Industrie Service

Choose certainty.
Add value.

Verification Report

Danish Energy Agency

Second Periodic Verification of the Project
"Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin" under JI Track 1

3rd Monitoring period: 01-01-2009 to 31-12-2009

Report No. 600500438

15 October 2010

TÜV SÜD Industrie Service GmbH
Carbon Management Service
Westendstrasse 199 - 80686 Munich - GERMANY

Industrie Service

Report No.	Date of first issue	Version No.:	Revision date	No. of pages
6005004382	11-08-2010	02	15-10-2010	18 (without cover page and annexes)
Subject:			Second Periodic Verification under JI Track 1	
Executing Operational Unit:				
TÜV SÜD Industrie Service GmbH, Carbon Management Service Westendstrasse 199 - 80686 Munich, Federal Republic of Germany				
Project Participant (client):				
1. (Buyer of credits and client of TÜV SÜD) Ministry of Climate and Energy Danish Energy Agency Amaliegade 44 DK-1256; Copenhagen K; Denmark 2. (Project owner) ROMAG TPP				
Registration number / Project Title			Project: "Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin"	
Monitoring period:			01-01-2009 to 31-12-2009	
First Monitoring Report (version/date)			Version 01 / 22-01-2010	
Final Monitoring Report (version/date)			Version 02 / 22-07-2010	

Industrie Service

Summary:
TÜV SÜD Industrie Service GmbH has performed the second periodic verification of the JI track 1 project: "Energy efficiency improvement of the district heating system in Drobeta Turnu Severin". This is in total the third verification that has been conducted for this project. The initial and first verification was for emission reductions achieved in the year 2007 (Pre-JI) for the purpose of transferring AAUs and the second was for ERUs from the first Year under JI Track 1.
The project consists of 38 heat conversion substations connected to the secondary network of the Drobeta Turnu-Severin district heating system operated by ROMAG Thermo PP. The total length of the secondary networks pipework is approximately 175 km including heating and hot portable water distribution. Heat to the network is provided by the ROMAG Thermo PP CHP plant that is equipped with 6 boiler units and 6 turbines.
The management of ROMAG Thermo PP is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions.
A document review, followed by a site visit was conducted to verify the information submitted by the project participant regarding the present verification period. Based on the assessment carried out, the verifier confirms the following:

- that the project has been implemented and operated in accordance with the description given in the approved and registered PDD (version 08, 07 11 2009). http://ji.unfccc.int/JIITLProject/DB/09PG38GL1EVUCD8D8JUNQEI4RPHUVJ/details
- that the project is completely implemented as described in the PDD.
- that the monitoring plan complies with the project specific methodology (described in the registered PDD, see above) and the monitoring has been carried out in accordance with the monitoring plan. Installed equipment essential for generating emission reductions run reliably and the meters are calibrated appropriately. The project is generating emission reductions as a JI track 1 project.

The verifier can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion refers to the project's GHG emissions and resulting GHG emission reductions reported, both determined using the valid project's baseline, its monitoring plan and its associated documents.
Based on the information we have seen and evaluated, we confirm that the implementation of the project resulted in 71.316 t CO_{2e} of emission reductions (ERUs) during the verification period 01-01-2009 to 31-12-2009. In the registered PDD it has been estimated that the yearly ERs would be approximately 83,868 tCO_{2e}. The less ERs from 2009 are a result of a higher thermal efficiency of the power plant by operating mostly in combined heat and power (CHP) process. Since they are less than estimated it is conservative and thus can be accepted.
A possibilty of double counting of ERs is also excluded as clearly stated in §8 of the LoA from the Romanian DFP. These ERs can be transferred as ERUs as long as there is an agreement between the Host country and the Buyer country.

Assessment Team Leader: Thomas Kleiser **Assessment Team Members:** Auditor Steffen Klein **Project Manager:** Georgios Agrafiotis	**Technical Reviewer:** Robert Mitterwallner **Certification Body responsible:** Rachel Zhang Deputy Head of Certification Body

TÜV SÜD Industrie Service GmbH Carbon Management Service

Industrie Service

Abbreviations

ACM	Approved Consolidated Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board
CER	Certified Emission Reduction
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CO_{2e}	Carbon dioxide equivalent
CR / CL	Clarification Request
DEA	Danish Energy Agency
DNA	Designated National Authority
DOE	Designated Operational Entity
DVM	Determination and Verification Manual
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
JI	Joint Implementation
KP	Kyoto Protocol
LoA	Letter of Approval
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-Governmental Organisation
PDD	Project Design Document
PP	Project Participant
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
VP	Verification Protocol

Industrie Service

Main Documents (referred to in this report)

Methodology (name / version)	N/A	
Scope	3 (Energy demand)	
Technical Area	3.1 (Heat and Steam efficiency)	
PDD:	Version 08. 07 11 2009	
Revised Monitoring Plan:	N/A	
	Version	Date
Published Monitoring Report	01	22-01-2010
Revised Monitoring Report	02	22-07-2010
Project documentation link:	http://ji.unfccc.int/JIITLProject/DB/09P G38GL1EVUCD8D8JUNQEI4RPHUVJ/details	

Table of Contents **Page**

1 INTRODUCTION

1.1 Objective

Danish Energy Agency has commissioned an independent verification by TÜV SÜD Industrie Service GmbH (TÜV SÜD) of its registered JI track 1 project: "Energy efficiency improvement of the district heating system in Drobeta Turnu Severin".
The objective of the verification work is to comply with the requirements of paragraph 62 of the CDM Modalities and Procedures and with the Decision 9 (JI Guidelines) issued in COP/MOP 1 Montreal 2005. The JI DVM was also used as guidance for the verification since it came into force in the mean time. Finally national requirements of Romania as they are described in the Romanian National JI Track I Procedure have been taken under consideration.

According to this assessment TÜV SÜD shall:

- ensure that the project activity has been implemented and operated as per the PDD "Energy efficiency improvement of the district heating system in Drobeta Turnu Severin" Version 08, 07-11-2009, and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place as described in the PDD.
  http://ji.unfccc.int/JIITLProject/DB/09PG38GL1EVUCD8D8JUNQEI4RPHUVJ/details
- ensure that the published MR and other supporting documents provided are complete, verifiable and in accordance with applicable JI requirements,
- ensure that the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the registered PDD.

1.2 Scope

The verification scope encompasses an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the Accredited Independent Entity. The verification is based on the submitted monitoring report, the determined project design documents including its monitoring plan and determined report, the applied monitoring methodology, relevant decisions, clarifications and guidance from the CMP and the JISC and any other information, references and national regulations relevant to the project activity's resulting emission reductions. These documents are reviewed against the requirements of the Kyoto Protocol, the JI Modalities and Procedures and related rules and guidance as well as against requirements as described in the Romanian National Guidelines and Procedures for JI Track 1 projects.

Based on the requirements in the JI DVM, TÜV SÜD has applied a rule-based approach for the verication of the project. The principles of accuracy, completeness, relevance, reliability and credibility were combined with a conservative approach to establish a traceable and transparent verification opinion.
The verification considers both quantitative and qualitative information on emission reductions.
The verification is not meant to provide any consultancy towards the client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the monitoring activities.

1.3 GHG Project Description

Project activity:	"Energy efficiency improvement of the district heating system in Drobeta Turnu Severin"
UNFCCC registration number:	RO1000133

UNFCCC link: http://ji.unfccc.int/JI_Parties/DB/5T6DPV4N47Z6OW3HI1GX0QKFOUI6YL/viewDFP

Project Participants:	ROMAG TPP, Regia Autonoma pentru Activitati Nucleare – RAAN – project owner represented by the Director GABRIEL BALACI Danish Energy Agency, Danish Ministry of Climate and Energy represented by Inge Gerhardt Pedersen, Chief Programme Coordinator for Romania
Location of the project:	Latitude 44°40 min 25.5 N, Longitude 22°41 min 18 E
Date of registration as Track 1:	02-04-2010

http://ji.unfccc.int/JIITLProject/DB/09PG38GL1EVUCD8D8JUNQEI4RPHUVJ/details

Starting date of the official JI crediting period:	01-01-2008

After ROMAG TPP took over the district heating system from the municipality in 2003, the power plant initiated a number of activities in order to improve the overall efficiency of heat and hot portable water supply to consumers.
The JI Track 1 project activity focuses on the heat conversion part of the heat conversion substations and the secondary district heating network for supply of heat and hot portable water. In this context the project includes the redesign of the secondary district heating network and a subsequent replacement of in total approximately 190 km of heat and hot portable water pipes by new pre-insulated district heating pipes. Moreover the project comprises the installation of 114 new heat exchangers in 38 heat conversion substations located within the secondary district heating network. In connection with the rehabilitation work, heat metering devices have been installed at the heat conversion substation to meter the heat and hot portable water consumption side.

The district heating network rehabilitation project reduces heat and water losses within the secondary district heating network and the heat conversion substations connected to primary network. Buttom up this leads to the fuel consumption reduction at the ROMAG – TERMO CHP power plant and effects a reduction of the annual greenhouse gas emissions of the coal fired plant.

Besides greenhouse gas emission reductions, there is expected to be a decrease of local dust and particle pollution from lignite transportation and combustion in association with the proposed project activity.

2 METHODOLOGY

2.1 Verification Process

The verification process is based on the approach depicted in the JI Determination and Verification Manual.
Standard auditing techniques have been adopted for the verification process. The verification team performs first a desk review, followed by an on-site visit, which results in the formation of a protocol that includes all the findings. The next step involves the evaluation of the findings through direct communication with the PPs and then finally the preparation of the verification report. This verification report and other supporting documents then undergo an internal quality control by the CB "climate and energy" before submission to the client, the Danish Energy Agency (DEA) and the Romanian DFP.

2.2 Verification Team

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

Name	Qualification	Coverage of scope	Coverage of technical area	Host country experience
Thomas Kleiser	**ATL**	☑	☑	☑
Steffen Klein	GHG-A	☑	☑	☑
Georgios Agrafiotis	GHG-T	☑		

Thomas Kleiser is Head of the Certification Body of "Carbon Management Service" at TÜV SÜD Industrie Service GmbH since 2009 and lead auditor. He has participated in more than 100 CDM and JI project assessments, (validations /determinations and verifications) and more than 20 voluntary projects under different schemes.

Steffen Klein is an appointed auditor for CDM and JI projects of the CB "climate and energy" of TÜV SÜD Industrie Service GmbH. The experience in CDM and JI projects he has gained (determination and verification) by participation in projects in Russia, Poland, Czech Republic, Pakistan and Colombia. As a graduated engineer he is an expert in the field of energy systems performing energy consultancy and certification services. Working for TÜV SÜD over 12 years he is a lead auditor in EU-ETS since 2004.

Georgios Agrafiotis is determiner and verifier for JI and voluntary projects. He has work experience in the field of industrial environmental technology and protection and also in technical environmental projects. As GHG trainee he has been appointed scopes 1,5 and 13 as per UNFCCC definition.

2.3 Review of Documents

The Monitoring Report version 01 submitted by the PP on 22/01/2010 and was assessed based on all the relevant documents as listed above. The aim of the assessment in the desk review was to:

- verify the completeness of the data and the information presented in the MR,
- check the compliance of the MR with respect to the monitoring plan depicted in the registered PDD. Particular attention to the frequency of measurements, the quality of the metering equipment including calibration requirements, and the quality assurance and quality control procedures was paid,
- evaluate the data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

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

2.4 On-site Assessment and follow-up Interviews

During 28-04-2010 to 29-04-2010, TÜV SÜD performed a physical site inspection and on-site interviews with project stakeholders to:

- confirm the implementation and operation of the project,
- review the data flow for generating, aggregating and reporting the monitoring parameters,
- confirm the correct implementation of procedures for operations and data collection,
- cross-check the information provided in the MR documentation with other sources,
- check the monitoring equipment against the requirements of the PDD including calibrations, maintenance etc.
- review the calculations and assumptions used to obtain the GHG data and ER,
- identify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters.

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

2.5 Quality of Evidence to Determine Emission Reductions

Among several evidence items submitted, the following relevant and reliable evidence material have been used by the audit team during the verification process:

1. Monitoring report for 2009
2. Monitoring Plan, Guidelines and Procedures
3. JI Process Data Log Sheets 2009, Monthly reports
4. Calibration protocols
5. Determination of fuel parameters
6. Training evidences
7. Process control equipment (data collection)
8. Quality assurance procedures of all relevant processes

Sufficient evidence covering the full verification period in the required frequency/completeness is available to validate the figures stated in the final MR. The source of the evidence will be discussed in chapter 3 of this report. Specific cross-checks have been done in cases that further sources were available. The monitoring report's figures were checked by the audit team against the raw data. The

data collection system meets the requirements of the monitoring plan as per the project specific methodology.

2.6 Resolution of Clarification and Corrective and Forward Action Requests

The objective of this phase of the verification process is to resolve any outstanding issues which require clarification for TÜV SÜD's positive conclusion of the achieved GHG emission reduction. The findings raised as Forward Action Requests (FARs) (if any) indicated in previous reports (determination/verification) were discussed during communications between the PP and TÜV SÜD. To guarantee the transparency of the verification process, the concerns raised in the desk review, the on-site audit assessments and the follow up interviews together with the responses that have been provided by the PP are documented in Annex 1 (verification protocol).

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

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

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

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

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

2.7 Internal Quality Control

As a final step of verification, the final documentation including the verification report and annexes have to undergo an internal quality control by the Certification Body (CB) "climate and energy", i.e. each report has to be finally approved either by the Head of the CB or the Deputy (a Veto person and /or Expert fully independent from the project and the verification process can be further linked to the review). In case one of these two persons is part of the assessment team, the approval can only be given by the person who is not a part of the assessment team. If the documents have been satisfactorily approved, the Final Verification Report is submitted to the Danish Energy Agency along with the relevant documents.

3 VERIFICATION RESULTS

In the following sections, the results of the verification are stated. The verification results relate to the project performance as documented and described in the final PDD and Monitoring Report (22-07-2010, version 02). The verification findings for each verification subject are presented below:

3.1 FARs from Determination / Previous Verification

The verification team confirms that all FARs presented in the determination report have been correctly addressed by the PPs.

3.2 Project Implementation in accordance with the Project Design Document

The project was implemented modular in several phases since October 2006, finished before the end of the year 2007. When finishing a relevant phase this part is completely operational.

The project is fully implemented according to the description presented in the registered PDD since December 2007.

The project includes the redesign of the secondary district heating network and a subsequent replacement of in total approximately 190 km of heat and hot portable water pipes by new pre-insulated district heating pipes. Moreover the project comprises the installation of 114 new heat exchangers in 38 heat conversion substations located within the secondary district heating network.

The verifier confirms, through the visual inspection, that all physical features of the proposed JI project activity including data collecting systems and storage have been implemented in accordance with the PDD. The project activity is completely operational since finalizing the last phase in December 2007.

There is no difference between the values of the data and/or variables presented in the MR and the stated data in the PDD. The project activity is completely operational since finalizing the last phase in December 2007. Then in total 1,485 consumers are connected to the district heating system, 419 consumers to the primary network and 1,066 consumers to the secondary network.

There is a growing number of new connections to consumers in the secondary network from HCS that are a part of the project. Until the end of 2009 there are in total 468 new consumers connected to secondary network, including 162 new connections in 2009. Further more in 2009 there have been connected 88 new consumers to primary network, in total 222 until the end of 2009.

These connections are monitored separately and considered as not project integrated. Baseline and project emissions caused by connections to new consumers of the primary and secondary network are discounted in the calculation. This is due to the project specific methodology in the registered PDD.

The estimated ERs in the registered PDD with annual 83.868 t CO_{2e} meet the ERs really achieved in 2007. The estimation in the registered PDD was used as reference for judging of the annual ERs during the crediting period of the project.

In the monitoring period 2009 the result with 71.316 t CO_{2e} ERs is lower than it was estimated in the approved PDD. It is significant lower than in the monitoring period 2008 with 110.054 t CO_{2e} ERs.

This was caused by a 10 % higher thermal efficiency of the ROMAG THERMO power plant in 2009 while running mostly in CHP process. The average temperatures in the heating seasons of 2008 and 2009 in the local area of the project activity are not significant different and there is a higher heat consumption in the secondary network of approximately 6 % in 2009. The increased efficiency in the heat production process also overcompensate the higher heat consumption in 2009.

3.3 Compliance of the Monitoring with the Monitoring Plan

The monitoring has been carried out in accordance with the Monitoring Plan contained in the PDD. All parameters were monitored and determined as per the Monitoring Plan.
The verification of the parameters required by the Monitoring Plan is provided as follows:

Data / Parameter:	$Q_{P,DH,primary}$
Data unit:	Gcal
Description:	District heat supplied to the primary network
Source of data used:	Recordings in logbooks are archived in paper form, the values of the daily reports are put into an excel spreadsheet prepared for one month. The project relevant data of one month are summarized in a JI Process Data Log Sheet. The equipment used has been calibrated according to the requirements of the approved monitoring plan.
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports and related samples of daily records issued by the Heat Production Department. No discrepancies have been found and all data are consistent to the calculation tool and used in the calculation Excel sheets.
Cross-check	The parameter that can be used for plausibility crosscheck is the calculated system efficiency of primary network in the Monitoring Excel Spreadsheet Tool. The efficiency is related to total amount of heat delivered to the primary network.

Data / Parameter:	$Q_{P,ps}$
Data unit:	Gcal
Description:	Process steam produced for heavy water producers
Source of data used:	Continuous measuring system transferring data hourly to the TPP central control room (digital). Data were also manually recorded in the logbook and logged for the day The equipment used has been calibrated according to the requirements of the approved monitoring plan.
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the Heat Production Department. No discrepancies have been found and all data are consistent to the calculation tool.
Cross-check	Calculation can be crosschecked by monthly or annual heat balances between fuel consumption and total heat production considering the thermal efficiency of the boilers.

Data / Parameter:	$Q_{P,DH,HCS}$
Data unit:	Gcal
Description:	District heat supplied to heat conversion substations (HCS)
Source of data used:	Data are collected manually and automatically, acquired and stored with the SCADA-System, every hour and logged for the day. The equipment used has been calibrated according to the requirements of the approved monitoring plan.
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool.
Cross-check	Calculation can be crosschecked with the heat supplied to consumers considering the efficiency of HCS.

Data / Parameter:	$Q_{P,DH,pr.con}$
Data unit:	Gcal

Description:	District heat supplied to consumers connected to the primary network
Source of data used:	Data are collected manually monthly.
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool. Approved monthly reports for the full monitoring period have been supplied
Cross-check	Calculation can be crosschecked with the general heat balance of power plant and supplied networks.

Data / Parameter:	$Q_{P,DH,secondary}$
Data unit:	Gcal
Description:	District heat supplied to secondary network
Source of data used:	Data are collected manually and automatically, acquired and stored with the SCADA-System, every hour and logged for the day.
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool. Approved monthly reports for the full monitoring period have been supplied
Cross-check	Calculation can be crosschecked with the heat supplied to single consumers connected to the heat conversion substations (HCS).

Data / Parameter:	$Q_{P,DH,consumers}$
Data unit:	Gcal
Description:	District heat supplied to consumers connected to the secondary network
Source of data used:	Data are collected manually monthly, stored in the accounting system of the District Heat Department and provided to the JI-Department.
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool. Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.
Cross-check	Calculation can be crosschecked with the heat supplied to secondary network considering the efficiency of the secondary network.

Data / Parameter:	$Q_{P,DH,pr.new\_con}$
Data unit:	Gcal
Description:	District heat supplied to new consumers connected to the primary network
Source of data used:	Data are collected manually monthly, stored in the accounting system of the District Heat Department and provided to the JI-Department..
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool. Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied. New customers will be separately monitored and documented as foreseen in the registered PDD. The separate accounting of new consumers is done with the contract management system. Additional new consumers have been connected during the monitoring period 2009.
Cross-check	Calculation can be crosschecked with the balance of total heat supplied to primary network considering the efficiency of primary network.

Data / Parameter:	$Q_{P,DH,sec.new\_con}$
Data unit:	Gcal
Description:	District heat supplied to new consumers connected to the secondary network
Source of data used:	Data are collected manually monthly, stored in the accounting system of the District Heat Department and provided to the JI-Department..
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool. Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied. New customers will be separately monitored and documented as foreseen in the registered PDD. The separate accounting of new consumers is done with the contract management system. Additional new consumers have been connected during the monitoring period 2009.
Cross-check	Calculation can be crosschecked with the balance of total heat supplied to secondary network considering the efficiency of secondary network.

Data / Parameter:	$cv_{P,lignite}$
Data unit:	Kcal/kg
Description:	Net calorific value of lignite
Source of data used:	Onsite analysis manufacturer, stored at the ROMAG TPP laboratory and provided to the JI-Department.
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the Technical Department. The responsible JI-Project management and the staff of the ROMAG TPP laboratory was interviewed during audit how sampling and analysing processes are conducted. The calibration of the equipment was checked onsite the ROMAG TPP laboratory by certificates. The procedures are well implemented and the accreditation of the ROMAG TPP laboratory is in process.
Cross-check	A second analyse from each delivery is made by ROMAG TPP laboratory. In case of a deviation a backup witness sample will be analysed by both. Net calorific value of lignite is one component for the calculation of the boiler applied fuel heat. The general energy balance of the power plant that is done anyway gives the possibility of crosscheck in combination with the amount of fired lignite.

Data / Parameter:	$cv_{P,oil}$
Data unit:	Kcal/kg
Description:	Net calorific value of oil
Source of data used:	Onsite analysis manufacturer, stored at the ROMAG TPP laboratory and provided to the JI-Department.
Means of verification/Comments:	Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the Technical Department. The responsible JI-Project management and the staff of the ROMAG TPP laboratory was interviewed during audit how sampling and analysing processes are conducted. The calibration of the equipment was checked onsite the ROMAG TPP laboratory by certificates. The procedures are well implemented and the accreditation of the ROMAG TPP laboratory is in process.
Cross-check	Net calorific value of fuel oil is one component for the calculation of the boiler applied fuel heat. The balances of the boilers, only fired with oil, give the

	possibility of crosscheck in combination with the amount of fired oil.

Data / Parameter:	$V_{P,lignite}$
Data unit:	T
Description:	Quantity of lignite consumed
Source of data used:	invoices, weight sheets, stock survey, stored at the technical department and provided to the JI-Department.
Means of verification/Comments:	The total amount of delivered lignite is weighted by deliverer and invoiced. Incoming waggons are weighted by weigh-bridge for check. Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the Technical Department and single consumption sheets for each month. No discrepancies have been found and all data are consistent to the calculation tool.
Cross-check	The amount of consumed lignite is one component for the calculation of the boiler applied fuel heat. The general energy balance of the power plant that is done anyway gives the possibility of crosscheck in combination with the net calorific value of lignite.

Data / Parameter:	$V_{P,oil}$
Data unit:	T
Description:	Quantity of oil consumed
Source of data used:	invoices, weight sheets, tank level, stored at the technical department and provided to the JI-Department.
Means of verification/Comments:	The total amount of delivered oil is weighted by deliverer and invoiced. Incoming waggons are weighted by weigh.bridge for check. Monthly mass balances are representative in accordance with the produced and measured heat. Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the Technical Department and single consumption sheets for each month.. No discrepancies have been found and all data are consistent to the calculation tool.
Cross-check	The amount of consumed oil is one component to calculate the fuel heat applied by the boiler. The balances of the boilers, only fired with oil, give the possibility of crosscheck in combination with the net calorific value of fired oil.

3.4 Assessment of Data and Calculation of Greenhouse Gas Emission Reductions

All data have been available and all the parameters have been monitored in accordance with the monitoring plan.
The reported data have been cross-checked against other sources available as explained above in chapter 3.3.
The verifier confirms that the methods and formulae used to obtain the baseline, project and leakage emissions are appropriate. The same has been done in accordance with the methods and formulae described in the monitoring plan and PDD.
The verifier confirms that all the emission factors and default values (ex-ante values from PDD) have been correctly justified. All the emission factors and default values are explicitly mentioned in the monitoring report.

4 SUMMARY OF FINDINGS

The verifier can confirm that the MR and related documents are complete and verifiable in accordance with the JI Track 1 requirements. All the findings raised by the verification team, the responses by the PPs and the conclusion from the team are presented in Annex 1. The means of verification and resulting changes in the MR or related documents are identified in the following table:

CAR 1: The value for January in the sheet IPUT DATA_ENERGY PRODUCTION of the calculation tool is not consistent to the record in the monthly report of the JI Department and Heat Production Department.
CAR 1, means of verification
Updated MR spreadsheet was checked.
CAR 1, changes in the MR or related documents
The value for January in the sheet IPUT DATA_ENERGY PRODUCTION of the calculation tool has been updated accordingly to the record in the monthly report of the JI Department and Heat Production Department. This mistake must be an oversight and has to be avoided by dublechecking each input value of the calculation tool.

CAR 2: Please put the completely parameter description in the sheet IPUT DATA_ENERGY PRODUCTION column E (H) of the calculation tool.
CAR 2, means of verification
Updated MR spreadsheet was checked.
CAR 2, changes in the MR or related documents
The parameter description in column E (H) in the sheet IPUT DATA_ENERGY PRODUCTION of the calculation tool has been updated. Now the parameter description is accordingly to the MR and the PDD.

CAR 3: An update of the annual values in the Monitoring Report 2009 chapter 3.10 and 7. is necessary after completed correction according to CAR#1.
CAR 3, means of verification
Updated MR was checked against corrected MR spreadsheet.
CAR 3, changes in the MR or related documents
The annual values in the Monitoring Report 2009 have been updated accordingly to the new results after implementing corrected values in the calculation tool. There are no more discrepancies.

CR 1: Monthly reports issued by the JI-Department for the full monitoring period have been provided onsite. Please provide the missing copies of March and December 2009.
CR 1, means of verification
The completeness of the monthly reports was checked. The values have been crosschecked with the calculation tool.
CR 1, changes in the MR or related documents
Monthly reports issued by the JI-Department for the full monitoring period have been provided completely.

CR 2: Please provide the certificate to accreditation of the laboratory of ROMAG TPP coal department that is conducting the analysis of the lignite.
CR 2, means of verification
For the Monitoring Period 2009 the determination of the calorific values for lignite and oil for

comparison with supplier determined values was carried out by an accredited third party laboratory. In the year 2010 this task was delegated to ROMAG Thermo coal department laboratory. During onsite audit the calibration certificates for the equipment have been checked. The accreditation process is in progress. FAR#1 has been issued.
CR 2, changes in the MR or related documents
The accreditation process of ROMAG TPP Laboratory for fuel analysis is right now in progress. The certificate will be provided once the accreditation process is completed and the certificate has been issued. (see FAR 1)

CR 3: Please provide monthly values for 2009 of the net calorific value of lignite determined and reported by the ROMAG TPP coal department for crosscheck.
CR 3, means of verification
There are no deviations to the data in the Monthly reports of the JI department and in the MR 2009.
CR 3, changes in the MR or related documents
The monthly values for 2009 of the net calorific value of lignite reported by the ROMAG TPP coal department have been provided. These were referenced in the IRL.

CR 4: Please provide monthly values for 2009 of the net calorific value of oil determined and reported by the ROMAG TPP coal department for crosscheck.
CR 4, means of verification
There are no deviations to the data in the Monthly reports of the JI department and in the MR 2009.
CR 4, changes in the MR or related documents
The monthly values for 2009 of the net calorific value of oil reported by the ROMAG TPP coal department have been provided. These were referenced in the IRL.

CR 5: Please provide monthly values for 2009 of the quantity of lignite consumed determined and reported by the ROMAG TPP coal/ technical department for crosscheck.
CR 5, means of verification
There are no deviations to the data in the Monthly reports of the JI department and in the MR 2009.
CR 5, changes in the MR or related documents
Monthly values and the single consumption sheets for 2009 of the quantity of lignite consumed determined and reported by the ROMAG TPP coal/ technical department have been provided. These were referenced in the IRL.

CR 6: Please provide monthly values for 2009 of the quantity of oil consumed determined and reported by the ROMAG TPP coal/ technical department for crosschecks.
CR 6, means of verification
There are no deviations to the data in the Monthly reports of the JI department and in the MR 2009.
CR 6, changes in the MR or related documents
Monthly values and the single consumption sheets for 2009 of the quantity of oil consumed determined and reported by the ROMAG TPP coal/ technical department have been provided. These were referenced in the IRL.

CR 7: What were the changes at power plant side in general to reach this indicated improvement of thermal efficiency?
CR 7, means of verification
The declaration can be followed by considering the calculation with values verified by TÜV

SÜD for the Monitoring periods 2008 and 2009. The fact of a higher total efficiency of the ROMAG THERMO power plant, major less fuel consumption because of almost pure CHP processing, leads to less emission reduction for the project in 2009. This is although the heat delivered to the district heating system is comparable.
CR 7, changes in the MR or related documents
There was no change in the documents necessary.

FAR 1: The accreditation process of ROMAG TPP Laboratory for fuel analysis is right now in progress. The certificate should be provided once the accreditation process is completed (latest Dec 2010), and the certificate has been issued.
FAR 1, means of verification
The accreditation has to be considered for the Monitoring Period 2010.
FAR 1, changes in the MR or related documents
N.A.

Industrie Service

5. VERIFICATION STATEMENT

TÜV SÜD Industrie Service GmbH has performed the second periodic verification for ERs from 2009 of the JI track 1 project: "Energy efficiency improvement of the district heating system in Drobeta Turnu- Severin". The verification is based on the currently valid documentation of the UN Framework Convention on Climate Change (UNFCCC) and takes into account in general all requirements for JI projects as well as specific national regulations as described in the Romanian National JI Track I Procedure of the Romanian DFP.

The management of ROMAG TPP is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions on the basis set out within the project's Monitoring Plan indicated in the PDD version 08, dated 07-11-2009. The verifier can confirm that:

- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- the project is operated as planned and described in the project design document;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements;
- the monitoring plan in Monitoring Report is as per the PDD
- that the monitoring plan in latest determined PDD is in accordance with the approach taken regarding baseline setting and monitoring (please see Appendix B of the JI Guidelines – Decision 9 COP/MOP).

Our opinion is based on the project's GHG emissions and resulting GHG emission reductions reported, which have been both determined through the valid project's baseline, its monitoring plan and its associated documents.

The AIE confirms that the reported emission reductions or enhancements of removals by sinks are accurate and free of material errors, omissions, or misstatements.

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

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

Verified emissions in the above reporting period:

Baseline emissions:	454,077	t CO_{2e}
Project emissions:	382,761	t CO_{2e}
Leakage emission:	0	t CO_{2e}
Emission reductions:	71,316	t CO_{2e}

Munich, 15-10-2010

Rachel Zhang
Deputy Head of the Certification Body "climate and energy"
TÜV SÜD Industrie Service GmbH

Munich, 15-10-2010

Thomas Kleiser
Assessment Team Leader

PERIODIC VERIFICATION
"Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin" **(2009)**

Annex 1: Verification protocol

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin

Date of Completion: 2010/09/30

Number of Pages: 72

Input by audit team in blue colour

Old text from previous verification (unchanged situation) in black colour

Table of Contents

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

1. Project Activity Implementation

1.1. Technology

Location (s)			
	PDD Description	Verified Situation	Conclusion and IRL
Description / Address: *Calea Tg. Jiului, Km. 5, Drobeta Turnu-Severin, Mehedinti*	*ROMAG TPP is located approximately 5 km north-east from Drobeta Turnu-Severin in the Mehedinti Region, Romania*	*The location of the project site is described correct. There is the ROMAG THERM power plant outside the city connected with the project site, heat distribution network in Drobeta Turnu-Severin.*	☑
GSP coordinates:	*Latitude 44°40 min 25.5 N, Longitude 22°41 min 18 E*	*Latitude 44°40 min 25.5 N, Longitude 22°41 min 18 E* *The information in the PDD and refers to the information stated on site.*	☑ IRL No.0
Technical Equipment – Main Components			
	PDD Description	Verified Situation	Conclusion and IRL
Description	*The CHP plant is equipped with 6 boiler units and 6 turbines. The thermal and electric efficiencies of the power plant amount to approximately 27% and 21%, respectively.*	*Boiler- and machine-house is one large but compact building. All the boilers and respective machines (turbine and generator) are in line. The operation of all the components could be followed up at the process control panels.*	☑ IRL No.4
Component 1- 6: Technical Features	*Boiler No.1 – No.6*	Capacity: *258 Gcal/h equiv. 300 MWh each* Manufacturer:	☑ IRL No.4

		SC VULCAN BUCHAREST SA Romania Commissioning date / Serial number: *No.1 31.07.1986 / CR1670 / 22244/82* *No.2 30.06.1987 / CR1670 / 22250/82* *No.3 27.04.1988 / CRG 1666 / 22721/84* *No.4 28.11.1988 / CR 1244 / 23723/86* *No.5 31.05.1990 / CR 1870 / 24729/88* *No.6 28.02.1991 / CRG 1870 / 24737/89*	
Component 7: Technical Features	*Turbo-generator no. 1, condensing turbine*	Capacity: *50 MW* Manufacturer: *SC GENERAL TURBO SA, Romania* Commissioning date: *31.07.1986* Serial number: *DSL 50-1 / 3829*	☑ IRL No.4
Component 8: Technical Features	*Turbo-generator no. 4, condensing turbine*	Capacity: *50 MW* Manufacturer: *SC GENERAL TURBO SA, Romania* Commissioning date: *31.07.1989* Serial number: *DSL 50-1 / 3832*	☑ IRL No.4
Component 9: Technical Features	*Turbo-generator no. 5, condensing turbine*	Capacity: *50 MW* Manufacturer: *SC GENERAL TURBO SA, Romania* Commissioning date: *08.04.2004* Serial number: *DSL 50-1 / 2660*	IRL No.4 ☑
Component 10: Technical Features	*Turbo-generator no. 6, condensing turbine*	Capacity: *25 MW* Manufacturer: *SC GENERAL TURBO SA,*	☑ IRL No.4

		Romania Commissioning date: *29.12.2004* Serial number: *SC 25 / 2682*	
Component 11: Technical Features	*Turbo-generator no. 2, backpressure turbine*	Capacity: *50 MW* Manufacturer: *SC GENERAL TURBO SA, Romania* Commissioning date: *30.06.1987* Serial number: *DKUL / 3226* *There are two backpressure turbines installed. The description in the PDD was updated in V8.*	☑ IRL No.4
Component 12: Technical Features	*Turbo-generator no. 3, backpressure turbine*	Capacity: *22 MW* Manufacturer: *SC GENERAL TURBO SA, Romania* Commissioning date: *02.08.2007* Serial number: *DKAR 22 / 22966* *Due to the verified situation onsite turbo-generator no. 3 is a backpressure machine.*	IRL No.4 ☑
Component 13: Technical Features	*38 Heat conversion substations*	Capacity: **HEAT** : 0 –3 Gcal/h; **HOT SANITARY WATER :** 0-2 Gcal/h Manufacturer: Reconstruction Commissioning date: 10/2006 - 28.02.2007 Serial number: HCS1; HCS2; HCS3; HCS4; HCS5; HCS6; HCS7; HCS8; HCS9; HCS13; HCS17; HCS19; HCS20; HCS21; HCS22; HCS23;	☑ IRL No.24

		HCS24; HCS25; HCS27; HCS29; HCS30; HCS31; HCS32; HCS35; HCS36; HCS38; HCS39; HCS40; HCS41; HCS42; HCS43; HCS53; HCS54; HCS55; HCS59; HCS60; HCS66; HCS67	
Operation Status during verification			
	Verified Situation		Conclusion and IRL
Approvals / Licenses	*ROMAG Termo TPP is supplying heat to customers of the primary and secondary heat distribution network of the Drobeta Turnu-Severin over many years. The project was implemented to increase the efficiency of the secondary network in the city area. The distribution network is owned and operated by a branch of ROMAG Termo since January 2004 when it was handed over by the municipality.* *A contract (operation permit, concession) has been provided that the actual situation of ownership and operation will be covering the project lifetime.*		*IRL No.32* ☑
Actual Operation Status	Start date of operation (each site if applicable*): 14/02/2006* Under construction ☐ In operation ☒ Out of operation ☐ Reason and date (if out of operation):		☑
	The data basis for an appropriate operation provide the excel spreadsheets of the annual Monitoring Report that allowed the calculation of energy balances and shows several efficiencies. The operation was verified onsite by visiting the power plant and the central control room for the district heating system with an indication of every HCS in operation. Samples of HCS were visited as well to check the installation and metering system.		☑
Remarks to Special Operational	Phased implementation: *The project was implemented between October 2006 and March 2008 in three stages. So it was finalized during the second monitoring period.*		☑

Status During the Verification Period	*The progress that was achieved is reflected by growing thermal efficiencies of the secondary network. After reconstruction the HCS were integrated in the project documented by Final Acceptance Reports. Then in total 1,485 consumers are connected to the district heating system, 419 consumers to the primary network and 1,066 consumers to the secondary network.* Special cases: *There is a growing number of new connections to consumers in the secondary network from HCS that are a part of the project. Until the end of 2009 there are in total 468 new consumers connected to secondary network, including 162 new connections in 2009. Further more in 2009 there have been connected 88 new consumers to primary network, in total 222 until the end of 2009.* *These connections are monitored separately and considered as not project integrated. Baseline and project emissions caused by connections to new consumers of the primary and secondary network are discounted in the calculation. This is due to the project specific methodology in the registered PDD.*	*IRL No.0 / No.36*

1.2. Organization

Project Participant (s)		
	Verified Situation	Conclusion and IRL
Entity / Responsible person: ROMAG TPP / General Director Danish Energy Agency / Deputy Programme Director	*The responsibilities have not changed regarding to positions in comparison to the registered PDD.*	☑
JI Project management:	*The responsibility has not changed due to the person.*	☑

ROMAG TTP / Eng. Lelia Dobjanschi		

1.3. Quality Management System

General aspects of the Quality Management System		
	Verified Situation	Conclusion and IRL
Quality Management Manual:	*The Monitoring Plan Guidelines and Procedures, Version 4 (IRL No.3) is the basic document that detailed guides to fulfil the requirements of reporting accordance to the Monitoring Plan.*	☑
Responsibilities:	*The Monitoring Plan refers directly to the Monitoring Plan Guidelines and Procedures. A further QM-Procedure "Management and Monitoring System, JI-Project (IRL No.7) provides all the responsibility in a detailed manner and refers to the JI-Project Organization Chart (IRL No.7)*	☑
Qualification and Training:	*Basis of qualification and training of key personal is the "Personal Training Procedure". This is applied to the secondary and high education personnel. The training is organized once per year and includes all requirements regarding the JI-Project.* *Participation records were verified onsite.*	☑ *IRL No. 14 / No.15*
Implementation of QM-system	*ROMAG TPP is practicing an approved QM-System based on ISO 9001. All the project relevant documents and procedures are integrated in the system that is strictly applied.*	☑

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

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin

Date of Completion: 2010/09/30

Number of Pages: 72

Remaining Requests from Previous Verifications	Summary of project owner response	Audit team Conclusion and IRL

2. Monitoring Plan Implementation

2.1. Parameters

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
	$V_{P,\ lignite}$	$V_{P,lignite}$	*2.4 table 1*	*Power Plant Fuel Consumption Determination.doc*	☑
	$V_{P,\ oil}$	$V_{P,oil}$	*2.4 table 2*	*Power Plant Fuel Consumption Determination.doc*	☑
	$cv_{P,\ lignite}$	$cv_{P,lignite}$	*2.3 table 1*	*Fuels Calorific Values Determination.doc Code: PO – RT 78, Edition 1, revision 1.*	☑
	$cv_{P,oil}$	$cv_{P,oil}$	*2.3 table 2*	*Fuels Calorific Values Determination.doc Code: PO – RT 78, Edition 1, revision 1.*	☑
	$Q_{P,\ DH,primary}$	$Q_{P,DH,primary}$	*2.2 table 1*	*IRL No.5*	☑
	$Q_{P,\ ps}$	$Q_{P,ps}$	*2.2 table 2*	*IRL No.5*	☑
	$Q_{P,\ DH,HCS}$	$Q_{P,DH,HCS}$	*2.2 table 3*	*Heat and Steam Delivered to Consumers.doc, chap.6.2.2, IRL No.11*	☑
	$Q_{P,\ DH,pr,con}$	$Q_{P,DH,pr.con}$	*2.2 table 4*	*IRL No.11*	☑
	$Q_{P,\ DH,\ secondary}$	$Q_{P,DH,sec\ ondary}$	*2.2 table 5*	*IRL No.11*	☑
	$Q_{P,\ DH,\ consumers}$	$Q_{P,DH,consumers}$	*2.2 table 6*	*IRL No.11*	☑
	$Q_{P,\ DH,\ pr.new\_con}$		*2.2 table 7*	*IRL No.11*	☑

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Parameters					
Meth/tool	PDD	MR	Included in table	Compliance	Conclusion and IRL
	Q_{P, DH, sec,new_con}		*2.2 table 8*	*IRL No.11*	☑

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Parameters measured directly with instruments

Table 1

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*District heat supplied to the primary network*	*n. a.*	*district heat delivered to primary network*	*Description of title is consistent.*	☑
Parameter ID (if available)	$Q_{P,DH,primary}$	*n. a*	$Q_{P,DH,primary}$	*Parameter ID is consistent*	☑
Data Unit	*Gcal*	*n. a*	*Gcal*	*Used unit is consistent.*	☑
Monitoring frequency (reading)	*every 8 hours, daily log*	*n. a*	*every 8 hours, daily log*	*This is consistent.*	☑
Monitoring frequency (recording)	*monthly*	*n. a*	*monthly*	*This is consistent.*	☑
Calibration requirements	*every 4 years*	*n. a*	*every 4 years*	*1. Heat computer* BV 0084760/23.01.08 BV 0085679/09.09.04 *2. Twin Thermo-resistances* BV 0084761/23.01.08 BV	☑ IRL No.5

				0083121/19.07.06 *3. Ultrasonic Flow Meter (FP)* BV 06.02 – 001/20.02.08 BV 06.02 – 007/27.09.04 *4. Ultrasonic Flow Meter (RP)* BV 06.02 – 002/20.02.08 BV 06.02 – 008/27.09.04	
Uncertainty level	*low*	*n. a*	*0.2 %*	*The value of the calibrated system is consistent to a "low" uncertainty level that was stated in the PDD.*	☑
Measurement Principle (if applicable)	*Ultrasonic flow meter, heat calculator*	*n. a*	*Ultrasonic flow meter, heat calculator*	*This is consistent*	☑
	Technical aspects				Conclusion and IRL
Instrument Type:					☑

	Heat Meter SONOFLO/CALEC consisting of: 1. Heat Computer CALEC-MB TWIN E 2. Twin Thermo Resistances Pt 100 TPK 3. Ultrasonic Flow Meter (Forward pipe) – SONO 3110/3000 4. Ultrasonic Flow Meter (Return pipe) – SONO 3110/3000	
Serial Number:	1. 4113149/00 2. 185055-00 3. 335908N310 4. 131204N417	☑
Manufacturer Model Nr.:	1. Heat Computer CALEC-MB TWIN E 2. Twin Thermo Resistances Pt 100 TPK 3. Ultrasonic Flow Meter (Forward pipe) – SONO 3110/3000 4. Ultrasonic Flow Meter (Return pipe) – SONO 3110/3000	☑
Specific Location:	Romag Thermo TPP, *At the fence of CHP*	☑
Measurement Range:	0 – 4000m3/h (0 – 160 Gcal/h)	☑
Gaps in operating time of instrument :	Period: *There were no gaps in operating time for this instrument.*	☑
	Default value used: *In case of gaps according to Project Procedure PO-RT94*	☑
	Justification: *according to Project Procedure PO-RT94*	☑
	QA/QC aspects	Conclusion and IRL
Source of data	*Readouts of instrumentation collected manually every 8 hours in and logged in daily reports.* *Type: measured electronically (digital), logbook, daily report*	☑
	Procedures: Internal Working Procedure PO-MCRTH 14	IRL

	QM PO-RT82 Management and Monitoring, training on the job *Internal Working Procedure PO-MCRTH 14.*	No.7/35 ☑
	Implementation of procedure: *The correctness of the procedure implementation has been assessed by onsite visit at the installation site and following the data flow.*	☑ IRL No. 12/13
	Responsibility: *Control Room Operating Staff - Turbine Department (PO-RT82)*	☑ IRL No.7
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are archived on paper and CDs in two different locations *Recordings in logbooks are archived in paper form, the values of the daily reports are put into an excel spreadsheet prepared for one month. The project relevant data of one month are summarized in an JI Process Data Log Sheet.*	☑
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 82: Management and Monitoring System, Project raw data are processed within the Technical Department, from were they are transferred to JI Project Department, where the final calculation for CO_2 emission reduction is made, based on the project approved methodology. Cells containing project formulae are locked. *Raw data related to Process Steam and Hot Water Production delivered to industrial consumers and district heating system are daily transferred electronically and as hard-copy to the Technical Department. Therefore the Turbine Department is responsible.* *The Technical Department is processing the data and validating it by calculation of heat balances.* *The Technical Department transfers the data to the JI-Department that is controlling, recording and archiving the data and performing the calculation.* *Data losses can be avoided because all data are daily stored electronically and per hardcopy. Row data can be followed down to logbook recordings.*	☑ IRL No.7 Annex 2

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. The data flow was followed up from logs to monthly reports for the full monitoring period.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports and related samples of daily records issued by the Heat Production Department. No discrepancies have been found and all data are consistent to the calculation tool and used in the calculation Excel sheets.* *Clarification Request No. 1:* *Monthly reports issued by the JI-Department for the full monitoring period have been provided onsite. Please provide the missing copies of March and December 2009.*	*IRL No. 12, 13, 25* CR #1 ☑
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*The parameter that can be used for plausibility crosscheck is the calculated system efficiency of primary network in the Monitoring Excel Spreadsheet Tool. The efficiency is related to total amount of heat delivered to the primary network.*	☑

Table 2

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*Process steam produced for heavy water producers*	*n. a.*	*Process steam production*	*As it describes the process steam production that is only delivered to heavy water producers it is consistent.*	☑
Parameter ID (if available)	$Q_{P,ps}$	*n. a.*	$Q_{P,ps}$	*Parameter ID is consistent*	☑
Data Unit	*Gcal*	*n. a.*	*Gcal*	*Used unit is consistent*	☑
Monitoring frequency (reading)	*Every our (manually and automatically) logged for the day*	*n. a.*	*Every our (manually and automatically) logged for the day*	*This is consistent.*	☑
Monitoring frequency (recording)	*monthly*	*n. a.*	*monthly*	*This is consistent.*	☑
Calibration requirements	*every 2 years*	*n. a.*	*every 2 years*	*Recent calibration campaign in 2008, details for every part of the metering equipment are provided in IRL No.24*	☑ IRL No.5/ No.24

				and can be assessed with documents in IRL No.7	
Uncertainty level	*low*	*n. a.*	*0,1 %*	*The value of the calibrated system is consistent to a "low" uncertainty level that was stated in the PDD.*	☑
Measurement Principle (if applicable)	*n. a.*	*n. a.*	Differential pressure *Diaphragm, heat calculator*	*Evidence was supplied by calibration certificates.*	☑ IRL No.5
	Technical aspects				Conclusion and IRL
Instrument Type: **Instrument 1 - 3**	**Feeders 16 bar**: 1. Computer MULTICAL CCA1212 2. Thermo Resistances Pt 100 3. Diaphragm DN = 558.88 4. Differential Pressure Transducer 5. Relative Pressure Transducer *3 meters for each line A, B, C: Computer "Multical"CCA 1212+thermoresistance Pt100+diaphragm+differential pressure sensor+relative pressure sensor*				☑ IRL No.17/18
Serial Number:					☑ IRL No.17/18

	Feeder 1 – 16 bar: 1. Computer – 0242 2. Thermo Resistances – 447 3. Diaphragm – 740-4 4. Differential Pressure Transducer – 3031/01 5. Relative Pressure Transducer – 403/00 **Feeder 2 – 16 bar**: 1. Computer – 0243 2. Thermo Resistances – 51 3. Diaphragm – 740-5 4. Differential Pressure Transducer – 3040 5. Relative Pressure Transducer – 401/00 **Feeder 3 – 16 bar**: 1. Computer – 0244 2. Thermo Resistances – 360 3. Diaphragm – 740-6 4. Differential Pressure Transducer – 3035/01 5. Relative Pressure Transducer – 5024/01	
Manufacturer Model Nr.:	**Feeders 16 bar**: 1. Computer MULTICAL CCA1212 2. Thermo Resistances Pt 100 3. Diaphragm DN = 558.88 4. Differential Pressure Transducer 5. Relative Pressure Transducer	☑ IRL No.17/18
Specific Location:	At the border between Romag Termo TPP and Romag Prod (Heavy Water Producer) *TPP , each main pipe 16 bar*	☑

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Measurement Range:	**Feeders 16 bar**: 1 – 16 bar / 0 – 400 t/h	☑
Gaps in operating time of instrument :	Period *There are no gaps in operating time for these instruments. In case of repair or calibration alternate pipe is used.*	☑
	Default value used: *n. a.*	☑
	Justification: *n. a.*	☑
Instrument Type: **Instrument 4 - 6**	**Feeders 40 bar**: 1. Computer MULTICAL CCA1212 2. Thermo Resistances Pt 100 3. Diaphragm DN20 = 226.31 4. Differential Pressure Transducer 5. Relative Pressure Transducer *3 meters for each line A, B, C: Computer "Multical"CCA 1212+thermoresistance Pt100+diaphragm+differential pressure sensor+relative pressure sensor*	☑ IRL No.17/18
Serial Number:		☑ IRL No.17/18

	Feeder 1 – 40 bar: 1. Computer – 0239 2. Thermo Resistances – 943 3. Diaphragm – 740-1 4. Differential Pressure Transducer – 3037/01 5. Relative Pressure Transducer – 401/01 **Feeder 2 – 40 bar**: 1. Computer – 0240 2. Thermo Resistances – 1241 3. Diaphragm – 740-2 4. Differential Pressure Transducer – 3023/01 5. Relative Pressure Transducer – 9002/01 **Feeder 3 – 40 bar**: 1. Computer – 0241 2. Thermo Resistances – 107 3. Diaphragm – 740-3 4. Differential Pressure Transducer – 3036/01 5. Relative Pressure Transducer – 9001/01	
Manufacturer Model Nr.:	**Feeders 40 bar:** 1. Computer MULTICAL CCA1212 2. Thermo Resistances Pt 100 3. Diaphragm DN20 = 226.31 4. Differential Pressure Transducer 5. Relative Pressure Transducer	☑
Specific Location:	At the border between Romag Termo TPP and Romag Prod (Heavy Water Producer) *Each main pipe 40 bar*	☑

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Measurement Range:	1 – 40 bar / 0 – 120 t/h	☑
Gaps in operating time of instrument :	Period: *There were no gaps in operating time for these instruments. In case of repair or calibration alternate pipe is used.*	☑
	Default value used: *In case of gaps according to Project Procedure PO-RT94*	☑
	Justification: *According to Project Procedure PO-RT94*	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type*: Continuous measuring system transferring data hourly to the TPP central control room (digital). Data were also manually recorded in the logbook and logged for the day.*	☑ *Ref Nr.0*
	Procedures: Internal Working Procedure PO-MCRTH 14 *QM PO-RT82 Management and Monitoring, PO-RT94 Determination of the Power Plant Heat and Steam delivered to consumers, training on the job*	*IRL No7/ 11/35* ☑
	Implementation of procedure: *The correctness of the procedure implementation has been assessed by onsite visit at the installation site and following the data flow.*	☑ IRL No. 12/13
	Responsibility: *Control Room Operating Staff - Turbine Department*	☑ IRL No.7/ 11
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are archived on paper and CDs in two different locations. *The records are in paper and in electronic form. Data are archived in data files and stored in different places. (Technical department, JI-Department)*	☑ IRL No.7/ 11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 82: Management and Monitoring System, Project raw data are processed within the Technical Department, from were they are transferred to JI Project Department, where the final calculation for CO_2 emission re-	☑ IRL No.7

	duction is made, based on the project approved methodology. Cells containing project formulae are locked. *Raw data related to Process Steam and Hot Water Production delivered to industrial consumers and district heating system are daily transferred electronically and as hardcopy to the Technical Department. Therefore the Turbine Department is responsible.* *The Technical Department is processing the data and validating it by calculation of heat balances.* *The Technical Department transfers the data to the JI-Department that is controlling, recording and archiving the data and performing the calculation.* *Data losses can be avoided because all data are daily stored electronically and per hardcopy. Row data can be followed down to logbook recordings.*	Annex 2
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. The data flow was followed up from logs to monthly reports for the full monitoring period.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the Heat Production Department. No discrepancies have been found and all data are consistent to the calculation tool.*	*See CR#1* *IRL No. 12, 13, 25* ☑
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*Calculation can be crosschecked by monthly or annual heat balances between fuel consumption and total heat production considering the thermal efficiency of the boilers.*	☑

Table 3

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*District heat supplied to heat conversion substations*	*n. a.* *(project specific approach presented in the approved and registered PDD)*	*District heat supplied to heat conversion substations*	*Description of title is consistent.*	☑
Parameter ID (if available)	$Q_{P,DH,HCS}$	*n. a.*	$Q_{P,DH,HCS}$	*Parameter ID is consistent*	☑
Data Unit	*Gcal*	*n. a.*	*Gcal*	*Unit is consistent.*	☑
Monitoring frequency (reading)	*Every our (manually and automatically) logged for the day*	*n. a.*	*Every our (manually and automatically) logged for the day*	*This is consistent.*	☑
Monitoring frequency (recording)	*monthly*	*n. a.*	*monthly*	*This is consistent.*	☑
Calibration requirements	*Every 4 years*	*n. a.*	*Every 4 years*	Based on the following Verification Permits (BV): **1 Heat Computer** V 0048706/14.01.09 V 0011784/04.05.06 **2. Twin Thermo**	☑ IRL No.5 *The situation was documented for HCS*

				Resistances V 0048706/14.01.09 V 027656/04.05.06. **3. Ultrasonic Flow Transducer** V 0048706/14.01.09 V 0011787/04.05.06	*no.3, All the project related 49 HCS are included in the calibration campaign*
Uncertainty level	*low*	*n. a.*	*2 %*	*The value of the calibrated system is consistent to a "low" uncertainty level that was stated in the PDD.* *The valid calibration permits cover the whole monitoring period.*	☑
Measurement Principle (if applicable)	*Heat meter*	*n. a.*	*Ultrasonic*	*This is consistent. More specification is provided within followed.*	☑
	Technical aspects				Conclusion and IRL

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Instrument Type:	Heat Meter KAMSTRUP A/S consisting of: 1. Heat Computer MULTICAL 2. Twin Thermo Resistances 3. Ultrasonic Flow Transducer ULTRAFLOW	☑ IRL No.24
Serial Number:	1. Heat Computer - 4966623 2. Twin Thermo Resistances - 3589423 3. Ultrasonic Flow Transducer - 3589267	☑ IRL No.24
Manufacturer Model Nr.:	1. Heat Computer MULTICAL 2. Twin Thermo Resistances 3. Ultrasonic Flow Transducer ULTRAFLOW	
Specific Location:	*HCS 3, district heating*	☑
Measurement Range:	0 – 5 Gcal/h	☑
Gaps in operating time of instrument :	Period: *There were no gaps in operating time for these instruments.*	☑
	Default value used: In case of gaps according to Project Procedure PO-RT94. Heat delivered to consumers related to the HCS the instrument fails can be used.	☑
	Justification: According to Project Procedure PO-RT94.	☑
	QA/QC aspects	Conclusion and IRL
Source of data	*Data are collected manually and automatically, acquired and stored with the SCADA-System, every hour and logged for the day.* Type: Digital	☑ IRL No.1/No.2
	Procedures: Internal Working Procedure PO-MCRTH 14 *QM PO-RT82 Management and Monitoring, PO-RT94 Determination of the Power Plant Heat and Steam delivered to consumers, training on the job*	☑ *IRL No.7/ 11/ 35*

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

	Implementation of procedure: *The correctness of the procedure implementation has been assessed by onsite visit at the installation site and following the data flow.*	☑ IRL No. 12/13
	Responsibility: District Heating Department Staff	☑ IRL No.7/ 11
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations.	☑ IRL No.11
Data transfer and protection of input data for calculations	*According to Project Procedure PO – RT – 94, project data are transferred from District Heating Department to JI Project Department manually.* *Input of data and calculation is performed by JI Department of ROMAG THERMO.*	☑ IRL No.11
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool.*	*See CR#1* *IRL No.19 / 25*
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*Calculation can be crosschecked with the heat supplied to consumers considering the efficiency of HCS.*	☑

Table 4

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*District heat supplied to consumers connected to the primary network*	*n. a.*	*District heat supplied to consumers connected to the primary network*	*Description of the title is consistent.*	☑
Parameter ID (if available)	$Q_{P,DH,pr.con}$	*n. a.*	$Q_{P,DH,pr.con}$	*Parameter ID is consistent*	☑
Data Unit	*Gcal*	*n. a.*	*Gcal*	*Unit is consistent.*	☑
Monitoring frequency (reading)	*Manually, monthly*	*n. a.*	*Manually , monthly*	*This is consistent.*	☑
Monitoring frequency (recording)	*monthly*	*n. a.*	*monthly*	*This is consistent.*	☑
Calibration requirements	*Every 4 years*	*n. a.*	*Every 4 years*	**1. Heat Computer** BV 0218320/ 05.12.06 **2. Twin Thermo-Resistances** BV 70288/05.12.06, **3. Flow Transducer** BV 0218320/ 05.12.06. Before the project implementation	☑ *IRL No.24* *The situation was documented for private heat station Gheorghe Titeica Nr.38* *All the sta-*

				there was no measuring equipment installed. The billing of heat was made based on heated area.	*tions of consumers connected to the primary network (379 similar) are included in the calibration campaign*
Uncertainty level	*low*	*n. a.*	*2 %*	*The value of the calibrated system is consistent to a "low" uncertainty level that was stated in the PDD.* *The valid calibration permits cover the whole monitoring period.*	☑
Measurement Principle (if applicable)	*Heat meter*	*n. a.*	*Ultrasonic*	*This is consistent. More specification is provided within followed.*	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Heat Meter POLLUSTAT EX consisting of: 1. Heat Computer 2. Twin Thermo-Resistances 3. Flow Transducer				☑ IRL No.24

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Serial Number:	1. Heat Computer – 6466008 2. Twin Thermo-Resistances – 07427 3. Flow Transducer 6466008	☑ IRL No.24
Manufacturer Model Nr.:	POLLUSTAT EX	☑
Specific Location:	Private House – Druga Dumitru; 38 Gheorghe Titeica St., Drobeta Turnu Severin.	☑
Measurement Range:	0 – 1 Gcal/h	☑
Gaps in operating time of instrument :	Period: *There were no gaps in operating time for these instruments.*	☑
	Default value used: *None default values have been used.*	☑
	Justification: *According to Project Procedure PO-RT94.*	☑
	QA/QC aspects	Conclusion and IRL
Source of data	*Data are collected manually monthly.* Type: digital	☑ IRL No.1/No.2
	Procedures: Internal Working Procedure PO-MCRTH 14 *QM PO-RT82 Management and Monitoring, PO-RT94 Determination of the Power Plant Heat and Steam delivered to consumers, training on the job*	☑ *IRL No.7/ 11/ 35*
	Implementation of procedure: *The correctness of the procedure implementation has been assessed by onsite visit at the installation site and following the data flow.*	☑ IRL No. 12/13

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

	Responsibility: District Heating Department Staff	☑ IRL No.7/ 11
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations.	☑ IRL No.11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 94, project data are transferred from District Heating Department to JI Project Department manually. *Input of data and calculation is performed by JI Department.*	☑ IRL No.11
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool.*	*See CR#1 IRL No.19 / 25* ☑
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*Calculation can be crosschecked with the general heat balance of power plant and supplied networks.*	☑

Table 5

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*District heat supplied to secondary network*	*n. a.*	*District heat supplied to secondary network*	*Description of the title is consistent.*	☑
Parameter ID (if available)	$Q_{P,DH,secondary}$	*n. a.*	$Q_{P,DH,secondary}$	*Parameter ID is consistent*	☑
Data Unit	*Gcal*	*n. a.*	*Gcal*	*Unit is consistent.*	☑
Monitoring frequency (reading)	*Every our (manually and automatically) logged for the day*	*n. a.*	*Every hour (manually and automatically) logged for the day*	*This is consistent.*	☑
Monitoring frequency (recording)	*monthly*	*n. a.*	*monthly*	*This is consistent.*	☑
Calibration requirements	*Every 4 years*	*n. a.*	*Every 4 years*	**HEAT System-** latest 2 calibrations: 29.11.06 14.01.09. **HOT SANITARY WATER System** latest 2 calibrations: 04.05.2006 14.01.2009	☑ IRL No.27 *The situation was documented for HCS no.3, All the project related 49 HCS are included in*

					the calibration campaign
Uncertainty level	*low*	*n. a.*	*2 %*	*The value of the calibrated system is consistent to a "low" uncertainty level that was stated in the PDD.* *The valid calibration permits cover the whole monitoring period.*	☑
Measurement Principle (if applicable)	*Heat meter*	*n. a.*	*Ultrasonic*	*This is consistent. More specification is provided within followed.*	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Heat Meters KAMSTRUP A/S consisting of: 1. Heat Computer MULTICAL 2. Twin Thermo-Resistances 3. Ultrasonic Flow Transducer ULTRAFLOW				☑ IRL No.24
Serial Number:	**HEAT** 1. Heat Computer – 4966675 2. Twin Thermo-Resistances - 3589411 3. Ultrasonic Flow Transducer – 3589305 **HOT SANITARY WATER** 1. Heat Computer – 4966559				☑ IRL No.24

	2. Twin Thermo-Resistances - 3589432 3. Ultrasonic Flow Transducer – 4966559	
Manufacturer Model Nr.:	1. Heat Computer MULTICAL , 2. Twin Thermo-Resistances , 3. Ultrasonic Flow Transducer ULTRAFLOW	☑ IRL No.24
Specific Location:	HCS no.3, district heating	☑
Measurement Range:	**HEAT** : 0 –3 Gcal/h; **HOT SANITARY WATER :** 0-2 Gcal/h	☑ IRL No.24
Gaps in operating time of instrument :	Period: *There were no gaps in operating time for these instruments.*	☑
	Default value used: *In case of gaps* according to Project Procedure PO-RT94. Heat delivered to consumers related to the HCS the instrument fails can be used.	☑
	Justification: According to Project Procedure PO-RT94.	☑
	QA/QC aspects	Conclusion and IRL
Source of data	*Data are collected manually and automatically, acquired and stored with the SCADA-System, every hour and logged for the day.* Type: Digital	☑ IRL No.1/No.2
	Procedures: Internal Working Procedure PO-MCRTH 14 *QM PO-RT82 Management and Monitoring, PO-RT94 Determination of the Power*	☑ *IRL No.7/*

	Plant Heat and Steam delivered to consumers, training on the job	*11/ 35*
	Implementation of procedure: *The correctness of the procedure implementation has been assessed by onsite visit at the installation site and following the data flow.*	☑ IRL No. 12/13
	Responsibility: District Heating Department Staff	☑ IRL No.7/11
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations.	☑ IRL No.11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 94, project data are transferred from District Heating Department to JI Project Department manually. *Input of data and calculation is performed by JI Department.*	☑ IRL No.11
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool.*	*See CR#1* *IRL No.19 / 25* ☑
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*Calculation can be crosschecked with the heat supplied to single consumers connected to the HCS.*	☑

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin

Date of Completion: 2010/09/30

Number of Pages: 72

Table 6

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*District heat supplied to consumers connected to the secondary network*	*n. a.*	*District heat delivered to consumers connected to secondary network*	*As it describes the heat to consumers connected to the secondary network it is consistent*	☑
Parameter ID (if available)	$Q_{P,DH,consumers}$	*n. a.*	$Q_{P,DH,consumers}$	*Parameter ID is consistent*	☑
Data Unit	*Gcal*	*n. a.*	*Gcal*	*Unit is consistent.*	☑
Monitoring frequency (reading)	*Manually, monthly*	*n. a.*	*Manually, monthly*	*This is consistent. The system will be improved to* SCADA (after completing the connections of local Heat Meters to the new installed M Bus cable)	☑ IRL No. 0
Monitoring frequency (recording)	*monthly*	*n. a.*	*monthly*	*monthly*	☑
Calibration requirements	*Every 4 years*	*n. a.*	*Every 4 years*	Evidence of the latest 2 calibrations: **HEAT 1. Heat Computer** BV 000062797/12.11.07 **2. Twin Thermo-**	☑ IRL No.28 *The situation was documented for one of*

				Resistances BV 000062647/12.11.07 **3. Flow Transducer** BV 000062650/12.11.07 **HOT SANITARY WATER** **1. Heat Computer** BV 241/ 21.07.08, 2. Twin Thermo-Resistances BV 000062647/21.07.2008 3. Flow Transducer BV 000062503/21.07.2008 Before the project implementation there was no measuring equipment installed. The billing of heat was made based on heated area.	*similar consumer connected to HCS No.54. All project related 1.502 consumers are included in the calibration campaign according to their time of connection.*
Uncertainty level	*low*	*n. a.*	*2 %*	*The value of the calibrated system is consistent to a "low" uncertainty level that was stated in the PDD.* *The valid calibration*	☑

				permits cover the whole monitoring period.	
Measurement Principle (if applicable)	*Heat meter*	*n. a.*	*Ultrasonic*	*This is consistent. More specification is provided within followed.*	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Heat Meter US ECHO/Botosani – Romania consisting of: 1. Heat Computer – ELTRAM CF 55 2. Twin Thermo-Resistances 3. Flow Transducer – USECHO II ELSAFLO.				☑ IRL No.24
Serial Number:	**HEAT** 1. Heat Computer – 07729981 2. Twin Thermo-Resistances – 0700190 3. Flow Transducer – 07725981 **HOT SANITARY WATER** 1. Heat Computer – 07741904; 2. Twin Thermo-Resistances – 0700103; 3. Flow Transducer – 07730054.				☑ IRL No.24
Manufacturer Model Nr.:	1. Heat Computer – ELTRAM CF 55 2. Twin Thermo-Resistances 3. Flow Transducer – USECHO II ELSAFLO				☑ IRL No.24
Specific Location:	Private House – Marica Stefan;16 Decebal St., Drobeta Turnu Severin, (PT54)				☑ IRL No.24
Measurement Range:	**HEAT**: 0-1Gcal/h, **HOT SANITARY WATER:** 0-0,5 Gcal/h				☑

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Gaps in operating time of instrument :	Period: *There were no gaps in operating time for these instruments.*	☑
	Default value used: *In case of gaps* according to Project Procedure PO-RT94. Heat supplied to secondary network related to the HCS the consumer is connected can be used.	☑
	Justification: According to Project Procedure PO-RT94.	☑
	QA/QC aspects	Conclusion and IRL
Source of data	*Data are collected manually monthly.* Type: digital	☑ IRL No.1/No.2
	Procedures: Internal Working Procedure PO-MCRTH 14 *QM PO-RT82 Management and Monitoring, PO-RT94 Determination of the Power Plant Heat and Steam delivered to consumers, training on the job*	*IRL No.7/ 11/ 35* ☑
	Implementation of procedure: *The correctness of the procedure implementation has been assessed by onsite visit at the installation site and following the data flow.*	☑ IRL No. 12/13
	Responsibility: District Heating Department Staff	☑ IRL No.7/ 11
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations.	☑ IRL No.11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 94, project data are transferred from District Heating Department to JI Project Department manually. *Input of data and calculation is performed by JI Department.*	☑ IRL No.11
	Quality of evidence	Conclusion and IRL

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department.* **Error! Reference source not found.**: *The value for January in the sheet IPUT DATA_ENERGY PRODUCTION of the calculation tool is not consistent to the records in the monthly report of the JI Department and Heat Production Department.* *Corrective Action Request No.2:* *Please put the completely parameter description in the sheet IPUT DATA_ENERGY PRODUCTION column E (H) of the calculation tool.*	*See CR#1* *IRL No.19 / 25* *CAR#1* *CAR#2* *These issues have been solved.* ☑
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.* *Corrective Action Request No.3:* *An update of the annual values in the Monitoring Report 2009 chapter 3.10 and 7. is necessary after completed correction according to CAR#1.*	*CAR#3* *MR was updated accordingly.* ☑
Crosscheck (if available)	*Calculation can be crosschecked with the heat supplied to secondary network considering the efficiency of the secondary network.*	☑

Table 7

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*District heat supplied to new consumers connected to the primary network*	*n. a.*	*District heat delivered to new consumers connected to the primary network*	*As it describes the heat to new consumers connected to the primary network it is consistent.* *The order of parameter descriptions in the MR follows PDD and Monitoring Manual*	☑ IRL No.1, No.2
Parameter ID (if available)	$Q_{P,DH,pr.new\_con}$	*n. a.*	$Q_{P,DH,pr.new\_con}$	*Parameter ID is consistent*	☑
Data Unit	*Gcal*	*n. a.*	*Gcal*	*Unit is consistent.*	☑
Monitoring frequency (reading)	*Manually, monthly*	*n. a.*	*Manually, monthly*	*This is consistent.*	☑
Monitoring frequency (recording)	*monthly*	*n. a.*	*monthly*	*This is consistent.*	☑
Calibration requirements	*Every 4 years*	*n. a.*	*Every 4 years*	Evidence of the latest calibration:	☑ IRL No.32 *The situation was documented for one of*

				1. Heat Computer BV 000112638/04.09.09 **2. Twin Thermo-Resistances** BV 000112638/04.09.09 **3. Flow Transducer** BV 000112638/04.09.09. The connection has been made in September 2009 (Commissioning Protocol dated 18.09.2009)	*similar consumers recently new connected to primary network.* *All project related 197 consumers are included in the calibration campaign according to their time of connection.*
Uncertainty level	*low*	*n. a.*	*2 %*	*The value of the calibrated system is consistent to a "low" uncertainty level that was stated in the PDD.* *The valid calibration certificate from the Meteorological Institute Craiova covers the whole Monitoring period.*	☑
Measurement Principle (if applicable)	*Heat meter*	*n. a.*	*Ultrasonic*	*This is consistent. More specification is provided within fol-*	☑

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

				lowed.	
	Technical aspects				Conclusion and IRL
Instrument Type:	Heat Meter ACTARIS – Romania consisting of: 1. Heat Computer – ELSONIC COMPACT 2. Twin Thermo-Resistances 3. Flow Transducer – ELSONIC COMPACT				☑ IRL No.24
Serial Number:	1. Heat Computer – 0879515; 2. Twin Thermo-Resistances – 0711708; 3. Flow Transducer – 0879515				☑ IRL No.24
Manufacturer Model Nr.:	1. Heat Computer – ELSONIC COMPACT 2. Twin Thermo-Resistances 3. Flow Transducer – ELSONIC COMPACT				☑ IRL No.24
Specific Location:	Private House – Rosculet Lenuta; 8, Aurelian St., Drobeta Turnu Severin				☑ IRL No.24
Measurement Range:	0-1Gcal/h				☑
Gaps in operating time of instrument :	Period: *There were no gaps in operating time for these instruments.*				☑
	Default value used: *In case of gaps* according to Project Procedure PO-RT94.				☑
	Justification: According to Project Procedure PO-RT94.				☑
	QA/QC aspects				Conclusion and IRL
Source of data	*Data are collected manually monthly.* Type: digital				☑ IRL No.1/No.2

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

	Procedures: Internal Working Procedure PO-MCRTH 14 *QM PO-RT82 Management and Monitoring, PO-RT94 Determination of the Power Plant Heat and Steam delivered to consumers, training on the job*	☑ *IRL No.7/ 11/ 35*
	Implementation of procedure: *The correctness of the procedure implementation has been assessed by onsite visit at the installation site and following the data flow.*	☑ IRL No. 12/13
	Responsibility: District Heating Department Staff	☑ IRL No.7/ 14
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations.	☑ IRL No.11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 94, project data are transferred from District Heating Department to JI Project Department manually. *Input of data and calculation is performed by JI Department.*	☑ IRL No.11
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool. New customers will be separately monitored and documented as foreseen in the registered PDD. The separate accounting of new consumers is done with the contract management system. Additional new consumers have been connected during the monitoring period 2009.*	*See CR#1* *IRL No.19 / 25* ☑

	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*Calculation can be crosschecked with the balance of total heat supplied to primary network considering the efficiency of primary network.*	☑

Table 8

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*District heat supplied to new consumers connected to the secondary network*	*n. a.*	*District heat delivered to new consumers connected to the secondary network*	*As it describes the heat to new consumers connected to the secondary network it is consistent.*	☑ IRL No.1, No.2
Parameter ID (if available)	$Q_{P,DH,sec.new\_con}$	*n. a.*	$Q_{P,DH,sec.new\_con}$	*Parameter ID is consistent*	☑
Data Unit	*Gcal*	*n. a.*	*Gcal*	*Unit is consistent.*	☑
Monitoring frequency (reading)	*Manually, monthly*	*n. a.*	*Manually, monthly* *When the SCADA-System will be fully operational data are monitored every our (manually and automati-*	*This is consistent.*	☑

			cally) logged for the day		
Monitoring frequency (recording)	*monthly*	*n. a.*	*monthly*	*This is consistent*	☑
Calibration requirements	*Every 4 years*	*n. a.*	*Every 4 years*	**HEAT** **1. Heat Computer** BV 00007530/04.11.08 **2. Twin Thermo-Resistances** BV 00007530/04.11.08 **3. Flow Transducer** BV 00007530/04.11.08 **HOT SANITARY WATER** **1. Heat Computer** BV 000096028/27.02.09 **2. Twin Thermo-Resistances** BV 000096028/27.02.09 **3. Flow Transducer** BV 000096028/27.02.09. **HEAT** :The connection has been made in September 2008 (Commissioning Pro-	☑ IRL No.30 *The situation was documented for one of similar consumers recently new connected to secondary network.* *All project related 437 consumers are included in the calibration campaign according to their time of connection*

				tocol dated 04.11.2008) **HOT SANITARY WATER:** The connection has been made in August 2009	
Uncertainty level	*low*	*n. a.*	*2 %*	*The value of the calibrated system is consistent to a "low" uncertainty level that was stated in the PDD.* *The valid calibration permits cover the whole monitoring period.*	☑
Measurement Principle (if applicable)	*Heat meter*	*n. a.*	*Ultrasonic*	*This is consistent. More specification is provided within followed.*	☑

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

	Technical aspects	Conclusion and IRL
Instrument Type:	Heat Meter ACTARIS – Romania consisting of: 1. Heat Computer – ELSONIC COMPACT 2. Twin Thermo-Resistances 3. Flow Transducer – ELSONIC COMPACT	☑ IRL No.24
Serial Number:	**HEAT** 1. Heat Computer – 08792500 2. Twin Thermo-Resistances – 09981 3. Flow Transducer – 08792500 **HOT SANITARY WATER:** 1. Heat Computer – 08792500 2. Twin Thermo-Resistances – 0711222 3. Flow Transducer – 08792500	☑ IRL No.24
Manufacturer Model Nr.:	1. Heat Computer – ELSONIC COMPACT 2. Twin Thermo-Resistances – 3. Flow Transducer – ELSONIC COMPACT	☑ IRL No.24
Specific Location:	Private House Nicolici Stefan; 25, KISELEFF St., Drobeta Turnu Severin (PT10)	☑ IRL No.24
Measurement Range:	0-1 Gcal/h	☑
Gaps in operating time of instrument :	Period: *There were no gaps in operating time for these instruments.*	☑
	Default value used: *In case of gaps* according to Project Procedure PO-RT94.	☑
	Justification: According to Project Procedure PO-RT94.	☑
	QA/QC aspects	Conclusion and IRL

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Source of data	*Data are collected manually monthly.* Type: digital	☑ IRL No.1/No.1
	Procedures: Internal Working Procedure PO-MCRTH 14 *QM PO-RT82 Management and Monitoring, PO-RT94 Determination of the Power Plant Heat and Steam delivered to consumers, training on the job*	☑ *IRL No.7/ 11/ 35*
	Implementation of procedure: *The correctness of the procedure implementation has been assessed by onsite visit at the installation site and following the data flow.*	☑ IRL No. 12/ 13
	Responsibility: District Heating Department Staff	☑ IRL No.7/ 11
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations.	☑ IRL No.11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 94, project data are transferred from District Heating Department to JI Project Department manually. *Input of data and calculation is performed by JI Department.*	☑ IRL No.11
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the District Heating Department. No discrepancies have been found and all data are consistent to the calculation tool. New customers will be separately monitored and documented as foreseen in the registered PDD. The separate accounting of new consumers is done with the con-*	*See CR#1* *IRL No.19 / 25* ☑

	tract management system. Additional new consumers have been connected during the monitoring period 2009.	
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*Calculation can be crosschecked with the balance of total heat supplied to secondary network considering the efficiency of secondary network.*	☑

2.2. Parameters measured through sampling

Table 1

Sampling information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*Net calorific value of lignite*	*n. a.*	*Lower calorific value (MR) / Net calorific value of lignite (Calculation tool)*	*Description of title is consistent.*	☑
Parameter ID (if available)	$cv_{P,lignite}$	*n. a.*	$cv_{P,lignite}$	*Parameter ID is consistent*	☑
Data Unit	*kcal/kg*	*n. a.*	*kcal/kg*	*Unit is consistent.*	☑

Sampling frequency	Based on onsite analysis and billing records	*n. a.*	Before delivery, for each lot of lignite	*This is consistent.*	☑
Sampling point	*Onsite analysis manufacturer*	*n. a.*	*Onsite analysis manufacturer*	*This is consistent.*	☑
Uncertainty level	*low*	*n. a.*	± 50 Kcal/Kg	*The value of the certified analysis system is consistent to a "low" uncertainty level that was stated in the PDD.*	☑
	Technical aspects				Conclusion and IRL
Sampling Principle:	Systemic Samples				☑
Methodology of Sampling:	ISO 1988				☑ IRL No.24
Sample Analysed by:	*Supplier / laboratory of ROMAG TPP coal department*				☑ IRL No.24
Certification of Analyser/ Laboratory:	*The calibration of the equipment was checked onsite the ROMAG TPP laboratory by certificates.* *Clarification Request No. 2:* *Please provide the certificate to accreditation of the laboratory of ROMAG TPP coal department that is conducting the analysis of the lignite.* ***Forward Action Request No. 1:*** *The accreditation process of ROMAG TPP Laboratory for fuel analysis is right now in progress. The certificate should be provided once the accreditation process is com-*				*CR#2* *This issue is solved partly.* *FAR#1* ☑

	pleted (latest Dec 2010), and the certificate has been issued.	
Methodology of Sample Analysis (if applicable)	SR ISO 1928/1995	☑
Measurement Range:	800 – 3000 Kcal/Kg	☑
Gaps in sampling frequency	Period: *n. a.*	☑
	Default value used: *n. a.*	☑
	Justification: *n. a.*	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: Certificates (Record Book)	☑
	Procedures: PO – RT – 78 *Fuels Calorific Values Determination*	☑
	Implementation of procedure: *The responsible JI-Project management and the staff of the ROMAG TPP laboratory was interviewed during audit how sampling and analysing processes are conducted. The calibration of the equipment was checked onsite the ROMAG TPP laboratory by certificates.* *Clarification Request No. 3:* *Please provide monthly values for 2009 of the net calorific value of lignite determined and reported by the ROMAG TPP coal department for crosscheck.*	*See CR#2 / FAR#1* *IRL No.10, 25, 34* *CR#3* ☑ *IRL No.36*
	Responsibility: *Head of Calorimetric Laboratory*	☑

	Representativeness: *Lignite samplings are split in three portions, and separate analysis are carried out at the level of Supplier and Consumer, while the third portion is kept as witness sample. In case of differences are higher than 50 kcal/Kg, the witness sample will be analyzed and its value will be considered as final value.*	☑ *IRL No.24*
	Reproducibility: Lignite samplings are split in three portions, and separate analysis are carried out at the level of Supplier and Consumer, while the third portion is kept as witness sample.	☑ IRL No.24
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations	☑ IRL No.11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 82: Management and Monitoring System, Project raw data are processed within the Technical Department, where from are transferred to JI Project Department, where the final calculation for CO_2 emission reduction is made, based on the project approved methodology. Cells containing project formulae are locked	☑ IRL No.24
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the Technical Department. No discrepancies have been found and all data are consistent to the calculation tool.*	☑ IRL No. 25
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in*	☑

	the calculation tool.	
Crosscheck (if available)	*A second analyse from each delivery is made by ROMAG TPP laboratory. In case of a deviation a backup witness sample will be analysed by both.* *The amount of consumed lignite is one component to calculate the fuel heat applied by the boiler. The general energy balance of the power plant that is done anyway gives the possibility of crosscheck in combination with the amount of fired lignite.*	☑

Table 2

Sampling information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*Net calorific value of oil*	*n. a.*	*Fuel oil lower calorific value (MR) / Net calorific value of fuel oil (Calculation tool)*	*Description of title is consistent.*	☑
Parameter ID (if available)	$cv_{P,oil}$	*n. a.*	$cv_{P,oil}$	*Parameter ID is consistent*	☑
Data Unit	*kcal/kg*	*n. a.*	*kcal/kg*	*Unit is consistent.*	☑
Sampling frequency	Based on onsite analysis and billing records	*n. a.*	For each lot of fuel oil.	*This is consistent.*	☑
Sampling point	*Onsite analysis*	*n. a.*	Fuel oil supplier	*This is consistent*	☑

	manufacturer		and Consumer (before unload-ing)	*when onsite means at TPP site before unloading.*	
Uncertainty level	*low*	*n. a.*	± 50 Kcal/Kg	*The value of the certified analysis system is consistent to a "low" uncertain-ty level that was stated in the PDD.*	☑
	Technical aspects				Conclusion and IRL
Sampling Principle:	Random sampling				☑
Methodology of Sampling:	SR ISO 1928/1995				☑ IRL No.24
Sample Analysed by:	*Supplier / laboratory of ROMAG TPP coal department*				☑ IRL No.24
Certification of Analyser/ Laboratory:	*The calibration of the equipment was checked onsite the ROMAG TPP laboratory by certificates. See CR#2.*				☑ *See CR#2 / FAR#1*
Methodology of Sample Analysis	SR ISO 1928/1995				☑
Measurement Range:	8000 – 10000 Kcal/Kg				☑
Gaps in sampling frequency	Period: *n. a.*				☑
	Default value used: *n. a.*				☑
	Justification: *n. a.*				☑
	QA/QC aspects				Conclusion

		and IRL
Source of data	Type: Certificates (Record Book)	☑
	Procedures: PO – RT – 78 *Fuels Calorific Values Determination*	☑ IRL No.8
	The responsible JI-Project management and the staff of the ROMAG TPP laboratory was interviewed during audit how sampling and analysing processes are conducted. The accreditation of the laboratory and the calibration of the equipment were checked. *Clarification Request No. 7* *Please provide monthly values for 2009 of the net calorific value of oil determined and reported by the ROMAG TPP coal department for crosscheck.*	*IRL No.8, 25, 31#* *CR#4* ☑ *IRL No.36*
	Responsibility: Head of Calorimetric Laboratory	☑
	Representativeness: *The sampling is done for every delivery of fuel oil before unloading into the tank storage.*	☑
	Reproducibility: *There are two samples that are analyzed taken at the same time by the supplier and TPP.*	☑
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations	☑ IRL No.11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 82: Management and Monitoring System, Project raw data are processed within the Technical Department, where from are transferred to JI Project Department, where the final calculation for CO_2 emission reduction is made, based on the project approved methodology. Cells containing project formulae are locked	☑ IRL No.24
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-*	☑

	Procedure. Approved monthly reports for the full monitoring period have been supplied.	IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. These reports were checked with monthly reports issued by the Technical Department. No discrepancies have been found and all data are consistent to the calculation tool.*	☑ IRL No. 25
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*Net calorific value of fuel oil is a part of the transport document of the supplier.* *A second analyse from each delivery is made by ROMAG TPP laboratory. In case of a deviation a backup witness sample will be analysed by both.*	☑

2.3. Parameters obtained through external sources and accounting data

Table 1

External sources and accounting information *use a separate table for each single parameter*					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*Quantity of lignite consumed*	*n. a.*	*Total power plant lignite consumption (MR) / Quantity of*	*Description of title is consistent.*	☑

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

			lignite consumed (Calculation tool)		
Parameter ID (if available)	$V_{P,lignite}$	*n. a.*	$V_{P,lignite}$	*Parameter ID is consistent*	☑
Data Unit	*T*	*n. a.*	*T*	*Unit is consistent*	☑
	Technical aspects				Conclusion and IRL
Description of Data / Data Refers to:	*Delivered and invoiced Lignite consumed in boilers of TPP* According to Project Procedure "PO – RT – 81 *Power Plant Fuel Consumption Determination"*				☑
Date of Data:	*01/01/2009 – 31/12/09*				☑
Gaps in data	Period: *n. a.*				☑
	Default value used: *n. a.*				☑
	Justification: *n. a.*				☑
	QA/QC aspects				Conclusion and IRL
Source of data	Type*: invoices, weight sheets, stock survey*				☑
	Responsibility: *TPP coal department*				☑ IRL No.7
	Representativeness: *The total amount of delivered lignite is weighted by deliverer and invoiced. Incoming waggons are weighted by weigh-bridge for check. Monthly mass balances are representative in accordance with the produced and measured heat.*				☑
Reliability of Data Source:	According to Project Procedure "PO – RT – 81 *Power Plant Fuel Consumption Determination"*				☑ IRL No.6

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Is the Data up-to-date?	*All data are actual values regarding the reported years.*	☑
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations	☑ IRL No.11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 82: Management and Monitoring System, Project raw data are processed within the Technical Department, where from are transferred to JI Project Department, where the final calculation for CO_2 emission reduction is made, based on the project approved methodology. Cells containing project formulae are locked	☑ IRL No.24
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. No discrepancies have been found and all data are consistent to the calculation tool.* Clarification Request No. 5: *Please provide monthly values for 2009 of the quantity of lignite consumed determined and reported by the ROMAG TPP coal/ technical department for crosscheck.*	IRL No.25 *CR#5* *IRL No.38* ☑
	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*The amount of consumed lignite is one component for the calculation of the boiler applied fuel heat. The general energy balance of the power plant that is done anyway gives the possibility of crosscheck in combination with the net calorific value of lignite.*	☑

Table 2

External sources and accounting information *use a separate table for each single parameter*					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	*Quantity of oil consumed*	*n. a*	*Total power plant fuel oil consumption (MR) / Quantity of fuel oil consumed (Calculation tool)*	*Description of title is consistent.*	☑
Parameter ID (if available)	$V_{P,oil}$	*n. a*	$V_{P,oil}$	*Parameter ID is consistent*	☑
Data Unit	*T*	*n. a*	*T*	*Unit is consistent*	☑
	Technical aspects				Conclusion and IRL
Description of Data / Data Refers to:	*Delivered and invoiced oil consumed in boilers of TPP* According to Project Procedure "PO – RT – 81 *Power Plant Fuel Consumption Determination"*				☑
Date of Data:	*01/01/2009 – 31/12/2009*				☑
Gaps in data	Period: *n. a.*				☑
	Default value used: *n. a.*				☑
	Justification: *n. a.*				☑
	QA/QC aspects				Conclusion and IRL
Source of data	Type: *invoices, weight sheets, tank level*				☑

	Responsibility: *Boiler department*	☑ IRL No.7
	Representativeness: *The total amount of delivered oil is weighted by deliverer and invoiced.* Incoming waggons are weighted by weigh-bridge for check *Monthly mass balances are representative in accordance with the produced and measured heat.*	☑ IRL No.7
Reliability of Data Source:	According to Project Procedure "PO – RT – 81 *Power Plant Fuel Consumption Determination"*	☑ IRL No.6
Is the Data up-to-date?	*All data are actual values regarding the reported year 2009.*	☑
Archiving of raw data and protection measures	According to Project Procedure PO – RT – 94 project data are processed within District Heating Department and are archived on paper and CDs in two different locations	☑ IRL No.11
Data transfer and protection of input data for calculations	According to Project Procedure PO – RT – 82: Management and Monitoring System, Project raw data are processed within the Technical Department, where from are transferred to JI Project Department, where the final calculation for CO_2 emission reduction is made, based on the project approved methodology. Cells containing project formulae are locked	☑ IRL No.24
	Quality of evidence	Conclusion and IRL
Completeness of data	*Evidence of completeness of data is provided by the implemented and verified QM-Procedure. Approved monthly reports for the full monitoring period have been supplied.*	☑ IRL No.7
Data verification	Consistency of raw data with calculation tool: *Monthly reports issued by the JI-Department for the full monitoring period have been provided. No discrepancies have been found and all data are consistent to the calculation tool.* Clarification Request No. 7: *Please provide monthly values for 2009 of the quantity of oil consumed determined and reported by the ROMAG TPP coal/ technical department for crosscheck.*	IRL No. 25 CR#6 IRL No.38

	Consistency of calculation tool with monitoring report: *All data provided in the Monitoring Report 2009 are consistent with the annual values in the calculation tool.*	☑
Crosscheck (if available)	*The amount of consumed oil is one component for the calculation of the boiler applied fuel heat. The balances of the boilers, only fired with oil, give the possibility of cross-check in combination with the net calorific value of fired oil.*	☑

2.4. Other parameters not included in the methodology/tool but included in the PDD

Other information *use a separate table for each single parameter*				
	PDD	MR	Verified	Conclusion and IRL
Parameter title	*n. a.*	*n. a.*	*n. a.*	*n. a.*
Parameter ID (if available)	*n. a.*	*n. a.*	*n. a.*	*n. a.*
Data Unit	*n. a.*	*n. a.*	*n. a.*	*n. a.*
	Technical aspects			Conclusion and IRL
Description of Data / Data Refers to:	*Description e.g. invoice of electricity consumed, NCV of gas consumed from gas provider, IPCC*			
Date of Data:	*Date*			
Gaps in data	*Period: applicable for missing data; include several periods if necessary separated by /*			
	Default value used: description			
	Justification: the theoretical most conservative approach shall be used			

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

	QA/QC aspects	Conclusion and IRL
Source of data	Type: *e.g. reports, website, certificates*	
	Responsibility: *e.g. function of responsible for the data acquisition*	
	Representativeness: *how is verified that the data is representative for the period within the relevant frequency and/or monitoring period?*	
Reliability of Data Source:	*e.g.: certification of data source*	
Archiving of raw data and protection measures	*Describe how the data will be archived, e.g. in CDs, in archive (for paper).* *Is there any redundancy and / or IT solution of data protection measures*	
Data transfer and protection of input data for calculations	*Manual or digital transfer from raw data source to input data for calculations (in calculation tool); how is it done and who does it?* *Protection measures in the calculation tool to avoid unintentional errors or data losses*	
	Quality of evidence	Conclusion and IRL
Completeness of data	*Include a statement that sufficient evidence is available, both in terms of frequency and in covering the full monitoring period. Any deviation shall also be described above in Gaps in operating time of instrument*	
Data verification	Consistency of raw data with calculation tool: *Include a statement on how the data used in the calculation tool (transferred data) has been verified against the raw data e.g. the total flow for each month has been verified based on the logbook data (raw data) available on-site and no discrepancies have been found*	
	Consistency of calculation tool with monitoring report: *Include also an statement that the data in the monitoring report is consistent with the calculation tool*	
Crosscheck (if available)	*If comparable information is available from sources other than that used in the monitoring report, then the DOE shall cross check the monitoring report against the other*	

3. Data Processing and ER calculation

Description of data processing from transferred data to final results in the calculation tool		
Step	Description	Conclusion and IRL
Consistency	*All abbreviations and units used in the MR and the calculation tool are consistent with the PDD. They are traceable to the raw data what clearly corresponding to parameters.*	☑
Calculation Tool description	*The single sheets and parameters are clearly described and transparent. The description follows exactly the PDD and the MR. Revision number and issuing date are indicated at the Front Page sheet* *All formulae, intermediate steps and constants described transparently including correct units and in compliance with the registered PDD. The transparent description of the sheets leads to long formula description for the cells with complex calculations. The values are traceable clearly by analysing the related links properly.*	☑ *IRL No.2*
Elimination of not plausible data (if applicable)	*n. a.*	
Transformation from useable data to input data for further calculation (if applicable)	*n. a.*	
Ex-ante data	*n. a.*	
Default parameter	*Molar masses:* M_{CO2} = *44,01 g/mol* M_{C} = *12,01 g/mol* *Carbon factors for fuels:*	☑

	Lignite 27,60 t C/TJ *Fuel oil 21,10 t C/TJ* *These values refer to "Revised 2006 IPCC Guidelines".* *Oxidation factors: Are issued by the Ministry of Environment and also used in emission calculation of EU-ETS* *Lignite 97,00 %* *Fuel oil 99,50 %*	
Formulae check	*All formulae included in the calculation tool are in compliance with the pictured formulae in the PDD, D.1.1.2* *Baseline emissions = (('INPUT DATA_ENERGY PRODUCTION'!H10)/'ANNEX IV_BASELINE DATA'!$G$86/'ANNEX I_SYSTEM EFFICIENCIES'!D10/'ANNEX I_SYSTEM EFFICIENCIES'!C10*'INPUT DATA_FUEL CONSUMPTION'!H10*'ANNEX VI_CONVERSION FACTOR'!$C$7*'ANNEX V_EMISSION FACTOR DATA'!$C$7)+('INPUT DATA_ENERGY PRODUCTION'!H10/'ANNEX IV_BASELINE DATA'!$G$86/'ANNEX I_SYSTEM EFFICIENCIES'!D10/'ANNEX I_SYSTEM EFFICIENCIES'!C10*'INPUT DATA_FUEL CONSUMPTION'!I10*'ANNEX VI_CONVERSION FACTOR'!$C$7*'ANNEX V_EMISSION FACTOR DATA'!$C$8)-('ANNEX II_EMISSIONS NEW CON.'!C10)* *Project emissions =('INPUT DATA_ENERGY PRODUCTION'!H10/'ANNEX I_SYSTEM EFFICIENCIES'!F10/'ANNEX I_SYSTEM EFFICIENCIES'!E10/'ANNEX I_SYSTEM EFFICIENCIES'!D10/'ANNEX I_SYSTEM EFFICIENCIES'!C10*'INPUT DATA_FUEL CONSUMPTION'!H10*'ANNEX VI_CONVERSION FACTOR'!$C$7*'ANNEX V_EMISSION FACTOR DATA'!$C$7)+('INPUT DATA_ENERGY PRODUCTION'!H10/'ANNEX I_SYSTEM EFFICIENCIES'!F10/'ANNEX I_SYSTEM EFFICIENCIES'!E10/'ANNEX I_SYSTEM EFFICIENCIES'!D10/'ANNEX I_SYSTEM EFFICIENCIES'!C10*'INPUT DATA_FUEL CONSUMPTION'!I10*'ANNEX VI_CONVERSION FACTOR'!$C$7*'ANNEX V_EMISSION FACTOR DATA'!$C$8)-('ANNEX II_EMISSIONS NEW CON.'!D10)*	☑

	Emission reductions = C10-D10	
Rounding functions	*There were no rounding functions applied in the Calculation tool. Calculation is due to Excel properties.*	☑
Calculation tool changes and protection measures	*The final calculation for CO2 emission reduction is made in the JI Project Department, based on the project approved methodology. According to Project Procedure PO – RT – 82: Management and Monitoring System, Project raw data are processed within the Technical Department, where from are transferred to JI Project Department. Data inputs into the tool are only done by authorised staff members of this department. The blank tool is prepared for data input includes Baseline Data and all calculation steps.* Cells containing project formulae are locked. *The calculation tool has not to be modified due to fixed calculation of the emission reduction. New connections to primary and secondary network are considered by measured values that influence the results of the calculation.*	*IRL No.2* ☑
Reported data	*The actual reported data in the Monitoring Report of the year 2009 are consistent with the results of the corresponding calculation tool.* *See CAR#3*	*See CAR#3* *IRL No.1, IRL No.3* ☑

4. Additional assessment

4.1. Internal Review

Description and performance of internal review		
	Description	Conclusion and IRL

Procedure	*The QM-Procedure PO-PT 82 – Management and Monitoring System JI-Project describes the responsibilities of all project involved TPP departments. This procedure has been updated in May 2010 for the following Monitoring Periods. The responsibilities of the JI Project Manager and JI Project Deputy Manager have been split so as to avoid activities overlap as well as to improve the project information and data check/ calculation/ verification process (procedure paragraph 5.2.2).* *The organigram in Annex 1 illustrates the cross-linked structure. The "Annex 2-JI Project Data Handling Process and QA Activities" contents the details regarding acquisition and handling of all necessary data.* *There were no changes in the Procedure during the Monitoring Period 2009.* *Finally all data, already approved at the department level are monthly provided to the JI-Department. There the delivered data are reviewed with additional raw data, e.g. daily records. The JI-Department issues a monthly JI-Project report that is reviewed and signed by PM and DPM. The approved data are put into the calculation tool. The Monitoring Report bases upon the annual results and is independently reviewed and signed by PM and DPM.*	☑ *IRL No.7*
Documentation	*In the monthly JI-Project report (JI Process Data Log Sheet) the JI-Project Manager has to sign that the review of the data sheet and the data log has been performed and all procedures have been followed.*	☑ *IRL No.25*
Responsibilities	*The General Director of TPP ROMAG THERMO approves the Project Monitoring Reports finally.*	☑ *IRL No.7*

4.2. Peculiarities

Description of Peculiarities and unexpected Daily Events during the verification period		
	Description	Conclusion and IRL
Performance	*The project was implemented in steps since October 2006, finished before the end of 2007 and finally accepted in March 2008. This lead to increasing baseline and project emissions in 2008 compared to*	

	2007. In the Monitoring period 2009 baseline and project emissions accordingly the emission reductions decreased by a slightly (4.5 %) increasing district heat delivered to consumers connected to the secondary network. This was caused by a considerable increase (from 23 % in 2008 to 33 % in 2009) of the thermal efficiency of the power plant that leads to a lower total amount of fuel based CO_2 emissions. *The performance of the implemented modernisation of the district heating system leads to the expected results. There were no further peculiarities in the operation of the system in the Monitoring Period of 2009.* *The annual maintenance of the whole network is performed in summer season and needs only a couple of days.* *Clarification Request No. 7:* *What were the changes at power plant side in general to reach this indicated improvement of thermal efficiency?*	*CR#7* *This issue is considered as solved.* ☑
Documentation	*n. a.*	☑
Measures	*There are no additional measures necessary then the implemented procedures and common maintenance.*	☑

4.3. Further additional requirements

Description of additional requirements to be checked		
	Description	Conclusion and IRL
environmental issues	*There are no additional requirements indicated in the registered PDD.*	☑ IRL No.0

4.4. Data Reporting

Description of the Monitoring Report		
	Comments and Results	Conclusion and IRL
Compliance with UNFCCC regulations	*The project is applying a project specific methodology approach. All requirements from the project specific methodology approach are fulfilled. The Monitoring Plan and the PDD are consistent.* *Verification period is from 01. January 2009 to 31. December 2009.*	☑ *IRL No.1/ 3* ☑
Completeness and Transparency	*The parameters in the MR are clearly described, including why the parameter is reported and how it is considered in the calculation. The calculation formulae according to the registered PDD are a part of the MR.*	☑
Correctness	*All of the provided values were correctly transferred from the assessed calculation tool to the MR.*	*See CAR#3*

5. Compilation and Resolutions of CARs, CRs and FARs

Corrective Action Requests by audit team			
	Comments and Results	Ref	Conclusion and IRL
Issue	**Corrective Action Request No.1** *The value for January in the sheet IPUT DATA_ENERGY PRODUCTION of the calculation tool is not consistent to the record in the monthly report of the JI Department and Heat Production Department.*	*2.2, Table 6*	☑ IRL No. 2
Response	*The value for January in the sheet IPUT DATA_ENERGY PRODUCTION of the calculation tool has been updated accordingly to the record in the monthly report of the JI Department and Heat Production Department.*		
Assessment	*The value for January in the sheet IPUT DATA_ENERGY PRODUCTION of the calculation tool is now consistent to the record in the monthly report of the JI Department and Heat Production Department. This mistake must be an oversight and has to be avoided by duble-checking each input value of the calculation tool.*		
Issue	**Corrective Action Request No.2** *Please put the completely parameter description in the sheet IPUT DATA_ENERGY PRODUCTION column E (H) of the calculation tool.*	*2.2, Table 6*	☑ IRL No. 2
Response	*The parameter description in column E (H) in the sheet IPUT DATA_ENERGY PRODUCTION of the calculation tool has been updated.*		
Assessment	*The parameter description in the sheet IPUT DATA_ENERGY PRODUCTION column E (H) of the calculation tool is complete and accordingly to all project documents. Now the parameter description is accordingly to the MR and the PDD.*		
Issue	**Corrective Action Request No.3** *An update of the annual values in the Monitoring Report 2009 chapter 3.10 and 7. is necessary after completed correction according to CAR#1.*	*2.2, Table 6*	

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Corrective Action Requests by audit team			
Response	*The annual values in the Monitoring Report 2009 have been updated.*		☑
Assessment	*The annual values in the Monitoring Report 2009 have been updated accordingly to the new results after implementing corrected values in the calculation tool. There are no more discrepancies.*		IRL No. 1

Clarification Requests by audit team			
	Comments and Results	Ref	Conclusion and IRL
Issue	**Clarification Request No. 1** *Monthly reports issued by the JI-Department for the full monitoring period have been provided onsite. Please provide the missing copies of March and December 2009.*	*2.2, Table 1*	☑ IRL No. 25
Response	*Monthly reports issued by the JI-Department for the full monitoring period have been provided completely.*		
Assessment	*The values in the MR 2009 excel-sheet can be assessed completely by the monthly reports issued by the JI-Department for the full monitoring period.*		
Issue	**Clarification Request No. 2** *Please provide the certificate to accreditation of the laboratory of ROMAG TPP coal department that is conducting the analysis of the lignite.*	*2.3, Table 1*	*This issue is solved partly.* *See FAR#1* ☑
Response	*The accreditation process of ROMAG TPP Laboratory for fuel analysis is right now in progress. The certificate will be provided once the accreditation process is completed and the certificate has been issued.*		
Assessment	*For the Monitoring Period 2009 the determination of the calorific values for lignite and oil for comparison with supplier determined values was carried out by an accredited third party laboratory. In the year 2010 this task was delegated to ROMAG Thermo coal department laboratory. During onsite audit the calibration certificates for the equipment have been checked. The accreditation process is in progress.*		
Issue	**Clarification Request No. 3** *Please provide monthly values for 2009 of the net calorific value of lignite determined and reported by the ROMAG TPP coal department for crosscheck.*	*2.3, Table 1*	☑ IRL No.36
Response	*The monthly values for 2009 of the net calorific value of lignite reported by the ROMAG TPP coal department have been provided*		
Assessment	*There are no deviations to the data in the Monthly reports of the JI department and in the*		

Clarification Requests by audit team			
	MR 2009.		
Issue	**Clarification Request No. 4** *Please provide monthly values for 2009 of the net calorific value of oil determined and reported by the ROMAG TPP coal department for crosscheck.*	*2.3, Table 2*	☑ IRL No.36
Response	*The monthly values for 2009 of the net calorific value of oil reported by the ROMAG TPP coal department have been provided*		
Assessment	*There are no deviations to the data in the Monthly reports of the JI department and in the MR 2009.*		
Issue	**Clarification Request No. 5** *Please provide monthly values for 2009 of the quantity of lignite consumed determined and reported by the ROMAG TPP coal/ technical department for crosscheck.*	*2.4, Table 1*	☑ IRL No.37, 38
Response	*Monthly values and the single consumption sheets for 2009 of the quantity of lignite consumed determined and reported by the ROMAG TPP coal/ technical department have been provided.*		
Assessment	*There are no deviations to the data in the Monthly reports of the JI department and in the MR 2009.*		
Issue	**Clarification Request No. 6** *Please provide monthly values for 2009 of the quantity of oil consumed determined and reported by the ROMAG TPP coal/ technical department for crosscheck.*	*2.4, Table 2*	☑ IRL No.37, 38
Response	*Monthly values and the single consumption sheets for 2009 of the quantity of oil consumed determined and reported by the ROMAG TPP coal/ technical department have been provided.*		
Assessment	*There are no deviations to the data in the Monthly reports of the JI department and in the MR 2009.*		
Issue	**Clarification Request No. 7** *What were the changes at power plant side in general to reach this indicated improvement of thermal efficiency?*	*4.2*	☑

Clarification Requests by audit team			
Response	*The improvement of thermal efficiency in 2009 versus to 2008, is due to the fact that in 2009 the ROMAG TERMO TPP was operated in a nearly pure cogeneration operational pattern (producing 1,561,147 Gcal as steam, 350,288 Gcal as heat for DH and 1,252,963 MWh for a fuel consumption of 5,806,927 Gcal – lignite and fuel oil) compared to 2008 when it was operated in a condensing operational pattern (producing 1,570,079 Gcal as steam, 341,588 Gcal as heat for DH and 1,906,995 MWh for a fuel consumption of 8,214,929 Gcal – lignite and fuel oil).*		
Assessment	*This declaration can be followed by considering the calculation with values verified by TÜV SÜD for the Monitoring periods 2008 and 2009. The fact of a higher total efficiency of the ROMAG THERMO power plant, major less fuel consumption because of almost pure CHP processing, leads to less emission reduction for the project in 2009. This is although the heat delivered to the district heating system is comparable.*		

Verification Protocol

Project Title: Energy efficiency improvement of the district heating system in Drobeta Turnu-Severin
Date of Completion: 2010/09/30
Number of Pages: 72

Forward Action Requests by audit team			
	Comments and Results	Ref	Conclusion and IRL
Issue	**Forward Action Request No. 1** *The accreditation process of ROMAG TPP Laboratory for fuel analysis is right now in progress. The certificate should be provided once the accreditation process is completed (latest Dec 2010), and the certificate has been issued.*	*2.3, Table 1*	
Response			
Assessment			

Annex 2: Information Reference List

Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date(dd/mm/yyyy)	Additional Information (Relevance in JI Context)
0.	Grue & Hornstrup	PDD "Engery efficiency improvement of the district heating system in Drobeta Turnu-Severin, V 8	07/11/2009	*V 1, 15/06/2006* *V 8, 07/11/2009*
1.	ROMAG-THERMO	Monitoring Report 2009	22/07/2010	*V 2, 22/07/2010*
2.	ROMAG-THERMO	100207_Drobeta Turnu Severin Monitoring Report 2009.xls	22/07/2010	*V 2, 22/07/2010*
3.	Grue & Hornstrup	Monitoring Plan, Guidelines and Procedures, Version 4	2009-11-07	
4.	ROMAG-THERMO	ROMAG TERMO TPP - Main Equipment Technical Features	07/11/2009	
5.	ROMAG-THERMO	Calibration and validity permits for steam and heat metering system	National Institute for Metrology 2004 - 2008	*Steam and heat output, heat to consumers*
6.	ROMAG-THERMO	PO – RT 81 Fuel consumption	Internal document – 2007 – 2008	
7.	ROMAG-THERMO	PO – RT 82 Management and Monitoring System, JI-Project, QM System	May 2010	update
8.	ROMAG-THERMO	PO – RT 78 Coal calorific value determination	Internal document – 2007 – 2008	Laboratory standard
9.	ROMAG-THERMO	Organizational scheme, JI Project Responsibilities	Internal document – May 2010	
10.	ROMAG-THERMO	PO – RT 84 Data collection during emergencies (back-up)	Internal document – 2009	
11.	ROMAG-THERMO	PO – RT 94 Heat and steam recording procedure	Internal document – 2009	
12.	ROMAG-THERMO	Manual logbook steam production K 6	Internal document –	

Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date(dd/mm/yyyy)	Additional Information (Relevance in JI Context)
			2009	
13.	ROMAG-THERMO	Manual logbook turbine parameters	04/2010	Actual recordings
14.	ROMAG-THERMO	PO – RT 83 Personnel training procedure	2009	
15.	ROMAG-THERMO	JI Project Training participation lists	15.05.2009	
16.	ROMAG-THERMO	Training session in JI monitoring procedure	Version 6, 15.01.2009	
17.	ROMAG-THERMO	Steam_heat_metering_equip.pdf		Serial no. of meters.
18.	ROMAG-THERMO	Steam_metering_equip.pdf		Serial no. of meters.
19.	ROMAG-THERMO	Monthly Reports Heat Delivery, Thermo department	Jan 2009 – Dec 2009	
20.	ROMAG-THERMO	Coal consumption, daily records	12/2009	
21.	ROMAG-THERMO	Calibrare_cantare.pdf		Calibration for weightbridge for coal
22.	ROMAG-THERMO	Calibration protocol calorimetric bomb, ROMAG Thermo laboratory	26.05.2009	
23.	ROMAG-THERMO	Calibration protocol calculation system, ROMAG Thermo laboratory	26.05.2009	
24.	ROMAG-THERMO	Information and details regarding VP, 2. Monitoring Plan Implementation	11/2009	
25.	ROMAG-THERMO	JI Process Data Log Sheet	Jan 2009 – Dec 2009	Monthly reports
26.	S.C. Termo Actic S.R.L., Drobeta Turnu-Severin	Calibration protocol Pollustat EX, Private HCS Gheorghe Titeica Nr. 38	05.12.2006	Consumer connected to primary network, sample
27.	BRML Craiova	Calibration protocols of all devices HCS P.T. 13	20.08.2008/ 08.12.2006	heat from primary network to secondary

Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date(dd/mm/yyyy)	Additional Information (Relevance in JI Context)
				network, sample PT 13
28.	S.C. Termo Actic S.R.L., Drobeta Turnu-Severin	Calibration protocol US Echo DN 25/ DN 20; casa: Marica Stefan, Decebal Nr. 16 (PT 54)	12.11.2007/ 21.07.2008	heat supplied to consumers, secondary network, sample
29.	RAAN Suc. ROMAG-Thermo, Sectia Termoficare	Calibration protocol, New consumer primary network; Private HCS Ruculescu Lenuta, Aurelian No.8/10	04.09.2009	New consumer connected to primary network, sample
30.	RAAN Suc. ROMAG-Thermo, Sectia Termoficare	Calibration protocol, New consumer secondary network, Casa Nicolici Stefan, Kiseleff Nr.25 (PT10)	04.11.2008/ 27.02.2009	New consumer connected to secondary network, sample
31.	S.C. Filiala ICEMENERG S.A. Bucarest	Determination of oxidation factor, 2009	31.03.2009	
32.	ROMAG-THERMO	Excerpt from Concession Contract	19.12.2003	Concession period
33.	APM MH	LEA Reports, Semi Annual QA – Checklist for local EPA, 2009	28.01./29.01.2010	
34.	ROMAG-THERMO	PO-MCRTH 14, Internal QM-Procedure, Technical Media	July 2009	
35.	ROMAG-THERMO	Contract situation new consumers connected to primary and secondary network	29.04.2010	System printout
36.	ROMAG-THERMO	Monthly net calorific values for lignite and oil, year 2009	2010	Cross check reports

Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date(dd/mm/yyyy)	Additional Information (Relevance in JI Context)
	Sectie Combustibil			
37.	ROMAG-THERMO JI Project Manager	Summary of lignite and oil consumption, year 2009	2010	Cross check reports
38.	ROMAG-THERMO Sectie Combustibil	Single consumption sheets of lignite and oil, year 2009	Jan – Dec 2009	Cross check reports