JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM
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CONTENTS

Annexes

SECTION A. General description of the project

A.1. Title of the project:

Boiler efficiency improvement at Holboca CET Iasi II

Version number of the document: v.4

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A.2. Description of the project:

The project activity involves the utilization of fire-side cleaning technology under the trademark Therma Chem FS12, in order to improve the thermal and production efficiency of two (2) existing primary boiler installations at Holboca CET Iasi II. In additional an associated new ash removal system will be installed in order to handle the increased loading of fly ash existing the boiler installations.

Holboca CET Iasi II is a combined heat and power plant (CHP) owned by S.C. CET Iasi S.A. the municipal owned energy supply company, which operates the below plants located in and nearby the city of Iasi, Romania:

CET	Iasi I	–	combined heat and power plant located in the city of Iasi
CET	Iasi II	–	combined heat and power plant located in the city of Holboca
UFET	Iasi	–	heat only plant
URPS	Iasi	–	repair and spare parts plant

The Holboca CET Iasi II plant is equipped with two high pressure boilers, each with a capacity of 260 Gcal/h, producing 420 t/h of steam, and two turbo generators with a capacity of 50 MW each. The combined heat and power plant is fuelled by hard coal[1] and produces both heat and hot portable water for the city and moreover supplying power to the national electricity grid. Holboca CET Iasi II is interconnected with CET Iasi I by the primary network, where hot water produced by both plants is mixed and then supplied to the district heating network. Holboca CET Iasi II is in operation approximately 6 months per year, only during the heating season. It should be noted that the two boilers at Holboca CET Iasi II operate on a sequential bases and not in parallel.

The existing primary steam boilers and associated equipment at Holboca CET Iasi II were refurbished from 1997 – 2001, making it possible to perform a fuel switch from lignite to hard coal, in order to improve the overall thermal and production boiler efficiencies. This fuel switch project was financed by the Nordic Investment Bank (NIB) and executed by Fortum Engineering (Finland). The steam boilers have been operating for approximately 4 years since the rehabilitation was completed, but still have operational problems related to slagging of the boilers radiant sections (upper part of the combustion chamber), super heater surfaces, slags of economizer surfaces etc. This slagging of installations decreases the thermal efficiency of the boiler equipment, and requires many shutdowns during the heating season in order to clean the installations. The effect is that in order to keep the heat production at the required level an increased amount of coal is used, which has a negative impact on the total greenhouse gas emissions of the plant.

The project activity will help alleviate these operational problems due to slagging of the existing boilers through the use of Therma Chem FS12. Therma Chem FS12 cleans and prevents the deposit of dust and slag within the energy production equipment, which in turn will lead to an overall efficiency increase of

[1] For the start up of the boiler installation, heavy fuel oil is used

the boilers and corresponding greenhouse gas emission reductions (CO_2) based on reduced fuel consumption. At the same time regular use of Therma Chem FS12 diminishes the need to shut down and clean boilers installations due to the excessive deposit of dust and slag on equipment. The new ash removal system will handle the increased loading of fly ash existing the boiler installations due to the cleaning technology.

A.3. Project participants:

The **Project Proponent** is S.C. CET Iasi S.A. Centrala de Termoficare, a municipality owned company registered in Romania. The company operates 3 power plants as well as 1 repair and spare parts plant in and around the city of Iasi. S.C. CET Iasi S.A. holds legal title to the emission reductions generated from the project activity and holds a Letter of Endorsement for the JI project from the Romanian Ministry of the Environment and Water Management.

The **Project Emission Reduction Buyer** is the Danish Government as represented by the Danish Environmental Protection Agency (hereafter called "DEPA"). DEPA is responsible for the Danish Ministry of Environment's efforts to develop and finance JI and CDM projects in Central and Eastern Europe and is also the Danish Governments Designated National Authority.

A.4. Technical description of the project:

A.4.1. Location of the project:

Holboca, Iasi, Romania

A.4.1.1. Host Party(ies):

Romania

A.4.1.2. Region/State/Province etc.:

Iasi

A.4.1.3. City/Town/Community etc.:

Holboca

A.4.1.4. Detail of physical location, including information allowing the unique identification of the project (maximum one page):

Holboca CET Iasi II is located between the city of Iasi (approx. 13 km away) and the town of Holboca (approx. 8 km away), in the north-eastern part of Romania, close to the Moldavian border.

Figure 1: Iasi, Romania

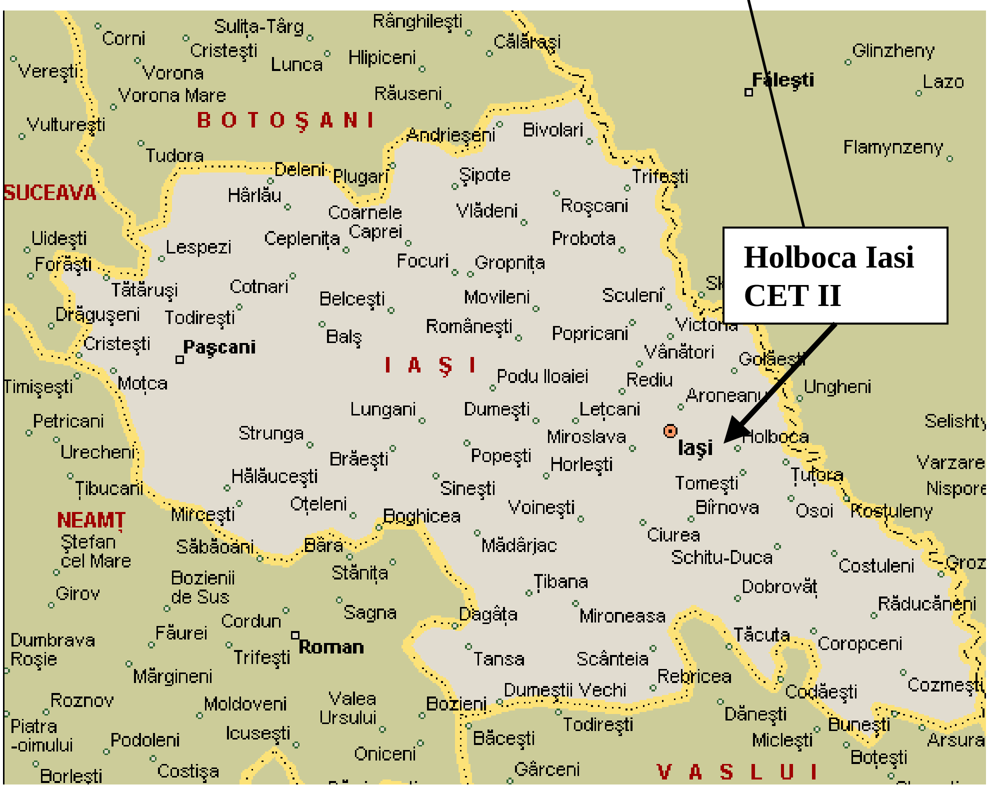


Figure 2: Holboca, Iasi County

A.4.2. Technology(ies) to be employed, or measures, operations or actions to be implemented by the project:

The project encompasses the application of the chemical Therma Chem FS12 into the existing boilers as well as the erection of a new ash handling system.

Therma-Chem FS 12:

The proposed project is based on the injection of Therma Chem FS12 into the existing boilers in order to prevent deposition of slag inside boiler radiant sections, heat exchanger surfaces etc.

Therma Chem FS12 represents an on-load fire side treatment for large industrial boilers and process heaters operated on fossil fuels, which allows for the elimination or significant reduction of deposits on heat exchanger surfaces, super heater, economizer, and air pre-heaters. In effect Therma Chem FS12 cleans and prevents the deposit of dust and slag within the energy production equipment, which in turn significantly impacts the decreasing energy efficiency of the system due to these deposits. At the same time regular use of Therma Chem FS12 diminishes the need to shut down and clean boiler installations due to the excessive deposit of dust and slag on equipment.

The Therma Chem FS12 technology has a number of positive impacts on the slag and ash materials, deposited on heat exchanger surfaces inside the boiler during the combustion process. First, it significantly reduces the amount of slag depositing in the radiant section; so there will be less materials falling down on the bottom of the boiler, which would need to be removed to the crushers. Consequently, it increases the amount of ash due to better combustion. The oxidizing process of the carbon from the fuel is increased preventing the ash and other impurities from the fuel sticking on the heat exchanger surfaces inside the boiler. The unburned carbon, which is very sticky adheres on the metallic surfaces inside the boiler forming deposits which constitute a thermal barrier. Accordingly the boiler efficiency and capacity decreases. At the same time other operating parameters are seriously altered and therefore the boiler must be shut down on a regular basis to be cleaned in order to restore it to an optimal operating condition.

The Therma Chem FS12 technology changes the physical nature of the deposits from the heat exchange surfaces inside the boiler, making them more uniform, fine, porous, chemically neutral, and much better prepared for further transportation. Consequently the effects of the Therma Chem FS12 technology are the following:

- it increases the boiler efficiency and capacity, thus decreasing fuel consumption and hence the associated greenhouse gas emissions and the quantity of ash and other materials released;
- it maintains the normal boiler operating parameters over prolonged operating periods, eliminating the shut downs for boiler cleaning and condition restoration;
- through better efficiency, it will help the power plant to reduce its “costs of compliance” with emissions regulations, taking into account the reduction of SOx and NOx emissions as well as other particulates due to reduced fuel consumption per ton of steam produced.

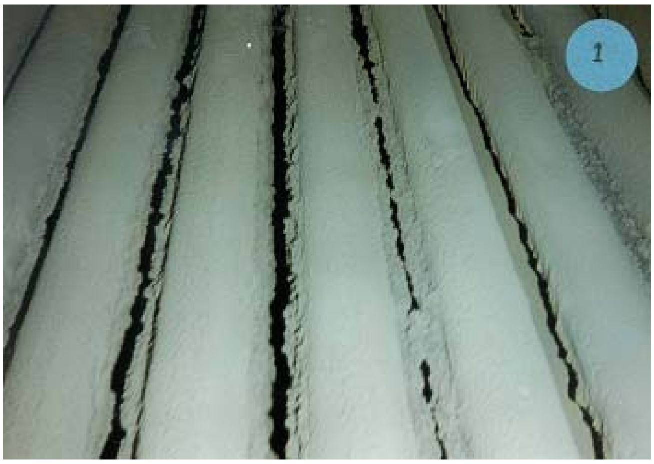


Figure 3: Before Therma Chem FS 12 treatment

Figure 4: After continuous Therma Chem FS 12 treatment (approximately 75 days after)

Therma Chem FS12 has been available on the market since 1982, and has been applied in the follow energy sector, Oil- and petrochemical sector, paper industries, and breweries. The installations within these industries that have utilized Therma Chem FS12 are mainly located in Europe, Canada, and the United States. In relation to coal fired installations, there are several installations located in the UK, which have used Therma Chem FS12, in particular paper mills in Scotland. One of the largest installations to use Therma Chem FS12 was PowerGen, Ince Power Station (500 MW_{el}), in the UK. This power station used Therma Chem FS12 on a daily bases for three years until the fuel supply contract for Orimulsion expired, and fuel was switched over.

As mentioned in the previous section, operational problems with the existing boilers in the Holboca CET Iasi II have occurred since the rehabilitation and switching of fuel was completed in year 2002. To solve the operational problems of the boiler installations, the Romanian company EnergyServ (licenced supplier of Therma Chem) has tested Therma Chem FS12 on a trial basis at Holboca CET Iasi II for a period of 1100 operating hours to prove Therma Chem's ability to improve boiler efficiencies on boiler number 2 at the site. The test has demonstrated that Therma Chem FS12 can increase the efficiency of the existing boilers installed and at the same time decreases emissions from the power plant.

Ash handling system:

The slag and ash resulting from the coal combustion process is currently removed hydraulically to the ash and slag silos by means of a bagger pumping system. In the boiler radiant sections, the slag and ash, which falls on the bottom, is in a solid state removed by a Kratzer type system and transported to a crusher. From here, the crushed materials fall free into a gutter where they are then transported to a bagger pumping system. The ash and slag removal in the boiler radiant section is carried out during frequent shut down of the boiler plant.

The fly-ash as well as the other incombustible materials produced during the combustion process, which travel together with the flue gases are partially retained in the 4 collecting funnels located at the outlet of the boiler, 4 collecting funnels located below the air pre-heaters and 32 collecting funnels located below the electrostatic precipitators. From these collecting funnels, the removal is executed in dry conditions, through a vertical tube network, to the hydraulic collecting system placed above the gutters, that take over and transport the ash as a fluid, to the bagger pumping station, as well.

In order to remove the fly ash (which will increase due to the project activity) in a dry state during the combustion process, a new ash removal system will be installed under the project activity. The new Ash Removal System has been designed to remove the fly ash during combustion in a dry state. The system consists of:

- Ash collecting equipment (with existing funnels);
- Ash disposal duct network, equipped with a dedicated discharge butterfly valve;
- Pneumatic ash transport installations with pressurized vessels equipped with 2 specific valves that might allow the interconnection of the individual ash transport installations in order to optimize the operating process;
- Central dry ash collecting silos with a capacity of 600 m^3 endowed with 2 outlets, one allowing ash disposal through trucks or rail cars to construction facilities and the other one leading to the existing bagger pumping system;
- Air compressed fan;
- Supervisory Control And Data Acquisition system (SCADA) with terminals installed in the unit control room for monitoring and operation.

From the existing funnels the ash is directed through the ash disposal ducts network to the pneumatic ash transport installation, namely to the pressurized vessel. The discharge butterfly valve located on the ash disposal duct can direct also the ash to the existing hydraulically ash removal system. In the first stage the new system will be operated in parallel with the existing one. Once the pressurized vessel is fully loaded the intake valve is automatically closed and by means of air compression the ash is transported through the ash transport ducts to the central dry ash collecting vessel. From this vessel the ash can be directed to one of the two outlets. The process is fully automated and the electricity consumption of the new ash handling system is as expected to be 72 kW during full operation.

A.4.3. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances:

The proposed project activity aims to reduce the emissions of greenhouse gases by increasing the thermal and production efficiency of 2 existing steam boilers fueled by hard coal. The boiler efficiencies will increase by adding the chemical Therma Chem FS12 to the combustion process. This prevents deposits on combustion chamber walls, inside boiler tubes, pre-heater surfaces, economizer etc. The increase of the thermal boiler efficiency results in a decrease of the overall coal consumption at Holboca CET Iasi II and hence a reduction of annual emissions.

Moreover the project will reduce fuel costs by reducing the consumption of coal at Holboca CET Iasi II. At the same time the application of Therma Chem FS12 may help the power plant to reduce its "costs of compliance" with the emission regulations, taking also into account the reduction of SO_X and NO_X emissions and other particles due to reduced fuel consumption per produced ton of steam. This will simultaneously lead to a reduction of Romania's total greenhouse gas emissions.

Without participation in Joint Implementation, the annual greenhouse gas emissions would at best remain on the present levels. This is due to the below reasons:

- Energy efficiency has low priority when it comes to the existing facilities at Holboca CET Iasi II. This is partially due to long prevailing attitudes relating to improving energy efficiency in Romania, which are historically limited due to low energy and fuel prices. More importantly the project would not be financially viable and the required investment has a higher potential for creating financial losses without Joint Implementation;
- The Municipalit of Iasi and S.C. CET Iasi S.A. have a prioritized investment plan which currently focuses on the rehabilitation of the district heating network and substations, and not improvements in production at Holboca CET Iasi II;
- There are no national standards or policies regarding the application of a chemical such as Therma Chem FS 12 in order to improve the overall thermal efficiency of boilers;
- Most heat and power plants in Romania are in a rather poor condition so investments usually focus on complete rehabilitation of facilities;

It should be noted that an Additionality Test is presented in section B 2.

A.4.3.1. Estimated amount of emission reductions over the crediting period:

The implementation of the proposed project activity will result in an estimation of greenhouse gas emission reductions, conservatively calculated at approximately 130,000 t CO_2 over the first seven year crediting period (2006-2012).

The table below depicts baseline emissions, project emissions and emission reductions on an annual basis.

Year	Baseline emissions (tCO2/yr)	Project Emissions (tCO2/yr)	Emission reductions (tCO2/yr)
2006	147.017	136.925	10.092
2007	294.035	273.851	20.184
2008	294.035	273.851	20.184
2009	294.035	273.851	20.184
2010	294.035	273.851	20.184
2011	294.035	273.851	20.184
2012	294.035	273.851	20.184
TOTAL	1.911.227	1.780.029	131.198

A.5. Project approval by the Parties involved:

The Romanian Ministry of the Environment and the Danish Environmental Protection Agency will be responsible for the project approval in the respective countries.

SECTION B. Baseline

B.1. Description and justification of the baseline chosen:

Applicability:

The baseline methodology is applicable to project activities where operational problems occur related to slagging of coal fired steam boiler installations such as deposits of slag layers from boiler combustion chambers, pre-heater surfaces, super heater surfaces etc.

Approach:

The baseline approach for the proposed project activity is derived by using data of existing, actual or historical, greenhouse gas emissions as applicable under paragraph 48 of the CDM modalities and procedures. This choice seems to be suitable since there are reasons to expect that fuel consumption and greenhouse gas emissions will follow historical trends in the absence of the project. This approach moreover assumes that the business-as-usual scenario (baseline) would have continued into the future in the absence of any intervention that would change the historical trend.

The baseline methodology is based on the following stepwise approach:

Step I: Selection of the time duration with the most applicable emission factors per produced ton of steam for the baseline and project

Step II: Calculation of the baseline and project emissions by multiplying the corresponding emission factors per produced ton of steam with the amount of steam produced

Step III: The difference between the baseline and the project emissions represent the total emission reductions

The following values are used for developing the baseline:

- Fuel consumption [in t/day]
- Steam production [in t/day]
- Net calorific value of fuel used [in kcal/kg]
- Emissions associated with the corresponding fuel consumption [in kg CO_2]
- Crediting period of 7 years [2006-2012]

Procedure:

The estimation of the emission reductions for introducing Therma Chem FS 12 to the boiler facilities at Holboca CET Iasi II is based on actual operation data and test results from using Therma Chem FS 12. The project will have an impact on the fuel consumption, while the life steam production will stay at a constant level. Also it is assumed that the current fuel is continued to be used in the existing facility at least up to the end of the crediting period without any retrofit, which extends its capacity or overall efficiency.

Moreover the introduction of Therma Chem FS 12 to the boiler facilities will have an impact on the ash consistency itself. The ash will be in a pulverised form, much easier to handle. This justifies also the installation of a new ash handling system under the project activity, which will allow for a continuous ash transport out of the boiler system.

The basis for the emission calculation is a factor describing the specific CO_2 emissions per ton of produced steam. This factor will be calculated, both for the baseline period and the project and then compared. The emission difference of both factors describe the specific emission reductions per produced ton of steam. The total emission reductions of the project activity can then be calculated by multiplying the emission reductions per ton of steam with the total steam production of a selected operation period.

Strengths and weaknesses:

The baseline methodology is fairly conservative and easy to monitor because emission reductions are based on fuel consumption and steam production, both measured at the plant.

On the other hand no weaknesses of the baseline approach could be identified so far.

B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the JI project:

Step 0: Preliminary screening based on the starting date of the project activity

The starting date of the project activity is expected to be on the first day of the heating season in Iasi, Romania, thus around the 1st of October 2006. In this manner a Project Idea Note was developed for the Joint Implementation project and finalized in January 2006. Subsequently, an Letter of Intent for the development and trading of emissions reductions was signed by the project proponent, S.C. CET Iasi S.A., and the Danish Environmental Protection Agency in March 2006. A Letter of Endorsement for the Joint Implementation project was issued by the Romanian Council on Climate Change also in March 2006.

It should be noted that Thermo Chem FS12 treatment was utilized on a test bases at the facility for 1100 operating hours during a period from January to February 2005. This was a trial phase and one of the first applications of fire-side cleaning technology in Romania (the only other test application has been at power plant near Bucharest). The results of the cleaning and efficiency improvements were positive. However, the treatment was not continued for the rest of the 2004/2005 heating season or the 2005/2006 heating season. This is due to the fact that the treatment was too costly for S.C. CET Iasi S.A. to continue with it, and the over loading of the flue gas particle removal system was recognized. This additional operational cost of the Thermo Chem FS12 treatment, plus the need for a new flue gas particle removal system lead to the decision by S.C. CET Iasi S.A. to not continue with Thermo Chem FS12 treatment (not the letter from S.C. CET Iasi S.A. in Annex 4).

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

Sub-step 1a: Define alternatives to the project activity

The following are the identified alternatives for this project activity:

Alternative 0: Joint Implementation project activity

Alternative 1: Business as usual

Alternative 2: The project activity without JI participation and carbon credit trading

It should be noted that alternatives involving fuel switch or other boiler efficiency improvements at Holboca Iaşi CET II are excluded from this analysis. The basis for this exclusion is that the boilers and related equipment were recently extensively rehabilitated (from 1997-2001) and are of a quality comparable to new installations found in the EU. This investment is still being paid back, thus limiting the amount of investment capital that S.C. CET Iasi S.A can obtain, to projects which are less risky and have highest priority. Any such additional investments which would reduce CO2e emissions would also be in far excess of the investment required for the project activity. Of note is that S.C. CET Iasi S.A highest priority for investment is for the rehabilitation of the district heating system, which will not influence the JI project or alternatives.

Sub-step 1b: Enforcement of applicable laws and regulations

All of the alternatives are within applicable legal and regulatory requirements. The boiler units and associated equipment at Holboca Iaşi CET II were extensively upgraded, to an EU standard level by 2001. This upgrading was performed to not only extend the life and increase efficiency of the facility but also to meet expected Romanian and EU laws and regulations regarding energy production facilities. Alternatives 0, 1, and 2 are based on this currently established system and thus meet all applicable legal and regulatory requirements.

Step 2: Investment analysis

Sub-step 2a: Determine the appropriate analysis method

Investment comparison analysis will be used

Sub-step 2b: Apply investment comparison analysis

For this project activity it is best to apply an investment comparison analysis based on the Net Present Value of the project activity. In this case a discount rate of 10% is chosen, which is a reflective value based on the current Romanian economy. It is slightly over the rate of inflation 8 – 9 % (2005), and one and a half points over the National Bank of Romania's reference rate of 8.5% (June 2006), and in line with Romanian commercial bank rates (9.5-10.5%). Thus it is assumed that even a minimum investment would require a return of over 10% in order to sustain the currency value.

Sub-step 2c: Calculation and comparison of the financial indicators

It is clear through investment analysis that only the project activity under Joint Implementation (Alternative 0) holds enough economic viability (NPV of € 185,585). Buisness as Usual (Alternative 1) has no effect and the project activity, and without JI the project activity (Alternative 2) leads to a negative NPV of € -143,838. A summary table of this financial analysis is provided below with greater detail provided in Annex 4.

Alternatives	Estimated Investment Costs (€)	Estimated Project Costs (€)	Estimated Project Revenus and Savings (€)	NPV 10% (€)
1	0	0	0	0
2	1,790,000	5,647,605	5,612,886	-143,838
JI Project	1,790,000	5,752,605	6,268,876	185,585

Sub-step 2d: Sensitivity analysis

There are two parameters which can have an impact on the investment comparison analysis. They are the efficiency of the fire-side treatment and the price of hard coal.

The full long term specific efficiency improvement can not be guaranteed through the use of Therma Chem FS12. However, since Therma Chem FS12 was tested on a trial bases at the Holboca Iaşi CET II for a 1100 operational hours trial period, it is expected that the efficiency improvement should match the estimations in this PDD, which are based on the trial period. Any fluctuation in efficiency improvement is assumed to be less than +/- 10%.

European coal prices (API#2) over the last year have fluctuated between 55 – 69 USD/ton (44 – 55 EUR/ton), this is a 20% fluctuation, with the lowest prices during the heating season. Holboca Iaşi CET II has paid up to 66.20 EUR/ton for hard coal (market price plus transport). Given market fluctuations and a probably price increase over time an average future coal price of 66.20 EUR/ton is used in the financial analysis. Expected variation from this future coal price is likely assumed to be +/- 10%.

For this sensitivity and risk analysis combined best and worst case scenarios are developed where:

> **Case 1:** in the best case, the efficiency improvement from Therma Chem FS12 use is 10% higher than expected, and future coal prices are 10% higher than expected;

> **Case 2:** in the worst case, the efficiency improvement from Therma Chem FS12 use is 10% lower than expected, and future coal prices are 10% lower than expected.

The following out come of this sensitivity analysis is shown below, with a summary table of this sensitivity analysis and more detail provided in Annex 4.

Alternatives + 10% Efficency + 10% Coal Price	Estimated Investment Costs (€)	Estimated Project Costs (€)	Estimated Project Revenus and Savings (€)	NPV 10% (€)
1	0	0	0	0
2	1,790,000	5,647,605	6,791,593	406,643
JI Project	1,790,000	5,752,605	7,513,181	751,250
Alternatives - 10% Efficency - 10% Coal Price	**Estimated Investment Costs (€)**	**Estimated Project Costs (€)**	**Estimated Project Revenus and Savings (€)**	**NPV 10% (€)**
1	0	0	0	0
2	1,790,000	5,647,605	4,546,438	-641,893
JI Project	1,790,000	5,752,605	5,136,828	-370,916

Under Case 1 (+ 10% efficiency and + 10% coal price) the sensitivity analysis indicates that both Alternative 2 and the JI project (Alternative 0) would be financially viable and lead to a decent NPV over the project period. Under Case 2 (- 10% efficiency and - 10% coal price) the sensitivity analysis indicates that both Alternative 2 and the JI project (Alternative 0) would not be financially viable. Under Case 2, Alternative 2 has a major loss (NPV € -641,893) which clearly indicates how significantly risky the investment and project activity is without JI participation. Under Case 2, the JI Project (Alternative 0) has a loss (NPV € -370,916) which clearly indicates the JI project risks, but to a much lower extent.

The determination of potential project losses and gains is a major part in a decision making structure, especially when taking into account the various demands for investment. In this case a tool for determining the comparative impact of potential project gains and losses relating to the different alternatives is used. The Gain to Loss Ratio compares the magnitude of potential gains as opposed to the magnitude of potential losses. Thus an alternative would not be chosen if its potential for losses significantly outweighs its potential for gains. The Gain to Loss Ratio is determined for Alternative 2 and the JI project, a ratio is not determined for the Alternative 1 (B.A.U) as it has no financial impact. The Gain to Loss Ratio is indicated below:

Gain to Loss Ratio (X) = ABS (Potential Gain / Potential Loss)

[X < 1, the potential for losses exceed the potential for gains]

[X > 1, the potential for gains exceed the potential for losses]

Alternatives	Gain to Loss Ratio
1	NA
2	0.6
JI Project	2.0

As it can be seen the Gain to Loss Ratio for Alternative 2 is 0.6, which indicates that the potential for losses in of the project activity without JI participation is almost double the potential for gains. The Gain to Loss Ratio for the project activity with JI participation (Alternative 0) is 2.0 which clearly indicated a greater potential for gains than losses.

Based on the investment analysis comparison in Sub-step 2c and the sensitivity analysis in Sub-step 2d, is it clear that the project activity would not occur without participation in Joint Implementation due to 1) the indicated expected negative NPV of Alternative 2, and 2) the much higher potential for project losses as apposed to project gains of Alternative 2. This leads to the conclusion that the project activity would not occur without participating in Joint Implementation (Alternative 0) where the expected NPV is encouragingly positive and the potential for gains is much greater then the potential for losses. Thus, without participation in Joint Implementation only Alternative 1 business as usual would occur due to the fact that it present no net financial change for Holboca Iaşi CET II.

Step 3: Barrier analysis

Sub-step 3a: Identify barriers that would prevent the implementation of type of the proposed project activity:

Statements and evidence relating to the barriers to implementing the project activity without Joint Implementation are provided in Annex 4.

<u>Investment Barriers</u>

S.C. CET Iasi S.A. has limited ability to gain investment capital for on-site improvement projects. This ability to gain investment capital is limited due to the fact that the company and municipality have used up a major portion of their credit-line on existing investments. For Romanian municipalities in particular, their credit line (and ability to guarantee loans) is limited by the governmental regulations. S.C. CET Iasi S.A. has used a major portion of its credit-line on the boiler and equipment rehabilitation at Holboca Iaşi CET II from 1997 to 2001. Future investments by S.C. CET Iasi S.A. will be based on a priority and risk basis. In the recent past the municipality and S.C. CET Iasi S.A. setup and have initiated a prioritized investment plan, where the highest priority is for the rehabilitation of the district heating network (distribution and sub-stations). This rehabilitation program is nearing completion of the planning and financing phase by the European Bank for Reconstruction and Development (EBRD). There will be no improvements for Holboca Iaşi CET II under this new investment plan do to the extensive rehabilitation which was already completed. Any additional investments outside of the investment plan will focus on emergency and other improvements which are required for general and proper operation. The project activity is not required for general and proper operation as the boiler units have been operating at present conditions since 2001.

As indicated in the Investment Analysis (Step 2) the financial risks associated with the project activity are perceived to be significantly more than the prioritized investments. It can be seen in the sensitivity and risk analysis (Sub-Step 2d) that the potential losses on the investment are nearly twice greater than the potential gains without Joint Implementation involvement. This financial risk level is considered to be significantly higher than for example the upgrading of the district heating system, which requires a large investment but as proven in many Romanian cities will lead to a reduction of losses/production/costs of 20-30%. It is also a question as to what institution will provide the investment capital to the project activity without its participation in Joint Implementation.

<u>Barrier due to Prevailing Practice</u>

The use of Therma-Chem FS12 and fire-side cleaning technology in Romania has been very limited. To date Therma-Chem FS12 has been applied to only two installations in Romania (Iasi and Bucharest), both on a trail/test phase. The application was discontinued at both boiler plants due to the added costs of the treatment in operation despite the effectiveness in reducing slagging and shutdowns and start-ups. Therefore, at this point in time there has been no full-scale long term use of Therma Chem FS12 in Romania, and the technology of fireside treatment is completely new. Through the establishment of this project activity under Joint Implementation the application of Therma Chem FS12 will become more financially viable for long term operation and begin its integration into the energy sector in Romania.

Sub-step 3b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):

As indicated in Step 2 and Sub-Step 3a the project activity without Joint Implementation (Alternative 2) will not occur without the inclusion of Joint Implementation. Therefore, the only other alternative which is likely to happen is Alternative 1 – Business as Usual. Business as Usual will be the same general operation of the boiler plant since 2001, where the efficiency of operation has decreased over time. As indicated in Sub-Step 3a No other probable alternatives (e.g. additional investments) will lead to an increase in efficiency of the boiler units at Holboca Iaşi CET II.

Step 4: Common practice analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity:

As indicated previously the use of fire-side cleaning technology is new to Romania and has only been applied to on a trial/test bases in two installations (which has been discontinued). All other similar activities which lead to a similar effects, e.g. less slagging and increased efficency, that are available in Romania have limited applicability and have much higher investment costs. Such activities include 1) state of the art equipment (materials), 2) coating of equipment, and 3) use of natural gas – cleaner fuels.

Sub-step 4b: Discuss any similar options that are occurring:

As it is soon to be a part of the EU, state of the art equipment for boiler installations and fuel treatment are potentially available in Romania. However, the affordability for Romanian energy companies to acquire these types of technology is almost non-existent. Due to investment barriers it is far more likely that Romanian energy companies will choose less expensive modern and tried equipment in the future (such as the 1997-2001 rehabilitation at Holboca Iaşi CET II).

The coating of equipment to reduce slagging on radiant components in boiler installations is available but is very consuming in relation to investment and time. Coatings have a limited life-span and effectiveness which requires continues investment and downtime. These exceed that of the project activity. In addition, coatings can not be applied to all radiant surfaces (because they may reduce efficiency) and they will not reach all the surfaces that Therma-Chem FS 12 can.

The switch to cleaner fuels, such as natural gas is occurring in Romania. However, this activity is declining due to the increasing cost of natural gas. This increased cost is due to two reasons the increasing market prices of natural gas and the deregulation of the Romania gas sector (e.g. removal of subsidies). At least in the case of Holboca Iaşi CET II, fuel switch is not an option due to the investments in rehabilitation which took place in 1997-2001.

Step 5: Impact of Joint Implementation

Based on the investment analysis comparison in Sub-step 2c and the sensitivity analysis in Sub-step 2d, is it clear that the project activity would not occur without participation in Joint Implementation due to the indicated expected negative NPV of Alternative 2 (€ -143,838), and 2) the much higher potential for project losses as apposed to project gains of Alternative 2. This leads to the conclusion that the project activity would not occur without participating in Joint Implementation (Alternative 0) where the expected NPV is encouragingly positive and the potential for gains is much greater then the potential for losses. Thus, without participation in Joint Implementation only Alternative 1 - Business as Usual would occur due to the fact that it presents no net financial change for Holboca Iaşi CET II.

AS well, there is a clear investment barrier to implementing the project activity without Joint Implementation (Alternative 2). This is due to the fact that S.C. CET Iasi S.A. already has a prioritized investment plan which puts the rehabilitation of the district heating network (supply and sub-stations) as the highest priority. This investment which is being negotiation with EBRD will require a substantial amount of the companies and municipalities credit-line, also to mention that the credit-line is already reduced due to the past investments at Holboca Iaşi CET II. In addition the implementation of Alternative 2 holds much more financial risk for losses than Alternative 1 – Business as Usual, and Alternative 0 – the Project Activity with Joint Implementation.

There is no prevail practice of the use of fire-side cleaning technology in Romania. It’s application has been limited to a couple if installations and only on a trial and test phase.

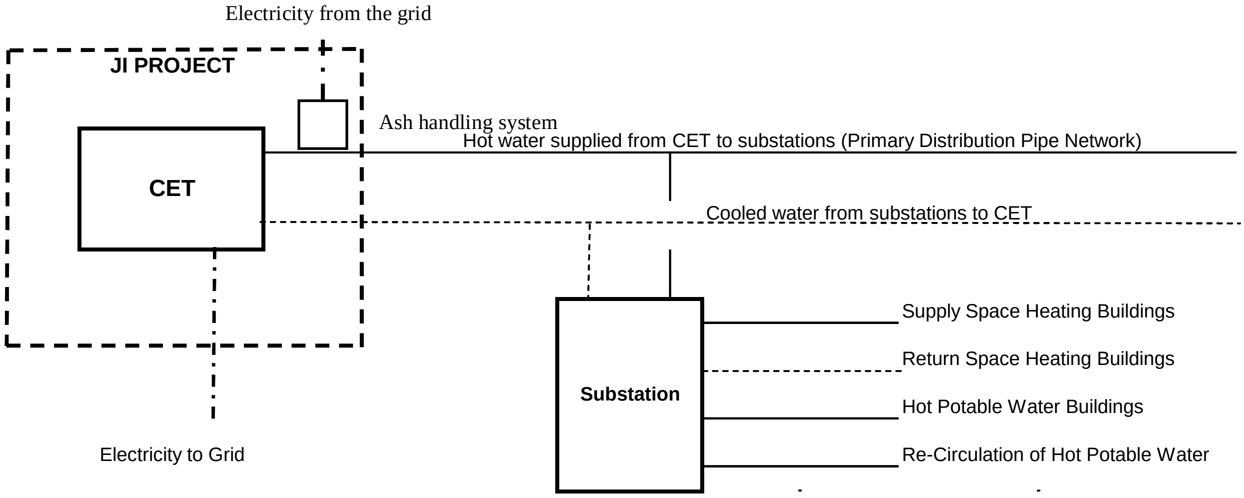
The investment and barrier analysis all indicate that the Business as Usual alternative is the mostly likely alternative in the absence of the project activity

The benefits of the project activity are increased thermal efficiency of the boiler units which will reduce fuel (hard coal) consumption and the emission of GHGs. This is expected to lead to a reduction of hard coal demand of approximately 8,900 tons per year and a reduction of approximately 20,000 tons of CO2 emissions per year. In addition the use of Therma-Chem FS12 will reduce shutdowns/start-ups and should extend the life of the energy production equipment.

B.3. Description of how the definition of the project boundary is applied to the project:

The project boundary shall encompass all anthropogenic emissions by sources of greenhouse gases under the control of the project participants that are significant and reasonably attributable to the CDM project activity.

The relevant emission sources included in the baseline and project boundary are the coal fire steam boilers installations as depicted in the graph below. The greenhouse gas which is accounted for is carbon dioxide (CO_2) from coal combustion in the boilers.



Leakage:

According to UNFCCC leakage is defined as "the net change in anthropogenic emission by source of greenhouse gas emission which occurs outside the project boundary, and which is measurable and attributable to the project activity". Leakage does not disqualify a project's validity, unless expected leakage emissions compensate a large percentage of the project emission reductions. However, it might be extremely difficult to identify leakage effects reliably. They can occur in two directions: positive leakage refers to emission reductions, while negative leakage refers to emission enhancement, induced outside the project boundary.

Positive leakage

With the proposed project the following positive leakage effect occurs:

- Less transportation of coal to Holboca CET Iasi II is required due to a reduced consumption at the plant (approximately 85 t CO_2/yr)

Negative leakage

With the proposed project the following negative leakage effects might occur:

- Transportation of Therma Chem FS 12 to the plant (11.36 CO_2/yr)
- Operation of the new ash handling system (151 t CO_2/yr)

In fact, both negative and positive leakage effects are most difficult to quantify. The Marrakech definition of leakage excludes consideration of effects that are not measurable. The identified leakage[2] effects amount to less then 1 % of the total greenhouse gas emission reductions associated with the project activity. Therefore leakage effects will not be considered further in this project.

B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline:

Detailed baseline information is provided in Annex 2 to this PDD.

[2] An quantitative estimation of the leakages for transportation (coal and Therma Chem FS 12) and operation of the new ash handling system can be found in Annex 4

The baseline approach was carried out by Grue & Hornstrup Consulting Engineers A/S and is based on measured data for the operation period in the year 2004.

The baseline study was prepared by:

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Guidance and review provided by:

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SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

The starting date for the project is expected to be October 1st 2006

C.2. Expected operational lifetime of the project:

The expected operational lifetime of the project is 10 years

C.3. Length of the crediting period:

The length of the period within which emission reduction units are to be earned ends in 2012. However, the project lifetime exceeds the first commitment period of the Kyoto Protocol, and additional emission reductions could be claimed once a post Kyoto period has been decided upon.

Under recent circumstance the length of the period within emission reduction units are to be earned is as follows:

- January 1st 2006 to December 31st 2007: AAUs (Assigned Amount Units)
- January 1st 2008 to December 31st 2012: ERUs (Emission Reduction Units)

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

The proposed project aims to reduce the emissions of greenhouse gases by increasing the efficiency of two existing steam boilers fueled by coal and fuel oil. The boiler efficiencies will increase by adding the chemical Therma Chem FS 12 to the combustion process. This prevents deposits on combustion chamber walls, inside boiler tubes, pre-heater surfaces, economizer etc. Accordingly the amount of coal used per produced ton of steam will decrease. At the same time the regular use of Therm Chem FS 12 diminishes the need for boiler shut down and boiler cleaning on regular basis during the operation period.

The estimation of the emission reductions for introducing Therma Chem FS 12 to the boiler facilities at Holboca CET Iasi II is based on actual operation data and test results from using Therma Chem FS 12 and corresponding reduced consumption of coal.

The fuel consumption will be the only parameters affecting the greenhouse gas emissions. The indication of the project performance will therefore be the changes in the fuel consumption at the boiler installations.

The coal consumption at Holboca CET Iasi II is calculated in accordance with a specific procedure. This takes in consideration the speed of the coal conveyor belt that feed each boiler as well as the coal level on the belt. With this data the actual coal consumption is calculated automatically and the results are displayed and recorded (e.g. hourly, daily, etc.).

The oil consumption and steam production is monitored and calculated in accordance with a specific procedure.

Note that the guidelines for monitoring are presented in Annex 3.

D.1.1. Option 1 – Monitoring of the emissions in the project scenario and the baseline scenario:

D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
$fP_{a,B1}$	Quantity of coal consumed in boiler 1	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
$fP_{a,B2}$	Quantity of coal consumed in boiler 2	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
$fP_{b,B1}$	Quantity of fuel oil consumed in boiler 1	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
$fP_{b,B2}$	Quantity of fuel oil consumed in boiler 2	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
qP_{B1}	Quantity of steam produced in boiler 1	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific

								procedures and logged for the day
qP_{B2}	Quantity of steam produced in boiler 2	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
CV_a	Calorific value of coal	-	kcal/kg	m	per day	100%	electronic and paper	Based on onsite analysis and billing records
CV_b	Calorific value of fuel oil	-	kcal/kg	m	per day	100%	electronic and paper	Based on onsite analysis and billing records

D.1.1.2. Description of formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

The project emissions are the sum of emissions associated with the operation of both boiler installations. The project emissions are calculated on a daily basis as follows:

$$PE = PE_{B1} + PE_{B2}$$

where:

PE	*[kg CO_2/day]*	*annual project emissions*
PE_{B1}	*[kg CO_2/day]*	*annual project emissions from boiler 1*
PE_{B2}	*[kg CO_2/day]*	*annual project emissions from boiler 2*

The estimation of the project emissions associated with the fuel consumption at both boiler installations is carried out on a daily basis in a likewise approach as follows:

$$PE_{Bx} = efP_{Bx} \times qP_{Bx}$$

where:

efP_{Bx}	*[kg CO_2/t]*	*steam-specific emissions (amount of CO_2 equivalents in tones emitted per 1 tone of steam produced)*
qP_{Bx}	*[t/day]*	*daily steam production*

The basis for the emission reduction calculation of the proposed project activity is a factor describing the specific CO_2 emissions per ton of steam produced (efP_{Bx}). This factor is calculated per day for each boiler installation as follows:

$$efP_{Bx} = \frac{EFP_a + EFP_b}{qP_{Bx}}$$

where:

EFP_a	*[kg CO_2/day]*	*kg of CO_2 equivalents associated with the daily coal consumption of the boiler*
EFP_b	*[kg CO_2/day]*	*kg of CO_2 equivalents associated with the daily fuel oil consumption of the boiler*
qP_{Bx}	*[t/day]*	*daily steam production*

The emission factor for the specific kind of fuel used is calculated in accordance with the “Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual” as follows:

<u>Coal:</u>

$$EFP_a = (fP_{a,Bx} \times CV_a \times 0.0041868) \times (32.15 - (0.234 \times CV_a \times 0.00418868)) \times 0.98 \times \frac{44}{12}$$

where:

$fP_{a,Bx}$	*[t/day]*	*daily quantity of coal consumed*
CV_a	[kcal/kg]	calorific value of coal

Fuel oil:

$$EFP_b = fP_{b,Bx} \times CV_b \times 0.0041868 \times 21.1 \times 0.99 \times \frac{44}{12}$$

where:

$fP_{b,Bx}$	[t/day]	daily quantity of fuel oil consumed
CV_b	[kcal/kg]	calorific value of fuel oil

D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
$fB_{a,B1}$	Quantity of coal consumed in boiler 1	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
$fB_{a,B2}$	Quantity of coal consumed in boiler 2	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day

$fB_{b,B1}$	Quantity of fuel oil consumed in boiler 1	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
$fB_{b,B2}$	Quantity of fuel oil consumed in boiler 2	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
qB_{B1}	Quantity of steam produced in boiler 1	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
qB_{B2}	Quantity of steam produced in boiler 2	-	tones	c	per day	100%	electronic and paper	Data calculated in accordance with specific procedures and logged for the day
CV_a	Calorific value of coal		kcal/kg	m	per day	100%	electronic and paper	Based on onsite analysis and billing records
CV_b	Calorific value of fuel oil	-	kcal/kg	m	per day	100%	electronic and paper	Based on onsite analysis and billing records

D.1.1.4. Description of formulae used to estimate baseline emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

The baseline emissions are the sum of emissions associated with the operation of both boiler installations. The baseline emissions are calculated on a daily basis as follows:

$$BE = BE_{B1} + BE_{B2}$$

where:

BE	*[kg CO_2/day]*	*annual project emissions*
BE_{B1}	*[kg CO_2/day]*	*annual project emissions from boiler 1*
BE_{B2}	*[kg CO_2/day]*	*annual project emissions from boiler 2*

The estimation of the baseline emissions associated with the fuel consumption at both boiler installations is carried out on a daily basis in a likewise approach as follows:

$$BE_{Bx} = efB_{Bx} \times qB_{Bx}$$

where:

efB_{Bx}	*[kg CO_2/t]*	*steam-specific emissions (amount of CO_2 equivalents in tones emitted per 1 tone of steam produced)*
qB_{Bx}	*[t/day]*	*daily steam production*

The basis for the emission reduction calculation of the proposed project activity is a factor describing the specific CO_2 emissions per ton of steam produced (efB_{Bx}). This factor is estimated per day for each boiler installation as follows:

$$efB_{Bx} = \frac{EFB_a + EFB_b}{qB_{Bx}}$$

where:

EFB_a	*[kg CO_2/day]*	*kg of CO_2 equivalents associated with the daily coal consumption of the boiler*

EFB_b	*[kg CO_2/day]*	*kg of CO_2 equivalents associated with the daily fuel oil consumption of the boiler*
qB_{Bx}	*[t/day]*	*daily steam production*

The emission factor for the specific kind of fuel used is calculated in accordance with the "Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual" as follows:

Coal:

$$EFB_a = (fB_{a,Bx} \times CV_a \times 0.0041868) \times (32.15 - (0.234 \times CV_a \times 0.00418868)) \times 0.98 \times \frac{44}{12}$$

where:

$fB_{a,Bx}$	*[t/day]*	*daily quantity of coal consumed*
CV_a	*[kcal/kg]*	*calorific value of coal*

Fuel oil:

$$EFB_b = fB_{b,Bx} \times CV_b \times 0.0041868 \times 21.1 \times 0.99 \times \frac{44}{12}$$

where:

$fB_{b,Bx}$	[t/day]	daily quantity of fuel oil consumed
CV_b	[kcal/kg]	calorific value of fuel oil

D. 1.2. Option 2 – Direct monitoring of emission reductions from the project (values should be consistent with those in section E.):

Not applicable, Option 1 is chosen.

D.1.2.1. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.1.2.2. Description of formulae used to calculate emission reductions from the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

D.1.3. Treatment of leakage in the monitoring plan:

The identified leakage effects amount to less then 1 % of the total greenhouse gas emission reductions associated wit the project activity. Therefore leakage effects will not be considered further in this project.

D.1.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.1.3.2. Description of formulae used to estimate leakage (for each gas, source etc.; emissions in units of CO_2 equivalent):

No leakages included as described in earlier paragraphs.

D.1.4. Description of formulae used to estimate emission reductions for the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

The following formula will be used in order to estimate the annual emission reductions associated with the project activity:

$$ER = BE - PE$$

where:

ER	*[kg CO_2/day]*	*annual emission reductions*
BE	*[kg CO_2/day]*	*annual baseline emissions*
PE	*[kg CO_2/day]*	*annual project emissions*

D.1.5. Where applicable, in accordance with procedures as required by the host Party, information on the collection and archiving of information on the environmental impacts of the project:

D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:

Data *(Indicate table and ID number)*	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
$fP_{a,B1}$	low	*Registration of these data is an integrated element in the procedures performed by the control room staff.*
$fP_{a,B2}$	low	*Registration of these data is an integrated element in the procedures performed by the control room staff.*
$fP_{b,B1}$	low	*Registration of these data is an integrated element in the procedures performed by the control room staff.*
$fP_{b,B2}$	low	*Registration of these data is an integrated element in the procedures performed by the control room staff.*
qP_{B1}	low	*Registration of these data is an integrated element in the procedures performed by the control room staff.*
qP_{B2}	low	*Registration of these data is an integrated element in the procedures performed by the control room staff.*

CV_a	low	*Registration of these data is an integrated element in the procedures performed by the control room staff.*
CV_b	low	*Registration of these data is an integrated element in the procedures performed by the control room staff.*

D.3. Please describe the operational and management structure that the project operator will apply in implementing the monitoring plan:

The operational and management structure including direct QA measures are detailed in the monitoring plan under Annex 3.

D.4. Name of person(s)/entity(ies) establishing the monitoring plan:

The monitoring plan was prepared by:

Mr. Thomas Bosse Borges

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SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

Based on the data from the treatment period for boiler II in January - February 2005, the following average emission factor per produced ton of steam was calculated:

Boiler $1_{project}$: 231 kg CO_2/t steam
Boiler $2_{project}$: 228 kg CO_2/t steam

Since the test treatment only included boiler II, the project emission factor for boiler I derives from the percentage difference of the emission factor per produced ton of steam from boiler II during baseline operation and project (treatment) operation, respectively.

The table below depicts the annual project emissions for both boiler installations, taking the annual steam quantity produced, into consideration. It should be noted that the project will be commissioned in October 2006. Consequently, in 2006 project emissions occur only for half of the year.

Year	Project Emissions (tCO2/yr)
2006	136.925
2007	273.851
2008	273.851
2009	273.851
2010	273.851
2011	273.851
2012	273.851
TOTAL	1.780.029

E.2. Estimated leakage:

The identified leakage effects amount to less then 1 % of the total greenhouse gas emission reductions associated wit the project activity. Therefore leakage effects will not be considered further in this project.

E.3. The sum of E.1. and E.2.:

Since no leakage effects will be considered in the project activity, the sum of E.1. and E.2. equals the project emissions:

Year	Project Emissions (tCO2/yr)
2006	136.925
2007	273.851
2008	273.851
2009	273.851
2010	273.851
2011	273.851
2012	273.851
TOTAL	1.780.029

E.4. Estimated baseline emissions:

From the operation data of Holboca CET power plant for the years 2002-2004 made available by the plant operator, the heating season in 2004 was selected as baseline scenario and corresponding data used for calculating the average emission factors per produced ton of steam.

A survey on the data available for the three years led to the fact that under conservative standpoints it is most reasonable to select year 2004 as baseline scenario.

The average emission factor per produced ton of steam for both boiler installations are as follows:

Boiler $1_{baseline}$*: 248 kg* CO_2*/t steam*

Boiler $2_{baseline}$*: 245 kg* CO_2*/t steam*

The table below depicts the annual project emissions for both boiler installations, taking the annual steam quantity produced, into consideration. It should be noted that the baseline emissions in 2006 are only calculated for a corresponding half a year operation period (from Oct. 2006 - Dec 2006). This is due to the fact that the project will be operational in October 2006.

Year	Baseline emissions (tCO2/yr)
2006	147.017
2007	294.035
2008	294.035
2009	294.035
2010	294.035
2011	294.035
2012	294.035
TOTAL	1.911.227

E.5. Difference between E.4. and E.3. representing the emission reductions of the project:

The emission reductions associated with the proposed project activity are based on the difference of the baseline average emission factor per produced ton of steam for both boiler installations and the project average emission factor per produced ton of steam for both boiler installations, respectively.

The table below illustrates the annual emission reductions associated with the proposed project activity:

Year	Emission reductions (tCO_2/yr)
2006	10.092
2007	20.184
2008	20.184
2009	20.184
2010	20.184
2011	20.184
2012	20.184
TOTAL	131.198

E.6. Table providing values obtained when applying formulae above:

Year	Baseline emissions (tCO_2/yr)	Project Emissions (tCO_2/yr)	Emission reductions (tCO_2/yr)
2006	147.017	136.925	10.092
2007	294.035	273.851	20.184
2008	294.035	273.851	20.184
2009	294.035	273.851	20.184
2010	294.035	273.851	20.184
2011	294.035	273.851	20.184
2012	294.035	273.851	20.184
TOTAL	1.911.227	1.780.029	131.198

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party:

To date it is assessed that no Environmental Impact Assessment is required by the host Party due to the small physical scale of the project activity, and that fact that it is occurring in an existing large installation. In this manner the project activity has a positive environmental impact since it will reduce the overall emissions from the facilities at Holboca CET, due to more efficient fuel use. These means that the net regulated emissions based on production from Holboca CET based on production of CO_2, NOx, Sulphur compounds, particles…ect. should be reduced by the project activity.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

Not applicable.

SECTION G. Stakeholders' comments

G.1. Information on stakeholders' comments on the project, as appropriate:

None received as of the date of issuing this version

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

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Annex 2

BASELINE INFORMATION

Baseline:

From the operation data of Holboca CET power plant for the years 2002-2004 made available by the plant operator, the heating season in 2004 was selected as baseline scenario and corresponding data used for calculating the average emission factors per produced ton of steam. A survey on the data available for the past three years led to the fact that under conservative standpoints it is most reasonable to select year 2004 as baseline scenario.

It should be mentioned that the following assumptions have been made in order to calculate the average emission factor per produced ton of steam for each of the boilers:

Steam production:

The Steam production data was only available as daily averages in t/h. In order to find the daily steam production, the hourly average steam production was multiplied with 24h. From the data available one can see, that on specific days, the fuel consumption was much lower then compare to the majority of the other days. Those days indicate boiler start ups and shut down periods (cleaning). A more detailed analysis of the operation data on those days would show, that during boiler start up, a considerable amount of fuel is used without generating any steam. Accordingly the specific emission factor per produced ton of steam would be much higher then the calculated average value. Due to the fact that data for steam production on those start up days could not made available, theses days are basically neglected in the calculation of the average emission factor per produced ton of steam under the baseline. This approach seems to be justified since it has a negative effect on the annual emission reductions associated with the project activity (conservative approach).

Specific emission factor per produced ton of steam:

The CO_2 emissions associated with the fuel consumption are calculated in accordance with the "Revised 1996 IPCC Guidelines for national Greenhouse Gas Inventories: Reference Manual" and take daily fluctuations in the calorific value for coal into account. Calculations are given in Section D 1.1.4.

The fuel specific emission factor is calculated based on:

- *Energy content*
- *Carbon content*
- *Un-oxidized carbon*

The average emission factor per produced ton of steam for both boiler installations is as follows:

- *Boiler $1_{baseline}$: 248 kg CO_2/t steam*
- *Boiler $2_{baseline}$: 245 kg CO_2/t steam*

The table below shows the operation data of both heat only boilers for the year 2004. The tables list the steam production per hour as average over a day (also as daily steam production multiplied with 24h), daily fuel consumption (both coal and fuel oil) for both boilers and the fuel specific calorific values (for coal and fuel *oil). Based on this data the specific CO_2 emissions per produced ton of steam are calculated for both boiler installations on a daily basis. The tables represent operation data on daily basis for the entire year (Jan 2004 – Dec 2004). It should be noted that the CET is in operation for approximately 5 months per year (Jan – Mar, Nov – Dec).*

Month	Day	Steam production				Coal consumption		Oil consumption		Calorific value	Calorific value	Specific Emissions	
		Boiler I		Boiler II		Boiler I	Boiler II	Boiler I	Boiler II	Coal	Fuel oil	Boiler I	Boiler II
		A	***qB ,B1 [A*24h]***	**B**	***qB ,B2 [B*24h]***	***fB a,B1***	***fB a,B2***	***fB b,B1***	***fB b,B2***	***CV a***	***CVb***	***efB ,B1***	***efB ,B2***
		t/h	t	t/h	t	t		t		kcal/kg	kcal/kg	kg CO2/t steam	
Jan	1												
	2			344	8256		890			6229			263
	3			340	8160		860	8		6210	9800		257
	4	346	8304			830		11		6253	9800	249	
	5	347	8328			880				5947		249	
	6	346	8304	196	4704	460	80	5	106	5806	9800		
	7			358	8592		890			5840			241
	8			356	8544		860		8	5879	9800		238
	9			356	8544		880		2	5801	9800		239
	10			353	8472		870		2	6051	9800		246
	11			354	8496		880			5421	9800		227
	12			355	8520		840		13	6185	9800		244
	13			353	8472		890			6031			250
	14			356	8544		910			6031			254
	15			354	8496		900			6039			252
	16			352	8448		900			5754			245
	17			338	8112		800		48	5940	9800		251
	18			348	8352		840	18	34	5516	9800		236
	19	358	8592			900		22		5760	9800	249	
	20	355	8520	351	8424	420	50	9	86	5601	9800		
	21			352	8448		800		53	5961	9800		243
	22			358	8592		830		35	6046	9800		243
	23			362	8688		800		35	5724	9800		223
	24			335	8040		830		35	5662	9800		248
	25			360	8640		810		35	6034	9800		236
	26			332	7968		840		37	5713	9800		255
	27	363	8712	320	7680	590	30	50	20	5963	9800		
	28	360	8640			880		33		5633	9800	242	
	29	365	8760			880		30		5804	9800	243	
	30	358	8592			920		25		5226	9800	237	
	31	357	8568			920		45		5079	9800	239	

Month	Day	Steam production				Coal consumption		Oil consumption		Calorific value	Calorific value	Specific Emissions	
		Boiler I		Boiler II		Boiler I	Boiler II	Boiler I	Boiler II	Coal	Fuel oil	Boiler I	Boiler II
		A	***qB ,B1 [A*24h]***	**B**	***qB ,B2 [B*24h]***	***fB a,B1***	***fB a,B2***	***fB b,B1***	***fB b,B2***	***CV a***	***CVb***	***efB ,B1***	***efB ,B2***
		t/h	t	t/h	t	t		t		kcal/kg	kcal/kg	kg CO2/t steam	
Feb	1												
	2	352	8448			830		50		5513	9800	237	
	3	344	8256			810		51		5402	9800	234	
	4	341	8184			870		52		5224	9800	246	
	5	355	8520			830		52		5596	9800	238	
	6	336	8064			820		52		4985	9800	228	
	7	332	7968			800		65		5678	9800	254	
	8	322	7728			780		65		5329	9800	244	
	9	317	7608			26		33		5771	9800		
	10												
	11												
	12												
	13			150	3600		70		140	5771	9800		
	14			172	4128		270		220	5771	9800		318
	15			179	4296		260		225	5771	9800		304
	16			184	4416		114		95	5771	9800		
	17												
	18												
	19												
	20	304	7296			100		95		5800	9800		
	21	342	8208			790		65		5626	9800	242	
	22	342	8208			810		45		5973	9800	250	
	23	350	8400			800		45		5926	9800	241	
	24	331	7944			760		45		5727	9800	237	
	25	329	7896			760		45		5993	9800	246	
	26	329	7896			780		45		5705	9800	243	
	27	337	8088			630		45		5841	9800		
	28	338	8112			630		44		5815	9800		
	29	329	7896			640		44		5209	9800		

Month	Day	Steam production				Coal consumption		Oil consumption		Calorific value	Calorific value	Specific Emissions	
		Boiler I		Boiler II		Boiler I	Boiler II	Boiler I	Boiler II	Coal	Fuel oil	Boiler I	Boiler II
		A	***qB,B1 [A*24h]***	**B**	***qB,B2 [B*24h]***	***fB a,B1***	***fB a,B2***	***fB b,B1***	***fB b,B2***	***CV a***	***CVb***	***efB,B1***	***efB,B2***
		t/h	t	t/h	t	t		t		kcal/kg	kcal/kg	kg CO2/t steam	
Mar	1												
	2	327	7848			810		40		5357	9800	240	
	3	338	8112			840		40		5537	9800	246	
	4	338	8112			830		52		5948	9800	261	
	5	350	8400			840		40		5948	9800	251	
	6	350	8400			840		40		6215	9800	259	
	7	357	8568			860		40		6168	9800	258	
	8	349	8376			860		40		5850	9800	254	
	9	351	8424			870		38		5432	9800	241	
	10	337	8088			840		40		6202	9800	268	
	11	336	8064	345	8280	290	540	25	60	6263	9800		
	12			339	8136		860		35	6133	9800		268
	13			337	8088		840		40	6042	9800		263
	14			343	8232		850		30	6171	9800		262
	15			332	7968		870		30	6226	9800		278
	16			343	8232		770		30	6303	9800		242
	17			315	7560		720		60	5768	9800		244
	18			310	7440		680		60	6384	9800		253
	19			275	6600		600		55	6128	9800		245
	20			269	6456		590		50	6234	9800		248
	21			260	6240		580		50	6619	9800		263
	22			256	6144		570		85	6021	9800		264
	23			257	6168		570		85	6414	9800		274
	24			254	6096		560		71	6015	9800		255
	25			254	6096		560		88	6185	9800		268
	26			259	6216		570		49	6225	9800		248
	27			255	6120		590		52	6342	9800		265
	28			259	6216		560		49	4557	9800		196
	29			293	7032		670		27	5956	9800		237
	30			338	8112		800		19	6054	9800		243
	31			297	7128		280			6489			

Month	Day	Steam production				Coal consumption		Oil consumption		Calorific value	Calorific value	Specific Emissions	
		Boiler I		Boiler II		Boiler I	Boiler II	Boiler I	Boiler II	Coal	Fuel oil	Boiler I	Boiler II
		A	***qB ,B1 [A*24h]***	**B**	***qB ,B2 [B*24h]***	***fB a,B1***	***fB a,B2***	***fB b,B1***	***fB b,B2***	***CV a***	***CVb***	***efB ,B1***	***efB ,B2***
		t/h	t	t/h	t	t		t		kcal/kg	kcal/kg	kg CO2/t steam	
Apr	1												
	2			278	6672		630		14	6244	9800		238
	3			310	7440		720		14	6326	9800		245
	4			311	7464		710		12	6153	9800		235
	5			307	7368		670		12	6465	9800		233
	6			299	7176		60		8	5771	9800		
	7												
	8												
	9												
	10												
	11												
	12												
	13												
	14												
	15												
	16												
	17												
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	23												
	24												
	25												
	26												
	27												
	28												
	29												
	30												
	31												

Month	Day	Steam production				Coal consumption		Oil consumption		Calorific value	Calorific value	Specific Emissions	
		Boiler I		Boiler II		Boiler I	Boiler II	Boiler I	Boiler II	Coal	Fuel oil	Boiler I	Boiler II
		A	***qB ,B1 [A*24h]***	**B**	***qB ,B2 [B*24h]***	***fB a,B1***	***fB a,B2***	***fB b,B1***	***fB b,B2***	***CV a***	***CVb***	***efB ,B1***	***efB ,B2***
		t/h	t	t/h	t	t		t		kcal/kg	kcal/kg	kg CO2/t steam	
Nov	1												
	2												
	3												
	4												
	5			278	6672		390		79	5839	9800		
	6			305	7320		800			5812			253
	7			315	7560		800			5619			238
	8			318	7632		790		1	5724	9800		237
	9			325	7800		800		20	5927	9800		249
	10			331	7944		820			5569			231
	11			322	7728		800			5626			233
	12			318	7632		800			5637			237
	13			319	7656		800			5385			228
	14			322	7728		860			5657			252
	15			346	8304		890			4561			204
	16			350	8400		910			5552			242
	17			345	8280		900			5635			245
	18			322	7728		810		25	5140	9800		230
	19			315	7560		800		17	5537	9800		243
	20			342	8208		890		3	5724	9800		249
	21			343	8232		890		4	4742	9800		214
	22			349	8376		890		10	5721	9800		247
	23			346	8304		890		14	5517	9800		243
	24			346	8304		890		4	4728	9800		211
	25			349	8376		890		8	5529	9800		239
	26			354	8496		890		12	5654	9800		242
	27			352	8448		910			5637			243
	28			348	8352		900		5	5689	9800		247
	29			347	8328		890		9	5653	9800		245
	30			349	8376		900			6030			256

Month	Day	Steam production				Coal consumption		Oil consumption		Calorific value	Calorific value	Specific Emissions	
		Boiler I		Boiler II		Boiler I	Boiler II	Boiler I	Boiler II	Coal	Fuel oil	Boiler I	Boiler II
		A	***qB ,B1 [A*24h]***	**B**	***qB ,B2 [B*24h]***	***fB a,B1***	***fB a,B2***	***fB b,B1***	***fB b,B2***	***CV a***	***CVb***	***efB ,B1***	***efB ,B2***
		t/h	t	t/h	t	t		t		kcal/kg	kcal/kg	kg CO2/t steam	
Dec	1				0								
	2			342	8208		860		6	5537	9800		236
	3			331	7944		820			5422			226
	4			333	7992		850			5136			223
	5			341	8184		880			5549			240
	6	323	7752	352	8448	200	630	70	30	5745	9800		
	7			342	8208		890			5594			243
	8			337	8088		890			5057			228
	9			342	8208		880		5	4887	9800		218
	10			347	8328		890			5626			241
	11			348	8352		890			5781			245
	12			351	8424		900			5443			235
	13			352	8448		890		14	5558	9800		240
	14	359	8616	350	8400	550	500	13		5832	9800		
	15	354	8496			920		4		5633		244	
	16	344	8256			880				5733		244	
	17	355	8520			910				5709		244	
	18	347	8328			750		26		5810	9800	218	
	19	342	8208			890		12		5676	9800	251	
	20	349	8376			910				6143		262	
	21	351	8424			900		1		5965	9800	253	
	22	350	8400			920				5934		258	
	23	350	8400			910				6021		258	
	24	350	8400			910				5861		252	
	25	346	8304			930				5867		261	
	26	350	8400			920				5663		248	
	27	350	8400			920				5883		256	
	28	332	7968			910		1		5643	9800	259	
	29	340	8160			910				5630		252	
	30	345	8280			930				6030		267	
	31	336	8064			930		2		5592	9800	260	
		344		**319**						**5771**		**248**	**245**

Project:

Based on the data from the treatment period for boiler II in January - February 2005, the following average emission factor per produced ton of steam was calculated:

Boiler $1_{project}$: *231 kg* CO_2*/t steam*
Boiler $2_{project}$: *228 kg* CO_2*/t steam*

Since the test treatment only included boiler II, the project emission factor for boiler I derives from the percentage difference of the emission factor per produced ton of steam from boiler II during baseline operation and project (treatment) operation, respectively.

The calculations of the average emission factor per produced ton of steam foe boiler II follow the same roots as described in the baseline approach.

The tables below show the operation data for boiler 2 during the Therma Chem FS 12 test period in January – February 2005 (operation data from Feb 10^{th} *2005 – Feb* 25^{th} *2005 selected from the entire test period for the project scenario). The tables list the steam production and fuel consumption per hour for boiler 2 and the fuel specific calorific value. Based on this data the specific* CO_2 *emissions per produced ton of steam are calculated for boiler 2 on an hourly basis.*

Date	hours	Steam production	Coal consumption	Calorific value	Specific Emissions
		Boiler II	Boiler II	Coal	Boiler II
		qP,B2	***fP a,B2***	***CV a***	***efP ,B2***
		t/h	t/h	kcal/kg	**kg CO2/t steam**
10-02-2005	647	330	34,5	5771	**241**
	648	347	35,6	5771	**236**
	649	352	35,8	5771	**234**
	650	348	35,6	5771	**235**
	651	344	35,6	5771	**238**
	652	342	35,6	5771	**239**
	653	340	34,1	5771	**231**
	654	353	30,4	5771	**198**
	655	332	32,6	5771	**226**
	656	332	32,6	5771	**226**
	657	341	32,6	5771	**220**
	658	330	32,8	5771	**229**
	659	329	33,4	5771	**234**
	660	331	33,6	5771	**234**
	661	330	33,6	5771	**234**
	662	329	33,6	5771	**235**
	663	331	33,6	5771	**234**
	664	332	33,6	5771	**233**
	665	334	33,8	5771	**233**
	666	338	34,0	5771	**231**
	667	345	34,5	5771	**230**
	668	348	34,5	5771	**228**
	669	396	34,5	5771	**200**
	670	396	34,5	5771	**200**

Date	hours	Steam production	Coal consumption	Calorific value	Specific Emissions
		Boiler II	Boiler II	Coal	Boiler II
		qP,B2	***fP a,B2***	***CV a***	***efP ,B2***
		t/h	t/h	kcal/kg	**kg CO2/t steam**
11-02-2005	734	338	35,2	5771	**240**
	735	348	35,3	5771	**233**
	736	337	35,3	5771	**241**
	737	337	35,3	5771	**241**
	738	337	35,3	5771	**241**
	739	337	35,3	5771	**241**
	740	337	35,3	5771	**241**
	741	347	33,3	5771	**221**
	742	352	33,3	5771	**218**
	743	339	33,3	5771	**226**
	744	343	33,3	5771	**223**
	745	340	33,3	5771	**225**
	746	340	33,3	5771	**225**
	747	341	33,3	5771	**225**
	748	344	33,3	5771	**223**
	749	344	33,3	5771	**223**
	750	341	33,3	5771	**225**
	751	346	33,3	5771	**221**
	752	347	33,3	5771	**221**
	753	346	33,3	5771	**221**
	754	349	33,3	5771	**220**
	755	347	33,3	5771	**221**
	756	341	33,3	5771	**225**
	757	342	33,3	5771	**224**
12-02-2005	758	336	33,3	5771	**228**
	759	346	33,7	5771	**224**
	760	345	33,7	5771	**225**
	761	344	33,7	5771	**225**
	762	344	33,7	5771	**225**
	763	344	33,7	5771	**225**
	764	345	33,7	5771	**225**
	765	335	33	5771	**227**
	766	332	32,6	5771	**226**
	767	329	32	5771	**224**
	768	330	31,8	5771	**222**
	769	320	31,5	5771	**226**
	770	316	31,3	5771	**228**
	771	316	31,3	5771	**228**
	772	321	31,9	5771	**229**
	773	318	31,9	5771	**231**
	774	310	31,9	5771	**237**
	775	339	33,7	5771	**229**
	776	337	33,7	5771	**230**
	777	339	33,7	5771	**229**
	778	339	33,7	5771	**229**
	779	344	33,7	5771	**225**
	780	330	33,7	5771	**235**
	781	330	33,7	5771	**235**

Date	hours	Steam production	Coal consumption	Calorific value	Specific Emissions
		Boiler II	Boiler II	Coal	Boiler II
		qP,B2	***fP a,B2***	***CV a***	***efP ,B2***
		t/h	t/h	kcal/kg	**kg CO2/t steam**
13-02-2005	782	321	33,8	5771	**242**
	783	321	33,8	5771	**242**
	784	311	32,4	5771	**240**
	785	310	32	5771	**237**
	786	313	31,8	5771	**234**
	787	315	31,8	5771	**232**
	788	321	31,8	5771	**228**
	789	322	31,8	5771	**227**
	790	312	30	5771	**221**
	791	296	30	5771	**233**
	792	294	30	5771	**235**
	793	293	30	5771	**236**
	794	298	30	5771	**232**
	795	299	29,4	5771	**226**
	796	304	29,4	5771	**222**
	797	314	30,7	5771	**225**
	798	316	30,5	5771	**222**
	799	311	30,5	5771	**226**
	800	316	30,9	5771	**225**
	801	308	30,9	5771	**231**
	802	309	30,5	5771	**227**
	803	307	30,5	5771	**229**
	804	310	30,5	5771	**226**
	805	307	30,5	5771	**229**
14-02-2005	806	305	31	5771	**234**
	807	310	31,2	5771	**232**
	808	312	31,2	5771	**230**
	809	309	31,2	5771	**232**
	810	307	31,2	5771	**234**
	811	310	31,2	5771	**232**
	812	306	31,2	5771	**235**
	813	302	31,2	5771	**238**
	814	310	31	5771	**230**
	815	311	31,1	5771	**230**
	816	297	30,1	5771	**233**
	817	305	30,1	5771	**227**
	818	305	30,1	5771	**227**
	819	309	30,1	5771	**224**
	820	303	30,1	5771	**229**
	821	310	30,1	5771	**223**
	822	313	30,1	5771	**221**
	823	309	30,1	5771	**224**
	824	309	30,1	5771	**224**
	825	304	30,1	5771	**228**
	826	303	30,1	5771	**229**
	827	303	30,1	5771	**229**
	828	300	29,4	5771	**225**
	829	293	29,4	5771	**231**

Date	hours	Steam production	Coal consumption	Calorific value	Specific Emissions
		Boiler II	Boiler II	Coal	Boiler II
		qP,B2	***fP a,B2***	***CV a***	***efP ,B2***
		t/h	t/h	kcal/kg	**kg CO2/t steam**
15-02-2005	830	288	29	5771	**232**
	831	287	29	5771	**232**
	832	288	29,4	5771	**235**
	833	293	29,6	5771	**232**
	834	292	29,6	5771	**233**
	835	293	29,4	5771	**231**
	836	278	28,3	5771	**234**
	837	285	28,2	5771	**228**
	838	287	28,2	5771	**226**
	839	278	27,8	5771	**230**
	840	282	27,8	5771	**227**
	841	276	27,8	5771	**232**
	842	276	28,2	5771	**235**
	843	288	28,6	5771	**228**
	844	281	28,6	5771	**234**
	845	283	28,8	5771	**234**
	846	284	29	5771	**235**
	847	286	29	5771	**233**
	848	285	29	5771	**234**
	849	283	29	5771	**236**
	850	284	29,3	5771	**237**
	851	283	29,3	5771	**238**
	852	289	29,3	5771	**233**
	853	289	29,3	5771	**233**
16-02-2005	854	305	29,5	5771	**223**
	855	295	29,2	5771	**228**
	856	290	29,2	5771	**232**
	857	291	29,2	5771	**231**
	858	294	29,2	5771	**228**
	859	292	29,2	5771	**230**
	860	294	29,2	5771	**228**
	861	267	27,3	5771	**235**
	862	278	27,3	5771	**226**
	863	270	27,3	5771	**233**
	864	261	27,3	5771	**241**
	865	264	27,3	5771	**238**
	866	260	27,1	5771	**240**
	867	270	27,1	5771	**231**
	868	276	27,1	5771	**226**
	869	272	27,1	5771	**229**
	870	274	27,1	5771	**228**
	871	278	27,1	5771	**224**
	872	271	27,1	5771	**230**
	873	274	27,1	5771	**228**
	874	277	27,1	5771	**225**
	875	276	27	5771	**225**
	876	276	26,8	5771	**223**
	877	278	26,8	5771	**222**

Date	hours	Steam production	Coal consumption	Calorific value	Specific Emissions
		Boiler II	Boiler II	Coal	Boiler II
		qP,B2	***fP a,B2***	***CV a***	***efP ,B2***
		t/h	t/h	kcal/kg	**kg CO2/t steam**
17-02-2005	878	276	26,8	5771	**223**
	879	278	26,8	5771	**222**
	880	270	26,8	5771	**228**
	881	270	26,8	5771	**228**
	882	270	26,8	5771	**228**
	883	284	26,4	5771	**214**
	884	275	26,4	5771	**221**
	885	270	26,2	5771	**223**
	886	255	25,1	5771	**226**
	887	249	24,9	5771	**230**
	888	245	24,9	5771	**234**
	889	247	24,9	5771	**232**
	890	239	24,9	5771	**240**
	891	241	24,9	5771	**238**
	892	241	24,9	5771	**238**
	893	242	24,9	5771	**237**
	894	254	24,9	5771	**226**
	895	246	24,9	5771	**233**
	896	245	24,9	5771	**234**
	897	245	24,9	5771	**234**
	898	243	24,9	5771	**236**
	899	241	24,9	5771	**238**
	900	245	24,9	5771	**234**
	901	247	24,9	5771	**232**
18-02-2005	902	264	26,4	5771	**230**
	903	277	26,6	5771	**221**
	904	274	26,6	5771	**223**
	905	270	26,6	5771	**227**
	906	277	26,6	5771	**221**
	907	273	26,6	5771	**224**
	908	267	26,7	5771	**230**
	909	275	27	5771	**226**
	910	292	28,8	5771	**227**
	911	289	28,5	5771	**227**
	912	294	28,5	5771	**223**
	913	293	28,5	5771	**224**
	914	290	28,5	5771	**226**
	915	290	28,3	5771	**224**
	916	296	28,3	5771	**220**
	917	291	28,3	5771	**224**
	918	290	28,3	5771	**224**
	919	283	28,3	5771	**230**
	920	294	28,3	5771	**221**
	921	292	28,3	5771	**223**
	922	295	28,6	5771	**223**
	923	296	28,2	5771	**219**
	924	295	28	5771	**218**
	925	295	28	5771	**218**

Date	hours	Steam production	Coal consumption	Calorific value	Specific Emissions
		Boiler II	Boiler II	Coal	Boiler II
		qP,B2	***fP** a,B2*	***CV** a*	***efP** ,B2*
		t/h	t/h	kcal/kg	**kg CO2/t steam**
19-02-2005	926	296	28	5771	**218**
	927	294	28	5771	**219**
	928	294	28	5771	**219**
	929	296	28	5771	**218**
	930	295	28	5771	**218**
	931	294	28	5771	**219**
	932	293	27,8	5771	**218**
	933	290	27,8	5771	**221**
	934	289	27,5	5771	**219**
	935	289	27,5	5771	**219**
	936	289	27,5	5771	**219**
	937	291	27,5	5771	**217**
	938	291	27,5	5771	**217**
	939	289	27,5	5771	**219**
	940	289	27,9	5771	**222**
	941	281	27,9	5771	**228**
	942	299	29,1	5771	**224**
	943	291	29,1	5771	**230**
	944	301	29,1	5771	**222**
	945	302	29,1	5771	**222**
	946	290	29,1	5771	**231**
	947	288	29,1	5771	**232**
	948	300	29,1	5771	**223**
	949	300	29,1	5771	**223**
20-02-2005	950	292	28,7	5771	**226**
	951	288	28,7	5771	**229**
	952	282	28,7	5771	**234**
	953	284	28,7	5771	**232**
	954	292	28,7	5771	**226**
	955	292	28,7	5771	**226**
	956	291	28,7	5771	**227**
	957	291	28,7	5771	**227**
	958	299	28,7	5771	**221**
	959	289	28,7	5771	**228**
	960	296	28,7	5771	**223**
	961	296	28,7	5771	**223**
	962	294	28,7	5771	**225**
	963	295	28,7	5771	**224**
	964	295	28,4	5771	**221**
	965	290	28,4	5771	**225**
	966	291	28,4	5771	**225**
	967	289	28,4	5771	**226**
	968	288	28,4	5771	**227**
	969	290	28,4	5771	**225**
	970	291	28,4	5771	**225**
	971	289	28,4	5771	**226**
	972	291	28,4	5771	**225**
	973	294	28,4	5771	**222**

Date	hours	Steam production	Coal consumption	Calorific value	Specific Emissions
		Boiler II	Boiler II	Coal	Boiler II
		qP,B2	***fP a,B2***	***CV a***	***efP ,B2***
		t/h	t/h	kcal/kg	**kg CO2/t steam**
21-02-2005	974	287	28,4	5771	**228**
	975	299	28,4	5771	**219**
	976	297	28,4	5771	**220**
	977	281	27,5	5771	**225**
	978	281	27,5	5771	**225**
	979	285	27,5	5771	**222**
	980	289	27,9	5771	**222**
	981	288	27,9	5771	**223**
	982	266	26,1	5771	**226**
	983	270	26,1	5771	**222**
	984	264	26,1	5771	**227**
	985	260	25,6	5771	**227**
	986	259	25,6	5771	**227**
	987	256	25,2	5771	**226**
	988	264	26,5	5771	**231**
	989	268	27,1	5771	**233**
	990	276	28,1	5771	**234**
	991	277	28,2	5771	**234**
	992	276	28,2	5771	**235**
	993	278	28,2	5771	**233**
	994	277	28,2	5771	**234**
	995	283	28,2	5771	**229**
	996	277	28,2	5771	**234**
	997	276	27,6	5771	**230**
22-02-2005	998	282	27,8	5771	**227**
	999	278	27,8	5771	**230**
	1000	277	27,8	5771	**231**
	1001	279	27,8	5771	**229**
	1002	285	28,4	5771	**229**
	1003	286	28,6	5771	**230**
	1004	286	28,6	5771	**230**
	1005	274	27,7	5771	**233**
	1006	266	26	5771	**225**
	1007	268	26,2	5771	**225**
	1008	269	26,4	5771	**226**
	1009	270	26,4	5771	**225**
	1010	271	26,4	5771	**224**
	1011	268	26,4	5771	**227**
	1012	269	26,4	5771	**226**
	1013	269	26,4	5771	**226**
	1014	273	26,4	5771	**222**
	1015	273	26,4	5771	**222**
	1016	273	26,4	5771	**222**
	1017	267	26,4	5771	**227**
	1018	271	26,4	5771	**224**
	1019	271	26,4	5771	**224**
	1020	271	26,4	5771	**224**
	1021	271	26,4	5771	**224**

Date	hours	Steam production	Coal consumption	Calorific value	Specific Emissions
		Boiler II	Boiler II	Coal	Boiler II
		qP,B2	***fP a,B2***	***CV a***	***efP ,B2***
		t/h	t/h	kcal/kg	**kg CO2/t steam**
23-02-2005	1022	265	26,8	5771	**233**
	1023	263	26,8	5771	**234**
	1024	261	26,8	5771	**236**
	1025	261	26,8	5771	**236**
	1026	265	26,8	5771	**233**
	1027	270	26,8	5771	**228**
	1028	268	26,8	5771	**230**
	1029	270	27	5771	**230**
	1030	270	27	5771	**230**
	1031	272	27	5771	**228**
	1032	274	27	5771	**227**
	1033	268	27	5771	**232**
	1034	269	27	5771	**231**
	1035	271	27	5771	**229**
	1036	277	27	5771	**224**
	1037	272	27	5771	**228**
	1038	271	27	5771	**229**
	1039	272	27	5771	**228**
	1040	271	27	5771	**229**
	1041	271	27	5771	**229**
	1042	276	27,4	5771	**228**
	1043	280	27,6	5771	**227**
	1044	281	27,6	5771	**226**
	1045	275	27,6	5771	**231**
24-02-2005	1046	272	27,1	5771	**229**
	1047	270	26,8	5771	**228**
	1048	269	26,8	5771	**229**
	1049	267	26,6	5771	**229**
	1050	269	26,5	5771	**227**
	1051	270	26,5	5771	**226**
	1052	274	26,5	5771	**222**
	1053	267	26,5	5771	**228**
	1054	268	26,5	5771	**227**
	1055	269	26,7	5771	**228**
	1056	271	26,7	5771	**227**
	1057	266	26,7	5771	**231**
	1058	267	26,7	5771	**230**
	1059	275	26,7	5771	**223**
	1060	269	26	5771	**222**
	1061	269	26	5771	**222**
	1062	274	26,5	5771	**222**
	1063	276	26,5	5771	**221**
	1064	277	26,9	5771	**223**
	1065	288	27,6	5771	**220**
	1066	284	27,6	5771	**224**
	1067	284	27,6	5771	**224**
	1068	287	27,6	5771	**221**
	1069	287	27,6	5771	**221**

Date	hours	Steam production	Coal consumption	Calorific value	Specific Emissions
		Boiler II	Boiler II	Coal	Boiler II
		qP,B2	***fP*** ***a,B2***	***CV*** ***a***	***efP*** ***,B2***
		t/h	t/h	kcal/kg	**kg CO2/t steam**
25-02-2005	1070	277	27,6	5771	**229**
	1071	289	28,3	5771	**225**
	1072	287	28,3	5771	**227**
	1073	283	28,3	5771	**230**
	1074	288	28,3	5771	**226**
	1075	289	28,3	5771	**225**
	1076	288	28,1	5771	**224**
	1077	284	27,8	5771	**225**
	1078	285	27,8	5771	**224**
	1079	279	27,8	5771	**229**
	1080	287	27,8	5771	**223**
	1081	281	27,8	5771	**228**
	1082	287	27,8	5771	**223**
	1083	278	27,8	5771	**230**
	1084	281	27,9	5771	**228**
	1085	283	28	5771	**228**
	1086	285	28	5771	**226**
	1087	284	28	5771	**227**
	1088	285	28	5771	**226**
	1089	283	28	5771	**228**
	1090	284	28	5771	**227**
	1091	287	27,9	5771	**224**
	1092	287	27,9	5771	**224**

Annex 3
MONITORING PLAN

Guidelines and Procedures are Located in a separate document

Annex 4

Appendixes

Leakage estimation:

Transport:

Transport emissions calculated in accordance with “UK National Atmospheric Emission Inventory – Methodology 2.9 – Diesel Trucks (HGV):

Therma Chem FS 12 transport:

Carbon Emissions: 875 kg C / t diesel
Fuel consumption: 181 g diesel / km
Distance: 2500 km (Scotland – Iasi); round trip 5000 km / year
Annual load: 40 t of Therma Chem FS 12 / year
Truck loads: 4 / year

Annual transport emissions: **11.36 t CO_2 / year**

Coal transport:

Carbon Emissions: 875 kg C / t diesel
Fuel consumption: 181 g diesel / km
Distance: 300 km round trip / year
Annual load: 10,000 t / year
Truck loads: 500 / year

Annual transport emissions: **85.2 t CO_2 / year**

Emissions associated with the operation of the new ash handling system:

Electric capacity: 82 kW
Operation duration: 3600 h / year
Emission factor el.: 0.513 t CO_2 / MWh

Annual emissions: **151 t CO_2 / year**

Investment Comparison Analysis

Alternatives

Alternative 0: Joint Implementation project activity

Alternative 1: Business as usual

Alternative 2: The project activity without JI participation and carbon credit trading

Financial analysis assumptions

This investment analysis takes into account the following assumptions based on the different alternatives:

- Total investment of the project activity is expected to be € 1,790,000
- An up-front capital investment by S.C. CET Iasi S.A. of € 179,000
- An expected 10-year Romanian commercial loan taken out by S.C. CET Iasi S.A. for € 1,611,000 at 10.5% interest . The interest is based on the Romanian National Bank reference rate of 8.5% (Jun 2006) plus 2%.
- An annual cost of Thermo-Chem treatment technology: € 291,600
- An annual operation and maintenance cost of € 2,000. Note that electricity is produced on site and is not included in the O&M cost of the ash handling system, and the net O&M cost of the ash handling system is expected to be approximately the same as the old system which is being replaced
- Average annual cost of Joint Implementation (e.g. verification) € 15,000
- An annual savings of less coal consumed (8,925 tons/yr x 66.20 €/ton = € 590,830). The price of 66.20 €/ton is an expected average forward price for the 2006-2012 period. This is based on billing records at Holboca Iaşi CET II and market fluctuations, 55 – 69 USD/ton (20%) in 2005/2006.
- An annual CO_2 savings of 20,184 tons/yr at a price of 5.00 €/ton CO_2e
- A Net Present Value (NPV) discount rate of 10%, which is a reflective value based on the current Romanian economy. It is slightly over the rate of inflation 8 – 9 % (2005), and one and a half points over the National Bank of Romania's reference rate of 8.5% (June 2006), and in line with Romanian commercial bank rates (9.5-10.5%).

Underlying Assumptions

Annual operation and maintenance costs (project)	2,000	EURO
Avg. Annual Joint Implementation Costs	15,000	EURO
Selling price for hard coal	66.2	EURO/ton
Annual cost of Therm-Chem FS12 (291,600 EURO)	[redacted]	
Price of ER	5.00	EUR/tonne of CO2 equ
Discount rate	10.0%	
Bank Interest Rate	10.5%	

	Total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Emission Reductions (CO2e)	131,198	10,092	20,184	20,184	20,184	20,184	20,184	20,184			
Coal Saved (tons)	66,937	4,462	8,925	8,925	8,925	8,925	8,925	8,925	8,925	8,925	8,925
Therm-Chem FS12 Consumption (liters)	270,000	18,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000

Investment Cost	1,790,000
Own financing	179,000
Principle for loan	1,611,000

Financial Analysis:
Project Activty With JI Participation

Debits	TOTALS	Up-Front	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Loan Payment	2,678,405		267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841
Treatment and O&M Cost	2,895,200		147,800	308,600	308,600	308,600	308,600	308,600	308,600	308,600	293,600	293,600
Revenue	**TOTALS**											
ERs	655,989			50,461	100,921	100,921	100,921	100,921	100,921	100,921		
Coal Savings	5,612,886		295,415	590,830	590,830	590,830	590,830	590,830	590,830	590,830	590,830	590,830
Cash Flow												
	516,270	-179,000	-120,225	64,850	115,311	115,311	115,311	115,311	115,311	115,311	29,390	29,390
NPV (10%)	**185,585**											
IRR	**23%**											

Financial Analysis:
Project Activity Without JI Participation

Debits	TOTALS	Up-Front	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Loan Payment	2,678,405		267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841
Treatment and O&M Cost	2,790,200		147,800	293,600	293,600	293,600	293,600	293,600	293,600	293,600	293,600	293,600
Revenue	**TOTALS**											
ERs	0		0	0	0	0	0	0	0	0	0	0
Coal Savings	5,612,886		295,415	590,830	590,830	590,830	590,830	590,830	590,830	590,830	590,830	590,830
Cash Flow												
	-34,719	-179,000	-120,225	29,390	29,390	29,390	29,390	29,390	29,390	29,390	29,390	29,390
NPV (10%)	**-143,838**											
IRR	**NEGATIVE**											

Sensativity Analysis:
Project Activty With JI Participation (10% Increase in efficency, and 10% increase in coal prices)

Debits	TOTALS	Up-Front	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Loan Payment	2,678,405		267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841
Treatment and O&M Cost	2,895,200		147,800	308,600	308,600	308,600	308,600	308,600	308,600	308,600	293,600	293,600
Revenue	**TOTALS**											
ERs	721,588			55,507	111,014	111,014	111,014	111,014	111,014	111,014		
Coal Savings	6,791,593		357,452	714,904	714,904	714,904	714,904	714,904	714,904	714,904	714,904	714,904
Cash Flow												
	1,760,575	-179,000	-58,188	193,971	249,478	249,478	249,478	249,478	249,478	249,478	153,464	153,464
NPV (10%)	**751,250**											
IRR	**63%**											

Sensativity Analysis:
Project Activity Without JI Participation (10% Increase in efficency, and 10% increase in coal prices)

Debits	TOTALS	Up-Front	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Loan Payment	2,678,405		267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841
Treatment and O&M Cost	2,790,200		147,800	293,600	293,600	293,600	293,600	293,600	293,600	293,600	293,600	293,600
Revenue	**TOTALS**											
ERs	0		0	0	0	0	0	0	0	0	0	0
Coal Savings	6,791,593		357,452	714,904	714,904	714,904	714,904	714,904	714,904	714,904	714,904	714,904
Cash Flow												
	1,143,987	-179,000	-58,188	153,464	153,464	153,464	153,464	153,464	153,464	153,464	153,464	153,464
NPV (10%)	**406,643**											
IRR	**45%**											

Sensativity Analysis:
Project Activty With JI Participation (10% decrease in efficency, and 10% decrease in coal prices)

Debits	TOTALS	Up-Front	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Loan Payment	2,678,405		267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841
Treatment and O&M Cost	2,895,200		147,800	308,600	308,600	308,600	308,600	308,600	308,600	308,600	293,600	293,600
Revenue	**TOTALS**											
ERs	590,390			45,415	90,829	90,829	90,829	90,829	90,829	90,829		
Coal Savings	4,546,438		239,286	478,572	478,572	478,572	478,572	478,572	478,572	478,572	478,572	478,572
Cash Flow												
	-615,777	-179,000	-176,354	-52,453	-7,039	-7,039	-7,039	-7,039	-7,039	-7,039	-82,868	-82,868
NPV (10%)	**-370,916**											
IRR	**NEGATIVE**											

Sensativity Analysis:
Project Activity Without JI Participation (10% decrease in efficency, and 10% decrease in coal prices)

Debits	TOTALS	Up-Front	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Loan Payment	2,678,405		267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841	267,841
Treatment and O&M Cost	2,790,200		147,800	293,600	293,600	293,600	293,600	293,600	293,600	293,600	293,600	293,600
Revenue	**TOTALS**											
ERs	0		0	0	0	0	0	0	0	0	0	0
Coal Savings	4,546,438		239,286	478,572	478,572	478,572	478,572	478,572	478,572	478,572	478,572	478,572
Cash Flow												
	-1,101,167	-179,000	-176,354	-82,868	-82,868	-82,868	-82,868	-82,868	-82,868	-82,868	-82,868	-82,868
NPV (10%)	**-641,893**											
IRR	**NEGATIVE**											

Letter of Endorsement

R O M Â N I A

MINISTERUL MEDIULUI ŞI GOSPODĂRIRII APELOR
CABINET MINISTRU
B-dul Libertăţii, nr.12, Sector 5, Bucureşti, Tel: 316.02.46; Fax: 312.42.27
Nr. ..1432../S.B./...12.03.2006

Scrisoare de Susţinere

pentru proiectul de tip Implementare în comun

"Creşterea randamentului cazanului la Holboca CET II Iaşi"

Implementând politica globală privind schimbările climatice, România, ca ţară inclusă în Anexa I a Convenţiei-cadru a Naţiunilor Unite asupra Schimbărilor Climatice (UNFCCC), aplică principiile articolului 3.3 al Convenţiei, care prevede, între altele, faptul că Părţile la UNFCCC trebuie să ia în considerare că "politicile şi măsurile necesare în domeniul schimbărilor climatice trebuie să fie eficiente din punct de vedere al costurilor astfel încât să asigure avantaje globale la cel mai scăzut cost posibil".

Articolul 6 al Protocolului de la Kyoto la UNFCCC, dă posibilitatea oricărei Părţi incluse în Anexa I a UNFCCC să transfere către, sau să achiziţioneze de la orice altă Parte unităţi de reducere a emisiilor (ERU-uri) generate de proiecte ce au ca scop reducerea emisiilor antropice de la surse, sau intensificarea absorbanţilor, de gaze cu efect de seră în scopul îndeplinirii angajamentelor prevăzute de articolul 3 al Protocolului.

Întrucât:

A. România a încheiat până în prezent 8 Memorandumuri de Înţelegere bilaterale în domeniul Schimbărilor Climatice, având ca obiectiv facilitarea implementării prevederilor art. 6 al Protocolului de la Kyoto, stabilind, în acelaşi timp, cadrul general pentru dezvoltarea proiectelor de tip Implementare în comun;

B. România a ratificat Protocolul de la Kyoto şi se conformează cu cerinţele de participare importante pentru dezvoltarea proiectelor de tip Implementare în comun (JI) pe baza Protocolului de la Kyoto, a Acordurilor de la Marrakech şi a regulilor, deciziilor, liniilor directoare, modalităţilor şi procedurilor relevante adoptate subsecvent;

C. Compania SC CET Iaşi S.A. Centrala Electrica de Termoficare Holboca, Iaşi ("Entitatea de proiect") a prezentat propunerea de proiect JI "Creşterea randamentului cazanului la Holboca CET II Iaşi" ("Propunerea de proiect").

Ministerul Mediului şi Gospodăririi Apelor, în calitate de reprezentant legal şi autorizat în România, declară prin prezenta Scrisoare de susţinere că:

1. România doreşte să continue politica de implementare în comun a mecanismelor flexibile prevăzute de Protocolul de la Kyoto;
2. Propunerea de proiect a fost analizată la întâlnirea din 24 octombrie 2005 a Comisiei Naţionale pentru Schimbări Climatice şi a primit sprijinul acesteia pentru a continua pregătirea documentaţiei tehnice şi procedurale în vederea prezentării ulterioare la Comisie pentru obţinerea Scrisorii de aprobare;
3. În cazul în care rezultatele evaluării ulterioare a documentaţiei tehnice şi procedurale sunt pozitive, Ministerul Mediului şi Gospodăririi Apelor va lua în considerare, în urma avizului favorabil al Comisiei Naţionale pentru Schimbări Climatice, acordarea Scrisorii de aprobare pentru dezvoltarea propunerii de proiect pe baza unui Memorandum de Înţelegere, ca proiect JI conform art. 6 al Protocolului de la Kyoto, Acordurilor de la Marrakech şi a regulilor, deciziilor, liniilor directoare, modalităţilor şi procedurilor adoptate subsecvent;
4. România va îndeplini până la 1 septembrie 2006 toate cerinţele de participare, menţionate în Acordurile de la Marrakech, pentru implementarea mecanismelor flexibile prevăzute de Protocolul de la Kyoto.

Semnat în 17.03.2006..., la Bucureşti, România.

MINISTRU

Sulfina BARBU

<u>Letter from S.C. CET Iasi S.A.</u>

C.E.T.Iş CET IAŞI
SOCIETATE PE ACŢIUNI
SR AC ISO 9001 · IQNet · SR AC Certificat Nr. 550 ISO 14001

Calea Chişinăului nr.25 700265 - Iaşi, ROMANIA tel. 0232-237990 fax 0232-237992 WEB: www.cet-iasi.ro
Cont bancar BCR Iaşi IBAN RO49RNCB3200000000090001
Nr.înreg.Reg.Com.:J22/677/26.06.2002 Cod fiscal: R 14718982 Capital social subscris şi vărsat 79.049.830 lei

To: ***DEPA – Denmark***
G & H - Denmark

Subject: JI Project

In relation to the above mentioned project, we confirm hereunder the following:

- *the rehabilitation of the steam boilers at Holboca Iaşi CET II has been completed and no further additional investment are planed which could effect the efficiency of the steam boilers.*
- *Therma-Chem FS12 on-line treatment was installed successfully, under a test bases in 2005 but it was discontinued due to the expected increase of operational costs and the need for a new ash removal system.*
- *S.C. CET Iasi S.A. will not invest in the project without Joint Implementation due to the need of more financial security in the investment; the trading of the potential emission reductions provides this financial security.*
- *S.C. CET Iasi S.A. and the Municipality have established a prioritized investment plan for the cities district heating system and that the next major investment will be for the rehabilitation of the distribution system and heating substations (total value of 31 million Euros) to be financed by EBRD.*

We hope the above will clarify our position.

Looking forward to this project implementation,

Sincerely yours,
Dorin Ivana – General Manager
SC " CET IASI SA "

Letter from Energy Serv

Energy Serv

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office@energy-serv.ro
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Bd. N. Titulescu nr.12, Bl. 21A, sc. B, ap.57 sect.1
Bucharest - Romania

06.07.2006

GRUE & HORNSTRUP – Denmark

Subject: JI Project in SC CET IASI SA , Power and Heat Plant HOLBOCA

In relation the the above mentioned JI Project, we wish to make the following clarifications:

- Therma-Chem FS-12, manufactured by GB THERMA-CHEM Ltd – UK, Scotland, is a well known and proven fireside cleaning technology which has been proven effective in increasing boiler efficiency and availability in installations which have excessive slagging and fouling on their heat exchange surfaces.
- Therma-Chem FS-12 has been available in Romania, via EnergyServ, as a service and technology supplier, since 1996.
- The Therma-Chem FS12 has been applied, on a test bases, in only two coal fired installations in Romania (unit 1 # 2 in Holboca) and that the use has been discontinued at both installations due to increased operational costs. This is especially the case in Iasi where it was identified that a new ash handling system needed to be installed due to the increased load on the old system. The total investment costs at Iasi are expected to be 1.79 million Euros based on a feasibility analysis of EnergyServ.
- It is the hope of EnergyServ and GB Therma-Chem Ltd, that the inclusion of Joint Implementation in the application of Therma-Chem FS-12 will alleviate the past and current barriers to full-scale use of fireside cleaning technology in the Romanian energy sector and also worldwide.

Dragostin Catalin - Director

Dragostin

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