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Determination Report

The World Bank Group,
Prototype Carbon Fund, Washington

DETERMINATION OF SOFIA DISTRICT HEATING PROJECT

JI TRACK 1

Report No. 1030121

Revision 2

February 11, 2008

TÜV SÜD Industrie Service GmbH

Carbon Management Service
Westendstr. 199 - 80686 Munich - GERMANY

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Executing Operational Unit:		TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 - 80686 Munich Federal Republic of Germany		
Client:		The World Bank 1818 H Street, N.W. Washington, D.C 20433 USA		
Contract approved by:		Werner Betzenbichler		
Report Title:		Sofia District Heating Project		
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Summary:

The Certification Body ”Climate and Energy” has been ordered by The World Bank to perform a determination of the above mentioned project. The first assessment took place in 2003 and 2004 and is documented in the TÜV SÜD determination report 362472, issued February 19, 2004. For registration purpose TÜV SÜD re-assessed the mentioned project under current regulations. The final result here with is the conclusion of the previous and current determination.

Using a risk based approach; the re-determination of this project has been performed by document reviews and interviews by e-mail and telephone calls with the client.

As the result of this procedure, it can be confirmed that the submitted project documentation is in line with all requirements set by the Marrakech Accords and the Kyoto Protocol and relevant guidelines of Bulgarian Designated National Focal Point. A first letter of Approval of the Bulgarian DNF has been issued June 22, 2004. The sole remaining outstanding issue is the missing of the (Final) Letter of Approvals of the involved Annex-I-Parties.

Apart of this requirement, TÜV SÜD can recommend this project for acceptance as JI Track 1 project according to the recent Bulgarian rules.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 1.337.926 tonnes CO_{2e} within the whole Kyoto crediting period from 2008 to 2012 (to be issued as ERUs) since the starting date of the project January 1, 2008 until end of 2012 represent a reproducible estimation using the assumptions given by the project documents.

Work carried out by:	• Thomas Kleiser (Project manager, GHG Lead Auditor) • Robert Mitterwallner (GHG Auditor)	Internal Quality Control by: Werner Betzenbichler

Abbreviations

BEF	Baseline Emission Factor for the Bulgarian Grid
CAR	Corrective action request
CDM	Clean Development Mechanism
CR	Clarification request
DOE	Designated Operational Entity
DNF	Designated National Focal Point
DP	Determination Protocol
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission reduction
ERU	Emission Reduction Unit
GHG	Greenhouse gas(es)
IRR	Internal Rate of Return
JI	Joint Implementation
JISC	JI Supervisory Committee
KP	Kyoto Protocol
LoA	Letter of Approval
MoEW	Bulgaria Ministry of Environment and Water
MP	Monitoring Plan
MS	Management System
NGO	Non Governmental Organisation
NPV	Net Present Value
PDD	Project Design Document
SC	Supervisory Commitee

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1 INTRODUCTION

1.1 Objective

The World Bank in Washington has commissioned TÜV SÜD Industrie Service GmbH to conduct a determination of the "Sofia District Heating Project" with regard to the relevant requirements for JI project activities. The determination serves as a conformity test of the project design and is a requirement for all JI projects. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Determination is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions (in particular ERUs - in the first commitment period under the Kyoto Protocol).

UNFCCC criteria refer to the Kyoto Protocol Article 6 criteria and the Guidelines for the implementation of Article 6 of the Kyoto Protocol as agreed in the Marrakech Accords.

1.2 Scope

The determination scope is defined as an independent and objective review of the project design document (PDD), 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.

TÜV SÜD has, based on the recommendations in the Determination and Verification Manual (see http://ieta.org/ieta/www/pages/index.php?IdSitePage=392), and employed a risk-based approach in the determination, focusing on the identification of significant risks for project implementation and the generation of emission reductions.

This report is based on the PDD which has been issued 22th October, 2007. The version from 6th June, 2007 was published on the website of www.netinform.de. According to CARs and CRs indicated in the audit process the client decided to revise the PDD. The final version submitted on 22nd of October 2007 serves as the basis for the final conclusions presented herewith.

The determination is not meant to provide any consulting neither towards the World Bank nor toward the Bulgarian company Toplofikazia Sofia. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

Studying the existing project documentation, it was obvious that the competence and capability of the validation team has to cover at least the following aspects:

- Knowledge of Kyoto Protocol and the Marrakech Accords
- Environmental and Social Impact Assessment
- Skills in environmental auditing (ISO 14001)
- Quality Assurance

- Technologies, processes and operation of combined heat and power plants and heat only boilers and District Heating Systems
- Baseline concepts
- Monitoring concepts
- Political, economical and technical random conditions in host country

According to these requirements TÜV SÜD has assembled a project team in accordance with the appointment rules of the TÜV certification body “Climate and Energy”:

Thomas Kleiser is a lead auditor for CDM and JI projects at TÜV SÜD Industrie Service GmbH and head of CDM/JI division within TÜV SÜD. In this position he is responsible for the implementation of validation and certification processes for GHG mitigation projects. He has participated in more than 90 CDM and JI project assessments.

Robert Mitterwallner is a GHG-A with a background as auditor for environmental management systems (according to ISO 14001) and expert in environmental permit procedures. He is located at the headquarter of TUV SÜD Industrie Service in Munich. He has received training in the JI determination as well as CDM validation process and applied successfully as GHG Auditor for several scopes.

The audit team covers following requirements:

- Knowledge of Kyoto Protocol and the Marrakech Accords (All)
- Environmental and Social Impact Assessment (All)
- Skills in environmental auditing (ISO 14001) – (All)
- Quality Assurance (All)
- Technologies, processes and operation of heat only boilers and energy efficiency (All)
- Baseline concepts (All)
- Monitoring concepts (All)
- Political, economical and technical random conditions in host country (All)

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

Werner Betzenbichler –Head of the Certification Body “Climate and Energy”

1.3 GHG Project Description

The project foresees the replacement of piping and the replacement of substations by new ones with new heat exchangers and pumps. The purpose of the project is to increase the efficiency of the district heating system in Sofia and, hence, aggregate savings of input fuel (gas and heavy fuel oil) to the combined heat and power (CHP) plants and heat only boilers (HOB).

The project is located in Sofia managed by the Sofia District Heating Company (DHC), also referred to as Toplofikazia Sofia (TS), a municipal and government owned company. TS distributes hot water to four separated distribution networks – Sofia, Sofia East, Zemliane, and Luilin.

In total about 100 km of pipeline trace and about 10.000 substations will be replaced until the end of 2007.

The Sofia DH sources are two CHP plants which generated 3,840 GWh of heat per year in 2003, two large HOBs which generated 1,680 GWh of heat per year in 2003 and seven small isolated heating plants which produced 480 GWh of heat per year in 2003.

The majority of heating goes to residential buildings, which are mostly high-rise apartment complexes. Each residential building contains one or more substations that distribute hot water to individual radiators within flats. Older substations are mostly “direct”, and bleed hot water directly from the main distribution network into the building. Newer buildings use “indirect” substations, which use a secondary circulation network and pump, and a heat exchanger connected to the primary distribution network.

The Project Participant of the Host Country is Toplofikazia Sofia.

The project documentation has been developed by Nexant Inc Washington from the United States of America.

2 METHODOLOGY

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

- It organises, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent determination process where TÜV SÜD has documented how a particular requirement has been validated and the result of the determination.

The determination protocol consists for this project of three tables. The different columns in these tables are described in Figure 1.

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

Determination Protocol Table 1: Mandatory Requirements			
Requirement	**Reference**	**Conclusion**	**Cross reference**
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), 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 determination report. It is used in case of an outstanding, currently not solvable issue, AI means Additional Information is required.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent determination process.

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

Determination Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action and additional Information requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Determination conclusion***
If the conclusions from the draft determination are either a Corrective Action Request or a Clarification or Additional Information Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification or Additional Information Request is explained.*	*The responses given by the Client or other project participants during the communications with the independent entity should be summarised in this section.*	*This section should summarise the independent entity's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

2.1 Review of Documents

The project participants submitted a PDD and additional background documents related to the project design and baseline. A review of all these documents has been performed in order to identify all issues for discussion by phone or email from July to November 2007.

2.2 Follow-up Interviews

Follow-up interviews were not applicable here for re-determination.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the determination is to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified in order to achieve a positive conclusion during the assessment process. Clarification and Corrective Action Requests raised by TÜV SÜD have been resolved by the revised PDD submitted 22nd October 2007. Furthermore additional documents have been submitted separately in order to provide the required evidences. To guarantee the transparency of the determination process, the concerns raised are and the response given are summarised in chapter 3 below. The whole process is documented in more detail in the final determination protocol in Annex 1.

3 DETERMINATION FINDINGS

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

1. The findings from the desk review of the project design document and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Determination Protocol in Annex 1.

2. Where TÜV SÜD has identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, has been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Determination Protocol in Annex 1.

3. Where Clarification and Corrective Action Requests have been issued, the response by the project participants to resolve these requests is summarized in the final determination report.

The final conclusions of the determination are presented consecutively.

3.1 Project Design / Mandatory Requirements

3.1.1 Discussion

The project's spatial boundaries are clearly described for the project installation and respective emissions reduction through efficiency increase of district heating network. The geographical coordinates are also included in the PDD: The project starting date is clearly defined as well as the crediting period which will cover the years 2008-2012 in accordance with the first commitment period (generation of ERUs).

The Technical Description (A.2 and A.4.3) presented in the PDD, shows a complete description of the project's system. A time table with the measures implemented by the project has been added finally. The employed technology does reflect current good practice concerning the replacement and operation of pipes and substations.

The project requires initial training and maintenance efforts. The PDD gives information from whom those training will be performed if necessary.

The Bulgarian National Focal Point has not yet issued a final Letter of Approval.

3.1.2 Findings

Clarification Request 1:

The project history should be elaborated more detailed – at least a short explanation should be given why the project now was separated in two different projects.

Response: Sofia and Pernik Projects have been separated into two independent projects for re-determination due to the facts that projects have been implemented by different project entities and project characteristics are slightly different e.g. with differing implementation timetables.

Section A.2.of PDD has been revised concerning the history of the project and reasons to separate Sofia and Pernik projects into two different projects.

Corrective Action Request 1:

The number of substations to be replaced in the project has to be clarified (7000 or all) and, anyway, does not comply with the number given in chapter A.4.2.

Response: Project will replace 10000 substations based on current plan.

Clarification Request 2:

To provide a better overview about the current status of the project and the implementation of the measures a list (maybe on a quarterly basis) about conducted DH improvement measures related to the project should be added at least as an annex to the PDD. This is a basic requirement as an additional on-site visit is not envisaged in the context of this re-determination.

Response: Measures implemented by the project are included in table 2 of PDD.

Clarification Request 3:

The project participant IBRD as trustee of the PCF is listed with the PCF´s US address (World Bank Head Office). I should be clarified in the context of the Track 1 path used for this project whether this is possible or whether a European address should be given in the PDD. This is a general question to be clarified once in general for JI.

Response: Alternate European address is indicated in Annex 1.

Corrective Action Request 2:

The project boundaries as well as the consumers of heat are not clearly identified in the description of the project boundaries. This should be corrected.

Response: The project encompasses CHP plant and Heat Only Boilers and the total District Heating network up to the point of substation outputs.

Corrective Action Request 3:

The sectoral scope of the project type should be indicated in the PDD.

Response: Sectoral scope has been added to section A.4.2.of the PDD

Clarification Request 4:

The aspect training and maintenance should at least be discussed in the current updated PDD, too.

Response: Training and maintenance is discussed is section A.2. of the PDD.

Corrective Action Request 4:

The title (first line) and the sum (last line) in tables 1 and 2 does not comply with the form in the guidelines.

Response: Tables 1 and 2 have been revised in the PDD.

Clarification Request 5:

Annex 2 comprises only limited information on the baseline (mainly only calculation of the adjustment factor). Thus the baseline information in the PDD cannot be confirmed by the limited information from annex 2. Annex 2 should be elaborated more detailed and re-traceably.

Response: Annex 2 has been elaborated in the PDD and baseline has been discussed in more detailed way.

3.1.3 Conclusion

The PPs are aware about the missing LoA. Under the preliminary assumption that all required documents will be submitted the issue can be considered as resolved. All requested clarifications and all corrective action requests have been answered during determination.

3.2 Baseline

3.2.1 Discussion

For “Sofia District Heating Project” a project specific baseline approach has been established. It has been demonstrated in the PDD that the approved CDM methodology AM0044 is not applicable here.

Since the financial situation of Toploficatsia Sofia (TS) deteriorated steadily in the end of the 1990s due to voluntary disconnections by customers, low domestic tariffs among others, the

operating deficit of the plant operator TS was partly covered through subsidies from the central government. Two baseline alternatives have been discussed:

- the continuation of the current operation and maintenance practices,
- the implementation of the project activity in the business-as-usual conditions (without the JI component).

From the point of the view of the AIE it is plausible that, given the financial state of TS and considering AIEs insights and experiences regarding the general situation in the DH sector in Bulgaria, the company would have not been able to raise the required capital to rehabilitate the DH system. This issue and AIEs evaluation was also discussed and confirmed by the involved ministries. Therefore the baseline scenario that represent the most plausible and credible scenario was the continuation with the business-as-usual operation of the DH system for the foreseeable future with no changes to the operational capacity of the system with minimum maintenance (based on historical observed business-as-usual maintenance) in order to keep the system operational.

The baseline is established in a conservative project specific manner. It does take into account the major national and/or sectoral policies, macro-economic trends and political developments. Relevant key factors are described and their impact on the baseline and the project risk is evaluated.

3.2.2 Findings

Clarification Request 6:

The source “Modalities and Procedures for CDM ….”, which offers guidance in selection of project specific baseline approaches, is a extremely generalized source. The aspect “project – specific approach” should be elaborated much more detailed with reference on current guidance given by JI-Supervisory Committee for projects running under track 2 (but also valid for track 1).

> Response: Approach based on guidance by Joint Implementation Supervisory Committee has been elaborated in section B.1.of PDD.

Clarification Request 7:

The following report mentioned in the Excel based workbook under the folder “instructions” is not available; the quoted Annex 5 should be clarified.

Pöyry Report 60K05788.01.Q010 to EBRD, September 25, 2006 'Preliminary methodology for Monitoring and Verification of Energy Efficiency Measures (see Annex 5”).

In general: All literature and reports referred to in the PDD and in the calculations should be submitted to the determinator before final approval of the project.

> Response: Pöyry Report 60K05788.01.Q010 to EBRD, September 25, 2006 “Preliminary methodology for Monitoring and Verification of Energy Efficiency Measures” has been provided to the Determinator.

Clarification Request 8:

The District Heating Plant is within the project boundary, meanwhile information about the type of plant and installed power is not indicated in the PDD; the data in the folder "inputs and results" cannot be validated without that information, please clarify.

Furthermore there is a need to clarify the value for the "Predicted Baseline Fuel Use" in the folder "Baseline".

Response: Type of plants and capacities are included in section A.2.of the PDD.

Predicted Baseline Fuel used is calculated based on electricity generated and baseline heat production utilizing regression model based on correlation. Pls. see Figure 3 for details. Predicted Fuel Use = Fuel use in baseline * heating value of fuel. Natural gas and heavy fuel oil consumption in baseline is calculated based on historical correlation equations presented in section D.1.1.4. of the PDD. Gross baseline heat generation and gross electricity generation in the baseline scenario are the input values of the correlation equations.

Clarification Request 9:

Please clarify the GHG conversion factors in the folder "lookups" (e.g. by literature source) and give evidence why national conversion factors are not applicable here.

Response: IPCC conversion factors have been utilized. National conversion factor for natural gas is 55.82 kg/GJ in most recent Bulgarian National Inventory report. While the IPCC default value is 56.1 kg/GJ, the difference is insignificant (i.e. below 1%) in volume of ERs.

Caloric values are provided by the project entity.

Correction Action Request 5:

The baseline scenario and the project scenario and their basic assumptions should be described in more detail. Further it should be explained why the baseline scenario exceeds the emissions of project scenario and which assumptions are made in the project to demonstrate this. It has to be clearly highlighted that emission reductions in the project case related to reduced consumption (for example less consumers, reduced demand (higher temperatures in the winter season in Bulgaria over the past years) or reduction measures (insulation measures, installation of heat consumption meters) at the consumer side are definitely excluded in the calculation of emission reductions.

Response: Baseline calculation is based on actual heat sold (measured after substations) and baseline emissions are calculated backwards.

Changes in e.g. less consumers and reduced demand would be reflected exactly similarly in project and baseline cases.

It is assumed that possible measures at apartment level have not had any significant influence as e.g. heat meters were installed before the project and there have been no major insulation measures in apartment buildings.

Should future rehabilitation projects at apartment level impact the specific heat consumption, it could trigger the need to revise the relevant part of the baseline (Adjustment factor). This can be monitored via change of specific heat consumption during verification stage, i.e. should specific heat consumption considerably decrease after the full implementation of the project.

Correction Action Request 6:

Remarks and/or hints regarding regulatory or legal requirements should be added in chapter B.2 of the PDD.

Response: There are no specific legal requirements related to the project, especially regarding the rehabilitation of DH network and substations.

The project for rehabilitation of the heat energy supply system in Sofia has been established in full compliance with the elaborated energy strategy by the Council of Ministers of Republic Bulgaria and approved by the National Assembly.

Correction Action Request 7:

Please include information on greenhouse gases, their source and whether the source is within or outside the project boundaries in the PDD. The requirements and rules/guidance for JI project has made a big step forward within the last three years, thus also for a track 1 project the guidance given by JI-SC should be taken into account to guarantee transparency, conservativeness, re-traceability and plausibility of assumptions/calculations also in track 1 projects (see as an example the approved JI project for Podilsky Cement in Ukraine).

http://ji.unfccc.int/JI_Projects/DB/BPTY5S44EIX1J50RM66G4QOACHEV2G/Determination/TUEV-SUED1169913262.47/historicalDeterminationReport.html

Response: Reduction of CO_2 emissions due to project are taken into account from (i) Sofia CHP Plant, (ii) Heat Only Boilers (ii) from the grid due to more efficient pumps.

Emissions related to BAU replacement of pipes are added to the project emissions.

Table concerning the sources of emissions has been included in section B.3. of the PDD.

Tracking database also calculates CH_4 and N_2O emissions from CHP and HOB Plants but these emissions are negligible (below 0.5%).

Correction Action Request 8:

Please provide date of baseline setting in the format DD/MM/YYYY as indicated in the guideline.

Response: Date formats have updated in sections B.4.and D.4.of the PDD.

3.2.3 Conclusion

The financial barriers are plausible and seem to be retraceable that JI revenues increase the willingness of financial institutions to provide reasonable loans. The project complies with appropriate regulations.

However, the applied emission factors which are not the most conservative need to be confirmed by the host country and the country purchasing the credits.

3.3 Duration of the Project

3.3.1 Discussion

The crediting period for the emission reduction units ERUS is defined as being from 2008 – 2012 in accordance with the first commitment period defined in the Kyoto Protocol.

The project implementation schedules are defined. The PDD defines as starting date 1st of October 2003 which is plausible considering the pre-determination report of 2004. The operational lifetime of the project is announced to last 25 years. This timeframe is sufficiently conservative.

3.3.2 Findings

Corrective Action Request 9:

But please differentiate more transparently and clearly between the first commitment period under the Kyoto protocol and the time before – as this is not an official time period for track 1. Please also highlight in the PDD that you want to go for track 1 (which reduces some requirements for your project).

> Response: The first commitment period and early credits have been differentiated in a more clear way in the PDD.
>
> JI Track 1 is discussed in section A.2. of PDD.

3.3.3 Conclusions

The Kyoto period is explicit defined as being from January 1,2008 until December 31,2012 in accordance with the first commitment period defined in the Kyoto Protocol.

The revised PDD is resolving the belonging issues. The project is in compliance with the requirements.

3.4 Monitoring Plan

3.4.1 Discussion

The monitoring methodology for the hydropower projects is rather straightforward and does reflect current good practice and is supported by the monitored and recorded data. The monitoring provisions are in line with the project boundaries.

No leakage emissions are monitored according to the monitoring plan as there are no emissions to be expected. The monitoring methodology for the district heating project does reflect current good practice.

The monitoring plan does not provide the collection of environmental impacts. The approvals of EIA or the construction permits show that there are not any relevant environmental impacts.

3.4.2 Findings

Corrective Action Request 10:

There is a need to describe the measurement method and the QA/QC procedure for the parameter Electricity consumed in frequency controlled pumps.

In general: There is no clear information available on accuracy/uncertainty of the parameters/measurements and also no information available whether there are cross-check opportunities in case measurements/monitoring fails or data get lost.

Response: The measurement of consumed electricity from frequency converter motors is carried out by means of measurement system. It includes measurement transformers, electric meter, secondary circuit measurement, terminals and fuses. Comparison can be made for the quantity of measured electricity through the energy balance based on all flows. More details concerning accuracy/uncertainty of the parameters/measurements as well as cross-checks are included in section D.1.5. of the PDD.

Bulgarian regulations require that all measurement equipment should be calibrated at regular intervals according to specified standards. The calibrations are undertaken either by government organizations or in some cases by private companies. Heat meters are calibrated based on national requirement every two years.

Clarification Request 10:

But please discuss whether there might be a need (if applicable) to measure the steam production (if any) and in which way changes in steam production can influence the calculation of emission reductions.

Response: Steam production for the industry equals to 1-2 % of total heat supply. No energy efficiency improvements have been made for steam network or appliances, and therefore steam production is expected to be constant over the period 2005-2012. Because of negligible and unchangeable amount of produced steam, the steam production can not influence the calculation of emission reductions and therefore it has been disregarded. However, the steam production is reflected in project emissions as emissions are calculated based on fuel consumption. As emissions related to steam production are taken into account in project case but not in baseline case, approach is conservative as baseline emissions are underestimated.

Corrective Action Request 11:

There is a need to describe the QA/QC procedure for the calculated parameter natural gas consumption.

Response: The calculated natural gas consumption is automatically calculated by tracking database based on input data required.

The main input data is heat sold. Heat meters are installed in substations under the art.5 from the Measurement Law. Measurement devices are verified by authorized laboratories with eligibility certificates according to the "Regulation for measurement devices, subjected to metrological control". The data from the heat meters are contained in the heat meters memory for a period of 36 months. At the beginning of each month technician, in the presence of the representative of the apartment house, as per the requirements of the Energy Law, records the heat meter data by a hand-held terminal. A server with software for heat meter data processing is installed in each DH region. The final data are prepared in the table form and handed over to the computational center of Toplofikazia Sofia for invoicing of heat sold. After review of the invoiced heat energy of the consumers, the printing lists with invoices in due diligence are signed by the directors of respective DH regions. The primary data are stored in the technical departments of each DH region, and the final data in Commercial Department of Toplofikazia Sofia AD.

Corrective Action Request 12:

Add in PDD information about the parameter Heavy Fuel Oil consumption, if applicable.

Response: Information is included in section D.1.1.1.

Corrective Action Request 13:

There is a need to describe the QA/QC procedure for the calculated parameter Baseline Heat Production.

Response: Baseline heat sold is calculated based on measured heat sold.

The important part of the project is the reduction of network losses. Therefore, the heat sold to clients is monitored instead of heat produced (heat sold = heat produced - losses). In the baseline, heat produced is calculated based on heat sold in baseline, substation losses and network losses during the historical reference years.

Pls. see also reply to CAR 11.

Corrective Action Request 14:

It should be described why not the heat produced and delivered to the grid but the heat sold to clients is used as monitoring parameter.

Response: Pls. see the reply to CAR 13.

3.4.3 Conclusion

All aspects regarding future responsibilities for registration, monitoring, measurement are already fixed in advance. Procedures for training of monitoring personnel are described, too.

The discussed issues are considered to be resolved. The project does fulfil all the prescribed requirements completely.

3.5 Calculation of GHG Emissions

3.5.1 Discussion

The project's spatial boundaries are clearly described. Uncertainties in the GHG emissions estimates are addressed in the documentation.

No further aspects of leakage have been identified; hence further leakage calculation is not requested.

The project will definitely result in fewer GHG emissions than the baseline scenario. The calculation of emission reductions is correctly computed. Baseline emissions have been calculated in a conservative manner.

3.5.2 Findings

No findings

3.5.3 Conclusion

The project does fulfil all the prescribed requirements completely.

3.6 Environmental Impacts

The pre-determination of environmental impacts did cover sufficiently this subject.

3.7 Local stakeholder process

The pre-determination of local stakeholder process did cover sufficiently this subject.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project design document on its website for 30 days from.

Due to the second assessment a second global stakeholder project has been launched according to UNFCCC regulations as well. The project was published for 30 days (July 3 to August 1, 2007) under
http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=3317&Ebene1_ID=26&Ebene2_ID=1008&mode=1

No comments have been received in this period.

5 DETERMINATION OPINION

The Certification Body "Climate and Energy" has been ordered by The World Bank, Washington to perform a re-determination of the above mentioned project. The first assessment took place in 2004 and is documented in the determination report No. 362472, issued19th February 2004. For registration purpose TÜV SÜD re-assessed the mentioned project under current regulations and JI track 1. The final result here with is the conclusion of the previous and current determination.

Using a risk based approach; the determination of this project has been performed only by document reviews and interviews by e-mail and via telephone with the client.

As the result of this procedure, it can be confirmed that the submitted project documentation is in line with all requirements set by the Marrakech Accords and the Kyoto Protocol and relevant guidelines of Bulgarian Designated National Authority. The sole remaining outstanding issue is the missing of the (final) Letter of Approvals of the involved Annex-I-Parties.

Apart of this requirement, TÜV SÜD can recommend this project for acceptance as JI Track 1 project according to the recent Bulgarian rules.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 1.337.926 tonnes CO_{2e} within the whole Kyoto crediting period from 2008 to 2012 (to be issued as ERUs) since the starting date of the project January 1, 2008 until end of 2012 represent a reproducible estimation using the assumptions given by the project documents.

As these figures will depend on the future performance of the project, this confirmation gives no guarantee on the realisation.

The determination is based on the information made available to us and the engagement conditions detailed in this report. The determination has been performed using a risk-based approach as described above. The only purpose of the report is its use during the registration process as JI project under track 1. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the determination opinion, which will go beyond that purpose.

Munich, 2008-02-11

Thomas Kleiser

Project Manager

Munich, 2008-02-11

Werner Betzenbichler

Certification Body
Climate and Energy

Annex 1

Determination Checklist

Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PDD in GSP	Final PDD
A. General description of the project				
A.1. Title of the project activity:				
A.1.1. Does the used project title clearly enable to identify the unique JI activity?	8	Yes, the title of the project is clearly indicated. There is no risk of mix-up with any other project in the region.	☑	☑
A.1.2. Are there an indication of a revision number and the date of the revision?	8	Yes, version number and date of the document are indicated. The current PDD is an update and extraction of a PDD in which rehabilitation and improvement measures in the district heating systems of Sofia and Pernik have been considered together. This PDD has already been validated positively by TÜV SÜD in early 2004. **Clarification Request No. 1:** The project history should be elaborated more detailed – at least a short explanation should be given why the project now was separated in two different projects.	**CR 1**	☑
A.1.3. Is this in consistency with the time line of the project's history?	2, 8	The implementation of the project started already in 2003 (see chapter C.1 of the PDD). TÜV SÜD issued a pre-determination report on February 19th 2004. The summarizing conclusion herein was: "Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions, 1.348.579 tons CO_{2e} during the intended crediting period from 2004 to 2012 in case of Sofia District Heating and of 191.137 tons CO_{2e} during the intended crediting period from 2004 to 2012 in case of Pernik." The crediting period is starting in 2008.	☑	☑

A.2.	**Description of the project activity:**				
A.2.1.	Is the description delivering a transparent overview of the project activities?	1, 8	Yes, the purpose of the project (background) as well as the project itself is explained. The reasons for the Re-Determination are clearly identified. **<u>CORRECTIVE ACTION REQUEST No. 1:</u>** The number of substations to be replaced in the project has to be clarified (7000 or all) and, anyway, does not comply with the number given in chapter A.4.2.	**CAR 1**	☑
A.2.2.	What proofs are available evidencing that information provided in the description is in compliance with actual situation or planning?	1, 8	See results of the pre-determination in 2004. The starting situation for the project could be confirmed in the on-site audit in November 2003 in the context of the first determination. But since end of 2003 more than 3 1/ years have passed in which diverse measures in this project have been implemented. These are: - replacement of piping, - replacement of substations with new heat exchangers and pumps. The time-schedule for the implementation of these measures is not given in the PDD. The implementation itself has not been verified by the validator. **<u>Clarification Request No. 2:</u>** To provide a better overview about the current status of the project	**CR 2**	☑

			and the implementation of the measures a list (maybe on a quarterly basis) about conducted DH improvement measures related to the project should be added at least as an annex to the PDD. This is a basic requirement as an additional on-site visit is not envisaged in the context of this re-determination.		
A.2.3.	Is the information provided by these proofs consistent with the information provided by the PDD?	8	See CR 2 above.	☑	☑
A.2.4.	Is all information provided in consistency with details provided by further chapters of the PDD?	8	See CR 2 above.	☑	☑
A.3. Project participants:					
A.3.1.	Is the form required for the indication of project participants correctly applied?	8	Yes	☑	☑
A.3.2.	Is the participation of all listed entities or Parties confirmed by each of them?	2	Yes, this was already part of the successful determination in 2004.	☑	☑
A.3.3.	Is all information provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	1, 8	Yes, see above **Clarification Request No. 3:** The project participant IBRD as trustee of the PCF is listed with the PCF´s US address (World Bank Head Office). It should be clarified in the context of the Track 1 path used for this project whether this is possible or whether a European address should be given in the PDD. This is a general question to be clarified once in general for JI.	**CR 3**	☑
A.4. Technical description of the project activity:					
A.4.1.	*Location of the project activity:*				

A.4.1.1.	Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	8	The description in chapter B.3 is very limited and not verbally underlined and explained. According to guidance given by UNFCCC for JI projects – even if this is (probably) a project that can run under track 1 – the project boundaries should be described and worked out more clearly. This means (to be described at least verbally): - Are the spatial boundaries of the project identical with the spatial extension of the municipalities of Sofia, Sofia East, Zemliane and Luilin or is there a limiting? - Does the number of households connected to the DH change over time (there should be experiences from the last 3 years). - In the Sofia District Heating Company hot water and electricity are produced. Is there as well steam or hot water production for industrial purposes? If applicable, how many companies take delivery of steam or hot water and did the number change over time? - Are the project boundaries before and after the project the same or did some consumers (e.g. industrial consumers) change the supplier/way of supply? **<u>CORRECTIVE ACTION REQUEST No. 2:</u>** The project boundaries as well as the consumers of heat are not clearly identified in the description of the project boundaries. This should be corrected.	**CAR 2**	☑
A.4.1.2.	How is it ensured, that the project proponents can implement the project at this site (ownership, licenses, contracts etc.)?	2, 8	These questions have already been finally solved during the pre-determination in 2003/2004. There are no open issues related to ownerships, licenses and contracts over the runtime of this project	☑	☑
A.4.2.	*Technology(ies) to be employed, or measures, operations or actions to be implemented by the project activity:*				

A.4.2.1.	To which category(ies) is the project activity belonging to? Is it correctly identified and indicated?	8	The project belongs to the category II ”Energy Distribution”. **<u>CORRECTIVE ACTION REQUEST No. 3:</u>** The sectoral scope of the project type should be indicated in the PDD.	**CAR 3**	☑
Does the project design engineering reflect current good practices?		2	Yes, see the results of the pre-determination in 2003/2004.	☑	☑
A.4.2.2.	Does the description of the technology to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance?	8	Yes.	☑	☑
A.4.2.3.	Is the technology implemented by the project activity environmentally safe?	8	Yes.	☑	☑
A.4.2.4.	Is all information provided in compliance with actual situation or planning as available by the project participants?	1, 2, 8	Yes. But Please consider also CR 1	☑	☑
A.4.2.5.	Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	8	Yes.	☑	☑
A.4.2.6.	Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1, 8	No, it is not likely that within the project period a more efficient technology will come up.	☑	☑
A.4.2.7.	Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	8	No, the training can be included in the ongoing training procedures at Toplofikazia Sofia – see also results of the first determination.	☑	☑

A.4.2.8.	Does the project make provisions for meeting training and maintenance needs? Explanation how the needs for training and maintenance are covered? Are there any evidences for them (Contracts, Manuals...)?	1, 8	See results of the pre-determination. As far as necessary training programs are considered and will be conducted in parallel to the project implementation by Toplofikazia Sofia. **Clarification Request No. 4:** The aspect training and maintenance should at least be discussed in the current updated PDD, too.	**CR 4**	☑
A.4.2.9.	Is a schedule available on the implementation of the project and are there any risks for delays?	8	A rough schedule is indicated by the information in section C. But see also CR 1 and CR 2.	☑	☑
A.4.3.	*Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed project activity, including why the emission reductions would not occur in the absence of the proposed project activity, taking into account national and/or sectoral policies and circumstances:*				

A.4.3.1. Is the form required for the indication of projected emission reductions correctly applied?	8	No. **CORRECTIVE ACTION REQUEST No. 4:** The title (first line) and the sum (last line) in tables 1 and 2 do not comply with the form in the guidelines.	**CAR 4**	☑
A.4.3.2. Are the figures provided consistent with other data presented by the PDD?	8	Yes, the figures in tables 1 and 2 in chapter 4.3.1 are consistent with the figures in tables 6a and 6b of chapter E.	☑	☑
A.4.3.3. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	8	Yes,	☑	☑
A.4.3.4. Is all information provided consistent with the details given in remaining chapters of the PDD (in particular annex 2)?	1, 8	In principle, yes. **Clarification Request No. 5:** Annex 2 comprises only limited information on the baseline (mainly only calculation of the adjustment factor). Thus the baseline information in the PDD cannot be confirmed by the limited information from annex 2. Annex 2 should be elaborated more detailed and re-traceably.	**CR 5**	☑
A.5. Project approval by the Parties involved:				
Open issues related to the approval of the Parties involved are covered in a separate “completeness checklist”				
B. Baseline				
B.1. Description and justification of the baseline chosen				
B.1.1. Are reference number, version number,	8	There is no reference to any CDM methodology or something	☑	☑

	and title of the baseline and monitoring methodology clearly indicated?		comparable. The project uses a project specific approach. Baseline is determined based on existing actual or historical emissions.		
B.1.2.	Is the applied version the most recent one or still applicable?	8	Not applicable (see B.1.1)	☑	☑
B.1.3.	Is the methodology sufficiently described?	1, 3, 6, 8	Not in all aspects. **Clarification Request No. 6:** The source "Modalities and Procedures for CDM ….", which offers guidance in selection of project specific baseline approaches, is a extremely generalized source. The aspect "project –specific approach" should be elaborated much more detailed with reference on current guidance given by JI-Supervisory Committee for projects running under track 2(but also valid for track 1). **Clarification Request No. 7:** The following report mentioned in the Excel based workbook under the folder "instructions" is not available; the quoted Annex 5 should be clarified. *Pöyry Report 60K05788.01.Q010 to EBRD, September 25, 2006 'Preliminary methodology for Monitoring and Verification of Energy Efficiency Measures (see Annex 5").* In general: All literature and reports referred to in the PDD and in the calculations should be submitted to the determinator before final approval of the project. **Clarification Request No. 8:** The District Heating Plant is within the project boundary, mean-	**CR 6** **CR 7** **CR 8**	☑

		while information about the type of plant and installed power is not indicated in the PDD; the data in the folder "inputs and results" cannot be validated without that information, please clarify. Furthermore there is a need to clarify the value for the "Predicted Baseline Fuel Use" in the folder "Baseline". **<u>Clarification Request No. 9:</u>** Please clarify the GHG conversion factors in the folder "lookups" (e.g. by literature source) and give evidence why national conversion factors are not applicable here.	**CR 9**	
B.1.4.	Is the applied methodology considered being the most appropriate one?	8	Yes – the PDD describes and uses a project specific approach which is deemed to be the most appropriate for this specific type of project. This estimation is valid for Sofia DH JI project although meanwhile approved CDM methodologies are available for DH projects. But there are several reasons – mainly applicability criteria and measures in the project - why these methodologies (AM0044 and AM0036) are not applicable for this project in Sofia.	☑	☑
B.1.5.	Can the geographic and system boundaries for the relevant distribution channel clearly be identified?	8	No, see CAR 2 and CR 1 and CR 2.	☑	☑
B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the project activity					
Description of how the baseline scenario is identified and description of the identified baseline scenario					
B.2.1.	Is a description of the baseline scenario, (b) a description of the project scenario, and	7, 8	The description of the investment barrier and common practice does not focus sufficiently on the analysis showing why the emissions in the baseline scenario would likely exceed the emissions		☑

	(c) an analysis showing why the emissions in the baseline scenario would likely exceed the emissions in the project scenario.		in the project scenario. **CORRECTIVE ACTION REQUEST No. 5:** The baseline scenario and the project scenario and their basic assumptions should be described in more detail. Further it should be explained why the baseline scenario exceeds the emissions of project scenario and which assumptions are made in the project to demonstrate this. It has to be clearly highlighted that emission reductions in the project case related to reduced consumption (for example less consumers, reduced demand (higher temperatures in the winter season in Bulgaria over the past years) or reduction measures (insulation measures, installation of heat consumption meters) at the consumer side are definitely excluded in the calculation of emission reductions.	**CAR 5**	
B.2.2.	Have all technically feasible baseline scenario alternatives to the project activity been identified and discussed by the PDD?	8	Yes, see clause 1 of chapter B.1.	☑	☑
B.2.3.	Does the project identify correctly and excludes those options not in line with regulatory or legal requirements?	1, 8	No **CORRECTIVE ACTION REQUEST No. 6:** Remarks and/or hints regarding regulatory or legal requirements should be added in chapter B.2 of the PDD.	**CAR 6**	☑
B.2.4.	Have applicable regulatory or legal requirements been identified?	1, 8	No, see **CAR 6**		☑
B.2.5.	In case of applying step 2 of the additionali-	8	Argumentation given in PDD is deemed to be sufficient.	☑	☑

	ty tool: Is the analysis method appropriately identified (step 2a)?				
B.2.6.	In case of applying step 3 (barrier analysis): Is a complete list of barriers developed that prevent alternatives to occur?	8	See B.2.5	☑	☑
B.2.7.	In case of applying step 3 (barrier analysis): Is transparent and documented evidence provided on the existence and significance of these barriers?	8	See B.2.5	☑	☑
B.2.8.	In case of applying step 3 (barrier analysis): Is it transparently shown that at least one of the alternatives is not prevented by the identified barriers?	8	See B.2.5	☑	☑
B.2.9.	Have other activities in the host country / region similar to the project activity been identified and are these activities appropriately analyzed by the PDD (step 4a)?	8	See B.2.5	☑	☑
B.2.10.	If similar activities are occurring: Is it demonstrated that in spite these similarities the project activity would not be implemented without the JI (step 4b)?	8	See B.2.5	☑	☑
B.2.11.	Is it appropriately explained how the approval of the project activity will alleviate the economic and financial hurdles or other identified barriers (step 5)?	8	See B.2.5	☑	☑

B.3. Description of how the definition of the project boundary is applied to the project:				
B.3.1. Do the spatial and technological boundaries as verified on-site comply with the discussion provided by the PDD?	1, 8	Not in total – see CAR 2 and CR 1 and CR 2		☑
Description of the sources and gases included in the project boundary (Fill in the required amount of sub checklists for sources and gases as given by the methodology applied and comment at least every line answered with "No")				
B.3.2. Sources:	1, 8	Sources of emissions, gases and questions whether the sources are within in the project boundaries or not are not discussed in the PDD. Boundary checklist / Yes / No Source and gas(es) discussed by the PDD? Yes Inclusion / exclusion justified? Yes Explanation / Justification sufficient? Yes Consistency with monitoring plan? yes **CORRECTIVE ACTION REQUEST No. 7:** Please include information on greenhouse gases, their source and whether the source is within or outside the project boundaries in the PDD. The requirements and rules/guidance for JI project has made a big step forward within the last three years, thus also for a track 1 project the guidance given by JI-SC should be taken into account to guarantee transparency, conservativeness, re-traceability and plausibility of assumptions/calculations also in track 1 projects (see as an example the approved JI project for Podilsky Cement in Ukraine). http://ji.unfccc.int/JI_Projects/DB/BPTY5S44EIX1J50RM66G4QOACHEV2G/Determination/TUEV-	**CAR 7**	☑

		SUED1169913262.47/historicalDeterminationReport.html		
B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline Emissions reductions				
B.4.1. Is there any indication of a date when determining the baseline?	8	Yes, **CORRECTIVE ACTION REQUEST No. 8:** Please provide date of baseline setting in the format DD/MM/YYYY as indicated in the guideline.	**CAR 8**	☑
B.4.2. Is this in consistency with the time line of the PDD history?	8	Yes	☑	☑
B.4.3. Is information of the person(s) / entity(ies) responsible for the application of the baseline methodology provided in consistency with the actual situation?	8	Yes	☑	☑
B.4.4. Is information provided whether this person / entity is also a project participant?	8	Yes	☑	☑

C. Duration of the project activity / crediting period					
C.1.	Are the project's starting date and operational lifetime clearly defined and reasonable?	2, 8	Yes. See also results form the former determination in 2003/2004. But the starting date – at least under track 2 – also should be given in DD/MM/YYYY – please consider this in the revision of the PDD.	☑	☑
C.2.	Is the assumed crediting time clearly defined and reasonable (crediting period between 2008 and 2012)?	1, 8	Yes. **CORRECTIVE ACTION REQUEST No. 9:** But please differentiate more transparently and clearly between the first commitment period under the Kyoto protocol and the time before – as this is not an official time period for track 1. Please also highlight in the PDD that you want to go for track 1 (which reduces some requirements for your project).	**CAR 9**	☑
D. Monitoring plan					
D.1. Description of monitoring plan chosen:					
Is the applied methodology considered being the most appropriate one?		8	The figures with the flow diagrams for the baseline and project emissions are representing transparently the monitoring algorithm.	☑	☑
D.1.1.	*Monitoring of the emissions in the project scenario and the baseline scenario:*				
In the following "data checklists" are shown for all data which are fixed at determination time, and "monitoring checklists" for all data which have to be monitored during the life-time of the project.					
D.1.1.1	Data to be collected in order to monitor emissions from the **project** and how these data will be archived				

Is the list of parameters presented by chapter D.1.1.1 considered to be complete with regard to the requirements of the applied methodology?	8	see CR 7	☑	☑
ID 111.1: Natural Gas Consumption [m³]	8	Data Checklist: Yes / No Data unit correctly expressed? Yes Appropriate description? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? Yes, see D.2 QA/QC procedures described? Yes, see D.2 QA/QC procedures appropriate? Yes, see D.2	☑	☑
ID 111.2: Heavy fuel oil consumption [t]	8	Data Checklist: Yes / No Data unit correctly expressed? Yes Appropriate description? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? Yes, see D.2 QA/QC procedures described? Yes, see D.2 QA/QC procedures appropriate? Yes, see D.2	☑	☑
ID 111.3: Emission factor Heavy Fuel Oil [g CO2/MJ]	8	Data Checklist: Yes / No Data unit correctly expressed? Yes Appropriate description? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes	☑	☑

		Choice of data correctly justified? — Yes Measurement method correctly described? — NA QA/QC procedures described? — NA QA/QC procedures appropriate? — NA			
ID 111.4: Emission factor heavy fuel oil [g CO2/MJ]	8	Data Checklist — Yes / No Data unit correctly expressed? — Yes Appropriate description? — Yes Source clearly referenced? — Yes Correct value provided? — Yes Has this value been verified? — Yes Choice of data correctly justified? — Yes Measurement method correctly described? — NA QA/QC procedures described? — NA QA/QC procedures appropriate? — NA		☑	☑
ID 111.5: Electricity consumed in frequency controlled pumps [MWh]	1, 8	Data Checklist — Yes / No Data unit correctly expressed? — Yes Appropriate description? — Yes Source clearly referenced? — Yes Correct value provided? — Yes Has this value been verified? — Yes Choice of data correctly justified? — Yes Measurement method correctly described? — No QA/QC procedures described? — No QA/QC procedures appropriate? — No **CORRECTIVE ACTION REQUEST No. 10:** There is a need to describe the measurement method and the QA/QC procedure for the parameter Electricity consumed in frequency controlled pumps. In general: There is no clear information available on accuracy/uncertainty of the parameters/measurements and also no information available whether there are cross-check opportunities in case measurements/monitoring fails or data get lost.		**CAR 10**	☑

ID 111.6: Electricity grid CO2 emission factor [kg CO2/MWh]	8	Data Checklist / Yes / No Data unit correctly expressed? Yes Appropriate description? Yes Source clearly referenced? See CR 9 Correct value provided? See CR 9 Has this value been verified? See CR 9 Choice of data correctly justified? See CR 9 Measurement method correctly described? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA		☑	☑
ID 111.7: Adjustment factor for infrastructure improvement [-]	8	Data Checklist / Yes / No Data unit correctly expressed? Yes Appropriate description? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA		☑	☑
D.1.1.2 Description of formula used to estimate emissions from the project					
Are formulae required for the estimation of project emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1, 8	Mainly yes. **Clarification Request No. 10:** But please discuss whether there might be a need (if applicable) to measure the steam production (if any) and in which way changes in steam production can influence the calculation of emission reductions (see comments on A.4.1.1)		**CR 10**	☑
D.1.1.3 Data to be collected in order to determine the **baseline** emissions within the project boundary how these data will archived					
Fill in the required amount of sub checklists for fixed data parameter and comment any line answered with "No"					

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<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>ID 113.1: Natural Gas Consumption [m³]</td><td>1, 8</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>No</td></tr><tr><td>QA/QC procedures appropriate?</td><td>No</td></tr></table>
<u>CORRECTIVE ACTION REQUEST No. 11:</u>
There is a need to describe the QA/QC procedure for the calculated parameter natural gas consumption.</td><td>CAR 11</td><td>☑</td></tr>
<tr><td>ID 113.2: Emission Factor Natural Gas [g CO2/MJ]</td><td>1, 8</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>See CR 9</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table></td><td>☑</td><td>☑</td></tr>
<tr><td>ID 113.3: Heavy Fuel Oil consumption [t]</td><td>1, 8</td><td><table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr></table></td><td></td><td>☑</td></tr>
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		Choice of data correctly justified? — Yes Measurement method correctly described? — No QA/QC procedures described? — No QA/QC procedures appropriate? — No **CORRECTIVE ACTION REQUEST No. 12:** Add in PDD information about the parameter Heavy Fuel Oil consumption, if applicable.	**CAR 12**	
ID 113.4: Emission Factor Heavy Fuel Oil [g CO2/MJ]	8	Data Checklist — Yes / No Data unit correctly expressed? — Yes Appropriate description? — Yes Source clearly referenced? — Yes Correct value provided? — Yes Has this value been verified? — Yes Choice of data correctly justified? — See CR 9 Measurement method correctly described? — NA QA/QC procedures described? — NA QA/QC procedures appropriate? — NA	☑	☑
ID 113.5: Electricity Production [MWh]	8	Data Checklist — Yes / No Data unit correctly expressed? — Yes Appropriate description? — Yes Source clearly referenced? — Yes Correct value provided? — Yes Has this value been verified? — Yes Choice of data correctly justified? — Yes Measurement method correctly described? — Yes QA/QC procedures described? — Yes QA/QC procedures appropriate? — Yes	☑	☑
ID 113.6: Baseline Heat Production [MWh]	1, 8	Data Checklist — Yes / No Data unit correctly expressed? — Yes		☑

		Appropriate description? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? NA QA/QC procedures described? No QA/QC procedures appropriate? No **CORRECTIVE ACTION REQUEST No. 13:** There is a need to describe the QA/QC procedure for the calculated parameter Baseline Heat Production.	**CAR 13**	
ID 113.7: Baseline Heat Sold [MWh]	1, 8	Data Checklist: Yes / No Data unit correctly expressed? Yes Appropriate description? Yes Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? Yes QA/QC procedures described? Yes QA/QC procedures appropriate? Yes **CORRECTIVE ACTION REQUEST No. 14:** It should be described why not the heat produced and delivered to the grid but the heat sold to clients is used as monitoring parameter (maybe there s a misunderstanding).	**CAR 14**	☑
Is the list of parameters presented by chapter D.1.1.3 considered to be complete with regard to the requirements of the applied methodology?	1, 8	See CR 7		☑
D.1.1.4 Description of formula used to estimate baseline emissions				
Are formulae required for the estimation of baseline	8	Yes.	☑	☑

emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?				
D.1.3 *Treatment of leakage in the monitoring plan:*				
Is it explained how the procedures provided by the methodology are applied by the proposed project activity?	8	Yes.	☑	☑
D.1.3.1 Data to be collected in order to determine the leakage emissions outside the project boundary				
Fill in the required amount of sub checklists for fixed data parameter and comment any line answered with "No"				
131.	8	Not applicable Data Checklist / Yes / No Data unit correctly expressed? NA Appropriate description? NA Source clearly referenced? NA Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA	☑	☑
D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:				
This aspect is covered for the relevant data in section D.1.1.1, D.1.1.3 and D.1.3.1				
D.3. Please describe the operational and management structure that the project operator will apply in implementing the monitoring plan:				
D.3.1. Is the operational and management structure clearly described and in compliance with the envisioned situation? Explanation of management structure and	2	Yes, see also the results of the former determination in 2003/2004.	☑	☑

	responsibilities.			
D.3.2.	Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	2	See comment to D.3.1	☑	☑
D.3.3.	Does the monitoring plan provide current good monitoring practice?	2	See comment to D.3.1	☑	☑
D.3.4.	Does annex 3 provide useful information enabling a better understanding of the envisioned monitoring provisions?	2	See comment to D.3.1	☑	☑
D.4.	**Name of person(s)/entity(ies) establishing the monitoring plan:**				
D.4.1.	D.4.1 Is information of the person(s) / entity(ies) responsible for the monitoring methodology provided in consistency with the actual situation?	2	Yes – but see also D.3.1.	☑	☑
D.4.2.	D.4.2 Is information provided whether this person / entity is also a project participant?	2	Yes - but see also D.3.1.	☑	☑
E. Estimation of greenhouse gas emission reductions					
E.1.	**Estimated project emissions and formulae used in the estimation**				
E.1.1.	Are formulae required for the estimation of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1, 8	No, not applicable – but at least some verbal argumentation on this issue should be added to the revised final PDD.	☑	☑
E.2.	**Estimated leakage and formulae used in the estimation, if applicable:**				
E.2.1.	Are formulae required for the estimation of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1, 8	No – see comment to E.1.1.	☑	☑

E.2.2. Why are the leakage emissions not constant over the years?	1, 8	Not applicable – see also E.1.1	☑	☑
E.3. The sum of E.1. and E.2.:				
E.3.1. Is the data provided under this section in consistency with data as presented by other chapters of the PDD?	1, 3, 6, 8	See comments and clarification requests in B.1.3	☑	☑
E.4. Estimated baseline emissions and formulae used in the estimation:				
Ex-ante calculation of emission reductions				
E.4.1. Is the projection based on the same procedures as used for later monitoring?	1, 3, 6, 8	See comments and clarification requests in B.1.3	☑	☑
E.4.2. Is the data provided under this section in consistency with data as presented by other chapters of the PDD?	1, 3, 6, 8	See comments and clarification requests in B.1.3	☑	☑
E.4.3. Are formulae required for the estimation of baseline emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1, 3, 6, 8	See comments and clarification requests in B.1.3 The figures for the emission reductions from 2004 to 2006 had been confirmed by the figures in Pöyry Report 2007 based on original and revised data base.	☑	☑
E.5. Difference between E.4. and E.3 representing the emission reductions of the project:				
E.5.1. Are formulae required for the determination of emission reductions correctly presented?	1, 3, 6, 8	See comments and clarification requests in B.1.3	☑	☑
E.6. Table providing values obtained when applying formulae above:				
E.6.1. Will the project result in fewer GHG emissions than the baseline scenario?	1, 3, 6, 8	See comments and clarification requests in B.1.3	☑	☑

E.6.2. Is the form/table required for the indication of projected emission reductions correctly applied?	1, 3, 6, 8	See comments and clarification requests in B.1.3	☑	☑
E.6.3. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	1, 3, 6, 8	See comments and clarification requests in B.1.3	☑	☑
E.6.4. Is the data provided under this section in consistency with data as presented by other chapters of the PDD?	1, 3, 6, 8	See comments and clarification requests in B.1.3	☑	☑
F. Environmental impacts				
	2	The environmental impacts were sufficiently pre-determined in 2003/2004. Hence, there is no need to reassess this subject.	☑	☑
G. Stakeholders' comments				
	´2	The stakeholder's comments were sufficiently pre-determined in 2003/2004. Hence, there is no need to reassess this subject.	☑	☑

H. Annexes 1 – 3				
Annex 1: Contact Information				
1. Is the information provided in consistency with the	8	Yes	☑	☑

one given under section A.3?				
2. Is information on all private participants and directly involved Parties presented?	1, 8	**Clarification Request No. 11:** The telephone and Fax number of the IBRD representative is not indicated.	**CAR 11**	☑
Annex 2: Baseline study				
1. If additional background information on baseline data is provided: Is this information in consistency with data presented by other sections of the PDD?	1, 3, 6, 8	See comments in B.1.3	☑	☑
2. Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	1, 3, 6, 8	See comments in B.1.3	☑	☑
3. Does the additional information substantiate statements given in other sections of the PDD?	1, 3, 6, 8	See comments in B.1.3	☑	☑
Annex 3: Monitoring information				
4. If additional background information on monitoring is provided: Is this information in consistency with data presented by other sections of the PDD?	8	Not Applicable	☑	☑
5. Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	8	Not Applicable	☑	☑
6. Do the additional information / procedures substantiate statements given in other sections of the PDD?	8	Not Applicable	☑	☑

Industrie Service

Table 2 Resolution of Corrective Action and Clarification Requests

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
Clarification Request No. 1: The project history should be elaborated more detailed – at least a short explanation should be given why the project now was separated in two different projects.	A.1.2	Sofia and Pernik Projects have been separated into two independent projects for re-determination due to the facts that projects have been implemented by different project entities and project characteristics are slightly different e.g. with differing implementation timetables. Section A.2.of PDD has been revised concerning the history of the project and reasons to separate Sofia and Pernik projects into two different projects.	Closed A separate determination protocol has been elaborated for Pernik DHC project.
CORRECTIVE ACTION REQUEST No. 1: The number of substations to be replaced in the project has to be clarified (7000 or all) and, anyway, does not comply with the number given in chapter A.4.2.	A.2.1	Project will replace 10000 substations based on current plan.	Closed The number of substations to be replaced has been modified.
Clarification Request No. 2: To provide a better overview about the current status of the project and the implementation of the measures a list (maybe on a quarterly basis) about conducted DH improvement measures related to the project should be added at least as an annex to the PDD. This is a basic requirement as an additional on-site visit is not envisaged in the context of this re-determination.	A.2.2	Measures implemented by the project are included in table 2 of PDD.	Closed According to the new information most of substations have been implemented.

Clarification Request No. 3: The project participant IBRD as trustee of the PCF is listed with the PCF´s US address (World Bank Head Office). I should be clarified in the context of the Track 1 path used for this project whether this is possible or whether a European address should be given in the PDD. This is a general question to be clarified once in general for JI.	A.3.3	Alternate European address is indicated in Annex 1.	Closed
CORRECTIVE ACTION REQUEST No. 2: The project boundaries as well as the consumers of heat are not clearly identified in the description of the project boundaries. This should be corrected.	A.4.1.1	The project encompasses CHP plant and Heat Only Boilers and the total District Heating network up to the point of substation outputs.	Closed Figure 2 indicates the boundary of the project. The Sofia District Heating Company, also referred to as Toplofikazia Sofia (TS), a municipal and government owned company distributes hot water to four separated distribution networks – Sofia, Sofia East, Zemliane, and Luilin.
CORRECTIVE ACTION REQUEST No. 3: The sectoral scope of the project type should be indicated in the PDD.	A.4.2.1	Sectoral scope has been added to section A.4.2.of the PDD	The sectoral scope indicated in the revised PDD is 2 “Energy distribution”.

Clarification Request No. 4: The aspect training and maintenance should at least be discussed in the current updated PDD, too.	A.4.2.9	Training and maintenance is discussed is section A.2. of the PDD.	Closed
CORRECTIVE ACTION REQUEST No. 4: The title (first line) and the sum (last line) in tables 1 and 2 does not comply with the form in the guidelines.	A.4.3.1	Tables 1 and 2 have been revised in the PDD.	Closed
Clarification Request No. 5: Annex 2 comprises only limited information on the baseline (mainly only calculation of the adjustment factor). Thus the baseline information in the PDD cannot be confirmed by the limited information from annex 2. Annex 2 should be elaborated more detailed and retraceably.	A.4.3.4	Annex 2 has been elaborated in the PDD and baseline has been discussed in more detailed way.	Closed More useful information and a table with tracking database results have been added now to the Annex 2.
Clarification Request No. 6: The source "Modalities and Procedures for CDM ….", which offers guidance in selection of project specific baseline approaches, is a extremely generalized source. The aspect "project –specific approach" should be elaborated much more detailed with reference on current guidance given by JI-Supervisory Committee for projects running under track 2 (but also valid for track 1).	B.1.3	Approach based on guidance by Joint Implementation Supervisory Committee has been elaborated in section B.1.of PDD.	It has been clarified that the CDM methodology AM0044 "Energy efficiency improvement projects: boiler rehabilitation or replacement in industrial and district heating sectors" is not applicable here as it is not a boiler rehabilitation project.

Clarification Request No. 7: The following report mentioned in the Excel based workbook under the folder "instructions" is not available; the quoted Annex 5 should be clarified. *Pöyry Report 60K05788.01.Q010 to EBRD, September 25, 2006 'Preliminary methodology for Monitoring and Verification of Energy Efficiency Measures (see Annex 5").* In general: All literature and reports referred to in the PDD and in the calculations should be submitted to the determinator before final approval of the project.	B.1.3	Pöyry Report 60K05788.01.Q010 to EBRD, September 25, 2006 "Preliminary methodology for Monitoring and Verification of Energy Efficiency Measures" has been provided to the Determinator.	Closed The quoted report is available.
Clarification Request No. 8: The District Heating Plant is within the project boundary, meanwhile information about the type of plant and installed power is not indicated in the PDD; the data in the folder "inputs and results" cannot be validated without that information, please clarify. Furthermore there is a need to clarify the value for the "Predicted Baseline Fuel Use" in the folder "Baseline".	B.1.3	Type of plants and capacities are included in section A.2.of the PDD. Predicted Baseline Fuel used is calculated based on electricity generated and baseline heat production utilizing regression model based on correlation. Pls. see Figure 3 for details. Predicted Fuel Use = Fuel use in baseline * heating value of fuel. Natural gas and heavy fuel oil consumption in baseline is calculated based on historical correlation equations presented in section D.1.1.4. of the PDD. Gross baseline heat generation and gross electricity generation in the baseline scenario are the input values of the correlation equations.	The energy consumption stated in Annex 2 is plausible regarding the installed thermal power indicated now in PDD.

Clarification Request No. 9: Please clarify the GHG conversion factors in the folder "lookups" (e.g. by literature source) and give evidence why national conversion factors are not applicable here.	B.1.3	IPCC conversion factors have been utilized. National conversion factor for natural gas is 55.82 kg/GJ in most recent Bulgarian National Inventory report. While the IPCC default value is 56.1 kg/GJ, the difference is insignificant (i.e. below 1%) in volume of ERs. Caloric values are provided by the project entity.	The Excel calculation "Tracking Data Base 2004 to 2006" applies figures from 1996 IPCC guideline, Meanwhile 2006 IPCC guideline is available and the figure for heavy fuel oil is slightly deferring from that applied here but it has been demonstrated that it is still a conservative approach. The Excel calculation "Tracking Data Base 2004 to 2006" applies figures for electricity grid CO2 emission factors for Bulgaria. These figures are listed as forecast maximum demand, hydro power included, average dispatch data in: **http://www2.moew.government.bg/recent_doc/climate/Baseline%20CEF%20Summary.pdf** Dispatch data adjusted under the same category of emission factors are more conservative than the applied ones. However, the applied emission factors need to be confirmed by the host country and the country purchasing the credits.

CORRECTIVE ACTION REQUEST No. 5: The baseline scenario and the project scenario and their basic assumptions should be described in more detail. Further it should be explained why the baseline scenario exceeds the emissions of project scenario and which assumptions are made in the project to demonstrate this. It has to be clearly highlighted that emission reductions in the project case related to reduced consumption (for example less consumers, reduced demand (higher temperatures in the winter season in Bulgaria over the past years) or reduction measures (insulation measures, installation of heat consumption meters) at the consumer side are definitely excluded in the calculation of emission reductions.	B.2.1	Baseline calculation is based on actual heat sold (measured after substations) and baseline emissions are calculated backwards. Changes in e.g. less consumers and reduced demand would be reflected exactly similarly in project and baseline cases. It is assumed that possible measures at apartment level have not had any significant influence as e.g. heat meters were installed before the project and there have been no major insulation measures in apartment buildings. Should future rehabilitation projects at apartment level impact the specific heat consumption, it could trigger the need to revise the relevant part of the baseline (Adjustment factor). This can be monitored via change of specific heat consumption during verification stage, i.e. should specific heat consumption considerably decrease after the full implementation of the project.	Closed**,** evidence for the emission reduction calculation years 2007 as well 2008 to 2012 has been given by submitting the corresponding excel spread sheet.
CORRECTIVE ACTION REQUEST No. 6: Remarks and/or hints regarding regulatory or legal requirements should be added in chapter B.2 of the PDD.	B.2.3	There are no specific legal requirements related to the project, especially regarding the rehabilitation of DH network and substations. The project for rehabilitation of the heat energy supply system in Sofia has been established in full compliance with the elaborated energy strategy by the Council of Ministers of Republic Bulgaria and approved by the National Assembly.	Closed

CORRECTIVE ACTION REQUEST No. 7: Please include information on greenhouse gases, their source and whether the source is within or outside the project boundaries in the PDD. The requirements and rules/guidance for JI project has made a big step forward within the last three years, thus also for a track 1 project the guidance given by JI-SC should be taken into account to guarantee transparency, conservativeness, re-traceability and plausibility of assumptions/calculations also in track 1 projects (see as an example the approved JI project for Podilsky Cement in Ukraine). http://ji.unfccc.int/JI_Projects/DB/BPTY5S44EIX1J50RM66G4QOACHEV2G/Determination/TUEV-SUED1169913262.47/historicalDeterminationReport.html	B.3.2	Reduction of CO2 emissions due to project are taken into account from (i) Sofia CHP Plant, (ii) Heat Only Boilers (ii) from the grid due to more efficient pumps. Emissions related to BAU replacement of pipes are added to the project emissions. Table concerning the sources of emissions has been included in section B.3. of the PDD. Tracking database also calculates CH_4 and N2O emissions from CHP and HOB Plants but these emissions are negligible (below 0.5%).	Closed The calculated CH_4 and N_2O emissions from combustion of fossil fuel are small compared to CO_2 emissions but, however, the approach is conservative.
CORRECTIVE ACTION REQUEST No. 8: Please provide date of baseline setting in the format DD/MM/YYYY as indicated in the guideline.	B.4.1	Date formats have updated in sections B.4.and D.4.of the PDD.	Closed

CORRECTIVE ACTION REQUEST No. 9: But please differentiate more transparently and clearly between the first commitment period under the Kyoto protocol and the time before – as this is not an official time period for track 1. Please also highlight in the PDD that you want to go for track 1 (which reduces some requirements for your project).	C.2	The first commitment period and early credits have been differentiated in a more clear way in the PDD. JI Track 1 is discussed in section A.2. of PDD.	Closed
CORRECTIVE ACTION REQUEST No. 10: There is a need to describe the measurement method and the QA/QC procedure for the parameter Electricity consumed in frequency controlled pumps. In general: There is no clear information available on accuracy/uncertainty of the parameters/measurements and also no information available whether there are cross-check opportunities in case measurements/monitoring fails or data get lost.	D.1.1 (ID 111.5)	The measurement of consumed electricity from frequency converter motors is carried out by means of measurement system. It includes measurement transformers, electric meter, secondary circuit measurement, terminals and fuses. Comparison can be made for the quantity of measured electricity through the energy balance based on all flows. More details concerning accuracy/uncertainty of the parameters/measurements as well as cross-checks are included in section D.1.5. of the PDD. Bulgarian regulations require that all measurement equipment should be calibrated at regular intervals according to specified standards. The calibrations are undertaken either by government organizations or in some cases by private companies. Heat meters are calibrated based on national requirement every two years.	Closed QA/QC procedures finally have been revised in a comprehensive manner.

Clarification Request No. 10: But please discuss whether there might be a need (if applicable) to measure the steam production (if any) and in which way changes in steam production can influence the calculation of emission reductions.	D.1.1.2	Steam production for the industry equals to 1-2 % of total heat supply. No energy efficiency improvements have been made for steam network or appliances, and therefore steam production is expected to be constant over the period 2005-2012. Because of negligible and unchangeable amount of produced steam, the steam production can not influence the calculation of emission reductions and therefore it has been disregarded. However, the steam production is reflected in project emissions as emissions are calculated based on fuel consumption. As emissions related to steam production are taken into account in project case but not in baseline case, approach is conservative as baseline emissions are underestimated.	Closed

CORRECTIVE ACTION REQUEST No. 11: There is a need to describe the QA/QC procedure for the calculated parameter natural gas consumption.	D.1.1.3 (ID 113.1)	The calculated natural gas consumption is automatically calculated by Tracking database based on input data required. The main input data is heat sold. Heat meters are installed in substations under the art.5 from the Measurement Law. Measurement devices are verified by authorized laboratories with eligibility certificates according to the "Regulation for measurement devices, subjected to metrological control". The data from the heat meters are contained in the heat meters memory for a period of 36 months. At the beginning of each month technician, in the presence of the representative of the apartment house, as per the requirements of the Energy Law, records the heat meter data by a hand-held terminal. A server with software for heat meter data processing is installed in each DH region. The final data are prepared in the table form and handed over to the computational center of Toplofikazia Sofia for invoicing of heat sold. After review of the invoiced heat energy of the consumers, the printing lists with invoices in due diligence are signed by the directors of respective DH regions. The primary data are stored in the technical departments of each DH region, and the final data in Commercial Department of Toplofikazia Sofia AD.	Closed Finally the QA/QC procedure for the calculated parameter natural gas consumption has been demonstrated in a more comprehensive manner.
CORRECTIVE ACTION REQUEST No. 12: Add in PDD information about the parameter Heavy Fuel Oil consumption, if applicable.	D.1.1.3 (ID 113.3)	Information is included in section D.1.1.1.	Closed

CORRECTIVE ACTION REQUEST No. 13: There is a need to describe the QA/QC procedure for the calculated parameter Baseline Heat Production.	D.1.1.3 (ID 113.6)	Baseline heat sold is calculated based on measured heat sold. The important part of the project is the reduction of network losses. Therefore, the heat sold to clients is monitored instead of heat produced (heat sold = heat produced - losses). In the baseline, heat produced is calculated based on heat sold in baseline, substation losses and network losses during the historical reference years. Pls. see also reply to CAR 11.	Closed The QA/QC procedure for the calculated parameter Baseline Heat Production has been described in more detail.
CORRECTIVE ACTION REQUEST No. 14: It should be described why not the heat produced and delivered to the grid but the heat sold to clients is used as monitoring parameter.	D.1.1.3 (ID 113.7)	Pls. see the reply to CAR 13.	Closed
Clarification Request No. 11: The telephone and Fax number of the IBRD representative is not indicated.	Annex 1-2	The telephone and Fax number of the IBRD representative are included in Annex 1.	Closed

Table 3 Unresolved Corrective Action and Clarification Requests (in case of denials)

Clarifications and / or corrective action requests by validation team	Id. of CAR/CR	Explanation of Conclusion for Denial
-	-	-

Annex 2

Information Reference List

Reference No.	Document or Type of Information
1.	Interviews by e-mail or telephone, conducted from July to November 2007 by auditing team of TÜV SÜD: Validation team: Robert Mitterwallner — TÜV SÜD Industrie Service GmbH, GHG Auditor Interviewed persons: Kari Hämekoski — World Bank, Senior Technical Specialist
2.	Determination Report 2004 of TÜV SÜD Industrie Service GmbH
3.	Pöyry Report 60K05788.01.Q010 to EBRD, September 25, 2006 “Preliminary methodology for Monitoring and Verification of Energy Efficiency Measures”
4.	2006 IPCC Guideline
5.	CO2 default emission factors for Bulgaria, published in: http://www2.moew.government.bg/recent_doc/climate/Baseline%20CEF%20Summary.pdf
6.	Excel Spread Sheet with Emission Reduction Sofia tracking data base, 21th of November 2007
7.	Excel Spread Sheet with Financial Sofia Calculations, 15th of November 2007
8.	PDD Version 22th of October 2007
9.	LoA from the Ministry of Environment and Water of the Republic of Bulgaria, issued 22nd June 2004