
2012	155506,0	

3.6.2 Findings

FAR1

Please provide justification for the difference of amount of ERU's for reported year in the PDD and MR.

Response

The difference in the emission reductions are explained as follows:



1. Determination is based on conservative approach; this means that the most unfavourable variant is considered with the further possibility to verify real reductions.
2. Real calorific characteristics (factors) of fuel could differ from PDD ones.
3. Fuel consumption is not stable, and it is difficult to predict season deviations affecting heat production.
4. The baseline was calculated accordingly for each year using developed methodology that was determined, so the PDD baseline was only a prediction.

Calculating emission reduction in the PDD was based on the conservative approach (according to the requirements of the determining organization). Emission reduction was calculated in accordance with proposed modification of efficiency factor for boilers and loss change in the heat distributing networks through insulation.

At the same time some measures' results that were difficult to foresee and to calculate, for example, "network management improvement" that is developed in network length reduction, replacement 4-pipes system with 2-pipes one etc., lead to additional essential reduction of fuel expense that was not taken into account in the PDD but influence the monitoring results.

Conclusion of the verification team

The issue will be closed during the next periodic verification.

3.6.3 Conclusion

The project complies with the requirements.

3.7 Accuracy of Emission Reduction Calculations

3.7.1 Discussion

Due to the methodology corrections for data uncertainty should be made. The audit team confirms that emission reduction calculations have been performed according to the Monitoring Plan and to the calculation methodology reported in the Section D of the Monitoring Report #0140/3 version 02.

Possible uncertainties and errors for such type project may arise from two main reasons: measurement and stipulation. Measurement error is due to



metering equipment inaccuracies. Stipulation occurs when some values are required to complete calculations, but these values cannot be measured directly. In these cases estimates are used in place of actual measurements, and therefore error may be introduced. The stipulation error itself may be estimated based on the expected accuracy of the stipulated values.

The project error can be calculated from the two error components described above. The total project error (Standard Error, SE) can be calculated by taking the square root of the sum of the squares of the individual error components, as below:

$$SE = \sqrt{[(\text{measurement error})^2 + (\text{stipulation error})^2]}$$

The monitoring plan developed for this project does not rely on any estimates and is therefore free of any stipulation errors.

$$\text{Thus, } SE = \sqrt{[(\text{measurement error})^2 + (0)^2]} = (\text{measurement error})$$

Although the project has 23 monitoring parameters, only one of them (volume of natural gas consumption) is measured directly. The remaining monitoring parameters used in calculation of the baseline and project line emissions are taken as statistic data. Furthermore, they are used for adjustment factors calculation. Calculations of adjustment factors are based on reported and base year parameters ratio. For example, temperature change factor is calculated as ratio of inside and outside temperature differences in reported and base years: $K_2 = (T_{in r} - T_{out r}) / (T_{in b} - T_{out b})$. Therefore any error in statistic data will be cancelled.

The volume of natural gas consumption measurement errors which impact the Standard Error and their level of accuracy are: $\pm 1.0 \%$ (usual value for the majority of meters).

Corresponding metered values of natural gas consumption, according to the conservatism principle, are corrected by accuracy of meters.

3.7.2 Findings

None

3.7.3 Conclusion

All requested corrections have been considered in the final Monitoring Report #0140/3 version 02. The project complies with the requirements.

3.8 Quality Evidence to Determine Emissions Reductions



3.8.1 Discussion

Concerning verification the calculation of emission reductions is based on internal data. The origin of those data was explicitly checked. Further on, entering and processing of those data in the monitoring workbook Excel sheet was checked where predefined algorithms compute the annual value of the emission reductions. All equations and algorithms used in the different workbook sheets were checked. Inspection of calibration and maintenance records for key equipment was performed for all relevant meters.

Necessary procedures have been defined in internal procedures and additional internal documents relevant for the determination of the various parameters on daily basis.

3.8.2 Findings

None

3.8.3 Conclusion

The project complies with the requirements.

3.9 Management System and Quality Assurance

3.9.1 Discussion

The general director of LE “Krymteplocomunenergo”, Mr. Igor Vayl’, appointed a responsible person, Mr. Mihaylo Sheyman, for the implementation and management of the monitoring process at the LE “Krymteplocomunenergo”. Mr. Mihaylo Sheyman is responsible for supervising data collection, measurements, calibration, data recording and storage.

In October 2007 European Institute for safety, security, insurance and environmental techniques carried out a comprehensive training “Organization and training of special group for necessary data collection according with Monitoring plan”. The group consist of staff of the LE “Krymteplocomunenergo” in particular:

Mr. Mihaylo Sheyman – Chief engineer;

Mr. Sergiy Zhukovskiy – Head of fuel-energy resources department;

Mrs. Olga Travina – Head of production department;

Mrs. Irina Bakaldina – senior engineer of production department;

Mrs. Nadiya Kim – senior engineer of fuel-energy resources department.

In addition the developers of the project are responsible for baseline and monitoring methodology development and data processing. In particularly: Dr. Vladimir Gomon, Managing Engineer of European Institute for safety, security, insurance and environmental techniques, is responsible for baseline and monitoring methodology development.



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Dr. Dmitri Paderno, vice director of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development.

Ms. Marina Denysyuk, engineer of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development and data processing.

As far as the main activity of LE “Krymteplocomunenergo” will not change in course of the JI project implementation, the special technical trainings for personnel are not necessary. The technical personnel of the enterprise have sufficient knowledge and experience for implementation of the project activity and maintenance of the usual equipment.

LE “Krymteplocomunenergo” provides personnel retraining according to protection of labor norms. The enterprise has the Labor protection department, which is responsible for raising the level of personnel skills and trainings.

In course of the JI project development, specialists of Institute of Engineering Ecology and then also of the European Institute for safety, security, insurance and environmental techniques carried out a comprehensive consultations and trainings for involved representatives of LE “Krymteplocomunenergo” on the necessary data collection according to Monitoring plan for the project.

3.9.2 Findings

CL 1

Please provide the information if any additional training was needed during installation of new equipment within monitoring period (2009) and whether such training was conducted of the responsible personnel.

Response

As far as the main activity of LE “Krymteplocomunenergo” will not change in course of the JI project implementation, the special technical trainings for personnel are not necessary. The technical personnel of the enterprise has sufficient knowledge and experience for implmentation of the project activity and maintenance of the usual equipment.

In cases of the new (never used at this enterprise before, for example: cogeneration units, foreign produced boilers, etc.) equipment installation, the company - producer of this equipment should provide trainings for personnel.

LE “Krymteplocomunenergo” provides personnel retraining according to protection of labour norms.

In course of the JI project development, specialists of Institute of Engineering Ecology and carried out in 2007 year a comprehensive consultations and trainings for involved representatives of LE

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“Krymteplocomunenergo” on the necessary data collection according to Monitoring plan for the project.

Conclusion of the verification team

The issue is closed.

3.9.3 Conclusion

The project complies with the requirements.

4 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Calculated Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	State-of-the-art technology is applied in an appropriate manner. Appropriate backup solutions are provided.
	Data calculations	✓	✓	✓	Emission reductions are calculated correctly
	Data management & reporting	✓	✓	✓	Data management and reporting were found to be satisfying.
Consistency	Changes in the project	✓	✓	✓	Results are consistent to underlying raw data.

5 SECOND PERIODIC VERIFICATION STATEMENT

Bureau Veritas Certification has performed a verification of the JI project “Rehabilitation of the District Heating System Rehabilitation of Crimea”. The verification is based on the currently valid documentation of the United Nations Framework Convention on the Climate Change (UNFCCC).

The management of the LE “Krymteplocomunenergo” 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



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Monitoring and Verification Plan indicated in the final PDD version 4. 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 #0140/3 version 02 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as planned and described in validated project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is ready to generate GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:

<u>Reporting period:</u>	From 01/01/2009 to 31/12/2009	
Baseline emissions :	553271	t CO2 equivalents.
Project emissions :	417519	t CO2 equivalents.
Emission Reductions :	135752	t CO2 equivalents.

6 REFERENCES

Category 1 Documents:

Documents provided that relate directly to the GHG components of the project.

- /1/ Project Design Document, version 2, dated 16 of August 2006
- /2/ Project Design Document, version 4, dated 23 of April 2008
- /3/ Monitoring Report #0140/3 version 01, dated 19 of January 2010
- /4/ Monitoring Report #0140/3 version 02, dated 02 of February 2010
- /5/ Verification Report by Bureau Veritas Certification Holding SAS UKRAINE-VER#/0031/2009 version 01 dated 31 of March 2009

Category 2 Documents:

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

- /6/ Documents checked during the verification onsite are presented in



Annex C

Persons interviewed:

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

- /1/ Sigal Aleksandr – Director of the Institute of Engineering Ecology
- /2/ Paderno Dmitriy – Vice -director of the Institute of Engineering Ecology
- /3/ Grechko Tetyana – Senior engineer of the Institute of Engineering Ecology
- /4/ Denysyuk Marina – Engineer of the Institute of Engineering Ecology
- /5/ Vail’ Igor – General director of LE “Krymteplocomunenergo”
- /6/ Zhukovsky Sergey – Head of the heat–and–power engineering service at the LE “Krymteplocomunenergo”
- /7/ Kim Nadiya – Senior Engineer Head of the of the heat–and–power engineering service at the LE “Krymteplocomunenergo”
- /8/ Sheyman Mihail– Chief Engineer of the LE “Krymteplocomunenergo”
- /9/ Jivica Vladimir – Head of the permanent of the House and Communal service Comission in the Simferopol town council.
- /9/ Padalka Vitaliy – Chief engineer at the Alushta department of LE “Krymteplocomunenergo”
- /10/ Lysyi Nikolay – Director of the Evpatoriya department of LE “Krymteplocomunenergo”
- /11/ Kovalenko Hennadiy – Head of the Kiev district in Simpferopol

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APPENDIX A: COMPANY JI PROJECT VERIFICATION PROTOCOL

Initial Verification Protocol Table 1

Objective	Reference	Comments	Conclusion (CARs/FARs)
1. Opening Session			
1.1. Introduction to audits	/8/	<p>The intention and the target of the audit were illustrated to the participants of the audit. Participants at the audit were the following persons:</p> <p>Verification team:</p> <p>Ms. Nadiia Kaiiun – Team leader, Lead Verifier, Bureau Veritas Ukraine;</p> <p>Ms. Kateryna Zinevych – Team member, Verifier, Bureau Veritas Ukraine;</p> <p>Mr. Oleg Skoblyk – Team member, Verifier, Bureau Veritas Ukraine.</p> <p>Interviewed persons: LE “Krymteplocmunenergo”:</p> <p>The general director of LE “KRYMTEPLOCOMUNENERGO”, Mr. Mihaylo Sheyman is responsible for the implementation and management of the monitoring process at the LE “Krymteplocmunenergo” and supervising data collection, measurements, calibration, data recording and storage.</p> <p>Dr. Vladimir Gomon, Managing Engineer of European Institute for safety, security, insurance and environmental</p>	OK



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Objective	Reference	Comments	Conclusion (CARs/FARs)
		<p>techniques, is responsible for baseline and monitoring methodology development Institute of Engineering Ecology: Dr. Dmitri Paderno, vice director of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development. Ms. Tetiana Grechko, senior engineer of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development and data processing.</p>	
1.2. Clarification of access to data archives, records, plans, drawings etc.	/8/	The verification team got open access to all required plans, data, records, drawings and to all relevant facilities.	OK
1.3. Contractors for equipment and installation works	/8/	Project has been implemented as defined in the PDD and the implementation is evidenced by statements of work completion.	OK
1.4. Actual status of installation works	/8/	<p>Implementation of boiler houses rehabilitation and network rehabilitation is realized according to the project plan. In several cases replacement of network pipes with different (from planned before) diameters took place. Same changes also were made in the monitoring methodology developed for “District Heating” projects in Ukrainian conditions”. Those changes concerned Adjustment factors calculations and allow to calculate GHG emissions reduction more transparent.</p>	



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Objective	Reference	Comments	Conclusion (CARs/FARs)
		<p>CAR 1. The start and duration of landfill gas utilization and CHP units installation is not included into the Monitoring Report for 2009. Please explain the deviations of the implementation schedule and which stage of implementation the frequency controllers installation are being undergone. Please specify whether it was considered while calculating emissions for the year 2009.</p> <p><i>Response</i></p> <p>Landfill gas utilization was not provided because LE "Krymteplocomunenergo" didn't get the corresponding letter of attorney from the owner of the Landfill.</p> <p>6 frequency controllers were installed in 2008 year, that is 42,86% from the planned amount and 8 frequency controllers were installed in 2009 year, that is 57,14% from the planned amount, thus under the PDD frequency controllers at LE " Krymteplocomunenergo " were installed in full.</p> <p>The main part of installed frequency controllers were implemented at the summer period 2009 year. It was not considered while calculating emissions for the year 2009, because it is possibly to expect emissions reduction due to power saving only in 2010.</p> <p>Implementation of CHP units at LE " Krymteplocomunenergo " is still at the project design stage. It is postponed because</p>	<p>CAR1</p> <p>CAR2</p>



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Objective	Reference	Comments	Conclusion (CARs/FARs)
		<p>of significant increasing of natural gas price and corresponding shift of the priorities for implementation of the energy saving measures. This was considered while calculating emissions for the year 2009, including baseline calculations.</p> <p>CAR 2. The section A.9. of Monitoring Report for 2009 states that fuel and energy saving measures within this project at the LE “Krymteplocomunenergo” led to additional GHG emissions reduction. Please specify what kind of measures led to additional emission reductions are meant.</p> <p><i>Response</i></p> <p>During 2009 have been introduced that kind of measures led to additional emission reductions are: replacement of old boilers by the new highly efficient boilers, reconstruction of boilers, replacement by heat exchangers, upgrading/replacement of boilers’ burners, application of the new insulation and the pre-insulated pipes, installation of frequency controllers (see annex 2). The main part of these fuel and energy saving measures led at the summer period 2009 year and it is possibly to expect additional GHG emissions due to power saving only in 2010.</p>	



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Objective	Reference	Comments	Conclusion (CARs/FARs)
2. Open issues indicated in determination report			
2.1. Missing steps to final approval	/4/	Based on the determination report the verification team identified no missing steps. The project has been approved by NFP.	OK
3. Implementation of the project			
3.1. Physical components	/8/	Implementation of boiler houses rehabilitation and network rehabilitation are realized according to project plan with some slippage from time-table. None of the project stages has not been finished yet. In several cases replacement of different (from planed before) diameters of network pipes takes place. Implementation of CHP units at LE "KRYMTEPLOCOMUNENERGO" and landfill gas extraction at Simferopol city landfill have not been finished yet. So follow the principle of conservatism the CO2 emissions reduction calculations by power production were not carried out.	OK
3.2. Project boundaries	/8/	Yes the project boundaries are as defined in the PDD.	OK



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Objective	Reference	Comments	Conclusion (CARs/FARs)
3.3. Monitoring and metering systems	/8/	The installations have the metering and measurement devices such as gas flow meters, electric power consumption meters to monitor parameters related to project. All equipments are of reputed make and included in the structured calibration plans where they are periodically calibrated. The procedures have been documented for the equipment operation.	OK
3.4. Data uncertainty	/8/	All measuring equipment corresponds to the regulatory requirements on accuracy of meters and measurement deviations that is calculated and certified. This ensures the required by the technology level of uncertainty of the estimations.	OK
3.5. Calibration and quality assurance	/8/	All monitoring equipment is part of detailed calibration plan. The strict control is maintained over the calibration process. On the date of verification, Calibration records of the measuring and monitoring equipment has been verified at site. All the meters have been found to be calibrated regularly as per determined calibration plan for each site.	OK



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Objective	Reference	Comments	Conclusion (CARs/FARs)
3.6. Data acquisition and data processing systems	/8/	<p>1. For automatic fuel control: gas flue commercial system installed at gas distributing units of the boiler-houses that consist of - gas flow meter and automatic corrector for temperature and pressure. Gas consumption registered automatically. Every day operator of a boiler house make registration of daily gas consumption in the special paper journal.</p> <p>For manual fuel control: gas flue commercial system installed at gas distributing units of the boiler-houses that consist of - gas flow meter, air temperature and temperature of the natural gas sensors and gas pressure at the entrance to the boiler-house sensor. Operators register gas consumption and parameters of gas: temperature and pressure in operational journals every hour. These parameters are used to bring gas consumption to normal conditions.</p> <p>Data is summarized daily and transferred to calculating centers of LE "Krymteplocomunenergo" branches located in City of Simferopol and towns: Alushta, Dzhankoj, Evpatoria, Kerch, Rozdolne, Feodosia and Jalta.</p> <p>Data from branches transferred to calculating centers of LE "Krymteplocomunenergo" where it is archiving.</p> <p>3. Every month calculating center transferred data to gas supplying company.</p> <p>All measuring equipment and calibration is presented in</p>	FAR 1



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Objective	Reference	Comments	Conclusion (CARs/FARs)
		<p>Annex 3. of the Monitoring Report version 02.</p> <p>FAR1. Please provide justification for the difference of amount of ERU's for reported year in the PDD and MR. Please provide such justifications in future monitoring reports if ERU's achieved will differ from those stated in PDD.</p> <p><i>Response</i></p> <p>The difference in the emission reductions are explained as follows:</p> <ol style="list-style-type: none"> 1. Determination is based on conservative approach; this means that the most unfavourable variant is considered with the further possibility to verify real reductions. 2. Real calorific characteristics (factors) of fuel could differ from PDD ones. 3. Fuel consumption is not stable, and it is difficult to predict season deviations affecting heat production. 4. The baseline was calculated accordingly for each year using developed methodology that was determined, so the PDD baseline was only a prediction. 	


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Objective	Reference	Comments	Conclusion (CARs/FARs)
		<p>Calculating emission reduction in the PDD was based on the conservative approach (according to the requirements of the determinating organization). Emission reduction was calculated in accordance with proposed modification of efficiency factor for boilers and loss change in the heat distributing networks through insulation.</p> <p>At the same time some measures' results that were difficult to foresee and to calculate, for example, "network management improvement" that is developed in network length reduction, replacement 4-pipes system with 2-pipes one etc., lead to additional essential reduction of fuel expense that was not taken into account in the PDD but influence the monitoring results.</p>	
3.7. Reporting procedures	/8/	<p>The Monitoring Plan defines the responsibilities to consolidate the data required for emission reduction calculations. Calculations are transparent and restricted to entering annually the production data into a predefined Excel spreadsheet.</p>	OK
3.8. Documented instructions	/8/	<p>Section B.3. Data processing and archiving (including software used) of the Monitoring Report version 2 provides with the necessary information relating the procedures for the monitoring, measurements and reporting. These were</p>	OK



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Objective	Reference	Comments	Conclusion (CARs/FARs)
		verified onsite and found satisfactory.	
3.9. Qualification and training	/8/	<p>The overall authority of the project is personally supervised by Mihaylo Sheyman who is responsible for collection and compilation of all data related to this JI Project at LE “Krymteplocomunenergo”.</p> <p>The responsibilities and authorities are described for each individual in job descriptions as required statutorily.</p> <p>CL 1. Please provide the information if any additional training was needed during installation of new equipment within monitoring period (2009) and whether such training was conducted of the responsible personnel.</p> <p><i>Response</i> As far as the main activity of LE “Krymteplocomunenergo” will not change in course of the JI project implementation, the special technical trainings for personnel are not necessary. The technical personnel of the enterprise has sufficient knowledge and experience for implmentation of the project activity and maintenance of the usual equipment. In cases of the new (never used at this enterprise before, for example: cogeneration units, foreign produced boilers,</p>	CL1


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Objective	Reference	Comments	Conclusion (CARs/FARs)
		<p>etc.) equipment installation, the company - producer of this equipment should provide trainings for personnel. LE "Krymteplocomunenergo" provides personnel retraining according to protection of labour norms. In course of the JI project development, specialists of Institute of Engineering Ecology and carried out in 2007 year a comprehensive consultations and trainings for involved representatives of LE "Krymteplocomunenergo" on the necessary data collection according to Monitoring plan for the project.</p>	
3.10. Responsibilities	/8/	<p>The overall authority of the project is personally supervised by Mihaylo Sheyman who is responsible for collection and compilation of all data related to this JI Project at LE "Krymteplocomunenergo". The responsibilities and authorities are described for each individual in job descriptions as required statutorily.</p>	OK
3.11. Troubleshooting procedures	/8/	<p>Procedure exists to react in the case incorrect data appear or equipment failure. There is a separate procedure laid down for measuring and recording energy related parameters .These procedures include the troubleshooting tips.</p>	OK
4. Internal Data			



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Objective	Reference	Comments	Conclusion (CARs/FARs)
<p>4.1. Type and sources of internal data</p>	<p>/8/</p>	<p>The internal parameters are obtained according to the monitoring plan: Monitoring report version 2, contains internal parameters that are monitored.</p> <p>CAR 3. The information on project description provided in section A.3 of the Monitoring Report regarding number of boiler in the Crimea DH system included in the project, number of boilers to be replaced and renewed, amount of fuel to be saved due to project implementation does not comply with registered PDD. Please correct or explain the deviations. <i>Response</i></p> <p>The information on project description provided in section A.3 of the Monitoring Report #0140/3 version 01 regarding number of boiler in the Crimea DH system included in the project, number of boilers to be replaced and renewed, amount of fuel to be saved due to project implementation is corrected in Version 02 of the Monitoring Report.</p> <p>CAR 4. In section B.3 of the Monitoring Report it is stated that the scheme of data collection is described on Figure 5, while Figure 5 presents a photo of paper journal for natural gas consumption registration. Please provide a correct reference.</p>	<p>CAR 3</p> <p>CAR 4</p>



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Objective	Reference	Comments	Conclusion (CARs/FARs)
		<p><i>Response</i></p> <p>The reference is corrected in Version 02 of the Monitoring Report.</p>	
<p>4.2. Data collection</p>	<p>/8/</p>	<p>The responsibility for data collection is described in the monitoring plan. Natural gas consumption at boiler houses of LE “Krymteplocomunenergo” was carried out by the following scheme:</p> <p>1. For automatic fuel control: gas flue commercial system installed at gas distributing units of the boiler-houses that consist of - gas flow meter and automatic corrector for temperature and pressure. Gas consumption registered automatically. Every day operator of a boiler house make registration of daily gas consumption in the special paper journal.</p> <p>For manual fuel control: gas flue commercial system installed at gas distributing units of the boiler-houses that consist of - gas flow meter, air temperature and temperature of the natural gas sensors and gas pressure at the entrance to the boiler-house sensor. Operators register gas consumption and parameters of gas: temperature and pressure in operational journals every hour. These parameters are used to bring gas consumption to normal conditions.</p>	<p>OK</p>


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Objective	Reference	Comments	Conclusion (CARs/FARs)
		<p>Data is summarized daily and transferred to calculating centers of LE "Krymteplocomunenergo" branches located in City of Simferopol and towns: Alushta, Dzhankoj, Evpatoria, Kerch, Rozdolne, Feodosia and Jalta.</p> <p>Data from branches transferred to calculating centers of LE «Krymteplocomunenergo» where it is archiving.</p> <p>3. Every month calculating center transferred data to gas supplying company.</p>	
4.3. Quality assurance	/8/	Section B.3. Data processing and archiving (including software used) of the Monitoring Report version 2 provides with the necessary information relating the procedures for the monitoring, measurements and reporting. These were verified onsite and found satisfactory.	OK
4.4. Significance and reporting risks	/8/	As the records are maintained on daily basis and the consumption natural gas is a statutory records the chances of misstatement are hereby low.	OK
5. External Data			
5.1. Type and sources of external data	/8/	<p>The external data used are following:</p> <ul style="list-style-type: none"> •Emission factor of fuels – IPCC values are used. •Calorific Values of fuels – calculated values are used. <p>The external parameters are obtained according to the monitoring plan:</p>	OK



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Objective	Reference	Comments	Conclusion (CARs/FARs)
		Monitoring Report, Annex1 contains external parameters that are monitored.	
5.2. Access to external data	/8/	Origin of the external data is indicated in the monitoring report, Annex1.	OK
5.3. Quality assurance	/8/	See chapter 5.1..	OK
5.4. Data uncertainty	/8/	See chapter 5.1.	OK
5.5. Emergency procedures	/8/	See chapter 5.1.	OK
6. Environmental and Social Indicators			
6.1. Implementation of measures	/8/	<p>Environmental and social indicators are not defined in the monitoring plan. Hence the question is not applicable. But the client takes action on a voluntary basis regarding environmental and social issues:</p> <p>The auditor team on site was informed on local stakeholders' opinion. They expressed their appreciations for the project. As per them the project has brought improvements in heat supply system, which the project has</p>	OK


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Objective	Reference	Comments	Conclusion (CARs/FARs)
		brought in.	
6.2. Monitoring equipment	/8/	See chapter 6.1.	OK
6.3. Quality assurance procedures	/8/	See chapter 6.1.	OK
6.4. External data	/8/	See chapter 6.1.	OK
7. Management and Operational System			
7.1. Documentation	/8/	The company complies with all legal and statutory requirements of the Ukraine and the same were made available to the verification team. LE "Krymteplocmunenergo" has all the necessary permissions and licenses, issued by the State Inspection on Labor Safety, that allow performing of the following activities: to operate, repair and install the steam and hot-water boilers, steam and hot-water pipelines; to perform building and installation works;	OK



VERIFICATION REPORT

Objective	Reference	Comments	Conclusion (CARs/FARs)
		to perform designing works; to conduct adjustment and alignment of fuel-using equipment.	
7.2. Qualification and training	/8/	The overall authority of the project is personally supervised by Mihaylo Sheyman who is responsible for collection and compilation of all data related to this JI Project at LE "Krymteplocomunenergo". The responsibilities and authorities are described for each individual in job descriptions as required statutorily.	OK
7.3. Allocation of responsibilities	/8/	The responsibilities and authorities are described for each individual in job descriptions as required statutorily. Persons working at sites are aware of their responsibilities, and relative records are maintained.	OK
7.4. Emergency procedures	/8/	The emergency procedures with respect to operation controls are available in data control	OK
7.5. Data archiving	/8/	Data are archived in the physical and electronic forms and then stored electronically.	OK
7.6. Monitoring report	/8/	Calculations are laid down in the monitoring report.	OK
7.7. Internal audits and management review	/8/	In the Section B.1.3 and Section C of the Monitoring Report version 2 internal audits and control measures are performed. Measurement equipment calibration for LE "Krymteplocomunenergo" was carried out by Crimea center	OK



VERIFICATION REPORT

Objective	Reference	Comments	Conclusion (CARs/FARs)
		<p>of standardization and metrology and Vinnitsa regional state scientific-production center standardization and metrology for Promenergovuzol boiler-house and some boiler-houses in Evpatoria district.</p> <p>Performance review for the project is made by Production Technical department.</p>	

Periodic Verification Checklist Protocol Table 2: Data Management System/Controls

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
1. Defined organizational structure, responsibilities and competencies		



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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
1.1. Position and roles	Full	<p>The general director of LE “KRYMTEPLOCOMUNENERGO”, Mr. Igor Vail’, appointed a responsible person, Mr. Mihaylo Sheyman, for the implementation and management of the monitoring process at the LE “KRYMTEPLOCOMUNENERGO”. Mr. Mihaylo Sheyman is responsible for supervising data collection, measurements, calibration, data recording and storage.</p> <p>Dr. Vladimir Gomon, Managing Engineer of European Institute for safety, security, insurance and environmental techniques, is responsible for baseline and monitoring methodology development.</p> <p>Dr. Dmitri Paderno, vice director of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development.</p> <p>Ms. Tetiana Grechko, senior engineer of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development and data processing.</p>
1.2. Responsibilities	Full	<p>Mihaylo Sheyman, Head of the production and Technical Department is responsible for supervising data collection, measurements, calibration, data recording and storage at LE “Krymteplocomunenergo”.</p> <p>Dr. Vladimir Gomon, Managing Engineer of European Institute for safety, security, insurance and environmental techniques, is responsible for baseline and monitoring methodology development</p> <p>Dr. Dmitri Paderno, vice director of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development.</p>



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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
		Ms. Maryna Denysyuk, engineer of Institute of Engineering Ecology, is responsible for baseline and monitoring methodology development and data processing.
1.3. Competencies needed	Full	The overall authority of the project is personally supervised by Mihaylo Sheyman who is responsible for collection and compilation of all data related to this JI Project at LE "Krymteplocomunenergo". The responsibilities and authorities are described for each individual in job descriptions as required statutorily.
2. Conformance with monitoring plan		
2.1. Reporting procedures		The monitoring plan is as per the registered PDD. The uploaded version of PDD is publicly available at the site http://ji.unfccc.int/JI_Projects/DeterAndVerif/Verification/PDD/index.html where it was placed during determination process.



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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
		The monitoring methodology developed for “District Heating” projects in Ukrainian conditions” was used in monitoring process.
2.2. Necessary Changes	Full	Implementation of boiler houses rehabilitation and network rehabilitation is realized according to the project plan. Same changes also were made in the monitoring methodology developed for “District Heating” projects in Ukrainian conditions”. Those changes concerned Adjustment factors calculations and allow to calculate GHG emissions reduction more transparent.
3. Application of GHG determination methods		
3.1. Methods used	Full	The reporting procedures reflect the monitoring plan content. The calculation of the emission reduction is correct.
3.2. Information/process flow	Full	The necessary procedures have been defined in internal procedures and additional internal documents relevant for the determination of the various parameters on regular basis. Natural gas consumption at boiler houses of LE “Krymteplocomunenergo” was carried out by the following scheme:



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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
		<p>1. For automatic fuel control: gas flue commercial system installed at gas distributing units of the boiler-houses that consist of - gas flow meter and automatic corrector for temperature and pressure. Gas consumption registered automatically. Every day operator of a boiler house make registration of daily gas consumption in the special paper journal.</p> <p>2. For manual fuel control: gas flue commercial system installed at gas distributing units of the boiler-houses that consist of - gas flow meter, air temperature and temperature of the natural gas sensors and gas pressure at the entrance to the boiler-house sensor. Operators register gas consumption and parameters of gas: temperature and pressure in operational journals every hour. These parameters are used to bring gas consumption to normal conditions.</p> <p>Data is summarized daily and transferred to calculating centers of LE "Krymteplocmunenergo" branches located in City of Simferopol and towns: Alushta, Dzhankoj, Evpatoria, Kerch, Rozdolne, Feodosia and Jalta. Data from branches transferred to calculating centers of LE "Krymteplocmunenergo" where it is archiving.</p> <p>3. Every month calculating center transferred data to gas</p>



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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
		supplying company.
3.3. Data transfer	Full	The complete data is stored electronically and also the part of Management information system which is controlled by accounts
3.4. Data trails	Full	The necessary procedures have been defined in internal procedures and additional internal documents relevant for the determination of the all the parameters listed in the monitoring plan
4. Identification and maintenance of key process parameters		
4.1. Identification of key parameters	Full	The critical parameters for the determination of GHG emissions are the parameters listed in section D of the approved PDD
4.2. Calibration/maintenance	Full	The company maintains the elaborate calibration plan for each of the equipment. The audit team verified the status for all the equipment at the sites sampled for the audit and found them to be complying with the plan.
5. GHG Calculations		



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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
5.1. Use of estimates and default data	Full	The carbon emission factor & Net calorific values is used as a predetermined default value which has been defined in the PDD and confirmed during validation of the project.
5.2. Guidance on checks and reviews	Full	Internal audits and control measures are performed. Measurement equipment calibration for LE “Krymteplocomunenergo” was carried out by Crimea center of standardization and metrology and Vinnitsa regional state scientific-production center standardization and metrology for Promenergovuzol boiler-house and same boiler-houses in Evpatoria district.
5.3. Internal validation and verification	Full	Monitoring procedure for JI Project includes the responsibility and frequency for carrying out internal audits. The audit team did verify all the parameters listed in monitoring report
5.4. Data protection measures		The necessary procedures relating to Information technology are in place to provide necessary data security, and also prevent the unauthorized use of the same.



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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
5.5. IT systems	Partial	The IT system does not exist at the moment at LE “Krymteplocomunenergo” but there is planned development of such departments for Regional Districts of Crimea.

Periodic Verification Protocol Table 3: GHG calculation procedures and management control testing
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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
<p>Potential reporting risks based on an assessment of the emission estimation procedures can be expected in the following fields of action:</p> <ul style="list-style-type: none"> ➤ the calculation methods, ➤ raw data collection and sources of supporting documentation, ➤ reports/databases/information systems from which data is 	<p>Regarding the potential reporting risks identified in the left column the following mitigation measures have been observed during the document review and the on site mission:</p> <p>Key source data for this parameter are:</p> <ul style="list-style-type: none"> • meter reading. • Invoices and record for Fuels (and coal) for consumption and purchase. 	<p>The issue remaining is the way the data obtained is used to calculate the emission reduction in a conservative manner according to the approach prescribed in the PDD as well as the way data obtained is used to calculate the emissions reductions/</p>



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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
<p>obtained.</p> <p>Key source data applicable to the project assessed are hereby:</p> <ul style="list-style-type: none"> ➤ metering records (gas and power consumption per heat generated), ➤ process monitors (heat generation), ➤ operational logs (metering records), ➤ laboratory/analytical data (for energy content of fuels), ➤ accounting records, <p>Appropriate calibration and maintenance of equipment resulting in high accuracy of data supplied should be in place.</p> <p>It is hereby needed to focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may include:</p> <ul style="list-style-type: none"> ➤ manual transfer of data/manual calculations, ➤ position of the metering 	<p>The metering equipments are installed appropriately in the enclosure panels and same are of reputed make.</p> <p>Calculation methods: The reporting procedures reflect the monitoring plan content and the calculation of the emission reduction is correct and also additionally deducting the project emissions caused by fossil fuel.</p>	



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Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
equipment, ➤ unclear origins of data, ➤ accuracy due to technological limitations, ➤ lack of appropriate data protection measures (for example, protected calculation cells in spreadsheets and/or password restrictions).		

Periodic Verification Protocol Table 4: Detailed audit testing of residual risk areas and random testing

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including Forward Action Requests)
The issue remaining is the way the data obtained is used to calculate the emission reduction in a conservative manner according to the approach prescribed in the PDD.	There has been a complete check of data transferred from daily consumption and generation readings to the calculation tool. There was no error in such transfer. The correct installation of the metering equipment can be confirmed.	Having investigated the residual risks, the audit team comes to the following conclusion: Immediate action is not needed with respect to the current emission reduction calculation. Those corrections have been considered during the verification process, so no residual risk is open.



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Verification Protocol Table 5: 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	Verification conclusion
CAR 1. The start and duration of landfill gas utilization is not included into the implementation schedule in Monitoring Report for 2009. Please explain the deviations of the implementation schedule and which stage of implementation the frequency controllers installation are being undergone. Please specify whether it was considered while calculating emissions for the year 2009.	1.4	<p>Landfill gas utilization was not provided because LE "Krymteplocomunenergo" didn't get the corresponding letter of attorney from the owner of the Landfill.</p> <p>6 frequency controllers were installed in 2008 year, that is 42,86% from the planned amount and 8 frequency controllers were installed in 2009 year, that is 57,14% from the planned amount, thus under the PDD frequency controllers at LE "Krymteplocomunenergo" were installed in full.</p> <p>The main part of installed frequency controllers were implemented at the summer period 2009 year. It was not considered while calculating emissions for the year 2009, because it is possibly to expect emissions reduction due to power saving only in 2010. Implementation of CHP units at LE "Krymteplocomunenergo" is still at the project</p>	The issue is closed.



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		design stage. It is postponed because of significant increasing of natural gas price and corresponding shift of the priorities for implementation of the energy saving measures. This was considered while calculating emissions for the year 2009, including baseline calculations.	
CAR 2. The section A.9. of Monitoring Report for 2009 states that fuel and energy saving measures within this project at the LE “Krymteplocomunenergo” led to additional GHG emissions reduction. Please specify what kind of measures led to additional emission reductions are meant.	1.4	<p>During 2009 the following measures that led to additional emission reductions were implemented: replacement of old boilers by the new highly efficient boilers, reconstruction of boilers, replacement by heat exchangers, upgrading/replacement of boilers’ burners, application of the new insulation and the pre-insulated pipes, installation of frequency controllers (see annex 2).</p> <p>The main part of these fuel and energy saving measures were implemented at the summer period 2009 year and it is possibly to expect additional GHG emissions due to power saving only in 2010</p>	The issue is closed.
CAR 3. The information on project description provided in section A.3 of the Monitoring Report regarding number of boiler in the Crimea DH system	4.1	The information on project description provided in section A.3 of the Monitoring Report #0140/3 version 01 regarding number of boiler in the Crimea DH system included in the project, number of boilers to be	The issue is closed.



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included in the project, number of boilers to be replaced and renewed, amount of fuel to be saved due to project implementation does not comply with registered PDD. Please correct or explain the deviations.		replaced and renewed, amount of fuel to be saved due to project implementation is corrected in Version 02 of the Monitoring Report.	
CAR 4. In section B.3 of the Monitoring Report it is stated that the scheme of data collection is described on Figure 5, while Figure 5 presents a photo of paper journal for natural gas consumption registration. Please provide a correct reference.	4.1	The reference is corrected in Version 02 of the Monitoring Report.	The issue is closed
CL 1. Please provide the information if any additional training was needed during installation of new equipment within monitoring period (2009) and whether such training was conducted of the responsible personnel.	3.9	As far as the main activity of LE "Krymteplocomunenergo" will not change in course of the JI project implementation, the special technical trainings for personnel are not necessary. The technical personnel of the enterprise has sufficient knowledge and experience for implmentation of the project activity and maintenance of the usual equipment.	The issue is closed



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		<p>In cases of the new (never used at this enterprise before, for example: cogeneration units, foreign produced boilers, etc.) equipment installation, the company - producer of this equipment should provide trainings for personnel.</p> <p>LE “Krymteplocomunenergo” provides personnel retraining according to protection of labour norms.</p> <p>In course of the JI project development, specialists of Institute of Engineering Ecology and carried out in 2007 year a comprehensive consultations and trainings for involved representatives of LE “Krymteplocomunenergo” on the necessary data collection according to Monitoring plan for the project.</p>	
<p>FAR1. Please provide justification for the difference of amount of ERU’s for reported year in the PDD and MR.</p>	<p>3.6</p>	<p>The difference in the emission reductions are explained as follows:</p> <ol style="list-style-type: none"> 1. Determination is based on conservative approach; this means that the most unfavourable variant is considered with the further possibility to verify real reductions. 2. Real calorific characteristics (factors) of fuel could differ from PDD ones. 3. Fuel consumption is not stable, and it is difficult to predict season deviations affecting 	<p>The issue will be closed at the next periodic verification</p>



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		<p>heat production.</p> <p>4. The baseline was calculated accordingly for each year using developed methodology that was determined, so the PDD baseline was only a prediction.</p> <p>Calculating emission reduction in the PDD was based on the conservative approach (according to the requirements of the determining organization). Emission reduction was calculated in accordance with proposed modification of efficiency factor for boilers and loss change in the heat distributing networks through insulation.</p> <p>At the same time some measures' results that were difficult to foresee and to calculate, for example, "network management improvement" that is developed in network length reduction, replacement 4-pipes system with 2-pipes one etc., lead to additional essential reduction of fuel expense that was not taken into account in the PDD but influence the monitoring results.</p>	
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APPENDIX B: VERIFICATION TEAM



VERIFICATION REPORT

The verification team consists of the following personnel:

Nadiya Kaiiun, M. Sci. (environmental science)

Team Leader, Climate Change Lead Verifier

Bureau Veritas Ukraine Health, Safety and Environment Department Project Manager.

Nadiya Kaiiun has graduated from National University of Kyiv-Mohyla Academy with the Master Degree in Environmental Science. She is a Lead auditor of Bureau Veritas Certification for Environment Management Systems. She has performed over 15 audits since 2008. She has undergone intensive training on Clean Development Mechanism /Joint Implementation and is involved in the determination/verification of 10 JI projects.

Kateryna Zinevych, M.Sci. (environmental science)

Team Member, Climate Change Verifier

Bureau Veritas Ukraine Health, Safety and Environment Department Project Manager.

Kateryna Zinevych has graduated from National University of Kyiv-Mohyla Academy with the Master Degree in Environmental Science. She is a Lead Auditor of Bureau Veritas Certification for Environment Management Systems. She has undergone a training course on Clean Development Mechanism /Joint Implementation and she is involved in the determination/verification of 26 JI projects.

Oleg Skoblyk, Specialist (Power Management)

Team Member, Climate Change Verifier

Bureau Veritas Ukraine Health, Safety and Environment Department Project Manager.

He has graduated from National Technical University of Ukraine ‘Kyiv Polytechnic University’ with specialty Power Management. He is a Lead auditor of Bureau Veritas Certification for Environment Management System (IRCA registered). He performed over 10 audits since 2008. He has undergone intensive training on Clean Development Mechanism /Joint Implementation and he is involved in the determination/verification of 9 JI projects.



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Report reviewed by:

Ivan Sokolov, Dr. Sc. (biology, microbiology)

Internal technical reviewer, Climate Change Lead Verifier

Bureau Veritas Ukraine Health, Safety and Environment Department Manager.

Ivan Sokolov has over 25 years of experience in Research Institute in the field of biochemistry, biotechnology, and microbiology. He is a Lead Auditor of Bureau Veritas Certification for Environment Management Systems (IRCA registered), Quality Management Systems (IRCA registered), Occupational Health and Safety Management Systems, and Food Safety Management Systems. Mr. I.Sokolov has performed over 140 audits since 1999. He is a Lead Tutor of IRCA registered ISO 14000 EMS Lead Auditor Training Course, Lead Tutor of IRCA registered ISO 9000 QMS Lead Auditor Training Course. Ivan Sokolov is also a Tutor of Join Implementation/Clean Development Lead Verifier Training Course and has performed determination/verification of more that 50 JI projects.



APPENDIX C: DOCUMENTS CHECKED DURING VERIFICATION

No	Simferopil city
1.	Contract № 107-φ from a November, 01 in 2007 about sale-bye of heat energy between Leasing enterprise “Krymteplocomounenergo” and Communal enterprise “GEU of Central district”.
2.	Contract № 1348 from a April, 01 in 2008 about sale-bye of heat energy between Leasing enterprise “Krymteplocomounenergo” and “Ambulance station of Simferopol town”.
3.	Agreement № 3 from a December, 14 in 2007 about the providing of hydrometeorological services between the Leasing enterprise “Krymteplocomounenergo» and Center on hydrometeorology in ARC at MNS Ukraine.
4.	Letter of the Executive committee of Sholcinscoi City Rady № 02-5/142 from 10.03.2009
5.	Act about actual consumption of natural gas. City Soudak on a December, 31 2008.
6.	Act about actual consumption of natural gas. City Simferopol on a December, 31 2008.
7.	Act about actual consumption of natural gas. City Sholcino on a December, 31 2008.
8.	Act about actual consumption of natural gas. City Armjansk on a December, 31 2008.
9.	Act about actual consumption of natural gas. City Pervomajskoe on a December, 31 2008.
10.	Act about actual consumption of natural gas. City Alushta on a December, 31 2008.
11.	Act about actual consumption of natural gas. City Jalta on a December, 31 2008.
12.	Act about actual consumption of natural gas. City Jalta on a December, 31 2008.
13.	Act about actual consumption of natural gas. City Feodosia on a December, 31 2008.
14.	Act about actual consumption of natural gas. City Kerch on a December, 31 2008.
15.	Act about actual consumption of natural gas. S.c.t.Krasnogvardejskoe on a December, 31 2008.



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16.	Act about actual consumption of natural gas. s. Sovetsky a December, 31 2008.
17.	Act about actual consumption of natural gas. s. Nizhnegorsky a December, 31 2008.
18.	Act about actual consumption of natural gas. City Djankoy a December, 31 2008.
19.	City Evpatoria
20.	Act of receiving commission on acceptance to exploitation of the finished build object from June, 04 2008 «Replacement of heating main of D=219 mm – 120 m from a boiler room for Chapaeva str., 26. City Evpatoria.»
21.	Act of receiving commission on acceptance to exploitation of the finished build object from July, 04 2008 «Replacement of heating main of D=159 mm – 372 m from a boiler room for Chapaeva str., 26. City Evpatoria.»
22.	Act of receiving commission on acceptance to exploitation of the finished build object from March, 24 2008 «Replacement of heating main of D=125 mm – 48 m from a boiler room for Internatsionalnaja str., 135. City Evpatoria.»
23.	Act of receiving commission on acceptance to exploitation of the finished build object from July, 02 2008 «Replacement of heating main of D=57 mm – 56 m, D=89 mm – 62 m from a boiler room for Frunze str., 83a. City Evpatoria.»
24.	Act of receiving commission on acceptance to exploitation of the finished build object from January, 16 2008 «Replacement of heating main of D=273 mm – 176 m from a boiler room for Frunze str., 35a. City Evpatoria.»
25.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 19 2007 «Replacement of surface of caldron DCVR-20/13-20/13 № 3 at boiler room for Internatsionalnaja str., 135. City Evpatoria.»
26.	Act of receiving commission on acceptance to exploitation of the finished build object from August, 18 2008 «Replacement of heat surface of caldron DCVR-10/13 № 4 at boiler room for Krupskaja str., 48a. City Evpatoria.»
27.	City Soudak
28.	Act of receiving commission on acceptance to exploitation of the finished build object from October, 28 2008 « Replacement of heating main of D=159 mm – 334 m from a boiler room for Zhovtneva str., 7. City Soudak.»
29.	City Alushta
30.	Act of receiving commission on acceptance to exploitation of the finished build object from July, 07 2008 « Replacement of heating main of D=219 mm – 460 m by preliminary isolated pipe from a boiler room for Zarechnaja str., 43. City Alushta.»
31.	Act of receiving commission on acceptance to exploitation of the finished build object from July, 07 2008 « Replacement of heating main of D=250 mm – 46.5



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	m by from a boiler room for Zarechnaja str., 43. City Alushta.»
32.	City Simferopol
33.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 17 2004 « A reconstruction CTP-44 from a boiler room on Vuzlova str., 9 with replacement of Casing pipe water heaters on Lamellar water heaters : SWEP GX – 26 H*51 1/4401/EPDM-P (P=2330 cVt) City Simferopol
34.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 17 2004 « A reconstruction CTP-26 from a boiler room on Vuzlova str., 9 with replacement of Casing pipe water heaters on Lamellar water heaters : SWEP GX – 51 L*77 1.4401/EPDM-P (P=4655 κBт) – 2 things City Simferopol
35.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 23 2004 Setting of frequency transformers on the electric engines of smoke delete system and fans in PTVM st.№4 in a boiler room on Vuzlova str., 9 City Simferopol
36.	Act of receiving commission on acceptance to exploitation of the finished build object from October, 18 2005 Setting of frequency transformers on electric engines to the Recirculation pump in a boiler room on Vuzlova str., 9 City Simferopol
37.	Act of receiving commission on acceptance to exploitation of the finished build object from July, 23 2004 Replacement of heating main sites of D=80 mm – 200 m by twopipe calculation from a boiler room on Vuzlova str., 9 City Simferopol
38.	Act of receiving commission on acceptance to exploitation of the finished build object from July, 23 2004 Replacement of heating main sites of D=250 mm – 175 m by two-pipe calculation from a boiler room on Vuzlova str., 9 City Simferopol
39.	Act of receiving commission on acceptance to exploitation of the finished build object from July, 27 2004 Replacement of heating main sites of D=150 mm – 210 m by two-pipe calculation from a boiler room on Vuzlova str., 9 City Simferopol
40.	Checking Certificate of working mean of measuring technique № 02309 Name and conditional denotation – “Gas-meter RGC-600 Ser. № 2264 CTCE Belongs, located to the address: 1 Konnoj Army str., 37a City.Simpferopol”
41.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-01 Ser. № 5237 CTCE Belongs, located to the address: 1 Konnoj Army str., 37a City.Simpferopol”
42.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1577 CTCE Belongs, located to the address: 1 Konnoj Army str., 37a City.Simpferopol”
43.	Checking Certificate of working mean of measuring technique № 031153 Name and conditional denotation – “Signalling-explosimetr device CET-1 Ser. № 062



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	CTCE Belongs, located to the address: 1 Konnoj Army str., 37a City.Simpferopol”
44.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1517 CTCE Belongs, located to the address: 1 Konnoj Army str., 37a City.Simpferopol”
45.	Certificate about Acceptance “Sensor of absolute pressure MIDA-13P-01 Ser. № 02407819 CTCE Belongs, located to the address: 1 Konnoj Army str., 37a City.Simpferopol
46.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-02 Ser. № 1628 CTCE Belongs, located to the address: 1 Konnoj Army str., 37a City.Simpferopol”
47.	Certificate about Acceptance and Checking “Sensor Metran-43-FExDD model 3494-02 Ser. № 36325 CTCE Belongs, located to the address: 1 Konnoj Army str., 37a City.Simpferopol”
48.	Certificate about Acceptance “Transformer of pressure of measuring RS-28/Ex/0-400 cPa ABS/PD/M Ser. № 11063198 CTCE Belongs, located to the address: 1 Konnoj Army str., 37a City.Simpferopol
49.	Act of receiving commission on acceptance to exploitation of the finished build object from November, 19 2008 Repair of heating main located Sevastopolskaja str.,114, D=133 mm – 15 m from a boiler room 1 Konnoj Army str., 37a City Simpferopol
50.	Act of receiving commission on acceptance to exploitation of the finished build object from January, 24 2008 Repair of convective part of caldrion PTVM-30 № 1 at boiler room 1 Konnoj Army str., 37a City Simpferopol
51.	Act of receiving commission on acceptance to exploitation of the finished build object from March, 25 2008 Repair of convective part of caldrion PTVM-30 № 1 at boiler room 1 Konnoj Army str., 37a City Simpferopol
52.	Act of receiving commission on acceptance to exploitation of the finished build object from August, 20 2008 Repair of heating main located 1 Konnoj Army str., 82, D=426 mm – 23 m from a boiler room 1 Konnoj Army str., 37a City Simpferopol
53.	Act of receiving commission on acceptance to exploitation of the finished build object from January, 25 2008 «Reconstruction CTP-44 at Zamisky str., 70 from a boiler room on 1 Konnoj Army str., 37a with replacement of Casing pipe water heaters on Lamellar water heaters : DAN FP -50-2 things, 21lamellars. City Simpferopol
54.	Act of receiving commission on acceptance to exploitation of the finished build object from January, 25 2008 «Reconstruction CTP-44 at Aralscaja str., 59 from a boiler room on 1 Konnoj Army str., 37a with replacement of Casing pipe water heaters on Lamellar water heaters : DAN FP -50-1 things, 25 lamellars. City Simpferopol



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55.	Checking Certificate of working mean of measuring technique № 033615 Name and conditional denotation – “Gas-meter RGC-1000 Ser. № 1404 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
56.	Checking Certificate of working mean of measuring technique № 026494 Name and conditional denotation – “Gas-meter RGC-1000 Ser. № 1415 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
57.	Checking Certificate of working mean of measuring technique № 0266623 Name and conditional denotation – “Gas-meter RGC-1000 Ser. № 4997 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
58.	Checking Certificate of working mean of measuring technique № 031092 Name and conditional denotation – “Signalling-explosimetr device Ser. № 052 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
59.	Certificate about Acceptance “Transformer of pressure of measuring RS-28/Ex Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 02082115 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol
60.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1259 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
61.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1493 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
62.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1509 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
63.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-02 Ser. № 1567 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
64.	Certificate about Acceptance “Transformer of pressure of measuring RS-28/Ex Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 02073858 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol
65.	Certificate about Acceptance “Transformer of pressure of measuring RS-28/Ex Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 02073862. CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol
66.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-02 Ser. № 1396 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
67.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-02 Ser. № 1600 CTCE Belongs, located to the address: Batumsky lane., 2., City.Simpferopol”
68.	Act of receiving commission on acceptance to exploitation of the finished build object from February, 15 2007 Building of heating main located Ushakova str.,



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	D=57 mm – 348 m from a boiler room Batumsky lane., 2., City Simferopol
69.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 22 2005 Change of heating main located Trubachenko lane, 16a., D=219 mm – 40 m from a boiler room Batumsky lane., 2., City Simferopol
70.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 22 2005 Change of heating main located Millera str,- Trubachenko str., D=76 mm – 18 m D=89 mm – 74 m D=108 mm – 155 m, D=159 mm – 228 m from a boiler room Batumsky lane., 2., City Simferopol
71.	Act of receiving commission on acceptance to exploitation of the finished build object from February, 27 2008 Repair of convective part of caldrion TVG-8 № 2 at boiler room Turgeneva str., 11a City Simferopol
72.	Checking Certificate of working mean of measuring technique № 033614 Name and conditional denotation – “Gas-meter RGC-1000 Ser. №1110 CTCE Belongs, located to the address: Turgeneva str., 11a City.Simferopol”
73.	Checking Certificate of working mean of measuring technique № 026493 Name and conditional denotation – “Gas-meter RGC-1000 Ser. №1407 CTCE Belongs, located to the address: Turgeneva str., 11a City.Simferopol”
74.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. №1576 CTCE Belongs, located to the address: Turgeneva str., 11a City.Simferopol”
75.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. №1011 CTCE Belongs, located to the address: Turgeneva str., 11a City.Simferopol”
76.	Certificate about Acceptance “Transformer pressure measuring PC-28/Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 02082114 CTCE Belongs, located to the address: Turgeneva str., 11a City.Simferopol”
77.	Certificate about Acceptance “Transformer pressure measuring PC-28/Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 01082812 CTCE Belongs, located to the address: Turgeneva str., 11a City.Simferopol”
78.	Checking Certificate of working mean of measuring technique № 031227 Name and conditional denotation – “Signalling-explosimetr device CTX -1 Ser. № 839 CTCE Belongs, located to the address: Turgeneva str., 11a City.Simferopol”
79.	Checking Certificate of working mean of measuring technique № 031089 Name and conditional denotation – “Signalling-explosimetr device CET -1 Ser. № 049 CTCE Belongs, located to the address: Turgeneva str., 11a City.Simferopol”
80.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-02 Ser. № 1347 CTCE Belongs, located to the address: Turgeneva str., 11a City.Simferopol”
81.	Checking Certificate of working mean of measuring technique № 020358 Name and conditional denotation – “Gas-meter RGC-1000 Ser. № 0813 CTCE



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	Belongs, located to the address: Severny lane., 17., City.Simpferopol”
82.	Checking Certificate of working mean of measuring technique № 013156 Name and conditional denotation – “Gas-meter RGC-1000 Ser. № 0015 CTCE Belongs, located to the address: Severny lane., 17., City.Simpferopol”
83.	Checking Certificate of working mean of measuring technique № 031094 Name and conditional denotation – “Signalling-explosimetr device CET -1 Ser. № 055 CTCE Belongs, located to the address: Severny lane., 17., City.Simpferopol”
84.	Checking Certificate of working mean of measuring technique № 031178 Name and conditional denotation – “Signalling-explosimetr device CET -1 Ser. № 833 CTCE Belongs, located to the address: Severny lane., 17., City.Simpferopol”
85.	Certificate about Acceptance “Transformer pressure measuring PC-28/Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 02082122 CTCE Belongs, located to the address: Severny lane., 17., City.Simpferopol”
86.	Certificate about Acceptance “Transformer pressure measuring PC-28/Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 02082120 CTCE Belongs, located to the address: Severny lane., 17., City.Simpferopol”
87.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1550 CTCE Belongs, located to the address: Severny lane., 17., City.Simpferopol”
88.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1544 CTCE Belongs, located to the address: Severny lane., 17., City.Simpferopol”
89.	Certificate about Checking “Heat metre STU-1.№ 1094 CTCE Belongs, located to the address: Severny lane., 17., City.Simpferopol”
90.	Certificate about Acceptance “Complete set of Thermo transformer resistance KTSP-N. Ser. № 4107 CTCE Belongs, located to the address: Severny lane., 17., City.Simpferopol”
91.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-02 Ser. № 1564 CTCE Belongs, located to the address: Severny lane., 17. City.Simpferopol”
92.	Act of receiving commission on acceptance to exploitation of the finished build object from November, 19 2008 Building of heating main with using preliminary isolated pipe D=325 mm – 520 m from a boiler room Severny lane., 17, City Simpferopol
93.	Act of receiving commission on acceptance to exploitation of the finished build object from February, 25 2008 «Reconstruction CTP at Lermontova str., 14b with replacement of Casing pipe water heaters on Lamellar water heaters : DAN FP -50-2 things, 124 lamellars from a boiler room Severny lane., 17, City Simpferopol
94.	Act of receiving commission on acceptance to exploitation of the finished build object from February, 25 2008 «Reconstruction CTP at Lermontova str., 14b with replacement of Casing pipe water heaters on Lamellar water heaters :



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	DAN FP -31-2 things, 59 lamellars from a boiler room Severny lane., 17, City Simferopol
95.	Act of receiving commission on acceptance to exploitation of the finished build object from November, 19 2008 «Reconstruction CTP at Lermontova str., 5a with replacement of Casing pipe water heaters on Lamellar water heaters : DAN FP -20-2 things, 45 lamellars from a boiler room Severny lane., 17, City Simferopol
96.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 24 2008 Repair of heating main located Kujbysheva str., 29 D=426 mm – 50 m from a boiler room Severny lane., 17, City Simferopol
97.	Act of receiving commission on acceptance to exploitation of the finished build object from December, 29 2008 Repair of heating main located Franko bul.- Severny lane D=57 mm – 80 m from a boiler room Severny lane., 17, City Simferopol
98.	Act of receiving commission on acceptance to exploitation of the finished build object from January, 30 2008 Repair of screen pipes of caldron TVG-8 № 4 at boiler room Severny lane., 17, City Simferopol
99.	Act of receiving commission on acceptance to exploitation of the finished build object from March, 25 2008 Repair of convective part of caldron KVGM-20 № 1 at boiler room Fructovy lane., 13, City Simferopol
100.	Act of receiving commission on acceptance to exploitation of the finished build object from October, 27 2008 Repair of heating main located Fructovy lane., 13, D=630 mm – 26 m at boiler room Fructovy lane., 13, City Simferopol
101.	Act of receiving commission on acceptance to exploitation of the finished build object from December, 21 2005 Partial change of screen pipes of caldron KVGM-20 № 3 at boiler room Fructovy lane., 13 City Simferopol
102.	Act of receiving commission on acceptance to exploitation of the finished build object from January, 17 2007 Change of screen pipes of caldron KVGM-20 № 2 at boiler room Fructovy lane., 13 City Simferopol
103.	Act of receiving commission on acceptance to exploitation of the finished build object from January, 18 2006 Change of convective part of caldron KVGM-20 № 3 at boiler room Fructovy lane., 13 City Simferopol
104.	Act of receiving commission on acceptance to exploitation of the finished build object from October, 13 2005 Change of convective part of caldrons KVGM-20 №1 №2 №3 at boiler room Fructovy lane., 13 City Simferopol
105.	Act of receiving commission on acceptance to exploitation of the finished build object from August, 28 2007 Change of convective part of caldron KVGM-20 №2 at boiler room Fructovy lane., 13 City Simferopol
106.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 08 2005 Change of convective part of caldron KVGM-20 №1 at boiler room Fructovy lane., 13 City Simferopol



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107.	Act of receiving commission on acceptance to exploitation of the finished build object from January, 23 2008 Change of convective part of caldron KVGM-20 №1 at boiler room Fructovy lane., 13 City Simferopol
108.	Act of receiving commission on acceptance to exploitation of the finished build object from June, 21 2007 Change of convective part of caldron KVGM-20 №1 №2 at boiler room Fructovy lane., 13 City Simferopol
109.	Act of receiving commission on acceptance to exploitation of the finished build object from February, 25 2008 Change of convective part of caldron KVGM-20 №1 at boiler room Fructovy lane., 13 City Simferopol
110.	Act of receiving commission on acceptance to exploitation of the finished build object from June, 21 2007 «Replacement of heating main of D=400mm – 1800m from a boiler room Fructovy lane., 13 along Kujbysheva str.,Kievskaja str. City Simferopol.»
111.	Act of receiving commission on acceptance to exploitation of the finished build object from February, 27 2007 «Replacement of output devise of D=400mm on D=600mm at a boiler room Fructovy lane., 13 City Simferopol.»
112.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 19 2006 «Replacement of input pressure collector of net pumps at a boiler room Fructovy lane., 13 City Simferopol.»
113.	Act of receiving commission on acceptance to exploitation of the finished build object from June, 26 2008 «Building of heating main of D=108 mm – 150m from a boiler room Fructovy lane., 13 along Dekabristov str.,14/28 City Simferopol.»
114.	Act of receiving commission on acceptance to exploitation of the finished build object from January, 23 2008 «Change of heating main of D=325 mm – 65.5m from a boiler room Fructovy lane., 13 along Franko bul.,35 City Simferopol.»
115.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-01 Ser. № 5729 CTCE Belongs, located to the address: Fructovy lane., 13 City.Simferopol”
116.	Certificate about Acceptance “Sensor “Sapfir Ex” Ser. № 06375607 CTCE Belongs, located to the address: 1 Fructovy lane., 13 City.Simferopol
117.	Checking Certificate of working mean of measuring technique № 031154 Name and conditional denotation – “Signalling-explosimetr device CET -1 Ser. № 063 CTCE Belongs, located to the address: Fructovy lane., 13 City.Simferopol”
118.	Checking Certificate of working mean of measuring technique № 031174 Name and conditional denotation – “Signalling-explosimetr device CTX -17 Ser. № 796 CTCE Belongs, located to the address: Fructovy lane., 13 City.Simferopol”
119.	Certificate about Acceptance “Transformer of pressure of measuring RS-28/Ex/0-400 cPa ABS/PD/M Ser. № 11063202 CTCE Belongs, located to the address: : Fructovy lane., 13 City.Simferopol
120.	Checking Certificate of working mean of measuring technique № 026624 Name and conditional denotation – “Gas-meter RGC-600 Ser. № 2065 CTCE



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	Belongs, located to the address: Kirova str., 47a., City.Simpferopol”
121.	Checking Certificate of working mean of measuring technique № 029769 Name and conditional denotation – “Gas-meter RGC-250 Ser. № 5749 CTCE Belongs, located to the address: Kirova str., 47a., City.Simpferopol”
122.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1000 CTCE Belongs, located to the address: : Kirova str., 47a., City.Simpferopol”
123.	Certificate about Acceptance “Transformer of pressure of measuring RS-28/Ex Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 02082127 CTCE Belongs, located to the address: : Kirova str., 47a., City.Simpferopol
124.	Checking Certificate of working mean of measuring technique № 031175 Name and conditional denotation – “Signalling-explosimetr device CTX -17 Ser. № 798 CTCE Belongs, located to the address: Kirova str., 47a., City.Simpferopol”
125.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-02 Ser. № 490 CTCE Belongs, located to the address: Kirova str., 47a., City.Simpferopol”
126.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 23 2005 Change of feed up pumps 2K6-2 things by feed up pumps K20/30 - 2 things in a boiler room on Kirova str., 47a., City Simferopol
127.	Act of receiving commission on acceptance to exploitation of the finished build object from Juli, 12 2005 Change of main line pipes Dy=250mm -120 m in a boiler room on Kirova str., 47a., City Simferopol
128.	Act of receiving commission on acceptance to exploitation of the finished build object from August, 09 2006 Change of net pumps 6NDV-60 with electric engine 65 cVt by net pumps 6NDV-60 with electric engine 75 cVt in a boiler room on Kirova str., 47a., City Simferopol
129.	Act of receiving commission on acceptance to exploitation of the finished build object from April, 11 2006 Change of down collector of net pumps and install DU-600 device in a boiler room on Kirova str., 47a., City Simferopol
130.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 25 2007 Capital repairmen of caldron KB-2/95 №2 in a boiler room on Kirova str., 47a., City Simferopol
131.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 25 2007 Capital repairmen of caldron KB-2/95 №2 in a boiler room on Kirova str., 47a., City Simferopol
132.	Act of receiving commission on acceptance to exploitation of the finished build object from April, 22 2008 Repairmen of heating main at Kirova str.,47a, D=273 mm – 132 m from a boiler room in a boiler room on Kirova str., 47a., City Simferopol
133.	Act of receiving commission on acceptance to exploitation of the finished build object from May, 27 2008 Change of screen pipes of caldron KVV-2-95 № 2 in



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	a boiler room on Kirova str., 47a., City Simferopol
134.	Checking Certificate of working mean of measuring technique № 015306 Name and conditional denotation – “Gas-meter RGC-1000 Ser. № 4999 CTCE Belongs, located to the address: Strelkovaja str., 91a., City.Simpferopol”
135.	Checking Certificate of working mean of measuring technique № 013285 Name and conditional denotation – “Gas-meter RGC-600 Ser. № 2274 CTCE Belongs, located to the address: Strelkovaja str., 91a., City.Simpferopol”
136.	Certificate about Acceptance “Transformer of pressure of measuring RS-28/Ex Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 01082819 CTCE Belongs, located to the address: Strelkovaja str., 91a., City.Simpferopol
137.	Certificate about Acceptance “Transformer of pressure of measuring RS-28/Ex Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 01082818 CTCE Belongs, located to the address: Strelkovaja str., 91a., City.Simpferopol
138.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1534 CTCE Belongs, located to the address: Strelkovaja str., 91a., City.Simpferopol”
139.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1530 CTCE Belongs, located to the address: Strelkovaja str., 91a., City.Simpferopol”
140.	Checking Certificate of working mean of measuring technique № 031156 Name and conditional denotation – “Signalling-explosimetr device CET-1 Ser. № 066 CTCE Belongs, located to the address: Strelkovaja str., 91a., City.Simpferopol”
141.	Checking Certificate of working mean of measuring technique № 031173 Name and conditional denotation – “Signalling-explosimetr device CTX-17 Ser. № 791 CTCE Belongs, located to the address: Strelkovaja str., 91a., City.Simpferopol”
142.	Certificate about Acceptance and Checking “Calculator of volume of gas UNIVERSAL-02 Ser. № 1006 CTCE Belongs, located to the address: Strelkovaja str., 91a., City.Simpferopol”
143.	Act of receiving commission on acceptance to exploitation of the finished build object from November, 25 2008 Repair of heating main located Ketchemetskaja str.,1, D=219mm – 46 m from a boiler room Strelkovaja str., 96., City Simpferopol
144.	Act of receiving commission on acceptance to exploitation of the finished build object from November, 25 2008 Repair of heating main located Kievskaja str.,135, D=57mm – 58 m from a boiler room Strelkovaja str., 96., City Simpferopol
145.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 19 2006 Repair of convective part of caldrion KVG – 6.5 № 3 at boiler room Radischeva str., 78 City Simpferopol
146.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 5 2006 Replacement of net pump 5NDV by net pump D



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	200 at boiler room Radischeva str., 78 City Simferopol
147.	Act of receiving commission on acceptance to exploitation of the finished build object from September, 25 2004 Repairing fire slots at boiler room Radischeva str., 78 City Simferopol
148.	Act of receiving commission on acceptance to exploitation of the finished build object from November, 17 2005 Replacement of heating main located Bepalova str.,106, D=159mm – 100 m from a boiler Radischeva str., 78 City Simferopol
149.	Certificate about Acceptance and Checking “Transformer measuring of temperature PVT-01-1 Ser. № 1535 CTCE Belongs, located to the address: boiler Radischeva str., 78 City.Simferopol”
150.	Certificate about Acceptance “Transformer of pressure of measuring RS-28/Ex Ex(-30)/0,,160 кПа ABS/PD/M Ser. № 02082124 CTCE Belongs, located to the address: Radischeva str., 78 City.Simferopol
151.	Checking Certificate of working mean of measuring technique № 031088 Name and conditional denotation – “Signalling-explosimetr device CET-1 Ser. № 048 CTCE Belongs, located to the address: Radischeva str., 78 City.Simferopol”
152.	Checking Certificate of working mean of measuring technique № 031176 Name and conditional denotation – “Signalling-explosimetr device CTX-17 Ser. № 800 CTCE Belongs, located to the address: Radischeva str., 78 City.Simferopol”
153.	Checking Certificate of working mean of measuring technique № 013155 Name and conditional denotation – “Gas-meter RGC-1000 Ser. № 1428CTCE Belongs, located to the address Radischeva str., 78 City.Simferopol”
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155.	Actual charges of gas on to the boiler rooms of the Djancoj branch of «CTCE» for a 2008 year.
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168.	Contract №32/200 of heat energy purchase-sale. Alushta City. 01.10.2008.
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288.	Photo, gas meter RGK-1000. Serial № 1110.
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291.	SNiP 2-3-79 (1998)
292.	State Buildings Norms (B.2.6-31:2006)
293.	KTM 204 Ukraine 244-941