VERIFICATION REPORT

"TIMISOARA COMBINED HEAT AND POWER REHABILITATION FOR CET SUD LOCATION" IN ROMANIA

(ITL Project ID: RO1000021)

Verification Period:
01 January 2010 to 31 December 2011

REPORT NO. 2012-9612

REVISION NO. 02

DET NORSKE VERITAS

VERIFICATION REPORT

Date of first issue: 09 November 2012	Project No.: PRJC-417599-2012-CCS-CZE
Approved by Edwin Aalders	Organisational unit: DNV KEMA Energy & Sustainability Accredited Climate Change Services
Client: Swedish Energy Agency	Client ref.: Kenneth Möllersten

DNV CLIMATE CHANGE SERVICES AS

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 994 774 352 MVA

Summary:

DNV Climate Change Services AS (DNV) has performed the 2nd verification of the emission reductions reported for the "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania" (ITL Project ID RO1000021 – JI Track 1 project) for the period 01 January 2010 to 31 December 2011.

In our opinion, the GHG emission reductions reported for the project in the monitoring reports (MR for 2010 of version 02 dated 12 October 2012 and the MR for 2011 of version 02 dated 12 October 2012) are fairly stated and are accurate and free of material errors, omissions, or misstatements. The GHG emission reductions were calculated correctly on the basis of the monitoring plan contained in the Project Design Document version 02 of October 2006,

Hence, DNV is able to verify that the emission reductions from the "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania, during the period 01 January 2010 to 31 December 2011 amount to 81 958 tonnes of CO_2 equivalent.

Report No.: 2012-9612	Subject Group: Environment
Report title: "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania	
Work carried out by: Lumír Němeček	
Work verified by: Astakala Vidyacharan	

Date of this revision:	Rev. No.:	Number of pages:
09 November 2012	02	31

Indexing terms

Key words	Service Area
Climate Change Kyoto Protocol Validation Clean Development Mechanism	Verification
	Market Sector
	Process Industry

- ☒ No distribution without permission from the client or responsible organisational unit
- ☐ free distribution within DNV after 3 years
- ☐ Strictly confidential
- ☐ Unrestricted distribution

Table of Content *Page*

Abbreviations

ANRE	Romanian Energy Regulation Authority
BRML	Romanian Bureau of Legal Metrology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CHP	Combined Heat and Power
DNV	Det Norske Veritas
EPA	Environment Protection Agency
ERU	Emission reduction units
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
LoA	Letter of approval
MR	Monitoring report
N_2O	Nitrous oxide
NPG	National Power Grid
PDD	Project Design Document
RES	Renewable Energy Source
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change
GWP	Global Warming Potential

1 INTRODUCTION

Swedish Energy Agency has commissioned DNV Climate Change Services AS (DNV) to carry out the verification of the emission reductions reported for the "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania (the project) in the period 01 January 2010 to 31 December 2011. This report contains the findings from the verification and a verification statement for the certified emission reductions.

1.1 Objective

Verification is the periodic independent review and *ex post* determination by an Accredited Independent Entity (AIE) of the monitored reductions in GHG emissions that have occurred as a result of a Joint Implementation (JI) project activity during a defined verification period.

The objective of this verification was to verify the emission reductions reported for the "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania for the period 01 January 2010 to 31 December 2011.

DNV is an Independent Entity accredited by the Joint Implementation Supervisory Committee (JISC) for all sectoral scopes.

1.2 Scope

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

1.3 Description of the Project Activity

Project Parties:	Romania and Sweden
Title of project activity:	"Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania,
ITL Project ID:	ITL project number: RO1000021
CDM baseline and monitoring methodology	ACM0002 (version 04)
Project Entity:	SC Colterm SA Episcop Joseph Lonovici 4, Timisoara, Timis County

	300092 Romania
	Daniel Vaida, +40 256 308309, daniel.vaida@colterm.ro
Location of the project activity:	The project is located in Timisoara City, which is the administrative centre of the Timis County located in the western part of Romania and situated at 571 km far from Bucharest
Project's JI crediting period:	1 January 2008 to 31 December 2012
Period verified in this verification:	01 January 2010 to 31 December 2011

1.4 Methodology for Determining Emission Reductions

The project activity is the upgrade of the pre-project baseline heat production facility at CET Timisoara Sud with cogeneration capacity. The activity improves the system efficiency, thereby resulting in a) decreased consumer costs and b) reducing the GHG emissions impact of the activity on the environment.

According to the JI Supervisory Committee (JISC), Guidance on criteria for baseline setting and monitoring /49/ a baseline may be established in accordance with appendix B to decision 9/CMP.1. The selected elements of baseline and monitoring methodologies approved by the CDM Executive Board may be used, as appropriate.

The existing facility includes three large steam boilers, fuelled with lignite and natural gas, that are connected to the district heating heat exchangers with a pressure reduction station, reducing the pressure to an acceptable level. The rated capacity of turbogenerator is 19.7 MW. The project activity cogeneration unit generates electricity that is supplied to the grid (self-consumption deducted). The extracted heat is supplied to the district for heating purpose. As the new electricity generation capacity is connected to the power grid; the project falls into the prescriptions of ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" /51/ with respect to the estimation of emission reductions arising in the external grid. For the reason that ACM0002 is intended for projects generating electricity using renewable energy resources (while this project is a fossil-based CHP project), the methodology cannot be applied without modification. However since the project has been registered by JISC as a Track 1 project (UNFCCC JI web page) using the modified ACM0002 as described in the registered PDD /1/, DNV accepts the application of ACM0002 calculation methodology for the emission reductions.

In line with the applied methodology ACM0002 version 12 /51/, the emission reductions are determined as the difference between baseline emissions, project emissions and leakage:

$ER_y = BE_y - PE_y - L_y$.

Where:

***BE_y* - Baseline emissions**

Baseline emissions are calculated as follows:

$BE = BE_{N2O} + BE_{CH4} + BE_{NG} + BE_{LI}$

Where:

BE Baseline emissions tCO_2

BE_{N2O} Baseline emissions from N_2O tCO_2
BE_{CH4} Baseline emissions from CH_4 tCO_2
BE_{NG} Baseline emissions form NG consumption tCO_2
BE_{LI} Baseline emissions from lignite consumption tCO_2

***PE_y* - Project emissions**

Project emissions are calculated as follows:
$PE = PE_{GRID} + PE_{N2O} + PE_{CH4} + PE_{NG} + PE_{LI}$
Where:
PE Project emissions tCO_2
PE_{GRID} Project emissions from grid electricity imports tCO_2
PE_{N2O} Project emissions from N2O tCO_2
PE_{CH4} Project emissions from CH4 tCO_2
PE_{NG} Project emissions form NG consumption tCO_2
PE_{LI} Project emissions from lignite consumption tCO_2

***L_y* - Leakages** are considered to be zero as stated in the registered GS PDD (thereafter referred to as PDD and validation report) and as per the methodology /1//38//51/.

The project emissions are based on the monitoring of the volume of fuels (coal and natural gas) used, amount of heat supplied to the district, and the amount of electricity generated and exported to the grid and electricity consumption from the grid.

The baseline emissions calculations are based on the volume of fuels used, amount of heat supplied and amount of electricity consumed and the electricity supplied to the grid through the project activity.

As the project is a CHP activity, therefore two different approaches has been used to estimate the baseline emissions: one for heat generation and one for electricity generation.

The monitoring methodology for determining baseline emissions builds on measuring of:

- Volume of NG consumed $FF_{NG,P}$ (m^3)
- Volume of lignite consumed $FF_{LI,P}$ (t)
- District heat supplied to primary network $Q_{DH,P}$ (Gcal)
- Electricity production in project plant $E_{G,P}$ (MWh)
- Electricity supplied to national grid by the project plant $E_{EX,P}$ (MWh)
- Electricity imported from the national grid $E_{IM,P}$ (MWh)

2 METHODOLOGY

DNV has assessed and determined that the implementation and operation of the project activity, and the steps taken to report emission reductions comply with JI criteria and relevant guidance provided by the JI Supervisory Committee.

The assessment involved a desk review of relevant documentation as well as an on-site visit(s).

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

i) SC Colterm SA excel sheets included in the Monitoring reports /4/;

ii) Yearly Internal operation book 01 January 2010 to 31 December 2011 /7/

iii) Monthly Monitoring parameters sheets 01 January 2010 to 31 December 2011 /8/

iv) Invoices for coal, gas, heat and electricity provided by SC Colterm SA 01 January 2010 to 31 December 2011 /9//10//11//12/;

v) Calibration records /13//14//15//16/;

vi) Heat production licence /21/

vii) Electricity production licence /22/

The following parameters have been monitored:

- Volume of NG consumed
- Quantity of lignite consumed
- District heat supplied to primary network
- Electricity production in project
- Electricity supplied (exported) to national grid
- Electricity imported from national grid

Verification team

				Type of involvement					
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA1.1 competence
Team leader (JI verifier)	Němeček	Lumír	Czech Republic	✓	✓	✓	✓		✓
Technical Reviewer	Astakala	Vidyacharan	India					✓	✓

Duration of verification

Preparations: *From 09 October2012 to 10 October 2012*

On-site verification: *From 11 and 12 October 2012*

Reporting, calculation checks and QA/QC: *From 12 October 2012 to* 09 November 2012

2.1 Review of Documentation

Key documents provided by project participant reviewed before site visit were:

- Project design document (PDD) /1/,

- Baseline Study /2/,
- Monitoring plan /3/,
- Determination report /38/,
- Monitoring reports (2010, 2011) versions 1and 2 /4/ including 2 excel files (2010, 2011) used for calculation of emissions reductions /5/,
- Invoices of Natural gas, Electricity supplied to national grid, Deliveries of lignite, Electricity imported from National Grid /9//10//11//12/
- An evaluation of data management, the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions /1//2//3//4//7//8//13//14//15//26//27//28//29//38/
- Baseline and monitoring methodology ACM0002 version 12 applied by the project /51/
- National JI Track I Procedure /1/ and
- Other information and references relevant to the project activity's resulting emission reductions /16//17//18//19//20//21//22//23//24//25//26//27//28//28//29//30//31//32//33//34/ /35//36//37//48//49//50/

2.2 Site Visit

The SC Colterm SA - CET Sud location was visited by DNV on 11 and 12 October 2012. Data monitoring and meetings on the "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania with SC Colterm's responsible persons were arranged on the company headquarters and on the CET Sud site.

During the site visit the local records as Internal operation book for the period 01 January 2010 to 31 December 2011, Monthly Internal operation book 01 January 2010 to 31 December 2011, Monthly Monitoring parameters sheets 01 January 2010 to 31 December 2011, Invoices for coal, natural gas, heat and electricity provided by SC Colterm SA 01 January 2010 to 31 December 2011; calibration protocols for measurement devices /13//14//15//16/, Operating licences for heat and electricity production and ISO certificates 9001, 14001 and 18001.

The site visit covered:

- Investigation of whether all relevant equipment as per the PDD has been installed and works as anticipated /1//3//4/.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures /1//3/.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed /1//3/.
- Procedure for monthly QA check by Colterm/27/ and Procedure of annual QA check by EPA /28/
- The duly calibration of all metering equipment was checked and the operator has provided evidence that all metering equipment was duly calibrated /13//14//15//16/.
- The monitoring processes, routines and documentations were audited to check their proper application /1//3//7//8/ .

- The monitoring data were checked completely /7//8//9//10//11//12/.

The personnel interviewed are summarized in the table below:

Name	Organization and position	Topic of interview
Thomas Bosse Borges /52/	Project Grue + Hornstrup A/S, project manager	Monitoring report aspects
Boris Bobu /53/	SC Energy Serv SRL, Operations director	All aspects of the plant operation, data monitoring and reporting
Dorin Popa /54/	SC Colterm SA, Production manager	Opening meeting, agenda of the site visit
Sergiu Andra /55/	SC Colterm SA, Head of investment	All aspects of the plant operation, data monitoring and reporting
Daniel Vaida /56/	SC Colterm SA, Project manager	All aspects of the plant operation, data monitoring and reporting, invoicing
Nedeleu Rica /57/	SC Colterm SA Production dep. of CET Timisoara Sud	All aspects of the plant operation, data monitoring and reporting, invoicing

During this site visit, representative of DNV interviewed above mentioned key personnel of the plant and verified that the plant rehabilitation was realized according to PDD /1/ and Monitoring plan /3/. It was verified that the plant has been under full operation and electricity and heat have been really supplied into the district heating and electricity grid.

A cross-check between information provided in the monitoring report and data provided by the SC Colterm SA (plant operation books, inventories, purchase records and invoices of gas, coal and electricity /7//8//9//10//11//12/) has been done as well as the check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD /1/ and the Monitoring plan/3/ .

The site visit activities have covered the review of calculations and assumptions made in determining the GHG data and emission reductions.

QC/QA procedures have been provided under the ISO 9001, 14001: and 18001 standards /17//18//19/.

Agenda of the site visit

11 October 2012

Information about project – changes from PDD, status of implementation, environmental impact monitoring (Project manager)

Plant visit

Review of the site - Physical verification of technology employed and meters (including documentation) used for measurement of

- Volume of natural Gas consumed
- Volume of lignite consumed
- Cogeneration heat supplied
- Cogeneration electricity consumed in own plant
- Cogeneration electricity supplied to NPG

Review of emission reduction calculation - Measuring devices, calibration records, installation, and calibration protocols

- Volume of natural Gas consumed
- Volume of lignite consumed
- Cogeneration heat supplied
- Cogeneration electricity consumed in own plant
- Cogeneration electricity supplied to NPG

12 October 2012

Review of emission reduction calculation - continuing (Project manager, person responsible for data)

- Review of records related metrology requirements for measurement devices, primary data utilization (Data management system - Collection, Documentation, Archiving, Upgrade, Responsibility)
- Review of Monitoring report calculation – raw data, data flow, GHG emissions reduction calculation, HW/ SW,
- Training requirements

2.3 Closing out of verification findings

The objective of this phase of the verification was to resolve any issues which needed be clarified prior to DNV's conclusion that

i) the project activity has been implemented and operated in accordance with the PDD,

ii) the monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan and

iii) the data and calculation of GHG emission reductions are correct.

A corrective action request (CAR) is issued, where:

i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable JI requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

One CAR and six CLs were identified during the site visit. All of them have been closed adequately. The issues related to

- content of monitoring reports,
- formal mistakes and non-conformities between Monitoring report, excel sheets and, the primary data summary tables (heat production) and

- consequent calculations of ERs
- references
- calibrations

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania" for the period 01 January 2010 to 31 December 2011.

3.1 Remaining issues, CARs, FARs from previous verification

No remaining/open issues from 1st verification were identified /39/.

3.2 Project Implementation

Currently CET Timisoara SUD is fully under operation. While the PDD states the installed capacity as 18 MW, the installed rated capacity is 19.7 MW, as verified from the Monitoring Reports Timisoara Combined Heat and Power Rehabilitation for CET SUD Location, (2010, 2011) /4/ and verified during the site visit.

The project activity

- produces heat in hot water and steam boilers for supply to the centralised heating system of Timisoara and also
- produces electricity in the backpressure turbine EKOL E-R19.7-14,3 with rated capacity of 19.7 MW feeding by steam produced in 3 steam boilers and supplying electricity into the local distribution company ENEL and then to the National power grid. When no electricity is supplied to the grid the CET Timisoara SUD own consumption is from the grid.

Monitoring is provided by central monitoring system SCADA, which hourly read data from individual meters and is a source of input values for Yearly Operating Books (monthly summaries) /7/ and with Monthly monitoring parameters summaries approved by the Head of CET Timisoara Sud /8/.

The project corresponds with the PDD /1/ and the Determination report /38/, nevertheless the following changes have been done:

- While the PDD states the installed capacity as 18 MW, the installed rated capacity is 19.7 MW. During the feasibility study phase it was envisaged to install 18 MW cogeneration unit, however during the procurement phase, based on the technical aspects from the Tender Documents, Colterm TPP received several offers out of which a 19.7 MW turbogenerator unit was selected. According to the PDD (Version 2, October 2006 page 13) the total investment costs for a 18 MW turbo generator were estimated at 5 433 661 Euros. In comparison, the real costs for the 19.7 MW turbo generator, which was installed were 6 145 402 Euros. The change in turbo generator capacity is not expected to alter the projects additionality due to an increase in the costs connected to the capacity increase. A comparison of the estimated investment costs/MW capacity (18 MW turbo generator) and

the actual investment costs / MW capacity (19.7 MW turbo generator) shows that the specific investment costs for the actual turbo generator (19.7 MW) are with 311 949 Euros 4.5% higher than the specific investment costs for the estimated turbo generator (18 MW), respectively.

- Volume of lignite consumed:

  In accordance with the determined Monitoring Plan, the lignite consumption is to be determined based on invoices and through boiler weighing machines. This however is not possible, as coal consumption is not invoiced on a monthly basis and existing weighing machines only determine the quantity of coal delivered to the coal storage pits and not the actual coal consumption. The actual volume is calculated/determined according to: JI Project Procedures PO5_Coal Consumption Estimation /34/ and CET Timisoara Internal Procedure "PO – CLT – A – 23 Power Plant Energy Production and Energy Consumption Planning and Monitoring Process" /23/ (see paragraph 3.3 for details)

  The lignite receipt at the plant is weighed for each batch and summarized on a daily basis.

  The calorific content, humidity and the ashes of the coal are determined daily, by analysing the coal samples in the internal laboratory.

  Details about how to determine the physic-chemical characteristics of the coal can be found in the operational procedure PO-CLT-A-34 – "Determination of the caloric content of the solid fuels"/25/. Details about how to receive the coal are found in the operational procedure PO-CLT-A-30 – "Coal receiving and weighing"/26/. The calorific value of lignite is fixed at the baseline level and not monitored during the crediting period.

  DNV observes that the lignite receiving, analysis methods and the accounting procedures are as per the internal procedures PO-CLT-A-34 – "Determination of the caloric content of the solid fuels"/25/. Details about how to receive the coal are found in the operational procedure PO-CLT-A-30 – "Coal receiving and weighing"/26/ and are adequately adhered to. Documentation was physically checked and connected procedures verified during the site visit. Hence DNV can confirm that the deviation in the monitoring of lignite consumption procedure includes all the necessary steps and procedures for the coal consumption assessment; it is acceptable and provides sufficient results which were discussed and confirmed during the site visit.

- District heat supplied to primary network:

  As per the PDD /1/ , the heat supplied by the project is to be measured in GJ whereas, this is metered in Gcal as the instrument/SCADA system (CALEC MB) uses Gcal as the output unit. This deviation in DNV opinion is acceptable as the unit in GJ can be calculated from Gcal.

- Electricity consumed by the own plant (Auxiliary consumption).

  In accordance with the determined Monitoring Plan, the electricity consumed on-site is to be metered. This however is not possible as various on-site electricity consumers are not equipped with electricity meters. Instead it was decided to include the actual electricity production from the turbine ($E_{G,P}$) as additional monitoring parameter and then calculate the electricity consumed on-site by subtracting the electricity imported from the grid from the quantity of electricity produced and the quantity of electricity supplied to the grid.

In accordance with the determined Monitoring Plan /3/, the electricity consumed on-site is to be metered. This however is not possible as various on-site electricity consumers are not equipped with electricity meters. Instead it was decided to include the actual electricity production from the turbine ($E_{G,P}$) as additional monitoring parameter. And then calculate the electricity consumed on-site by subtracting the electricity imported from the grid from the quantity of electricity produced and the quantity of electricity supplied to the grid.

- Electricity production

  In accordance with the determined Monitoring Plan /3/, the electricity production from the turbine ($E_{G,P}$) is not a monitoring parameter. However in order to calculate the electricity consumed on-site, the electricity production from the turbine ($E_{G,P}$) is required as monitoring parameter.

  Under the original Feasibility study issued in 2003 as well as the PDD /1/ the project technology consisted of installing a backpressure steam turbine of about 18 MW in CET Timisoara Sud to process the steam produced in the steam boiler, increasing the energy efficiency. Project was completed in April 2007 and the rated capacity of newly installed turbine has been 19.7 MW.

All the above mentioned changes correspond with the Annex 2 of 22nd meeting of JISC. DNV can confirm that the physical location, emission sources, baseline scenario of the project has not changed and the changes are consistent with the JI specific approach and CDM methodology upon which the determination was prepared for the project. From the technical point of view DNV confirms these changes do not create any specific problems and are acceptable. Hence DNV confirms that the conditions defined by the paragraph 33 of the JI guidelines /49/ (Data used share reliable and provide a transparent picture of the emission reductions or enhancements of net removals monitored.) are still met for the project and the original determination opinion does not change.

3.3 Compliance with monitoring plan

The monitoring has been carried out in accordance with the PDD /1/ and Monitoring plan /3/

The below tables describe for each parameter, which is to be measured according to the monitoring plan, how DNV has verified that i) the actual monitoring complies with the monitoring plan and that ii) data have been assessed to correctly support the emission reductions being claimed.

Monitored Parameters

1. **Volume of NG consumed**

   The NG is consumed mainly during start-up of boilers process and as flame support.

   Volume of NG consumed is determined under JI Project Procedures

   - "PO2_Data Transfer" /24/ and
   - CET Timisoara Internal Procedure "PO – CLT – A – 23 Power Plant Planning and Monitoring of Energy production and Consumption"/23/.

   Measured data is logged on a monthly basis in accordance with

- JI Project Procedures "PO2_Data Transfer" /24/.

2. **Volume of lignite consumed**
The lignite consumption is calculated/determined under:

   - JI Project Procedures PO5_Coal Consumption Estimation /34/ and
   - CET Timisoara Internal Procedure "PO – CLT – A – 23 Power Plant Planning and Monitoring of Energy production and Consumption" /23/

   The calculated data is logged on a monthly basis in accordance with

   - JI Project Procedure "PO2_Data Transfer" /24/.
     This procedure defines several steps for the lignite hourly/daily/monthly/annual estimation/calculation process, as follows:
     - Quantity of Lignite - Hourly Consumption for Hot Water Boilers
     - Quantity of Lignite - Hourly Consumption for Steam Boilers
     - Quantity of Lignite - Total Daily/Monthly Consumption
     - Power Plant Lignite Stock - Yearly Check-up

   Details about how to determine the physics-chemical characteristics of the coal can be found in the

   - CET Timisoara Internal Procedure PO-CLT-A-34 – "Determination of the caloric content of the solid fuels"/25/.

   Details about how to receive the coal are found in the

   - CET Timisoara Internal Procedure PO-CLT-A-30 – "Coal receiving and weighing"/26/.

3. **District heat supplied to primary network**
The quantity of heat supplied to the primary network of the Municipal District Heating System by the power plant is determined under

   - JI Project Procedure "PO2_Data Transfer" and
   - CET Timisoara Internal Procedure "PO – CLT – A – 23 Power Plant Energy Consumption Planning and Monitoring Process" /23/.

   The calculated data is logged on a monthly basis in accordance with JI Project Procedure "PO2_Data Transfer" /24/.

4. **Electricity production**
The electricity production is determined under

   - JI Project Procedure "PO2_Data Transfer" and
   - CET Timisoara Internal Procedure "PO – CLT – A – 23 Power Plant Energy Consumption Planning and Monitoring Process" /23/

   The measured data is logged on a monthly basis in accordance with

   - JI Project Procedure "PO2_Data Transfer" /24/.

5. **Electricity supplied to national grid**
The electricity supplied to national grid is determined under

- JI Project Procedure "PO2_Data Transfer" /24/ and
- CET Timisoara Internal Procedure "PO – CLT – A – 23 Power Plant Energy Consumption Planning and Monitoring Process"/23/

The measured data is logged on a monthly basis in accordance with

- JI Project Procedure "PO2_Data Transfer" /24/.

6. **Electricity imported from national grid**
The electricity imported from the national grid is determined in accordance with
   - JI Project Procedure "PO2 - Data Transfer" /24/ and
   - CET Timisoara Internal Procedure "PO -CLT - A - 23 Power Plant Energy Consumption Planning and Monitoring Process" /23/

   The measured data is logged on a monthly basis in accordance with
   - JI Project Procedure "PO2_Data Transfer" /24/.

In accordance with the above mentioned changes the following parameters have been monitored:

Data variable	Data type	Data unit	Measured (m), calculated (c), estimated (e)	2010	2011
$FF_{NG,P}$	Volume of NG consumed	m^3	m	23 569 635	17 028 265
$FF_{LI,P}$	Quantity of lignite consumed	t	e/c	219 114.00	194 775.80
$Q_{DH,P}$	District heat supplied to primary network	Gcal	m	440 091	366 405
$E_{G,P}$	Electricity production in project	MWh	m	41 540.79	30 883.04
$E_{EX,P}$	Electricity supplied (exported) to national grid	MWh	m	24 082.44	18 447.66
$E_{IM,P}$	Electricity imported from national grid	MWh	m	6 244.70	6 467.35

During the above operating period, the monthly electricity productions as well as the electricity imported/exported from/to the grid are presented in the table above.

It should be noted that during May – September 2010 and May – October 2011 no energy (thermal, electric) has been delivered to the system due to the fact that during these months the heat demand was lower than the minimum acceptable operating capacity of the turbine.

No lignite has been consumed during these month and only small quantities of natural gas for technological consumption for various internal necessities.

The description of calibration procedures for the meters is included the table under section 9 "Accuracy of Emission Reduction Calculations" of Monitoring reports /4/ and in Monitoring plan /3/. Calibration procedures have been correctly as well as in time provided by authorised laboratories /40/. All the calibration protocols /13//14//15//16/ were evidenced by DNV during the site visit.

The CET Timisoara Sud PRAM – AMC (I & C) Laboratory staff is in charge with the activities related to the normal maintenance and repair process of the measuring and control equipment. The measuring and control equipment is repaired and tested using calibrated measurement standard equipment.

The calibration activities for the power plant equipment subject to periodic calibration verification are carried out in licensed laboratories specifically dedicated to these activities.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**Volume of natural gas consumed**
Measuring frequency:	continuously
Reporting frequency:	monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Natural Gas Measuring System FR 02 type which includes the Flow computer ROFAR (which displays NG consumption) No.12 / 1999, range 2500-19000 SMC/h, 1.5%, calibration every 2 years, includes the following parts: • NG Flow Computer ROFAR01Rokura-Farming, 0.25 %, calibration every 2 years • Absolute Pressure Transducer SPMC 731 Endress-Hauser No: 4NY0011, range 0 ÷ 7 bar abs.,0,3%, calibration every 2 years • Differential Pressure Transducer – 2 pcs., SPMD 235 Endress-Hauser – No 4SQ0041, 4SQ0045, range 0 ÷ 63 mbar, 0.1%, calibration every 2 years • Thermal Resistance, Tst 264, No. 4J001731, range -20 ÷ +60 °C, cl. B, calibration every 2 years
Is accuracy of the monitoring equipment as	Not defined in the PDD

stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Error of measurement of 1.5% is acceptable and represents the good monitoring practise /50/ and comply with Formal List Encompassing the Measuring Equipment L.O. 2010 /42/; Order 48/08.03.2010 issued by BRML /41/ and Natural Gas Measuring Regulation, 2008 /44/.
Calibration frequency /interval:	2 years
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Validity of the calibration protocols is defined for 2 years /13/
Company performing the calibration:	Calibration was done by the authorised laboratory SC FARMING OANA SERV. S.R.L. LABORATOR METROLOGIE /13//40/
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is (are) calibration(s) valid for the whole reporting period?	Yes Calibration protocols dated 24 October 2008 (valid 2 yrs), 6 October 2010 valid (1 yr) 8 October 2011 (valid 1 yr) /13/
If applicable, has the reported data been cross-checked with other available data?	Yes. Crosschecked with invoices /9/
How were the values in the monitoring report verified?	Crosschecked with invoices, Yearly Operating Books (monthly summaries) and with Monthly monitoring parameters summaries approved by the Head of CET Timisoara Sud /7//8/.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes PP is also certified under ISO 9001, 14001 and 18001 /18//19//20/
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	NA

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):):	**Quantity of lignite consumed**
Measuring frequency:	continuously
Reporting frequency:	monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes

Type of monitoring equipment:	Frequency (AEM 54), voltage (MIO, accuracy 1.5%) height of lignite layer metering – recalculating to the TJ consumption
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Steam Boilers – Each boiler is fitted with a system AER type, consisting in 4 (four) frequency convertors ACS ACS-CP-A / ACS550-01-015A-4 type (ABB), one for each coal conveyor belt (Redler belt): Outlet Signal 4 – 20 mA, Resolution 0.1%, Accuracy ± 1%, , calibration frequency 1 year . In the steam boilers control room there are 4 (four) control panels for each boiler, one panel/coal conveyor belt, fitted with frequency meters types: ACS-CP-A / ACS550-01-015A-4, serial numbers 523/2007/N-3, 399/2005/N-3, 400/2005/N-3, calibration frequency 1 year. Hot water Boilers – Each boiler is fitted with voltage meter, type M10 - serial numbers: 1143/92, 11359/98, 1362/92, 1363/92, Output Signal 0 – 250V, Accuracy 1.5%, Calibration frequency 1 year. The monitoring equipment is the standard equipment using in the industrial facilities with the sufficient accuracy representing good monitoring practise and comply with the Internal Procedure no. 4-02-77 and Annual Repair Activity Internal Procedure PP-CLT-10
Calibration frequency /interval:	yearly
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not defined in the PDD Calibration is provided by the internal I&C laboratory during the beginning of the heating season under the internal procedure PP-CLT-10. It represents good monitoring practise.
Company performing the calibration:	Internal I&C and laboratory, using of measuring etalons calibrated by external licensed laboratories such as BRML Timisoara and INM Bucuresti,
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes /16/
Is(are) calibration(s) valid for the whole reporting period?	Yes For the metering systems related to "Quantity of lignite consumed" only periodic internal verification activities are required. The Romanian Legal Authority in charge with calibration, verification and type tests of measuring instruments is Romanian Bureau of

	Legal Metrology (BRML). The related legislation in force which deals with calibration, verification and type tests of measuring instruments is Ordinance (Ordin) 48/2010 issued by BRML published within Official Gazette (Monitorul Oficial) 181/22.03.2010 /41/, which contains also the "Official List of measuring instruments subject to periodic calibration and verification" . (The above Ordinance came in force at 22.03.2010 and replaced the previous legislation, namely Ordinance (Ordin) 27/2004). Metering systems similar with "The metering systems related to Quantity of lignite consumed" for the following hot water and steam boilers: - HWB -1 (Hot Water Boiler) - HWB - 2 (Hot Water Boiler) - SB – 1 (Steam Boiler) - SB – 2 (Steam Boiler) - SB – 3 (Steam Boiler) are not part of the "Official List of measuring instruments subject to periodic calibration and verification" according with Ordinance (Ordin) 48/2010 /41/. However the Government Decision 1660/2005 stipulates that those measuring instruments which are not included in the Official List of the measuring instruments to be periodically calibrated and verified can be calibrated and verified according to specific procedures. Accordingly these measuring instruments are subject to periodic verification as per Power Plant Internal Procedure no. 4-02-77, every year, according with the "Power Plant Annual Planned Repair Program". Indeed some time these activities are performed at intervals longer than 12 calendar months due to the various constrains in planning the repair and maintenance activities. Taking into account the valid legislation and its incorporation into the "Power Plant Annual Planned Repair Program" under which the measuring instruments are subject to periodic verification every year, DNV has found to be this procedure acceptable.

	Verification dates of individual systems - Related Measuring Equipment: • **HWB -1 (Hot Water Boyler)** 01-31 October2009, 6-14 Octobeer 2010, 1.-30 April 2011 • **HWB - 2 (Hot Water Boyler)** 01-31 October 2009, 15-29 March 2010, 1.-30 April 2011 • **SB – 1 (Steam Boiler)** 01-31 May 2009, 7-25 May 2010, 3-21 October 2011 • **SB – 2 (Steam Boiler)** , 01-31 October 2009, 01-30 September 2010, 1.-.16 September 2011, • **SB – 3 (Steam Boiler)** 01-31 October 2009 02-31 August 2010, 01-09 Auhust 2011 /16/
If applicable, has the reported data been cross-checked with other available data?	Yes. Crosschecked with invoices from suppliers /12/
How were the values in the monitoring report verified?	Crosschecked with invoices from suppliers, Yearly Operating Books (monthly summaries) and with Monthly monitoring parameters summaries approved by the Head of CET Timisoara Sud /7//8//12/.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, checked by invoices. PP is certified under ISO 9001, 14001 and 18001 /18//19//20/
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	NA

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**District heat supplied to the primary network**
Measuring frequency:	Continuously
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Computer for thermal energy CALEC MB, Aquametro AB,, 4253547 / 02 Accuracy class: EN 1434-1/OIML Cl. 4,

	Measuring and calculation error:≤0.5%at ΔT≥3K, typ. 0.3%, calibration frequency 4 years Water Flow Meter SONOFLO (Danfoss) SONO 3000 Cod: 085F5017, serial number 030411N277, accuracy ± 0.5 % for water flows ranked from 0.15 – 10m^3/s Ultrasonic sounder 2 pcs., SONO 3200 Cod: 085/B5301, calibration frequency 4 years Thermal Resistance PT100TPK-1141 Pt 100, 4 wires connection, calibrationn frequency 4 years
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not defined in the PDD Above mentioned accuracy is acceptable and represents the good monitoring practise /50/ and comply with the Formal List Encompassing the Measuring Equipment L.O. 2010 /42/; Order 48/08.03.2010 issued by BRML /41/
Calibration frequency /interval:	4 yrs - Under the calibration protocol issued by authorised metrology laboratory AS INTERNATIONAL. S.R.L., dated 1 September 2006, 19 August 2010 and 19 August 2011 /15/
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not defined in the PDD Validity of calibration certificate is 4 yrs and 1 yr /15/ and represents good monitoring practise.
Company performing the calibration:	Performed by authorised metrology laboratory AS INTERNATIONAL. S.R.L. /15//40/
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes /15/
Is(are) calibration(s) valid for the whole reporting period?	Yes 1 January 2010 - 31 December 2011 /15/ Calibration protocols No:0132105, dated 01 September.2006, No:AS03/19.082010., dated 19 August 2010, No:0111251 dated 19 August 2011
If applicable, has the reported data been cross-checked with other available data?	Values were checked with Yearly Operating Books (monthly summaries) and with Monthly monitoring parameters summaries approved by Head of CET Timisoara Sud. /7//8/
How were the values in the monitoring report verified?	Values were checked with Yearly Operating Books (monthly summaries) and with Monthly monitoring parameters summaries approved by

	Head of CET Timisoara Sud. /7//8/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	PP is certified under ISO 9001, 14001 and 18001 /18//19//20/
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	NA

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**Electricity imported/supplied from/to National Grid**
Measuring frequency:	Continuously
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Bi-directoral Contor electricity meter, Electronic Meter, ABB A1R-L+, MG002672802 U = 2x(96-528)V, I=0,05-20A, Class 0,5 error ±0,25%, calibration frequency 10 years
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not defined in the PDD Above mentioned accuracy is acceptable and represents the good monitoring practise /50/ and complies with Formal List Encompassing the Measuring Equipment L.O. 2010 /42/; Order 48/08.03.2010 issued by BRML /41/ and Electricity Measuring Code /45/.
Calibration frequency /interval:	10 yrs
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not defined in the PDD Yes, validity of calibration certificate is 10 yrs /14/ and represents good monitoring practise.
Company performing the calibration:	Performed by the authorised laboratory ABB ROMETRICS S.R.L. /14/
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes, calibration protocol dated 17 November 2003 is valid 10 yrs. /14/
If applicable, has the reported data been	Yes, crosschecked with invoices /11/

cross-checked with other available data?	
How were the values in the monitoring report verified?	Crosschecked with invoices, yearly operating books (monthly summaries) and with monthly monitoring parameters summaries approved by the head of CET Timisoara Sud.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place??	Yes, checked by invoices. PP is certified under ISO 9001, 14001 and 18001 /18//19//20/
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	NA

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**Electricity produced**
Measuring frequency:	Continuously
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	No – deviation, newly established. The electricity production as monitoring parameter was not included in the initial Monitoring Plan, however is required under the existing set up in order to calculate emission reductions.
Type of monitoring equipment:	Multifunctional Power Logic system Merlin Gerin PM 500, serial number 31059, 0 – 25 MWh Accuracy: • Voltage: 140 to 480 V, Ac 0.5% • Current: 0.1 to 2xIn, Ac 0.5 %, • Power PF=0.5L to 0.8 C 1% of value, • Power Factor 0.5<PF<11%, • Frequency:45 to 65 Hz 0.1%, • Energy Active IEC 61036 class 1, • Energy Reactive IEC 61268 class 2,
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not defined in the PDD Above mentioned accuracy is acceptable and represents the good monitoring practise /50/ and complies with Electricity Measuring Code /45/ and Internal Procedure PP-CLT-10.

Calibration frequency /interval:	Yearly
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not defined in the PDD but according to the PP internal procedures, the metering systems related to "Electricity produced" are performed during the Turbo-generator Planned Annual Repair Activity - internal verification forms dated 01-31 May 2009, 12-27 May 2010 and 22-27 September 2011/6/. It represents good monitoring practise.
Company performing the calibration:	Internal I&C and laboratory, using measuring etalons calibrated by external licensed laboratories such as BRML Timisoara and INM Bucuresti.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes. For the metering systems related to "Electricity produced" only periodic internal verification activities are required. Verification dates of related measuring equipment: dated 01-31 May 2009, 12-27 May 2010 and 22-27 September 2011/6/. According to the PP internal procedures, the metering systems related to "Electricity produced" are performed during the Turbo-generator Planned Annual Repair Activities. In 2010 (May – September) and 2011 (May – October)
If applicable, has the reported data been cross-checked with other available data?	Values were checked with Yearly Operating Books (monthly summaries) and with Monthly monitoring parameters summaries approved by Head of CET Timisoara Sud. /7//8/
How were the values in the monitoring report verified?	Values were checked with Yearly Operating Books (monthly summaries) and with Monthly monitoring parameters summaries approved by the Head of CET Timisoara Sud /8/.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	PP is certified under ISO 9001, 14001 and 18001 /18//19//20/
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	NA

Data not monitored

Data variable	Description	Data value	Data unit	Source
$L_{GRID,B}$	Grid losses	14	%	The PDD /1/ states that there is a lack of publicly available data regarding the losses of electricity in the Romanian National Electricity Grid and further states that "confidential" studies indicate grid losses in the range of 14-15%. A working paper "Electricity Reform in Romania" published in August 2011 in Romania indicates total losses in the Romanian National Electricity Grid at 16.84% (Transport losses: 2.62 %; Distribution losses: 14.22 %). (http://competitionpolicy.ac.uk/documents/107435/107587/ccp08-11.pdf) The losses of 14 % applied in context of the project activity are well below the losses as indicated by the working paper, thus this approach is considered conservative.
$F_{EL,GRID,B}$	Specific fuel consumption for electricity production in the national grid	346	gCE/kWh	The specific fuel consumption for the electricity production in the national grid is based on the assumptions that the marginal power production in Romania is based on coal. For conservative reasons, the lowest annual specific fuel consumption, calculated based on the information taken from the Romanian Yearbook for 2004 was applied in context of the project activity. The PDD states that due to the lack of available data on the Power Plants serving to the Romanian Electricity Grid it was not possible to follow all the recommendations of the approved CDM Baseline Methodology ACM 0002 /51/. At the same time, considering the natural gas price projections on the international markets and the available coal-fired installed power connected to the Romanian grid, it was justified to consider coal based power plants as the marginal plant. Thus for the calculation of the emissions in the baseline, the marginal annual plant emission factor was calculated for the coal-fired power

				plants for the period 1992 – 2003, taking into account the information as per Romanian Yearbook for 2004.
$F_{TH,CET,B}$	Specific fuel consumption for heat production in the CET	181	kgCE/GCal	The specific fuel consumption for heat produced in the CET was calculated based on historical fuel input and heat output at the CET for the year 2006.
$f_{NG,CET,B}$	Share of natural gas entering the CET	31	%	The share of natural gas entering the CET is calculated based on fuel consumption and respective fuel specific calorific values in 2006
$f_{LI,CET,B}$	Share of lignite entering the CET	69	%	The share of lignite entering the CET is calculated based on fuel consumption and respective fuel specific calorific values in 2006
C_{NG}	Carbon content in natural gas	15.3	tC/TJ	IPCC /43/
C_{LI}	Carbon content in lignite	27.6	tC/TJ	IPCC
$Factor_{corr,NG}$	Carbon correction factor natural gas	0.995	-	IPCC
$Factor_{corr,LI}$	Carbon correction factor lignite	0.98	-	IPCC
$CH_{4\ NG}$	CH_4 content in natural gas	1.4	kg/TJ	IPCC
$CH_{4\ LI}$	CH_4 content in lignite	1	kg/TJ	IPCC
N_2O_{NG}	N_2O content in	0.1	kg/TJ	IPCC

	natural gas			
N_2O_{LI}	N_2O content in lignite	1.4	kg/TJ	IPCC /43/
GWP_{CH4}	Global Warming Potential of methane	21	-	IPCC
GWP_{N2O}	Global Warming Potential of N_2O	310	-	IPCC
NCV_{NG}	Calorific value of NG	8 050	$kCal/m^3$	Manufacturer design specifications
NCV_{LI}	Calorific value of lignite	1 600	kCal/kg	Manufacturer design specifications

3.4 Accuracy of Emission Reduction Calculations

All used data were of a high quality to assure accurate calculation. It is evidenced that the whole monitoring system was fully operational during the monitoring period. The calibration results ensure the correct functionality of all the necessary equipment pertinent to the project activity. DNV received access to all relevant documentation needed to verify the emission reduction calculation. All used information was traceable and appropriately archived.

The obtained data are transferred from raw data files to final calculation spreadsheets, which were presented during site visit and the part of the Monitoring reports. Two potential risks for this processing of data exist only. This is the failure of some measurement device (no failures of measuring equipment have been found), which was discussed in chapter 3.3, and human interference to files in time of data processing. The interference was excluded, when raw data and data from final monitoring report was compared. The formulas in monitoring report corresponds /5/ with provided evidences and monitoring plan /3/.

For the verification period of 01 January 2010 to 31 December 2011 the emissions are as follows:

	unit	2010	2011
Project emissions*	tCO_2	196 865	168 532
Baseline emissions*	tCO_2	245 830	201 526
Emission Reductions*	**tCO_2**	**48 965**	**32 993**

*Rounded values

Total emission reductions

2010	**48 965 tCO_2**
2011	**32 993 tCO_2**
Total verification period	**81 958 tCO_2**

The PDD estimates for the years 2010 and 2011 together are in total 69 342 tCO_2. The verified emission reductions are different (in the summary higher) than the estimated. The differences within the actual emission reductions generated in 2010 and 2011 and the estimated emission reductions as per PDD are different due to the fact The ERs are calculated based on actual monitoring parameters, rather than estimates as per PDD, utilizing the approach as indicated within the PDD /1/and described in the MRs /4/.

3.5 Quality of Evidence to Determine Emission Reductions

At present monitoring is provided partially by central monitoring system SCADA, (Simantic PCS7, manufactured by SIEMENS) whose implementation is in progress. The activities related to SCADA system (hard and soft) maintenance, check, control and upgrade activities are performed regularly by dedicated Colterm staff specifically trained SCADA manufacturer. Hourly read data from individual meters are recorded in power plant Daily Operation Parameters Data Sheets /8/, which are the source of input values for Yearly Operating Books/7/ (monthly summaries) and with Monthly monitoring parameters /8/ summaries approved by the Head of CET Timisoara Sud. All necessary documentation is collected,

referenced and aggregated and is easily accessible in spreadsheets. Measurements are performed by properly calibrated equipment, and the key data can also be cross-checked via other sources, such as invoices, daily reports and meters available in the operators control room. No assumptions are used that have any material influence on reported emission reductions".

All measurement and analytical instruments are calibrated regularly by authorised third part and as per the documented procedures used by the plant operators.

All instruments have a valid calibration covering the whole monitoring period. DNV confirms the all instruments are working within the specified error ranges as per certificates. The calibration certificates were provided as evidence of the work performed. The accuracy and calibration interval of the monitoring equipment is in accordance with the relevant legislation /41/ and with guidance provided by the CDM Executive Board /49/ and is controlled and calibrated in accordance with the specifications of the local standards and per the manufacturer specification. The monitoring system and instruments as well as the applied QA/QC scheme (i.e. calibration, maintenance, etc.), following supplier recommendations, represent good monitoring practice.

All meters and measuring equipment necessary for the project activity are located at the combined heat and power plant as per registered project documentation and according to the monitoring plan.

3.6 Management System and Quality Assurance

The quality assurance and quality control procedures in terms of equipment operation and maintenance as well as data reporting are covered by the documented procedures.

Local operators, instrumentation engineers and calibration personnel of the system have been trained by equipment suppliers and qualified internally. Data handling solutions involve redundancy, data manipulation protection, integrity check as well as proper archiving.

Quality assurance procedures are supported by the annual training activities of JI personnel. DNV received and checked the training protocols for 2010 and 2011 /36//37/. These protocols cover the JI and QA/QC areas..

According to Order 297/2008 /46/ that enforces the "National Procedure for using Joint Implementation (JI) Mechanism under Track I (National JI Track I Procedure), Chapter IV "Monitoring, determination and issuance of ERUs", the Local EPA Timisoara has verified the monitoring process related to Ji Project "Timisoara Combined Heat and Power Rehabilitation for CET SUD Location" on 17 February 2011 and 25 January 2012 /28/ and filled in the checklist form for 2010 and 2011 /47/.

SC Colterm SA has obtained the following ISO certifications

- ISO 9001 issued by SRAC CERT S.R.L. valid by 5 November 2012 /18/
- ISO 14001 issued by SRAC CERT S.R.L. valid by 5 November 2012 /19/
- ISO 18001 issued by SRAC CERT S.R.L. valid by 5 November 2012 /20/

As a result of the JI project activity the following operational forms and procedures were issued:

Forms:

- F01_Monthly QA Check List Colterm /27/
- F02_Semi Annual QA Check List EPA /28/
- F03_Monthly JI Monitoring Data Record /29/
- P01_Records and Documents Keeping /30/
- P02_Data transfer /31/
- P03_Monthly QA check Colterm /32/
- P04_Semi-Annual QA check EPA /33/
- P05_Coal consumption estimation /34/
- Annex Data Transfer /35/

Procedures

The monitoring process consists of the following process steps:

1. Collection
2. Documentation
3. Archiving
4. GHG emissions reduction calculation
5. Verification"

DNV can confirm that SC Colterm SA provided all above mentioned ISO certifications as an evidence that it fulfils the requirements of these standards concerning organisation, environmental system and occupational health and safety aspects and that they cover power management processes, production and sale/supply of electric power, production, transportation, distribution and supply of heat power and supply of cold water. DNV also physically checked operational forms and procedures mentioned above.

4 VERIFICATION STATEMENT

DNV Climate Change Services AS has performed the verification of the emission reductions reported for the "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania (UNFCCC Registration Reference No. RO1000021) for the period 01 January 2010 to 31 December 2011.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project.

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project.

DNV conducted the verification on the basis of the CDM monitoring methodology ACM0002 (version 04), the monitoring plan contained in the registered Project Design Document of version 02 of October 2006, and the monitoring reports (MR for 2011 of version 02 dated 12 October 2012 and the MR for 2011 of version 02 dated 12 October 2012). The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions of the "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania" (ITL project ID RO1000021) for the period 01 January 2010 to 31 December 2011 are fairly stated in the monitoring reports of MR for 2010 of version 02 dated 12 October 2012 and the MR for 2011 of version 02 dated 12 October 2012.

The GHG emission reductions were calculated correctly on the basis of the approved CDM baseline and monitoring methodology AM00002 (version 04) and the monitoring plan contained in the registered PDD of version 02 of October 2006,

DNV Climate Change AS is able to verify that the emission reductions from the "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" in Romania during the period 01 January 2010 to 31 December 2011 amount to 81 958 tonnes of CO_2 equivalent.

Prague and Oslo, 09 November 2012

Lumír Němeček
JI Verifier
DNV Prague, Czech Republic

Edwin Aalders
Approver,
DNV Climate Change Services AS

REFERENCES

4.1.1 Documentation provided by the project participants

/1/ SC Colterm SA and SC Eninvest SA: *Project Design Document - "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location"*, October 2006.

/2/ SC Colterm SA and SC Eninvest SA: *Baseline Study – "Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" (Annex 2 to PDD)*, January 2006

/3/ SC Colterm SA and SC Eninvest SA: Monitoring Plan - *"Timisoara Combined Heat and Power Rehabilitation for CET Sud Location" (Annex 3 to PDD)*, January 2006

/4/ SC Colterm SA and Grue + Hornstrup AlS in cooperation with EnergyServ: *Monitoring Reports Timisoara Combined Heat and Power Rehabilitation for CET SUD Location, Monitoring reportsfor 2010 and 2011 (MR for 2010 version 01 dated 20 September 2012, version 02 dated 12 October 2012, version 03 dated 7 November 2012 and the MR for 2011 version 01 dated 20 September 2012, version 02 dated 12 October 2012, version 03 dated 7 November 2012).*

/5/ SC Colterm SA and Grue + Hornstrup AlS in cooperation with EnergyServ: *Excel sheets for the Emissions calculation 2010 – 2011,* version 1 dated 20 September 2012, version 2 dated 12 October 2012

/6/ SC Colterm SA: *Internal working orders 2009– 2011 on production electricity meter*

/7/ SC Colterm SA *Yearly Production Internal Reports 2010 - 2011*

/8/ SC Colterm SA: *Monthly and daily monitoring parameters summaries approved by the Colterm director 2010 - 2011*

/9/ SC Colterm SA: *Natural gas invoices 2010 - 2011*

/10/ SC Colterm SA: *Electricity supplied to national grid – invoices 2010 - 2011*

/11/ SC Colterm SA: *Electricity imported from National Grid – invoices 2010 - 2011*

/12/ SC Colterm SA: *Deliveries of lignite – invoices 2010 – 2011, including yearly summary*

/13/ SC FARMING OANA SERV. S.R.L. *Calibration protocol on natural gas meter No.:0170628 dated 24.October2008, No:0016728, dated 6 October 2010 and 0020327,*

/14/ ABB ROMETRICS S.R.L. *Calibration protocol on electricity meter, No: TM-01521990,* dated 17 Nov 2003

/15/ AS INTERNATIONAL. S.R.L: *Calibration protocols on heat meter, No:0132105, dated 01 September.2006, No:AS03/19.082010., dated 19 August 2010, No:0111251 dated 19 August 2011*

/16/ SC Colterm SA: *Internal working orders 2009 – 2011 on coal consumption meters*

/17/ SC Colterm SA: *Coal amount on the stock – inventory results 2009 - 2011*

/18/ ISO 9001 issued by SRAC CERT S.R.L. valid by 5 November 2012

/19/ ISO 14001 issued by SRAC CERT S.R.L. valid by 5 November 2012

/20/ ISO 18001 issued by SRAC CERT S.R.L. valid by 5 November 2012

/21/ Autoritatea Nationala de Reglementare in Domeniul Energiei - *Licence on heat production No. 597/2004, issued on* 6 April 2004

/22/ Autoritatea Nationala dr Reglementare in Domeniul Energiei - *Licence on electricity production, No. 596/2004, issued on 6 April 2004*

/23/ SC Colterm SA: *PO-CLT-A-23 - Planning and Monitoring of Energy production and Consumption – Internal Operational Procedure*

/24/ SC Colterm SA: *JI Project Procedure "PO2_Data Transfer" Internal Operational Procedure*

/25/ SC Colterm SA: PO-CLT-A-34 – "*Determination of the caloric content of the solid fuels". Internal Operational Procedure*

/26/ SC Colterm SA: *PO-CLT-A-30 – "Coal receiving and weighing". Internal Operational Procedure*

/27/ SC Colterm SA: *F01_Monthly QA Check List Colterm*

/28/ SC Colterm SA: *F02_Annual QA Check List EPA (check lists dated 17 February 2011 and 25 January 2012*

/29/ SC Colterm SA: *F03_Monthly JI Monitoring Data Record*

/30/ SC Colterm SA: *JI Project Procedures - P01_Records and Documents Keeping*

/31/ SC Colterm SA: *JI Project Procedures - P02_Data transfer*

/32/ SC Colterm SA: *JI Project Procedures - P03_Monthly QA check Colterm*

/33/ SC Colterm SA: *JI Project Procedures - P04_Semi-Annual QA check EPA*

/34/ SC Colterm SA: *JI Project Procedures - PO5_Coal Consumption Estimation*

/35/ SC Colterm SA: *A Procedures - Annex Data Transfer*

/36/ SC Colterm SA: *Training Protocols 1 and 2*, 2010

/37/ SC Colterm SA: *Training Protocols 1 and 2*, 2011

4.1.2 Other project documents or documents used by DNV to verify the information provided by the project participants

/38/ DNV: *Determination report No. 2006-0423, revision 03* dated 15 January 2007

/39/ DNV: *1st Verification Report, version 02*, 9 May 2011

/40/ BRML: *List of Authorised companies for calibrations*
http://www.brml.ro/lista-cu-agenti-economici-autorizati

/41/ BRML: *Metrology order 48/08.03.2010, published within Official Gazette (Monitorul Oficial) 181/22.03.2010*

/42/ BRML: *Formal List Encompassing the Measuring Equipments L.O.* 2010

/43/ IPCC: *2006 IPCC Guidelines for National Greenhouse Gas Inventories*,2006
http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html

/44/ TRANSGAZ (Romanian Natural Gas Transport Company): *Natural Gas Measuring Regulation*, 2008
http://www.transgaz.ro/Downloads/Legislatie/Regulament_10.06.2011.pdf

/45/ ANRE: *Electricity Measuring Code21.06.2002*
http://www.anre.ro/ordin.php?id=189

/46/ Ministry of Environment and Sustainable Development: *Order 297/2008 for approving the National Procedure for using "Joint Implementation (JI)" mechanism under Track I, in accordance with Art. 6 of Kyoto Protocol,* dated March 21, 2008 and published in the Official Gazette of 21 April 2008 (Official Gazette no. 308/2008)
http://legestart.ro/Monitorul-Oficial-308-din-21.04.2008-(M.-Of.-308-2008-10382).htm

/47/ Agentia Regionala Pentru Protrctia Mediuluil Timisoara (Local EPA Timisoara):

Letters of Submission No: 1473/21.2.2011 and 2322/15.03.2012

4.1.3 Methodologies, tools and other guidance by the JI Supervisory Committee

/48/ JI Supervisory Committee: *Determination and verification manual*, version 01 adopted at JISC 19

/49/ JI Supervisory Committee, *Guidance on criteria for baseline setting and monitoring*, version 02 adopted at JISC18

/50/ European Parliament: *Directive 2004/22/EC of European Parliament and of the Council of 31 March 2004 on measuring instruments*

/51/ CDM Executive Board: *ACM0002 " Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version* 04

4.1.4 Persons interviewed during the verification

/52/ Thomas Bosse Borges, Grue + Hornstrup A/S, Project manager,

/53/ Boris Bobu, SC Energy Serv SRL, Operations director

/54/ Dorin Popa SC Colterm SA, Production manager

/55/ Sergiu Andra, SC Colterm SA, Head of investment department

/56/ Daniel Vaida, SC Colterm SA, Project manager

/57/ Nedeleu Rica, SC Colterm SA, Production dep. of CET Timisoara Sud

- o0o -

APPENDIX A

CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	During the primary data verification there were found some mistakes concerning the district heat supplied to the primary network in the excel sheet of 2010. These mistakes have to be revised and new values have to be used for revised calculations	Respective values have been corrected and the revised MRs submitted to DNV	Mistakes concerning the district heat supplied to the primary network in the excel sheet of 2010 /5/were corrected as well as corresponding calculation results and were included in the revised monitoring reports /4/. **CAR 1 has been closed**

Clarification requests

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 1	Provide the authorisation of third party companies performing the calibration activities	Respective authorisation has been submitted to DNV	Respective list of authorised companies for calibration activities issued by the BRML has been provided to DNV /40/. **CL1 has been closed**

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 2	Provide the explanation why the ERs are higher than estimated in the PDD	Respective explanation has been included in the MRs	Respective explanation has been included in the MRs /4/. The estimated emission reductions as per PDD are different due to the fact that the latter did not consistently follow the approach as per determined PDD. **CL2 has been closed**
CL 3	Explain the reasons why no energy was delivered to the grid during May – September 2010 and during May – October 2011.	Respective explanation has been included in the MRs	Respective explanation has been included in the MRs /4/. no energy was delivered to the grid during May – September 2010 and during May – October 2011 due to the fact that during these months the heat demand was lower than the minimum acceptable operating capacity of the turbine. **CL3 has been closed**
CL 4	Provide the coal inventory results 2010 - 2011 supported with invoices.	Respective inventories have been provided to DNV	Respective inventories as well as corresponding invoices were provided during the site visit /17/and verified by DNV. **CL4 has been closed**

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 5	Explain why the semi-annual quality assurance checks by the local EPA were done yearly.	The JI Project quality assurance checks is carried out according to Order 297/2008 that enforces the "National Procedure for using Joint Implementation (JI) Mechanism under Track I (National JI Track I Procedure), Chapter IV "Monitoring, determination and issuance of ERUs" (document attached and comments inserted). The interpretation of quality assurance checks by Local EPA Timisoara is given in the Letter of Submission (document attached and translation inserted). In other terms, although the Local EPA Timisoara carried out one verification per semester as stated in the aforementioned Procedure (Chapter IV, paragraph 1), it was issued only 1 (one) Report as stated in the aforementioned Procedure (Chapter IV, paragraph 2).	Explanation as well as local EPA interpretation was provided to DNV. According to Order 297/2008 that enforces the "National Procedure for using Joint Implementation (JI) Mechanism under Track I (National JI Track I Procedure), Chapter IV "Monitoring, determination and issuance of ERUs" /46/, the Local EPA Timisoara carried out one verification per semester as stated in the aforementioned Procedure (Chapter IV, paragraph 1), it was issued only 1 Report as stated in the aforementioned Procedure (Chapter IV, paragraph 2 and verified the monitoring process related to JI Project "Timisoara Combined Heat and Power Rehabilitation for CET SUD Location" on 17 February 2011 and 25 January 2012 /28/ and filled in the checklist form for 2010 and 2011 /47/ **CL 5 has been closed**

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 6	Provide the sources and references concerning not monitored parameters.	Respective source of references have been provided to DNV	The sources and references concerning not monitored parameters were included into the MRs /4/ as well as into the excel sheets /5/ and were checked during the site visit. **CL6 has been closed**

Forward action requests from previous verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR 1	No FAR raised		

Forward action requests from this verification

FAR ID	Forward action request	Response by Project Participants	DNV's assessment of response by Project Participants
FAR 1	No FAR raised		