DETERMINATION REPORT

INSTITUTE FOR ENVIRONMENT AND ENERGY CONSERVATION

DETERMINATION OF THE TECHNICAL UPGRADE OF OJSC DNIPROVSKY INTEGRATED IRON AND STEEL WORKS NAMED AFTER DZERZHYNSKY BY INSTALLATION OF TWO BILLET CONTINUOUS CASTING MACHINES AND TWO LADLE FURNACES

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Summary:

Bureau Veritas Certification has made the determination of the "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces" project of Institute for Environment and Energy Conservation located in the town of Dniprodzerzhynsk, Dnipropetrovsk region, Ukraine, on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

The determination scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final determination report and opinion. The overall determination, from Contract Review to Determination Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the determination process is a list of Clarification Requests, Corrective Actions Requests and Forward Actions Requests (CL, CAR and FAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies Guidance on criteria for baseline setting and monitoring and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.

Report No.:	Subject Group:
UKRAINE-det/0170/2010	JI

Project title:

"Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces"

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Abbreviations

AIE	Accredited Independent Entity
BFG	Blast Furnace Gas
CAR	Corrective Action Request
CBC	Continuous Bloom Caster
CCM	Continuous Casting Machines
CDM	Clean Development Mechanism
CHP	Combined Heat and Power
CL	Clarification Request
CO_2	Carbon Dioxide
DIISW	Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky
DFP	Designated Focal Point
DVM	Determination and Verification Manual
EIA	Environmental Impact Assessment
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Green House Gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
LF	Land Furnace
MP	Monitoring Plan
NGO	Non Government Organization
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change

1 INTRODUCTION

Institute for Environment and Energy Conservation has commissioned Bureau Veritas Certification to determine its JI project "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces" (hereafter called "the project") at 18-B Kirova Street, Dniprodzerzhynsk, Dnipropetrovsk region, Ukraine.

This report summarizes the findings of the determination of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The determination serves as project design verification and is a requirement of all projects. The determination is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meets the stated requirements and identified criteria. Determination is a requirement for all JI projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emissions reductions units (ERUs).

UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

1.2 Scope

The determination scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The determination is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Determination team

The determination team consists of the following personnel:

Ivan Sokolov
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Team Member, Bureau Veritas Certification Climate Change Verifier

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Team Member, Bureau Veritas Certification Financial Specialist

This determination report was reviewed by:

Leonid Yaskin
Bureau Veritas Certification Internal Technical Reviewer

2 METHODOLOGY

The overall determination, from Contract Review to Determination Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a determination protocol was customized for the project, according to the version 01 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of determination and the results from determining the identified criteria. The determination protocol serves the following purposes:

- It organizes, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent determination process where the determiner will document how a particular requirement has been determined and the result of the determination.

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

2.1 Review of Documents

The Project Design Document (PDD) submitted by Institute for Environment and Energy Conservation and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for users of the joint implementation project design document form, Guidance on criteria for baseline setting and monitoring, Kyoto Protocol, Clarifications on Determination Requirements to be checked by a Accredited Independent Entity were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests, Institute for Environment and Energy Conservation revised the PDD and resubmitted it as version 2 of 14/12/2010, version 3 of 11/01/2011, version 4 of 04/02/2011, version 5 of 01/03/2011, version 6 of 08/04/2011, version 7 dated 19/05/2011 and version 8 dated 12/07/2011 which is deemed final.

The determination findings presented in this report relate to the project as described in the PDD versions 1, 2, 3, 4, 5, 6, 7 and 8.

2.2 Follow-up Interviews

On 13/10/2010 Bureau Veritas Certification conducted a visit to the project site (PJSC “Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky”) and performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review.

Representatives of Institute for Environment and Energy Conservation and PJSC "Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky" were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
PJSC "Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky"	➢ Project history ➢ Project approach ➢ Project boundary ➢ Implementation schedule ➢ Organizational structure ➢ Responsibilities and authorities ➢ Training of personnel ➢ Quality management procedures and technology ➢ Rehabilitation/Implementation of equipment (records) ➢ Metering equipment control ➢ Metering record keeping system, database ➢ Technical documentation ➢ Monitoring plan and procedures ➢ Permits and licenses ➢ Local stakeholder's response.
CONSULTANT: Institute for Environment and Energy Conservation	➢ Baseline methodology ➢ Monitoring plan ➢ Additionality proofs ➢ Calculation of emission reduction.

2.3 Resolution of Clarification, Corrective Actions and Forward Actions Requests

The objective of this phase of the determination is to raise the requests for corrective actions, forward actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

Corrective Action Requests (CAR) is issued, where:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
(b) The JI requirements have not been met;
(c) There is a risk that emission reductions cannot be monitored or calculated.

Forward action request (FAR) informs the project participants of an issue, relating to project implementation but not project design, which needs to be reviewed during the first verification of the project.

The determination team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable JI requirements have been met.

To guarantee the transparency of the determination process, the concerns raised are documented in more detail in the determination protocol in Appendix A.

3 PROJECT DESCRIPTION

The project which is being implemented at the PJSC "Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky" is aimed at achieving steel production with lower energy consumption per unit of output through reduction of furnace process time in converters as the result of introduction of ladle furnaces (LFs) and stabilization of casting process at new seven-strand billet continuous casting machines (CCMs), which would inter alia yield significant reduction of GHG emissions to the atmosphere.

Public Joint Stock Company "Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky" (DIISW) is one of the largest facilities in the Ukrainian mining and steelmaking complex. The Plant located in the town of Dniprodzerzhynsk, Dnipropetrovsk region, in the eastern part of Ukraine.

Before implementation of the project, the DIISW's production units of the converter shop which were used in the Plant's steel making and casting process, included converter department with two converters, continuous casting department with two continuous bloom casters (CBCs), ingot casting mill with a mould yard. Prepared pig iron (with chemical properties and temperature homogenised in a holding furnace) blended with scrap and additives was loaded in converters where ferroalloys, desoxidants, lime and other materials were fed later in the course of the furnace process, and blowing of the melt was effected. Molten steel was then loaded into the dressing unit for temperature and chemical composition homogenisation before entering the ladle. Part of molten steel was further directed towards six-strand continuous bloom casters producing square billets for the rolling process; balance of molten steel was cast into ingots.

In an attempt to strengthen competitiveness of steelmaking process and reduce load on the environment, including through reduction of greenhouse gas (GHG) emissions into atmosphere, management of DIISW and its holding company Industrial Union of Donbass Corporation decided to upgrade the Plant's process cycle by introducing two ladle furnaces (LF 1 and LF 2) and two new seven-strand billet continuous casting machines (CCM 1 and CCM 3). The proposed project was considered as a JI project prior to its implementation commencement. This is confirmed by the Minutes of the Meeting on DIISW Refurbishment and Modernisation Project of 5 April 2007 where the importance of addressing the GHG emissions reduction from the project activity was highlighted.

The project scenario assumes that steel molten in converters will be dressed in the new two LFs where ferroalloys and other required additives will be fed. LFs will additionally consume electricity compared with the baseline scenario, however they would allow for shorter furnace process time and lower

temperatures in converters. Generally, energy saving in converters as the result of LFs implementation will result in reduction of overall energy intensity and stabilization of the furnace process. Thus, treatment of steel outside the converter in LFs (secondary steelmaking) will save time, energy, and will produce steel of higher quality on a consistent basis. The project scenario further assumes that steel treated in LFs will be fed into new seven-strand billet continuous casting machines allowing direct square billet production. This, compared to the baseline scenario, will result in lower amount of clippings and energy saving.

4 DETERMINATION CONCLUSIONS

In the following sections, the conclusions of the determination are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Determination Protocol in Appendix A.

The Clarification Requests, Corrective Action Requests and Forward Action Requests are documented in the Determination Protocol in Appendix A. The determination of the Project resulted in 41 Corrective Action Requests, 7 Clarification Requests and 1 Forward Action Request (to be addressed during 1st verification).

The numbers between brackets at the end of each section correspond to the DVM paragraph.

4.1 Project approvals by Parties involved (19-20)

The project has already been supported by the Government of the host Party (Ukraine), namely by the National Environmental Investment Agency of Ukraine, which has issued a Letter of Endorsement for the Project (Letter of Endorsement №56/23/7 dated 21/01/2010). Bureau Veritas Certification received this letter from the project participants and does not doubt its authenticity.
As for the present moment no written approvals of the project by Parties involved are available. After receiving Determination Report from the Accredited Independent Entity the project documentation will be submitted to the Ukrainian Designated Focal Point (DFP) which is National Environmental Investment Agency of Ukraine, for receiving a Letter of Approval. The written approval by another Party involved, Spain, will be obtained later on.

As the project has no approvals by the Parties involved, CAR 06 remains pending (refer to the Appendix A).

4.2 Authorization of project participants by Parties involved (21)

The official authorization of each legal entity listed as project participant in the PDD by Parties involved will be provided in the written project approvals (refer to 4.1 above).

4.3 Baseline setting (22-26)

The PDD explicitly indicates that using a methodology for baseline setting and monitoring developed in accordance with appendix B of the JI guidelines (hereinafter referred to as JI specific approach) was the selected approach for identifying the baseline. No applicable approved CDM methodologies are available for this project type; however, JI Project "Revamping and Modernization of the Alchevsk Steel Mill Based on CCMs Nos. 1 and 2 and LD Converters Nos. 1 and 2", implemented in Alchevsk, Ukraine, and registered in 2008 (ITL project ID UA1000022) which assumes implementation of CCMs and converters to replace open-hearth furnaces, may be treated as similar to the proposed project activity, therefore its methodology is applied to the project in question.

The PDD provides a detailed theoretical description in a complete and transparent manner, as well as justification, that the baseline is established:

(a) By listing and describing the following plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one:

   a. Production of steel using the existing technology: Blooming Mill 1150, Blooming Mill 1050, structural mill, Mill 500, continuous bloom casters 2 and 3 producing billets for the billet mill and other mills (business-as-usual);
   b. Modernization and refurbishment of steel production cycle using modern LFs and CCMs with the shutdown and decommissioning of Mill 500 (project itself without JI component).

(b) Taking into account relevant national and sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector. In this context, the following key factors that affect a baseline are taken into account:
   a. Basically all Ukrainian steel productions continue to one or another degree using "old-generation" CBCs and blooming mills. Regarding current situation in metallurgy sector, it should be noted that since 2005 the steel sector of Ukraine is improving really slow. Current standing of Ukrainian ferrous metallurgy is characterized by imperfect structure and lag in technology from developed countries. Range and shares of products of Ukrainian metallurgy are inconsistent with world market demand;
   b. Ukrainian iron and steel production facilities have inherited process equipment installed during the Soviet era, and iron and steel industry is today in need of a sector-wide reform. The criticality of transit to the innovative sectoral practices is discussed by production experts, scientists, and members of the government; however, innovative development of the nation's mining and steel industry is largely non-existent. In the recent years, the Cabinet of Ministers and the Parliament of Ukraine have many times reviewed a concept and a national program for the Ukrainian steelmaking sector reform, however documents developed and practical

decisions made bumped against lack of reliable financial and institutional support. At the moment of the investment decision, as well as currently, there were no regulatory or technical limitations neither for the operation of the older continuous bloom casters and the existing blooming mill equipment, not for adoption of new technologies for steel making, and such limitation will continue to be absent at least until 2012 (or even during a longer period, say until 2020), if there persist current Ukrainian economy conditions and intentions for its reform encouraging to hold back administrative barriers before commercial production activity carried out by private entities.

c. The existing general government sectoral policies, such as the Restructuring Program of the Iron and Steel Sector and the long-term Energy Strategy for Ukraine (adopted in 2006) have non-mandatory nature, and the proposed project is in line with them. National policy of Ukraine regarding the emissions of pollutants into atmosphere is determined by the Law of Ukraine On Protection of Atmospheric Air of 21 June 2001 No. 2556-III, and the relevant Order of the Ministry for Environment Protection of Ukraine dated 27.06.2006, No. 309, approves admissible level (limits) of pollutant emissions from stationary sources, but do not provide any specific requirements as to new technologies and do not ration GHG emissions from stationary sources. Nonetheless, most Ukrainian steelmaking enterprises continue successfully to operate equipment installed back during the Soviet era, which is particularly true for blooming mills, typically integrated with open hearth furnaces, whose share in total steel production was over 60% as of 2008, and continuous bloom casters operated by the most of the Ukrainian steelworks;

d. At the time of investment decision, DIISW's planned development strategy implied an increase of market share and expansion of production output. As to the current project, it is assumed that the same level of services would be offered in the baseline scenario as in the project scenario;

e. There were some obstacles of the investment nature related to limited access to finance from both domestic and international lenders and capital markets for the implementation of the project. The project's first stage coincided with the global economic crisis whose affects were particularly acute for the Ukrainian iron and steel sector. The backwardness of the Ukrainian domestic financial market, limited access to international loan markets, IUD (DIISW's parent company) credit rating and its decrease, prevented the implementation of the proposed project. As it is stated in the PDD the project activity is not financially attractive and would not have been chosen by the management of DIISW as a potential investment option without the JI component;

f. Project activity assuming implementation of two billet CCMs and two LFs is the most advanced alternative available in the market. New casting machines supplied by Siemens-VAI and ladle furnaces have the bundle of benefits of innovative character, such as

extremely rapid start-up of facility, simulation of phase transformations and of precipitation process in solidified steel, higher degree of process reliability and others for CCMs and reduced melting unit refining time and tapping temperature, exact temperature adjustment for continuous casting, steel purification and homogenization, reduction of refractory consumption and so on for LDs. All these benefits require technological innovations. To date, a similar project has been implemented only at PJSC Alchevsk Iron and Steel Works within the JI framework provided by the Kyoto protocol to UNFCCC. Accordingly, at the time of project commencement DIISW did not have specialists qualified to operate novel equipment. The enterprise required an extensive human resource training program to prepare personnel able to run new processes. However training itself can not address all the technological difficulties related to the project implementation. New facilities are not operating separately, they need to be integrated into existing technologically sophisticated units of complex operational development of steel, which also requires its whole modernisation. In such event technological barriers would have additionally prevented implementation of the proposed project.

All explanations, descriptions and analyses pertaining to the baseline in the PDD were found adequate and the baseline is identified appropriately.

4.4 Additionality (27-31)

The most recent version of the “Tool for the demonstration and assessment of additionality” approved by the CDM Executive Board was used, in accordance with the JI specific approach, defined in paragraph 2 (c) of the annex I to the “Guidance on criteria for baseline setting and monitoring”. All explanations, descriptions and analyses are made in accordance with the selected tool.

The PDD provides a justification of the applicability of the approach. Due to the fact that there is no approved CDM baseline and monitoring methodology which is applicable to the project type, the Additionality Tool is applied which is considered as a good practice for additionality justification.

Additionality proofs are provided. Two realistic and credible alternative scenarios to the project activity were identified and proven to be in compliance with mandatory legislation and regulations taking into account the enforcement in the region and Ukraine. Both investment and barrier analyses were used for demonstrating and assessing of the proposed project’s additionality.
Under the investment analysis the benchmark analysis was applied, and such financial indicator as IRR (Internal Rate of Return) was evaluated. The project IRR was proven to be below the benchmark, which means that the project activity is not financially attractive and would not have been chosen by the management of DIISW as a potential investment option without the JI component.
As to the barrier analysis, such investment obstacles as backwardness of the Ukrainian domestic financial market, limited access to international loan

markets, IUD (DIISW's parent company) credit rating and its decrease, and technological obstacles, namely innovative for Ukraine project equipment, lack of skills to operate new state-of-the-art imported process equipment, need to sustain precise operational practices as to load requirements etc., which would hinder project scenario implementation without additional revenue from Kyoto benefits, were described. No barriers exist to the baseline alternative, the continuation of the situation prior to the implementation of the project activity.
The PDD states that the project activity assuming development of two billet CCMs and two LFs is the most advanced alternative available at the market. New casting machines supplied by Siemens-VAI and ladle furnaces have the bundle of benefits of innovative character, such as extremely rapid start-up of facility, simulation of phase transformations and of precipitation process in solidified steel, higher degree of process reliability and others for CCMs and reduced melting unit refining time and tapping temperature, exact temperature adjustment for continuous casting, steel purification and homogenization, reduction of refractory consumption and so on for LDs. All these benefits require technological innovations. To date, a similar project has been implemented only at PJSC Alchevsk Iron and Steel Works within the JI framework provided by the Kyoto protocol to UNFCCC ("Revamping and Modernization of the Alchevsk Steel Mill Based on CCMs Nos. 1 and 2 and LD Converters Nos. 1 and 2", located in Alchevsk, Ukraine).
Thus, the overall conclusion is that the project activity meets additionality criteria, is not the baseline scenario and is additional.

The PDD provides a justification of the applicability of the approach with a clear and transparent description. Traceable and transparent information showing that the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to reductions of anthropogenic emissions by sources of GHGs was also provided. Additionality is demonstrated appropriately as a result of the analysis using the approach chosen.

4.5 Project boundary (32-33)

The project boundary defined in the PDD, which covers directly LD-Converters #1 and #2, two LFs and two seven-strand continuous slab casters and indirectly all technology modifications occurring as the result of the project implementation, including in sinter machines, blast furnaces, blooming line, billet mills etc., encompasses all anthropogenic emissions by sources of greenhouse gases (GHGs) that are:

(i) Under the control of the project participants, such as fuels used in the project and baseline, material flow as part of production process;

(ii) Reasonably attributable to the project such as electricity used under the project and baseline scenarios; and

(iii) Significant, i.e., as a rule of thumb, would by each source account on average per year over the crediting period for more than 1 per cent of

the annual average anthropogenic emissions by sources of GHGs, or exceed an amount of 2,000 tons of CO_2 equivalent, whichever is lower.

The delineation of the project boundary and the gases and sources included are appropriately described and justified in the PDD. Power grid, natural gas supply network and material suppliers were not included in the project boundary directly; however Ukraine's typical greenhouse gas emission factors for production and/or supply of electricity consumed under baseline and project scenarios have been factored in emission calculations. Thus, all CO_2 emissions related to project and baseline cases have been taken into account.

4.6 Crediting period (34)

The PDD states the starting date of the project as the date on which the implementation or construction or real action of the project began, and the starting date is 05/04/2007, which is after the beginning of 2000.

The PDD states the expected operational lifetime of the project in years and months, which is 40 years and 0 months.

The PDD states the length of the crediting period in years and months, which is 12 years and 3 months: 4 year and 3 months for the 1st commitment period (2008-2012) and 8 years for the period following the 1st commitment period (2013-2020), and its starting date is 01/10/2008, which is on the date the first emission reductions are generated by the project.

The PDD states that the crediting period for the issuance of ERUs starts only after the beginning of 2008 and does not extend beyond the operational lifetime of the project.

The PDD states that the extension of its crediting period beyond 2012 is subject to the host Party approval, and the estimates of emission reductions are presented separately for those until 2012 and those after 2012 in all relevant sections of the PDD.

4.7 Monitoring plan (35-39)

The PDD, in its monitoring plan section, explicitly indicates that JI specific approach was the selected.

The monitoring plan describes all relevant factors and key characteristics that will be monitored, and the period in which they will be monitored, in particular also all decisive factors for the control and reporting of project performance, such as statistics reporting forms; quality control (QC) and quality assurance (QA) procedures; the operational and management structure that will be applied in implementing the monitoring plan.

The monitoring plan specifies the indicators, constants and variables that are reliable (i.e. provide consistent and accurate values), valid (i.e. be clearly connected with the effect to be measured), and that provide a transparent picture of the emission reductions to be monitored such as total steel output; total pig iron input into steel making process; quantity of each fuel (natural gas)

used and electricity consumed in pig iron production, sintering process, furnace process, casting and for balance of process needs; quantity of each reducing agent (coke, anthracite, coal electrodes etc.) and each other input (limestone, dolomite, pellets etc.) in making pig iron and furnace process; self-generated electricity consumed; emission factors for fuel, reducing agents, other inputs and for electricity consumption.

The monitoring plan draws on the list of standard variables contained in appendix B of "Guidance on criteria for baseline setting and monitoring" developed by the JISC, such as BE (baseline emissions), PE (project emissions), EF (emission factors), NCV (net calorific value).

The monitoring plan explicitly and clearly distinguishes:

(i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination, such as emission factors of fuels used (natural gas), emission factor for electricity consumption, emission factors of reducing agents (coke, anthracite, coal electrodes), emission factors of each other input (limestone, dolomite, pellets).

(ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination, which are absent.

(iii) Data and parameters that are monitored throughout the crediting period, such as total steel output in project scenario; total pig iron input into steel making process in project and baseline scenarios; quantity of each fuel (natural gas) used and electricity consumed in pig iron production, sintering process, furnace process, casting and for balance of process needs both is project and baseline; quantity of each reducing agent (coke, anthracite, coal electrodes etc.) and each other input (limestone, dolomite, pellets etc.) in making pig iron and furnace process under the project and for baseline; self-generated electricity consumed.

The monitoring plan describes the methods employed for data monitoring (including its frequency) and recording, such as direct measurement with scales, flow meters, supply meters, and calculations with different recording frequency such as continuously or monthly and electronic or paper recording method. The respective information for each monitoring parameter is sufficiently described in the section D of the PDD.

The monitoring is focused on the collection of baseline data from the existing Converter – Blooming Mill/CBC – Rolling production cycle and historical data for decommissioned equipment, as well as annual monitored project data within the project boundary including:

– the types and amounts of different fuels used at various stages of the process;

- the amount and source of electricity consumed at various points of the process;
- the data required to formulate the electricity emissions factor;
- the quantities of material inputs entering into the project for the steel making process;
- the electricity and fuel used to produce the material inputs into the process;
- CO_{2e} emissions released during the preparation of inputs and during the steel making process;
- quantity of output.

The monitoring plan elaborates all algorithms and formulae used for the estimation/calculation of baseline emissions and project emissions, leakage, as appropriate, such as:

Baseline emissions:

$BE = TCPI_{b,i} + TCFP_{b,i} + TCCR_{b,i} + TCBPN_{b,i}$

where:
$TCPI_{b,i}$ = total embodied CO_{2e} of pig iron entering into the project, tCO_{2e}
$TCFP_{b,i}$ = total CO_{2e} in the furnace process, t CO_{2e}
$TCCR_{b,i}$ = total CO_{2e} in the casting, t CO_{2e}
$TCBPN_{b,l}$ = total CO_{2e} in the balance of production processes, t CO_{2e},
b = baseline
i = regular data registration interval

This includes 4 clear steps determining the CO_{2e} emissions from pig iron entering the baseline (Step 1), the emissions from the furnace process (Step 2), emissions from steel casting/rolling (Step 3), and emissions from balance of process needs required to produce the intended steel quantity (Step 4). The equations capture the entire CO_{2e} impacts of all material and energy flows into the baseline. Therefore the approach is both transparent and justifiable.

Step 1. Pig iron

$TCPI_{b,i} = (TCFCPI_{b,i} + TCEPI_{b,i} + TCIPI_{b,i})$,

where:
$TCFCPI_{b,i}$ = total CO_{2e} from fuel consumption in producing pig iron, t CO_{2e}
$TCEPI_{b,i}$ = total CO_{2e} from electricity consumption in producing pig iron, tCO_{2e}
$TCIPI_{b,i}$ = total CO_{2e} from inputs into pig iron, t CO_{2e}

Total CO_{2e} from fuel consumption in producing pig iron ($TCFCPI_{b,i}$) is the quantity of each fuel multiplied by the emission factor for that fuel:

$$TCFCPI_{b,i} = \sum_{1}^{fpi} \left(Q_{fpi,b,i} \times EF_{f,b} \right)$$

where:
$fpi_{b,i}$ = number of fuels used in making pig iron

$Q_{b,i}$ = quantity of fuel fpi used (1000 m^3)
$EF_{f,b}$ = tons of CO_{2e} per 35 314,67 ft^3 of each fuel

Total CO_{2e} from electricity consumption in producing pig iron ($TCEPI_{b,i}$) is the quantity of electricity multiplied by the emission factor for electricity:

$TCEPI_{b,i} = ECPI_{b,i} * EF_{e,b}$
where:
$ECPI_{b,i}$ = electricity consumed in producing pig iron, MWh
$EF_{e,b}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period

$TCIPI_{b,i}$ – the total CO_{2e} emissions from the material inputs into pig iron – include the CO_{2e} from fuel and electricity used to prepare iron ore, the total CO_{2e} from the reducing agents (coke, anthracite etc.) and the total CO_{2e} from limestone, dolomite, pellets etc.

$TCIPI_{b,i} = TCFIO_{b,i} + TCEIO_{b,i} + TCRAPI_{b,i} + TCLPI_{b,i}$,

where:
$TCFIO_{b,i}$ = total CO_{2e} from fuel used to prepare iron ore, t CO_{2e}
$TCEIO_{b,i}$ = total CO_{2e} from electricity consumption in preparing iron ore, t CO_{2e}
$TCRAPI_{b,i}$ = total CO_{2e} from reducing agents, t CO_{2e}
$TCLPI_{b,i}$ = total CO_{2e} from the other consumed inputs, t CO_{2e}

Total CO_{2e} from fuel used in sintering process ($TCFIO_{b,i}$) is the quantity of fuel multiplied by the emission factor for that fuel:

$$TCFIO_{b,i} = \sum_{1}^{fio} \left(Q_{fio,b,i} \times EF_{f,b} \right),$$

where:
$fio_{b,i}$ = number of fuels used in preparing iron ore
$Q_{b,i}$ = quantity of fuel fio used (1000 m^3)
$EF_{f,b}$ = tons of CO_{2e} per 1000 m^3 of each fuel

Total CO_{2e} from electricity consumption in sintering process ($TCEIO_{b,i}$) is the quantity of electricity multiplied by the emission factor for electricity:

$TCEIO_{b,i} = ECIO_{b,i} * EF_{e,b}$,

where:
$ECIO_{b,i}$ = electricity consumed in sintering process, MWh
$EF_{e,b}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period

Total CO_{2e} from reducing agents in pig iron production $TCRAPI_{b,i}$ is the quantity of each reducing agent multiplied by the emission factor for the reducing agent:

$$TCRAPI_{b,i} = \sum_{1}^{rapi} \left(Q_{rapi,b,i} \times EF_{ra,b} \right),$$

where:
$rapi_{b,i}$ = number of reducing agents in pig iron production

$Q_{rapi,b,i}$ = quantity of each reducing agent rapi used (tons)
$EF_{ra,b}$ = emission factor for reducing agent, t CO_{2e}/tonne in the relevant period

Total CO_{2e} from the other inputs such as limestone, dolomite, pellets etc. in pig iron production $TCOIPI_{b,i}$ is the quantity of each other input multiplied by the emission factor for that input:

$$TCOIPI_{b,i} = \sum_{1}^{oipi} \left(Q_{oipi,b,i} \times EF_{oi,b} \right),$$

where:
$oipi_{b,i}$ = number of the other inputs in pig iron production
$Q_{oipi,b,i}$ = quantity of each other input oipi used (tons)
$EF_{oi,b}$ = emission factor for the other inputs, t CO_{2e}/tonne in the relevant period

Step 2. Furnace process

The total CO_{2e} emissions from the furnace process ($TCFP_{b,i}$) include emissions from three sources: fuel, electricity and inputs into the furnace process.

$TCFP_{b,i} = TCFCFP_{b,i} + TCECFP_{b,i} + TCIFP_{b,i}$,

where:
$TCFCFP_{b,i}$ = total CO_{2e} from fuel consumption in furnace process, t CO_{2e}
$TCECFP_{b,i}$ = total CO_{2e} from electricity consumption in furnace process, t CO_{2e}
$TCIFP_{b,i}$ = total CO_{2e} from inputs into furnace process, t CO_{2e}

Tons of CO_{2e} for fuel used in the furnace process ($TCFCFP_{b,i}$) will be the quantity of each fuel multiplied by the emissions factor for that fuel:

$$TCFCFP_{b,i} = \sum_{1}^{ffp} \left(Q_{ffp,b,i} \times EF_{f,b} \right),$$

where:
$ffp_{b,i}$ = number of fuels used in the furnace process
$Q_{b,i}$ = quantity of fuel ffp used (1000 m^3)
$EF_{f,b}$ = tons of CO_{2e} per 1000 m^3 of each fuel

Tons of CO_{2e} for electricity used in the furnace process ($TCECFP_{b,i}$) will be the quantity of electricity multiplied by the emissions factor for electricity:

$TCECFP_{b,i} = ECFP_{b,i} * EF_{e,b}$,

where:
$ECFP_{b,i}$ = electricity consumed in the furnace process, MWh
$EF_{e,b}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period

The total tons of CO_{2e} from inputs into the furnace process ($TCIFP_{b,i}$) will include total tons of CO_{2e} from reducing agents (coke, anthracite etc.) and total tones of CO_{2e} from the other inputs in the furnace process (limestone, dolomite, pellets etc.):

$TCIFP_{b,i}$ = ($TCRAFP_{b,i}$ + $TCOIFP_{b,i}$),

where:
$TCRAFP_{b,i}$ = total CO_{2e} from reducing agents entering furnace process, t CO_{2e}
$TCOIFP_{b,i}$ = total CO_{2e} from the other inputs entering furnace process, t CO_{2e}

Total CO_{2e} from reducing agents entering furnace process $TCRAFP_{b,i}$ is the quantity of each reducing agent multiplied by the emission factor for the reducing agent:

$$TCRAFP_{b,i} = \sum_{1}^{rafp} \left(Q_{rafp,b,i} \times EF_{ra,b} \right),$$

where:
$rafp_{b,i}$ = number of reducing agents entering furnace process
$Q_{rafp,b,i}$ = quantity of each reducing agent rafp used (tons)
$EF_{ra,b}$ = emission factor for reducing agent, t CO_{2e}/tonne in the relevant period

Total CO_{2e} from the other inputs such as limestone, dolomite, pellets etc. entering furnace process $TCOIFP_{b,i}$ is the quantity of each other input multiplied by the emission factor for the other input:

$$TCOIFP_{b,i} = \sum_{1}^{oifp} \left(Q_{oifp,b,i} \times EF_{oi,b} \right),$$

where:
$oifp_{b,i}$ = number of the other inputs entering furnace process
$Q_{oifp,b,i}$ = quantity of each other input oifp used (tons)
$EF_{oi,b}$ = emission factor for the other inputs, t CO_{2e}/tonne in the relevant period

Step 3. Casting/rolling

The total tons CO_{2e} from the square billet casting/rolling process ($TCCR_{b,i}$) will be calculated from both the fuel and the electricity inputs into the process:

$TCCR_{b,i}$ = $TCFCR_{b,i}$ + $TCECR_{b,I}$,

where:
$TCFCR_{b,i}$ = total CO_{2e} from fuel consumption in square billet casting/rolling, t CO_{2e}
$TCECR_{b,i}$ = total CO_{2e} from electricity consumption in square billet casting/rolling

Tons of CO_{2e} for fuel used in square billet casting/rolling ($TCFCR_{b,i}$) will be the quantity of each fuel multiplied by the emissions factor for that fuel:

$$TCFCR_{b,i} = \sum_{1}^{fcr} \left(Q_{fcr,b,i} \times EF_{f,b} \right),$$

where:
$fcr_{b,i}$ = number of fuels used in the casting/rolling
$Q_{b,i}$ = quantity of each fuel fcr used (1000 m^3)

$EF_{f,b}$ = tons of CO_{2e} per 1000 m^3 of each fuel

Tons of CO_{2e} for electricity used in square billet casting/rolling ($TCECFP_{b,i}$) will be the quantity of electricity multiplied by the emissions factor for electricity:

$TCECR_{b,i} = ECCR_{b,i} * EF_{e,b,}$

where:
$ECCR_{b,i}$ = electricity consumed in square billet casting/rolling, MWh
$EF_{e,b}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period

Step 4. Balance of process needs

Total tones of CO_2 related to the balance of process needs of the project, namely production of secondary energy from the CHP plant (that produces blast-furnace blowing and potentially self-generated electricity), as well as processes that ensures supply of compressed air, steam, oxygen, nitrogen, argon and water required in the technological process. The relevant parameters are calculated based on the amounts of fuel and electricity consumed by the said processes:

$TCBPN_{b,i}$ = total tones of CO_2 related to the balance of process need of energy required for the project activity, being the sum of numbers of tones of CO_2 from fuel and electricity consumed:

$TCBPN_{b,i} = TCFCBPN_{b,i} + TCEBPN_{b,i,}$

where:
$TCFCBPN_{b,i}$ = total CO_{2e} from fuel consumption for balance of process needs of project activity, t CO_{2e};
$TCEBPN_{b,i}$ = total CO_{2e} from electricity consumption for balance of process needs of project activity, t CO_{2e};

Tons of CO_{2e} for fuel used for balance of process needs of project activity ($TCFCBPN_{b,i}$) will be the quantity of each fuel multiplied by the emissions factor for that fuel:

$$TCFCBPN_{b,i} = \sum_{1}^{fbpn} (Q_{fbpn,b,i} \times EF_{f,b}),$$

where:
$fbpn_{b,i}$ = number of fuels used in producing secondary energy used for balance of process needs
$Q_{b,i}$ = quantity of each fuel fbpn used (1000 m^3)
$EF_{f,b}$ = tons of CO_{2e} per 1000 m^3 of each fuel

Tons of CO_{2e} for electricity used for balance of process needs of project activity ($TCEBPN_{b,i}$) will be the quantity of electricity multiplied by the emissions factor:

$TCEBPN_{b,i} = (ECBPN_{b,i} – ECSG_{b,i}) * EF_{e,b},$

where:
$ECBPN_{b,i}$ = electricity used for production of secondary energy used for the balance of process needs (MWh)
$ECSG_{b,i}$ = self-generated electricity used in the project activity (MWh)
$EF_{e,b}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period.

Project emissions:

Project emissions will equal the total tons of CO_{2e} from the pig iron process and sintering (iron ore preparation) added to the total tons of CO_{2e} from the furnace process, total tons of CO_{2e} from the casting process, and total tons from the energy consumed for the balance of process needs. Equations capture the entire CO_{2e} impact from all material and energy flows into the project. Therefore the approach is both transparent and justifiable. Monitoring approach captures also potential changes in project design.

$PE_i = TCPI_{p,i} + TCFP_{p,i} + TCCR_{p,i} + TCBPN_{p,i}$,

where:
$TCPI_{p,i}$ = total embodied CO_{2e} of pig iron entering into the project, t CO_{2e} (project case)
$TCFP_{p,i}$ = total CO_{2e} in the furnace process, t CO_{2e} (project case)
$TCCR_{p,i}$ = total CO_{2e} in the casting process, t CO_{2e} (project case)
$TCBPN_{p,i}$ = total CO_{2e} in the balance of production processes, t CO_{2e} (project case)

p = project case
i = regular data registration interval

Step 1. Pig iron

$TCPI_{p,i} = (TCFCPI_{p,i} + TCEPI_{p,i} + TCIPI_{p,i})$,

where:
$TCFCPI_{p,i}$ = total CO_{2e} from fuel consumption in producing pig iron, t CO_{2e}
$TCEPI_{p,i}$ = total CO_{2e} from electricity consumption in producing pig iron, t CO_{2e}
$TCIPI_{p,i}$ = total CO_{2e} from inputs into pig iron, t CO_{2e}

Total CO_{2e} from fuels, input and electricity consumption in producing Pig Iron is the quantity of each fuel, input or electricity multiplied by the emission factor for that fuel, input or for the electricity consumption:

$$TCFCPI_{p,i} = \sum_{1}^{fpi} \left(Q_{fpi,p,i} \times EF_{f,p} \right),$$

where:
$TCFCPI_{p,i}$ = total CO_{2e} from fuel consumption in producing pig iron, t CO_{2e}
$fpi_{p,i}$ = number of fuels used in making pig iron
$Q_{p,i}$ = quantity of fuel fpi used (1000 m^3)
$EF_{f,p}$ = tons of CO_{2e} per 1000 m^3 of each fuel.

$TCEPI_{p,i} = ECPI_{p,i} * EF_{e,p}$,

where:
$TCEPI_{p,i}$ = total CO_{2e} from electricity consumption in producing pig iron, t CO_{2e}
$ECPI_{p,i}$ = electricity consumed in producing pig iron, MWh
$EF_{e,p}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period

$TCIPI_{p,i}$ – total CO2e emissions from the material inputs into pig iron – include the CO2e from fuel and electricity used to prepare iron ore, the total CO2e from the reducing agents (coke, anthracite etc.) and the total CO2e from limestone, dolomite, pellets etc.

$TCIPI_{p,i} = TCFIO_{p,i} + TCEIO_{p,i} + TCRAPI_{p,i} + TCOIPI_{p,i}$,

where:
$TCFIO_{p,i}$ = total CO_{2e} from fuel used to prepare iron ore, t CO_{2e}
$TCEIO_{p,i}$ = total CO_{2e} from electricity consumption in preparing iron ore, tCO_{2e}
$TCRAPI_{p,i}$ = total CO_{2e} from reducing agents, t CO_{2e}
$TCOIPI_{p,i}$ = total CO_{2e} from the other consumed inputs, t CO_{2e}

Total CO_{2e} from fuels, reducing agents, other consumed inputs and electricity used to prepare iron ore is the quantity of fuel multiplied by the emission factor for each fuel, reducing agent, input or for the electricity consumption:

$$TCFIO_{p,i} = \sum_{1}^{fio} \left(Q_{fio,p,i} \times EF_{f,p} \right),$$

where:
$TCFIO_{p,i}$ = total CO_{2e} from fuel used to prepare iron ore, t CO_{2e}
$fio_{p,i}$ = number of fuels used in preparing iron ore
$Q_{p,i}$ = quantity of fuel fio used (1000 m^3)
$EF_{f,p}$ = tons of CO_{2e} per 1000 m^3 of each fuel

$TCEIO_{p,i} = ECIO_{p,i} * EF_{e,p}$,

where:
$TCEIO_{p,i}$ = total CO_{2e} from electricity consumption in preparing iron ore, t CO_{2e}
$ECIO_{p,i}$ = electricity consumed in preparing iron ore, MWh
$EF_{e,p}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period

$$TCRAPI_{p,i} = \sum_{1}^{rapi} \left(Q_{rapi,p,i} \times EF_{ra,p} \right),$$

where:
$TCRAPI_{p,i}$ = total CO_{2e} from reducing agents, t CO_{2e}
$rapi_{p,i}$ = number of reducing agents in pig iron production
$Q_{rapi,p,i}$ = quantity of each reducing agent rapi used (tons)
$EF_{ra,p}$ = emission factor for reducing agent, t CO_{2e}/tonne in the relevant period

$$TCOIPI_{p,i} = \sum_{1}^{oipi} \left(Q_{oipi,p,i} \times EF_{oi,p} \right),$$

where:
$oipi_{p,i}$ = number of the other inputs in pig iron production
$Q_{oipi,p,i}$ = quantity of each other input oipi used (tons)
$EF_{oi,p}$ = emission factor for the other inputs, t CO_{2e}/tonne in the relevant period

Step 2. Furnace process

The total CO_{2e} emissions from the furnace process ($TCFP_{p,i}$) include emissions from three sources: fuel, electricity and inputs into the furnace process.

$TCFP_{p,i} = TCFCFP_{p,i} + TCECFP_{p,i} + TCIFP_{p,i}$,

where:
$TCFCFP_{p,i}$ = total CO_{2e} from fuel consumption in furnace process, t CO_{2e}
$TCECFP_{p,i}$ = total CO_{2e} from electricity consumption in furnace process, t CO_{2e}
$TCIFP_{p,i}$ = total CO_{2e} from inputs into furnace process, t CO_{2e}

Tons of CO_{2e} from fuels and electricity used in the furnace process will be the quantity of each fuel or electricity multiplied by the emissions factor for that fuel or for the consumed electricity:

$$TCFCFP_{p,i} = \sum_{1}^{ffp} \left(Q_{ffp,p,i} \times EF_{f,p} \right),$$

where:
$ffp_{p,i}$ = number of fuels used in the furnace process
$Q_{p,i}$ = quantity of fuel ffp used (1000 m^3)
$EF_{f,p}$ = tons of CO_{2e} per 1000 m^3 of each fuel

$TCECFP_{p,i} = ECFP_{p,i} * EF_{e,p}$,

where:
$TCECFP_{p,i}$ = total CO_{2e} from electricity consumption in furnace process, t CO_{2e}
$ECFP_{p,i}$ = electricity consumed in the furnace process, MWh
$EF_{e,p}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period

The total tons of CO_{2e} from inputs into the furnace process ($TCIFP_{p,i}$) will include total tons of CO_{2e} from reducing agents (coke, anthracite etc.) and total tones of CO_{2e} from the other inputs in the furnace process (limestone, dolomite, pellets etc.):

$TCIFP_{p,i} = (TCRAFP_{p,i} + TCOIFP_{p,i})$,

where:
$TCRAFP_{p,i}$ = total CO_{2e} from reducing agents entering furnace process, tCO_{2e}
$TCOIFP_{p,i}$ = total CO_{2e} from the other inputs entering furnace process, tCO_{2e}

Total CO_{2e} from reducing agents and other inputs, such as limestone, dolomite, pellets etc., entering furnace process is the quantity of each reducing agent or input material multiplied by the emission factor for that reducing agent or input:

$$TCRAFP_{p,i} = \sum_{1}^{rafp} \left(Q_{rafp,p,i} \times EF_{ra,p} \right),$$

where:
$TCRAFP_{p,i}$ = total CO_{2e} from reducing agents entering furnace process, tCO_{2e}
$rafp_{p,i}$ = number of reducing agents entering furnace process
$Q_{rafp,p,i}$ = quantity of each reducing agent rafp used (tons)
$EF_{ra,p}$ = emission factor for reducing agent, t CO_{2e}/tonne in the relevant period

$$TCOIFP_{p,i} = \sum_{1}^{oifp} \left(Q_{oifp,p,i} \times EF_{oi,p} \right),$$

where:
$TCOIFP_{p,i}$ = total CO_{2e} from the other inputs entering furnace process, tCO_{2e}
$oifp_{p,i}$ = number of the other inputs entering furnace process
$Q_{oifp,p,i}$ = quantity of each other input oifp used (tons)
$EF_{oi,p}$ = emission factor for the other inputs, t CO_{2e}/tonne in the relevant period

Step 3. Casting

The total tons CO_{2e} from the square billet casting process ($TCCR_{p,i}$) will be calculated from both the fuel and the electricity inputs into the process:
$TCCR_{p,i} = TCFCR_{p,i} + TCECR_{p,i}$,

where:
$TCFCR_{p,i}$ = total CO_{2e} from fuel consumption in square billet casting, tCO_{2e}
$TCECR_{p,i}$ = total CO_{2e} from electricity consumption in square billet casting

Tons of CO_{2e} from fuels and electricity used in square billet casting will be the quantity of each fuel or electricity consumed multiplied by the emissions factor for that fuel or for the consumed electricity:

$$TCFCR_{p,i} = \sum_{1}^{fcr} \left(Q_{fcr,p,i} \times EF_{f,p} \right),$$

where:
$fcr_{p,i}$ = number of fuels used in the casting
$Q_{p,i}$ = quantity of each fuel fcr used (1000 m^3)
$EF_{f,p}$ = tons of CO_{2e} per 1000 m^3 of each fuel

$TCECR_{p,i} = ECCR_{p,i} * EF_{e,p}$,

where:
$TCECR_{p,i}$ = total CO_{2e} from electricity consumption in square billet casting
$ECCR_{p,i}$ = electricity consumed in square billet casting, MWh
$EF_{e,p}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period

Step 4. Balance of process needs

Total tones of CO_2 related to the balance of process needs of the project, namely production of secondary energy from the CHP plant (that produces

blast-furnace blowing, chemically purified water and heat power), as well as processes that ensures supply of compressed air, steam, oxygen, nitrogen, argon and water required in the technological process. The relevant parameters are calculated based on the amounts of fuel and electricity consumed by the said processes:

$TCBPN_{p,i}$ is total tones of CO_2 related to the balance of process need of energy required for the project activity, being the sum of numbers of tones of CO_2 from fuel and electricity consumed:

$TCBPN_{p,i} = TCFCBPN_{p,i} + TCEBPN_{p,i}$,

where:
$TCFCBPN_{p,i}$ = total CO_{2e} from fuel consumption for balance of process needs of project activity, t CO_{2e};
$TCEBPN_{p,i}$ = total CO_{2e} from electricity consumption for balance of process needs of project activity, t CO_{2e};

Tons of CO_{2e} from fuels and electricity used for balance of process needs of project activity will be the quantity of each fuel or electricity multiplied by the emissions factor for that fuel or by the electricity emission factor:

$$TCFCBPN_{p,i} = \sum_{1}^{fbpn} (Q_{fbpn,p,i} \times EF_{f,p}),$$

where:
$TCFCBPN_{p,i}$ = total CO_{2e} from fuel consumption for balance of process needs of project activity, tCO_{2e}
$fbpn_{p,i}$ = number of fuels used in producing secondary energy used for balance of process needs
$Q_{p,i}$ = quantity of each fuel fbpn used (1000 m^3)
$EF_{f,p}$ = tons of CO_{2e} per 1000 m^3 of each fuel

$TCEBPN_{p,i} = (ECBPN_{p,i} – ECSG_{p,i}) * EF_{e,p}$,

where:
$TCEBPN_{p,i}$ = total CO_{2e} from electricity consumption for balance of process needs of project activity, tCO_{2e}
$ECBPN_{p,i}$ = electricity used for production of secondary energy used for the balance of process needs (MWh)
$ECSG_{p,i}$ = self-generated electricity used in the project activity (MWh)
$EF_{e,p}$ = emission factor for electricity, t CO_{2e}/MWh in the relevant period

Emission reductions are calculated using the equation:

$ER_i = BE_i – PE_i$,

where:
ER_i =Emission Reductions
BE_i = Baseline Emissions
PE_i = Project Emissions

i = regular data registration interval

The monitoring plan presents the quality assurance and control procedures for the monitoring process which are described in the section D.2 of the PDD. This includes, as appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept and made available on request.

The monitoring plan clearly identifies the responsibilities and the authority regarding the monitoring activities. The data required to monitor the ERs is routinely collected within the normal operations of the DIISW therefore monitoring is integral part of routine monitoring. The Monitoring Plan will be implemented by different specialists of the DIISW under supervision of Head of Technical Directorate's Technical Department and managed by top management of the Plant. Chief Engineer has overall project responsibility. All the main production shops and specialists of the plant will be involved into the preparation of monitoring report under coordination of Head of Technical Directorate's Technical Department. The Institute for Environment and Energy Conservation (project consultant) will also supervise the implementation of the Monitoring Plan for the project at regular intervals. The table 7 of the PDD section D indicates assigned roles and responsibilities for project monitoring. Additionally, the comprehensive organization chart of JI project management at DIISW is presented in the figure 7 of the Annex 3.

On the whole, the monitoring plan reflects good monitoring practices appropriate to the project type.

The monitoring plan provides, in tabular form, a complete compilation of the data that need to be collected for its application, including data that are measured or sampled and data that are collected from other sources (e.g. official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature etc.) but not including data that are calculated with equations.

The monitoring plan indicates that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project.

4.8 Leakage (40-41)

The PDD appropriately describes an assessment of the potential leakage of the project and appropriately explains which sources of leakage are to be calculated, and which can be neglected.

The leakage analysis showed that there should be no leakages expected from the project as long as the old technology employed is decommissioned and not used again somewhere else. The project developer will document that the previous equipment is decommissioned. The emissions from installing the new equipment will not be significant. The emissions from transport of materials will not be significantly higher for the baseline; however, this will not be taken into account to secure conservativeness of the analysis.

Therefore, leakage emissions are considered zero.

4.9 Estimation of emission reductions or enhancements of net removals (42-47)

The PDD indicates assessment of emissions in the baseline scenario and in the project scenario as the approach chosen to estimate the emission reductions generated by the project.

The PDD provides the ex ante estimates of:

(a) Emissions for the project scenario (within the project boundary), which are 25938257 tons of CO2eq for 2008-2012 and 70951295 tons of CO2eq for 2013-2020;

(b) Leakage, which is considered equal zero tons of CO_2eq;

(c) Emissions for the baseline scenario (within the project boundary), which are 31175256 tons of CO_2eq for the period from 2008 to 2012 and 85189691 tons of CO_2eq for 2013-2020;

(d) Emission reductions adjusted by leakage (based on (a)-(c) above), which are 5236999 tons of CO2eq for the period from 2008 to 2012, and 14238396 tons of CO2eq for 2013-2020.

The estimates referred to above are given:

(a) On an annual basis;

(b) From 01/10/2008 to 31/12/2020, covering the whole crediting period;

(c) On a source-by-source basis;

(d) For each GHG gas, which is CO_2;

(e) In tons of CO_2 equivalent, using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5 of the Kyoto Protocol;

The formulas used for calculating the estimates referred above are the same as those used for project monitoring and described in the section 4.7 above. All formulas are consistent throughout the PDD.

For calculating the estimates referred to above, key factors, e.g. fuel prices and availability, increase in production output, expected market development, etc., influencing the baseline emissions and the activity level of the project and the emissions as well as risks associated with the project were taken into account, as appropriate.

Data sources used for calculating the estimates referred to above, such as feasibility studies, production forecasts, actual historical monitored data, IPCC etc. are clearly identified, reliable and transparent.

Emission factors, such as CO_2 emission factors for each fuel (natural gas), reducing agent (coke, anthracite, coal electrodes), other input (limestone, dolomite, pellets) and electricity consumption used were selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.

The estimation referred to above is based on conservative assumptions and the most plausible scenarios in a transparent manner.

The estimates referred to above are consistent throughout the PDD.

The annual average of estimated emission reductions over the crediting period is calculated by dividing the total estimated emission reductions over the crediting period by the total months of the crediting period, and multiplying by twelve.

4.10 Environmental impacts (48)

The PDD (sections F.1 and F.2) provides the information on documentation containing the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party, such as project's Environmental Impact Assessment (EIA). EIA was developed by Ukrainian State Steelworks Design Institute (Ukrdipromez) and provides assessment of impact of the project activity on various components of natural, social, and manmade environment.

Recognizing the incremental nature of the overall project's implementation covering the installation of Ladle Furnaces (LFs) and seven-strand billet Continuous Casting Machines (CCMs), the EIA was undertaken for each project phase as the first and the second parts of the design and engineering documents were prepared for the mandatory technical approvals, one step in which was the formal State Environmental Due Diligence. As a result, the EIA for DIISW was presented in two volumes: one as part of the project proposal for refurbishment of the Converter shop and installation of LF 1, and the other one as part of the project proposal for refurbishment of Continuous Casting section at the converter shop with installation of two billet CCMs and LF 2.

The general environmental impact opinion derived via the procedure endorsed by the Ukrainian government is that the project will have a positive environmental impact and its foreseeable emergency negative impacts will be insignificant and easily repaired. Moreover, the project activity will cause no harmful transboundary impacts.

Positive opinions and relevant permits received by the project from the number of government agencies (Ministry for Environmental Protection of Ukraine, Ukrainian Health Ministry, Ministry for Emergencies, etc.) evidence that the proposed project activity will have comprehensive positive impact on various aspects of activity of the local community, and that the decisions which were

made were transparent and independent to the extent required by the Ukrainian law.

The PDD provides conclusion and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party.

4.11 Stakeholder consultation (49)

Information about the project was published in Dniprodzerzhynsk media. Furthermore, the relevant consultations with local stakeholders were conducted in May 2010 by representatives of the Institute for Environment and Energy Conservation jointly with DIISW personnel. No negative comments toward project implementation were received.

DIISW received a letter from Dniprodzerzhynsk Town Council in support of the "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces" project, signed by Dniprodzerzhynsk mayor Mr. Korchevsky.

Relevant information on stakeholder comments is included in the project's environmental impact assessment completed in accordance with Ukrainian statutory requirements.

5 SUMMARY AND REPORT OF HOW DUE ACCOUNT WAS TAKEN OF COMMENTS RECEIVED PURSUANT TO PARAGRAPH 32 OF THE JI GUIDELINES

No comments, pursuant to paragraph 32 of the JI Guidelines, were received.

6 DETERMINATION OPINION

Bureau Veritas Certification has performed a determination of the "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces" Project in Ukraine. The determination was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The determination consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final determination report and opinion.

Project participants used the latest tool for demonstration of the additionality. In line with this tool, the PDD provides barrier and investment analysis, and common practice analysis to determine that the project activity itself is not the baseline scenario.

Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is

implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions.

The determination revealed two pending issues related to the current determination stage of the project: the issue of the written approval of the project and the authorization of the project participant by the host Party. If the written approval and the authorization by the host Party are awarded, it is our opinion that the project as described in the Project Design Document, Version 08 meets all the relevant UNFCCC requirements for the determination stage and the relevant host Party criteria.

The review of the project design documentation (version 08) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.

The determination is based on the information made available to us and the engagement conditions detailed in this report.

7 REFERENCES

Category 1 Documents:
Documents provided by Institute for Environment and Energy Conservation that relate directly to the GHG components of the project.

/1/ PDD "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces", version 1 dated 16/08/2010
/2/ PDD "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces", version 2 dated 14/12/2010
/3/ PDD "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces", version 3 dated 11/01/2011
/4/ PDD "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces", version 4 dated 04/02/2011
/5/ PDD "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces", version 5 dated 01/03/2011
/6/ PDD "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces", version 6 dated 08/04/2011
/7/ PDD "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces", version 7 dated 19/05/2011
/8/ PDD "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces", version 8 dated 12/07/2011
/9/ Calculation of emission reductions, Excel file

/10/ Letter of Endorsement № 56/23/7 on the JI project "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces" dated January, 21, 2010 issued by National Environmental Investment Agency of Ukraine.

/11/ Minutes of the meeting on reconstruction and revamping of OJSC "Dneprovskiy Integrated Iron and Steel Works" dated 05/04/2007, chaired by Chairman of Director's Board Mr. S.Taruta, Donetsk

Category 2 Documents:
Background documents related to the design and/or methodologies employed in the design or other reference documents.

/1/ Guidelines for Users of the Join Implementation Project Design Document Form, version 04, JISC

/2/ Joint Implementation Project Design Document Form, version 01

/3/ Guidance on Criteria for Baseline Setting and Monitoring, version 02, JISC.

/4/ Glossary of JI terms, version 03, JISC.

/5/ Tool for the demonstration and assessment of additionality, Version 05.2

/6/ Guidelines for objective demonstration and assessment of barriers, Version 01

/7/ JISC "Clarification regarding the public availability of documents under the verification procedure under the Joint Implementation Supervisory Committee." Version 03

/8/ Decree of Cabinet of Ministers of Ukraine #206, dated 22/02/2006

/9/ The study project "Development of the electricity carbon emission factors for Ukraine" elaborated by the consultant Lahmeyer International under assignment from the European Bank for Development and Reconstruction (EBRD) dated 14/10/2010

/10/ The assessment report "Assessment of the Grid Emission Factor Calculation Model for Ukraine" prepared by TÜV SÜD Industrie Service GmbH of 15/10/2010

/11/ Order of the National Environmental Investment Agency of Ukraine (NEIA) № 43 of 28/03/2011 on approval of specific carbon dioxide emission indicators for 2010

/12/ Order of the National Environmental Investment Agency of Ukraine (NEIA) № 62 of 15/04/2011 on approval of specific carbon dioxide emission indicators for 2008

/13/ Order of the National Environmental Investment Agency of Ukraine (NEIA) № 63 of 15/04/2011 on approval of specific carbon dioxide emission indicators for 2009

/14/ Order of the National Environmental Investment Agency of Ukraine (NEIA) № 75 of 12/05/2011 on approval of specific carbon dioxide emission indicators for 2011

/15/ State ecological examination conclusion #501 concerning the working project materials "Technical upgrade of converter plant with installation of Ladle Furnace" of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky dated 08.06.07

/16/ Conclusion #5-1-2008 dated 15.08.2008 concerning the technical upgrade project of SCD of converter plan with installation Two Billet

Continuous Casting Machines and Ladle Furnace #2 of OJSC "DIISW"
/17/ State ecological examination conclusion #671 dated 11.07.08 concerning the working project materials "Technical upgrade of SCD of converter plan with installation of Two Billet Continuous Casting Machines and Ladle Furnace #2 of OJSC "DIISW"
/18/ State ecological examination conclusion № 05.03.02-03/18047 dated 12.04.2007
/19/ Conclusion of labor protection examination №12.2-01-05-0386.0 dated 19.04.2007
/20/ Conclusion of sanitary-hygienic examination №05.03.02-07/42357 dated 09.07.2008
/21/ Newspaper "Vedomosty" dated 10.10.2007 #41, article "Announcement of ecological consequences"
/22/ Newspaper "Vedomosty" dated 28.06.2006 #26, article "Announcement of ecological consequences"
/23/ Supplement to the conclusion #31 dated 23.01.2008. Comprehensive conclusion for technical upgrade of SCD of converter plan with installation Two Billet Continuous Casting Machines and Ladle Furnace #2
/24/ Supplement to the conclusion #522 dated 31.08.06. Comprehensive conclusion for installation the Ladle Furnace
/25/ Supplement to the Certificate dated 14.09.2009 №06544-5-1-110ВЛ
/26/ Permission #76 for carrying out the construction work dated 22.08.2009
/27/ Permission #5 for carrying out the construction work dated 16.02.2009
/28/ Permission №1210436900-99a for corrective action to the permission №1210436900-99 of pollutant emissions into the air be stationary sources
/29/ Permission #67 for carrying out the construction work dated 15.09.2007
/30/ Permissible pollutant emissions which are referred to the main emitter
/31/ Ecological and expert judgment of working draft "Technical upgrade of converter plant with installation of Ladle Furnace" of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky" of 2007.
/32/ Expert opinion of Fire safety state department MNF Ukraine №31/4/6299 dated 18.09.2008
/33/ Expert opinion #07 about accordance of the object to standard acts concerning the energy-saving. B.18 - 05.01024.75.11.3-195 dated 16.05.2007p.
/34/ Expert opinion #08 about accordance of the object to standard acts concerning the energy-saving. B.18 - 05.01024.75.11.3-080 dated 16.07.2008p.
/35/ Expert opinion dated 25.04.07 of fire-rescue department #2 of the central administrative board MNF Ukraine in Dnepropetrovsk region about carrying out the examination of accuracy and completeness of fire prevention execution
/36/ Expert opinion of State fire safety department of MNF Ukraine №31/4/4682 dated 14.07.2008
/37/ Statement #14, CSSC #3, foundations for strong constructions of columns.
/38/ Statement #16 of technical readiness "Steel-works of stabilization plant", dated 1.03.2010

/39/ Statement №30 of readiness of the pile field, 2009, CSSC #3, FOM #1
/40/ Statement №30 of readiness of the pile field, 2009, CSSC #3, FOM #5
/41/ Statement #31of readiness of the pile field
/42/ Statement #32 of transfer the executive documentation to the act of inspection #32
/43/ Statement #57 of technical readiness dated 28.05.2010. The system of waste removal
/44/ Statement #62 of technical readiness dated 16.08.2010.
/45/ Statement #1 of object readiness for operation dated 07.09.2009
/46/ Statement of state entrance examination of putting into operation the built object dated 16.12.2008
/47/ Statement of committee #1 about acceptance of continuous casting machine after individual test dated 15.09.2008
/48/ Statement of committee #1 about acceptance of continuous casting machines after comprehensive test dated 1.10.2008
/49/ Statement of coke-oven gas delivery dated 31.08.2010
/50/ Statement of conformance inspection the facts of functioning of gas clarification with design variable on the emission point #386 dated 13.09.2010. Registration number 11.10.2010
/51/ Statement of transfer of executive documentation to the statement of preview dated 11.10.2010
/52/ Statement of entrance examination concerning CSSC #3 dated 15.03.2010
/53/ Statement of entrance examination of DIISW CSSC #3 Operating platform dated 25.02.2010
/54/ Statement of receiving and transfer of natural gas dated 31.08.2010
/55/ Working committee statement of readiness of built continuous casting machine #1 for presentation for state entrance examination dated 10.10.2008
/56/ Electric power balance for August 2010
/57/ Coke and natural gas balance of gas shop for February 2010
/58/ Natural gas balance for 10.07.10. First level.
/59/ Natural gas balance for 10.07.10. Second level.
/60/ Gross pollutant emissions into the air of plant resources
/61/ The schedule of periodic verification of working standards of 2010
/62/ The schedule of periodic verification of basic reference and working standards of 2010
/63/ The schedule of periodic verification of measuring tool of 2010
/64/ The schedule of periodic verification of measuring tool of 2010. Geometric quantities
/65/ The schedule of periodic verification of measuring tool of 2010. Volume and capacity measurement
/66/ The schedule of periodic verification of measuring tool of 2010. Pressure and vacuum measurement
/67/ The schedule of periodic verification of measuring tool of 2010.Mechanical modification
/68/ The schedule of periodic verification of measuring tool of 2010. Heat engineering measurement
/69/ The schedule of periodic verification of measuring tool of 2010. Thermal and physic quantities and temperature

/70/ The schedule of periodic verification of measuring tool of 2010. Electric quantities.
/71/ The schedule of periodic verification of measuring tool of 2010. Electric measurement
/72/ The schedule of periodic verification of measuring tool of 2010. Mechanical measurement
/73/ Prime cost dynamics of cast iron ton for 2009
/74/ General contract №29-0454-02 dated 09.04.2009
/75/ General contract №552/2009-76/29-0436-02 dated 07.04.2009
/76/ Construction contract №26-2624-02 dated 19.12.2006
/77/ Construction contract №27-0621-02 dated 21.02.2007
/78/ Additional Agreement #1 to the Contract #29-0909-12 dd. 24.06.2009
/79/ Log book #4 of stationary sources of pollution and its characteristics.
/80/ Log book M-1 preparation SCD for operation
/81/ Summary comprehensive conclusion #128 of Ukrderzhinvestekspertyzy concerning the working draft of Technical upgrade of converter plant with installation of Ladle Furnace of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky dated 17.07.2007
/82/ Report on results of fuel, thermal energy and electric power consumption for January - December of 2009
/83/ Planned schedule of building and assembly jobs execution by PSL Ltd "Azovinteks" for 2007
/84/ Meter chart. Works number 017185
/85/ Register of electric power expenses of the industrial complex for 2009 - 2010
/86/ License #159170 for rendering of educational services by educational institutions connected with getting of education according to qualifying requirements of course vocational education, preconditioning, raising the level of skill dated 28.08.2006
/87/ Limits #19 on making and placing of waste for 2010
/88/ Quota #39 on making and placing of waste for 2009
/89/ License for construction work №105269 dated 7.06.2005
/90/ Report on generated, reported to used active electricity of Dniprovsky Integrated Iron and Steel Works from the 1st to the 3rd of August 2010
/91/ Report on reactive electricity consumption and generation of Dniprovsky Integrated Iron and Steel Works from the 1st to the 3rd of August 2010
/92/ Report on oxygen - compressor shop functioning for February 2010
/93/ Report on SCD #1 functioning for February 2010
/94/ Report on staff training according to the order #7 dated 04.01.2010
/95/ Report on natural gas for August 2010
/96/ Report on fuel consumption for August 2010
/97/ Operation factors of pollutant emissions sources into the air for 2004
/98/ Passport #272 of pressure transformer. Works number 19314
/99/ Passport #8 of pressure transformer. Works number 19333
/100/ Passport of places for temporary storage of factory waste in the converter plant
/101/ List of acceptance reports of separate types of works, constructs, manufacturing equipment and wires of continuous casting machine #3

/102/ List of active factory standards (with correction) dated 1.10.2010
/103/ List of documentation reported to CCM shop of networks and substations
/104/ List of measuring instrument tools liable to calibration dated 05.05.10
/105/ Schedule of departmental instrumental control of limiting emissions normality for 2010
/106/ Order #1178 of normative foundation of raw materials and materials consumption for 2010 dated 30.12.2009
/107/ Order #134 dated 12.02.2010 of appointment the workers of acceptance inspections
/108/ Order #565 dated 15.06.2007 of approval the working draft of technical upgrade the converter plant with installation of Ladle Furnace
/109/ Order #7 of working with the staff in 2010 dated 04.01.2010
/110/ Annex #1 to the Contract #29-0909-12 dd. 24.06.2009 "Commercial Specification #2 for Piping material for CCM 3"
/111/ Annex #1 to the order #7 dd. 04.01.2010. The plan of training and raising the level of staff skill of the plant for 2010
/112/ Annex #1 to the order #7 dd. 04.01.2010. The plan of training the staff on the training and production area of technical training and staff training department
/113/ Project "Technical upgrade of converter plant with installation of Two Billet Continuous Casting Machines and Ladle Furnace". Volume 1. Summary explanatory note.
/114/ Project proposals "Technical upgrade of converter plant with installation of Ladle Furnace. Statement of environmental consequences." Volume 2
/115/ Project proposals "Technical upgrade of converter plant with installation of Ladle Furnace. The estimation of influence on environment." Volume 2
/116/ Minutes №0332/П-2010 of parameterization of multiple-tariff electrical meter
/117/ Minutes of sample analysis #48 dated 9.03.2010
/118/ Minutes of sample analysis, chemical analysis #108 dated 28.02.2010
/119/ Minutes of sample analysis, chemical analysis #1695 dated 4.10.2010
/120/ Minutes of sample analysis, chemical analysis #724 dated 16.03.2010
/121/ Minutes of natural gas consumption measurement dated 17.05.10
/122/ Minutes of natural gas consumption measurement dated 28.05.08
/123/ Minutes of the project "Technical upgrade of OJSC Dniprovsky Integrated Iron and Steel Works based on the installation of Two Billet Continuous Casting Machines and Ladle Furnace #2
/124/ Minutes of sampling and testing dated 11.10.2010. BV #29/1/10/CRI/1045
/125/ Minutes of sampling and testing dated 11.10.2010. BV #29/1/10/K/1045
/126/ Working draft "Technical upgrade of converter plant with installation of Ladle Furnace." Volume 1. Summary explanatory note.
/127/ Work curriculum of training the staff by profession of welding blast-furnace of the 5th category
/128/ Pouring on the CSSC #014484
/129/ Pouring on the CSSC #023884
/130/ Report on acceptance of casting block for 12.10.10
/131/ Report on acceptance of ingots for 12.10.11

/132/ Production report on heat-resistant part JRC for February 2010
/133/ Decree # 130 dated 28.05.2009 about training of heads and specialists of plant organization departments concerning the problems of ecological management system
/134/ The result of electric power consumption of Dniprovsky Integrated Iron and Steel Works for August 2010
/135/ Decision # 31 dated 23.01.2008 about granting permission on Technical upgrade of SCD of converter plan with installation Two Billet Continuous Casting Machines and Ladle Furnace #2
/136/ Decision # 522 dated 31.08.2006 about granting permission on Technical upgrade of converter plan of Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky with installation Ladle Furnace #2
/137/ Book of curriculums, training and raising the level of skill programs of converter steel makers
/138/ Book of curriculums, training and raising the level of skill programs of steel caster workers
/139/ Certificate №0400000245 of built object accordance with project documentation, government standard requirements, construction standards and regulations dated 16.09.2009
/140/ Certification №06544-5-1-7-КЛ dated 01.02.2010
/141/ Certification of qualification №3794 granted Levchenko A.A.
/142/ Certification of qualification №3796 granted Voronints A.H.
/143/ Certification of qualification №3797 granted Bondarenko S.V.
/144/ Certification of qualification №3792 granted Gura G.B.
/145/ Certification of qualification №3799 granted Zhelyaev A.B.
/146/ Certification of qualification №3800 granted Pirogov E.V.
/147/ Certification of qualification №3801 granted Gapulenko K.N.
/148/ Certification of qualification №3802 granted Slabchenko A.N..
/149/ Certification of qualification №3803 granted Kalita A.B.
/150/ Certificate №06544-5-1-110 dated14.09.2009
/151/ Certificate №06544-5-3-123 dated 20.08.2010
/152/ Certificate dated 01.02.2010. Registration number №06544-5-1-7-КЛ
/153/ Certificate dated 14.09.2009. Registration number №06544-5-1-110ВЛ
/154/ The certificate of measuring instrument verification №16/1211 dated 28.07.2010
/155/ The certificate of measuring instrument verification №19-20/1480-09 dated 15.05.2005
/156/ Certificate #9 for coke gas mark "A" dated 1.10.2010
/157/ Certificate №01/005-3 dated 06.03.2010
/158/ Certificate of physical-chemical properties of natural gas dated 31.09.2010
/159/ Certificate №192.TIC.09 of training on the seminar "Internal auditor of management systems according with international standards ISO 14001:2004, OHSAS 18001:2007 и ISO 19011:2002" granted Bojko Natalia dated 05.06.2009
/160/ Group of Internal auditors of management systems, industrial security and professional health Dniprovsky Integrated Iron and Steel Works
/161/ Factory standard. Measurement assurance of measuring instruments.

Enter date 12.02.2007
/162/ Factory standard. Procedure of developing and certification of methods. Enter date 08.02.2005
/163/ Daily report TCD dated 10.10.2010
/164/ Daily report TCD dated 11.10.2010
/165/ Daily report TCD dated 12.10.2010
/166/ Technical and economic indices of plant operation for 2009
/167/ Technical and economic basis "Technical upgrade of SCD of converter plan with installation of Two Billet Continuous Casting Machines and Ladle Furnace #2." Volume 2. The estimation of influence on environment
/168/ Technical report on shop functioning concerning with preparing the charge for February 2010
/169/ Technical report on blast-furnace shop for 2009
/170/ Making and using of secondary power resources for 2009
/171/ Actual fuel expenses on the production the separate types of products and works for 2009
/172/ Ergometer. Oxygen. Starting date: September 2009.
/173/ Operational manual. Dust-removing system of installation Ladle Furnace and bunker supply system of dry and ferroalloys DIISW
/174/ Operational manual. Part 1/ Technological part # 0-20600РЭ. Continuous casting machines CCM 6РБ 14Г 28÷35/ 32÷40 У
/175/ Protocol of meeting on reconstruction and technical re-equipment Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky
/176/ Technical report of converter plant for January 2009
/177/ Description of the individual gas-treatment systems for LF
/178/ Certificate of physical-chemical properties of natural gas for the period from 01.12.2006 till 31.12.2006
/179/ Certificate of physical-chemical properties of natural gas for the period from 01.06.2006 till 30.06.2006
/180/ Certificate of physical-chemical properties of natural gas for the period from 01.06.2010 till 30.06.2010
/181/ Certificate of physical-chemical properties of natural gas for the period from 01.11.2010 till 30.11.2010
/182/ Analysis results of samples of blast-furnace, coke-oven and converter gases, taken on the territory of Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky
/183/ Protocol of works execution on sampling and samples analysis of blast-furnace, coke-oven and converter gases
/184/ Letter № 1316-4-3573 dated 07.12.2010 from Ministry of Industrial Policy of Ukraine on joint implementation project endorsement “Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces”.
/185/ Order of the Central Archival Administration under the Cabinet of Ministers of Ukraine of July 20, 1998 # 41 on approving list of typical documents and indication of document retention period.
/186/ Letter № 1316-4-3573 dated 07.12.2010 from Ministry of Industrial Policy of Ukraine on joint implementation project endorsement “Revamping and Modernization of the Alchevsk Steel Mill Based on CCMs Nos. 1 and 2

and LD Converters Nos. 1 and 2" with an opinion on the state of the art technology under the project.

/187/ Letter ref.No PR/Hs of 14-01-2011 from Siemens VAI Metal Technologies (SVAI) with a confirmation of project equipment (LDs, CCMs) lifespan of 40 years.

/188/ Chemical analysis of the anthracite seed used at DIISW for December 2010.

Persons interviewed:

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

/1/ Volodymyr Romanenko – Chief engineer of DIISW

/2/ Yuriy Antonov – Head of technical administration of DIISW

/3/ Sergiy Goncharenko – Head of new equipment technical revamping bureau of the technical department of DIISW

/4/ Mykhailo Turkin – Deputy chief power engineer of DIISW

/5/ Sergiy Ryaboshapko – Head of environmental protection department of DIISW

/6/ Ganna Zadvorska – Head of planning and economic department of DIISW

/7/ Iryna Grytsan – Deputy head of planning and economic department of DIISW

/8/ Gennadiy Borovikov – Head of capital construction administration of DIISW

/9/ Iryna Shabanova – Head of personnel training department of DIISW

/10/ Volodymyr Yevtushenko – Head of metrology laboratory of DIISW

/11/ Anatoliy Kryzhanovskyy – Head of sintering plant of DIISW

/12/ Oleksandr Marchenko – Head of blast furnace plant DIISW

/13/ Kostyantyn Nesvyet – Deputy head of converter plant of DIISW

/14/ A.Lebyotkin – Head of CCM 1 division of DIISW

/15/ Oleg Benidze – Head of municipal environmental committee of Dniprodzerzhynsk town

/16/ Valeriy Sebastyanov – town council delegate

/17/ Valentyn Seredyuk – Ecology department manager of Institute for Environment and Energy Conservation

/18/ Shamil Khakimzyanov – Consultant of Institute for Environment and Energy Conservation

APPENDIX A: JI PROJECT DETERMINATION PROTOCOL

BUREAU VERITAS CERTIFICATION HOLDING SAS

DETERMINATION PROTOCOL

Table 1. Check list for determination, according JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Ver. 01)

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
General description of the project				
Title of the project				
-	Is the title of the project presented?	The title of the project is presented in the section A.1 of the PDD. The project title is "Technical Upgrade of OJSC Dniprovsky Integrated Iron and Steel Works named after Dzerzhynsky by Installation of Two Billet Continuous Casting Machines and Two Ladle Furnaces".	OK	OK
-	Is the sectoral scope to which the project pertains presented?	The sectoral scope is indicated in the PDD and it is 3 (electricity consumption), 4 (manufacturing industries), 9 (metallurgy).	OK	OK
-	Is the current version number of the document presented?	The current version number of the PDD is stated in the section A.1.	OK	OK
-	Is the date when the document was completed presented?	The PDD present the document completion date as required.	OK	OK
Description of the project				
-	Is the purpose of the project included with a concise, summarizing explanation (max. 1-2 pages) of the: a) Situation existing prior to the starting date of the project;	The purpose of the project is stated in the section A.2 of the PDD and it implies achieving steel production with lower energy consumption per unit of output through reduction of furnace process time in converters as the result of introduction of LFs	CAR 01	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	b) Baseline scenario; and c) Project scenario (expected outcome, including a technical description)?	and stabilisation of casting process at new CCMs, which would inter alia yield significant reduction of GHG emissions to atmosphere (mainly CO_2). Situation existing prior to the starting date of the project and project scenario are included in the PDD. **CAR 01.** Please clearly describe the baseline of the proposed project in section A.2 of the PDD as required by Guidelines for JI PDD form users.		
-	Is the history of the project (incl. its JI component) briefly summarized?	The project history is summarized in the section A of the PDD. Information regarding JI component of the project, including JI prior consideration is presented as well.	OK	OK
Project participants				
-	Are project participants and Party(ies) involved in the project listed?	Yes, the respective information is presented in the section A.3 of the PDD. The Parties involved are Ukraine (Host Party) and Spain. **CAR 02.** The Institute for Environment and Energy Conservation is indicated as a project participant in the section A.3, however, in the sections B.4, D.4 it is stated that this organization is not a project participant. Please make the information consistent.	CAR 02	OK
-	Is the data of the project participants presented in tabular format?	The data of the project participants are presented in the tabular format. **CAR 03.** The format of the table in section A.3 prescribed by the Guidelines for JI PDD form users is not followed. Please correct.	CAR 03	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
-	Is contact information provided in Annex 1 of the PDD?	The contact information of project participants is provided in the tables of Annex 1 of the PDD.	OK	OK
-	Is it indicated, if it is the case, if the Party involved is a host Party?	Yes, it is indicated in the section A.3 of the PDD that Ukraine is a host Party.	OK	OK
Technical description of the project				
Location of the project				
-	Host Party(ies)	Ukraine	OK	OK
-	Region/State/Province etc.	Dnipropetrovsk region	OK	OK
-	City/Town/Community etc.	Dniprodzerzhynsk	OK	OK
-	Detail of the physical location, including information allowing the unique identification of the project. (This section should not exceed one page)	The PDD ver.1 includes information about the town were the project is located; however unique identification of the project site location is absent. **CAR 04.** Please provide more exact details of project site physical location, including information allowing the unique identification of the project in the section A.4.1.4 of the PDD.	CAR 04	OK
Technologies to be employed, or measures, operations or actions to be implemented by the project				
-	Does the project design engineering reflect current good practices?	The project design engineering reflects current good practices in steel making industry.	OK	OK
-	Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	The project uses state of the art technology. Process equipment supplied by Siemens VAI is based on state-of-the-art engineering, automation and control developments geared to minimise non-productive losses of energy and achieve maximum recovery of heat of the molten steel. It has been shown that the proposed project type has not diffused in the relevant sector and region and is not common practice for Ukraine.	OK	OK
-	Is the project technology likely to be	The project reflects current good practice and uses	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	substituted by other or more efficient technologies within the project period?	state of the art technology. The project equipment used is of a high efficiency. Currently in Ukraine there are neither regulations and nor laws which would require the adoption or use of more efficient technologies for the proposed project. Moreover, the proposed project is considered to be in line with the long-term energy strategy of Ukraine. Thus, it is unlikely that the project technology is to be substituted the other or more efficient technology within the project period.		
-	Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	The enterprise required an extensive human resource training program to prepare personnel able to run new processes. DIISW has worked out a detailed personnel training program assuming creation of a dedicated Project Implementation Group, aimed at supporting smooth realisation of the JI project. Employees of DIISW undergo field training at partner Ukrainian steelmaking enterprises. Equipment supplier (Siemens VAI) representatives monitor and supervise implementation of the project and training staff required to operate the new equipment. JI project maintenance will be in accordance with national requirements and DIISW internal routines with technical support on the part of Siemens VAI.	OK	OK
-	Does the project make provisions for meeting training and maintenance needs?	Yes, the project makes provisions for meeting training and maintenance. Refer to the check item above.	OK	OK
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				

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
sectoral policies and circumstances				
-	Is it stated how anthropogenic GHG emission reductions are to be achieved? (This section should not exceed one page)	Considering that within project activity amount of cutoff pieces will be reduced, respectively the amount of GHG – mainly CO_2 within the project's framework also will be reduced as a result of decreased consumption of materials and energy. This, in its turn, will cause drop in consumption of coal, coke, natural gas and electricity by other production departments, particularly sinter plant and blast furnace. Furthermore, replacement of continuous bloom casters and exclusion of the blooming mills will help to achieve savings of Blast Furnace gas (BFG), which will replace the consumption of natural gas (NG) under project scenario, as well as further savings on electricity. Generally, reduction of material resource consumption will be attained owing to implementation of more efficient process equipment in the proposed JI Project.	OK	OK
-	Is it provided the estimation of emission reductions over the crediting period?	**CAR 05.** In the section A.4.3.1 of the PDD please provide separate tables with estimated amount of emission reductions for Kyoto protocol commitment period and for the period following commitment period with data for each year of the crediting period. Please make the table format compliant with the Guidelines for JI PDD form users.	CAR 05	OK
-	Is it provided the estimated annual reduction for the chosen credit period in tCO2e?	The estimated annual average reductions are provided and these are 1232235 tCO_{2e} for 2008-2012 (the 1st commitment period) and 1779799 tCO_{2e} for 2013-2020 (after the 1st commitment	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		period).		
-	Are the data from questions above presented in tabular format?	Yes, all estimations are provided in the tabular format in the section A.4.3.1 of the PDD.	OK	OK
Project approvals by Parties				
19	Have the DFPs of all Parties listed as "Parties involved" in the PDD provided written project approvals?	**CAR 06.** The project has no approval of the host Party (Ukraine) no by other Party involved (Spain) were provided.	CAR 06	Pending
19	Does the PDD identify at least the host Party as a "Party involved"?	Ukraine, which is the host Party, and Spain are indicated as the Parties involved.	OK	OK
19	Has the DFP of the host Party issued a written project approval?	No written project approval by the host Party is available. Refer to CAR 06.	Refer to CAR 06 above.	Pending
20	Are all the written project approvals by Parties involved unconditional?	No written project approvals by the Parties involved are available. Refer to CAR 06.	Refer to CAR 06 above.	Pending
Authorization of project participants by Parties involved				
21	Is each of the legal entities listed as project participants in the PDD authorized by a Party involved, which is also listed in the PDD, through: − A written project approval by a Party involved, explicitly indicating the name of the legal entity? or − Any other form of project participant authorization in writing, explicitly indicating the name of the legal entity?	**CAR 07.** The authorizations of the legal entities project participant by the Parties involved are absent.	CAR 07	Pending
Baseline setting				
22	Does the PDD explicitly indicate which of the following approaches is used for	The PDD clearly indicates that the JI specific approach is used for baseline setting.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	identifying the baseline? − JI specific approach − Approved CDM methodology approach			
JI specific approach only				
23	Does the PDD provide a detailed theoretical description in a complete and transparent manner?	A detailed theoretical description in a complete and transparent manner is provided for the applied JI specific approach. **CL 01.** Please provide documented evidences confirming that the replaced CBC 3 and CBC 2, which is used for monitoring of baseline parameters, are identical. **CL 02.** Please submit the evidences which confirm that the CBC 2 will be in operation at least until 2020 and that the LF 1 started operation in January 2010.	CL 01 CL 02	OK OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
23	Does the PDD provide justification that the baseline is established: (a) By listing and describing plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one? (b) Taking into account relevant national and/or sectoral policies and circumstance? − Are key factors that affect a baseline taken into account? (c) In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, date sources and key factors? (d) Taking into account of uncertainties and using conservative assumptions? (e) In such a way that ERUs cannot be earned for decreases in activity levels outside the project or due to force majeure? (f) By drawing on the list of standard variables contained in appendix B to "Guidance on criteria for baseline setting and monitoring", as appropriate?	The baseline is established: (a) By listing and describing likely future scenarios available for the project owner DIISW and selecting the most plausible one. Two technically feasible alternatives (continuation of the current situation and project without JI component) were identified and assessed, and based on the alternatives analysis most plausible baseline scenario was identified which is continuing of the existing practice. (b) Taking into account relevant national and sectoral policies and circumstance in steel-making industry as well as key appropriate factors that affect a baseline, such as availability of capital for the project implementation; tariffs, local availability of project technologies and techniques, skills and know-how regarding CCM and LD installation and maintenance. (c) In a generally transparent manner with regard to the choice of the JI specific approach and related assumptions, parameters, data sources and key factors for baseline setting, which are listed in tabular format in Section B.1. (d) Taking into account of the uncertainty and	CAR 08 CAR 09 CL 03	OK OK OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		using a conservative assumption, (e) In such a way that ERUs cannot be earned for decreases in activity levels outside the project or due to force majeure. (f) By drawing on the list of standard variables some of which is contained in appendix B to "Guidance on criteria for baseline setting and monitoring". **CAR 08.** Please provide the summary of rundown of the technical steelmaking potential currently existing in Ukraine in the given PDD. **CAR 09.** The tables containing key information and data used for establishing baseline (section B.1) do not include the information on justification of the choice of data or description of measurement methods and procedures applied. The data sources should be stated more precisely. Moreover, the format of the tables does not correspond to the Guidelines for JI PDD form users. Please make appropriate corrections. **CL 03.** Please provide for review the opinion of the Ukrainian Ministry of Industrial Policy on the new CCMs installed in Ukraine.		

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
24	If selected elements or combinations of approved CDM methodologies or methodological tools for baseline setting are used, are the selected elements or combinations together with the elements supplementary developed by the project participants in line with 23 above?	No applicable approved CDM methodologies are available for this project type; however, the methodology of the registered JI Project "Revamping and Modernization of the Alchevsk Steel Mill Based on CCMs Nos. 1 and 2 and LD Converters Nos. 1 and 2", which is considered as similar to the proposed project activity, is applied to the project in question.	OK	OK
25	If a multi-project emission factor is used, does the PDD provide appropriate justification?	Carbon emission factor for electricity consumption is used in the current project. **CAR 10.** The electricity emission factor indicated in the PDD does not correspond to the factor used for emission calculations in Excel spreadsheets. Please make the information and calculations consistent in the PDD and supporting documentation. If in the calculations an emission factor for electricity consumption is used, which has never been applied before in any approved JI project, a detailed information/references on the factor as well as justification for its application must be provided.	CAR 10	OK
Approved CDM methodology approach only				
26 (a)	Does the PDD provide the title, reference number and version of the approved CDM methodology used?	The JI specific approach is used, the section is not applicable.	N/A	N/A
26 (a)	Is the approved CDM methodology the most recent valid version when the PDD is submitted for publication? If not, is the methodology still within the grace period	N/A	N/A	N/A

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	(was the methodology revised to a newer version in the past two months)?			
26 (b)	Does the PDD provide a description of why the approved CDM methodology is applicable to the project?	N/A	N/A	N/A
26 (c)	Are all explanations, descriptions and analyses pertaining to the baseline in the PDD made in accordance with the referenced approved CDM methodology?	N/A	N/A	N/A
26 (d)	Is the baseline identified appropriately as a result?	N/A	N/A	N/A
Additionality				
JI specific approach only				
28	Does the PDD indicate which of the following approaches for demonstrating additionality is used? (a) Provision of traceable and transparent information showing the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to emission reductions or enhancements of removals; (b) Provision of traceable and transparent information that an AIE has already positively determined that a comparable project (to be) implemented under comparable circumstances has additionality; (c) Application of the most recent version	The PDD indicates that the latest version of the "Tool for the demonstration and assessment of additionality" is used with a purpose of proving the project's additionality.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	of the "Tool for the demonstration and assessment of additionality. (allowing for a two-month grace period) or any other method for proving additionality approved by the CDM Executive Board".			
29 (a)	Does the PDD provide a justification of the applicability of the approach with a clear and transparent description?	The PDD provides a justification of the applicability of the approach. Due to the fact that there is no approved CDM baseline and monitoring methodology which is applicable to the project type, the Additionality Tool is applied which is considered as a good practice for additionality justification. **CAR 11.** In the section B.2 of the PDD please describe why and how the Additionality Tool is applicable for assessing additionality of the proposed JI project.	CAR 11	OK
29 (b)	Are additionality proofs provided?	The project's additionality is proved using stepwise approach prescribed by the Tool Additionality in section B.2 for the PDD. **CAR 12.** The use of benchmark analysis for the present project is the valid method for the present project. However, the benchmark introduced can not be considered as the proper measure as the benchmark is derived from integral loan interest rate calculated by the NBU using the pool of the loans issued in all currencies including UAH as well. All calculations in the present project financial model are made in USD, thereby the interest rates for the loans issued in foreign currency shall be	CAR 12 CAR 13 CAR 14 CAR 15 CAR 16 CAR 17 CAR 18 CAR 19 CAR 20 CAR 21 CAR 22	OK OK OK OK OK OK OK OK OK OK OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		used instead (the relevant data is available from NBU web site). Please correct. **CAR 13.** The use of the benchmark as of 2007 is correct as it complies with the article 6. of the Guidance on the Assessment of Investment Analysis. At the same time, presented financial calculations are based on financial data available as of July 2010 i.e. much later than investment decision date. Taking into account the requirement of the Guidance on the Assessment of Investment Analysis the calculations shall be based on the data available as of project starting date. Please make appropriate adjustments. **CAR 14.** Financial model itself represents the analysis of the business operation activities after implementation of the project rather than estimate of the financial effect of the project activities, while the proper method shall be based on comparison of the operational expenses for after-project and before the project situation (the project does not have any significant impact on sales so comparison of expenses ought to be sufficient). The difference of the expenses before and after project will constitute the actual financial effect of the project implemented. Please rework the model accordingly. **CAR 15.** The project financial model does not contain proper adjustment for inflation during the		

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		project period. Taking into account the fact that calculations are made in USD the US inflation rate shall be used for this purpose and for adjusting all future incomes and expenses on yearly basis. Please make appropriate corrections. **CAR 16.** The Guidance on the Assessment of Investment Analysis, article 4, requires the fair value of the assets at the end of assessment period to be included in the cash flow for the final year. In the case of proposed project the liquidation value of the assets for the final year is not included in the cash flow. Please add reasonable market value of the assets to the cash flow for the final year. **CAR 17.** In the investment analysis spreadsheet the IRR calculation formula in cell D76 does not account for the years 2021 and 2022. Please correct. **CAR 18.** The depreciation rate applied for calculation of the pre-tax income does not meet the requirements of the Ukrainian tax legislation (please refer to the Law of Ukraine "On taxation of enterprises' income No.334/94-VR". **CAR 19.** When calculating EBT the profit for the losses suffered during 2009-2010 was not adjusted thereby overstating the income taxes for 2011. Please correct.		

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		CAR 20. In order to ensure transparency and possibility to reproduce stated results of the investment analysis presented please submit the spreadsheets with calculation of sensitivity analysis indicating formulas. **CAR 21.** Please note that the facts represented in step 3 as the justification of the low credit rating is often referred to the facts of 2009-2010 which is not correct taking into account the fact that the project decision has been made in 2007 and the project started in 2008. In addition the barriers arising from the crisis in Ukrainian metallurgy starting September 2008 did not hinder implementation of at least the first stage of the present project. Please make appropriate adjustments. **CAR 22.** No publicly available sources confirming high debt burden of IUD are presented when IUD unattractive credit profile is described. Please provide the reference and details, for example D/E, EBITDA/Debt Servicing ratios.		
29 (c)	Is the additionality demonstrated appropriately as a result?	Yes, it is demonstrated that the project is additional to those that would otherwise occur.	OK	OK
30	If the approach 28 (c) is chosen, are all explanations, descriptions and analyses made in accordance with the selected tool or method?	**CAR 23.** Please apply the structure of Additionality Tool for demonstration and assessment of additionality, i.e., outcomes for each step and sub-step shall be clearly stated (refer to section B.2).	CAR 23	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		Additionally, please provide overall conclusion on whether proposed project is proved to be additional.		
Approved CDM methodology approach only				
31 (a)	Does the PDD provide the title, reference number and version of the approved CDM methodology used?	The JI specific approach is used, the section is not applicable.	N/A	N/A
31 (b)	Does the PDD provide a description of why and how the referenced approved CDM methodology is applicable to the project?	N/A	N/A	N/A
31 (c)	Are all explanations, descriptions and analyses with regard to additionality made in accordance with the selected methodology?	N/A	N/A	N/A
31 (d)	Are additionality proofs provided?	N/A	N/A	N/A
31 (e)	Is the additionality demonstrated appropriately as a result?	N/A	N/A	N/A
Project boundary (applicable except for JI LULUCF projects)				
JI specific approach only				
32 (a)	Does the project boundary defined in the PDD encompass all anthropogenic emissions by sources of GHGs that are: (i) Under the control of the project participants? (ii) Reasonably attributable to the project? (iii) Significant?	Yes, the project boundary is defined in line with all presented requirements. The emission sources identified include fuels used in the project and baseline, material flow as part of production process, and electricity used under the project and baseline scenarios.	OK	OK
32 (b)	Is the project boundary defined on the basis of a case-by-case assessment with regard to the criteria referred to in 32 (a) above?	Yes, the project boundary is defined based on case-by-case assessment according to the criteria stated in cl.32 (a) above.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
32 (c)	Are the delineation of the project boundary and the gases and sources included appropriately described and justified in the PDD by using a figure or flow chart as appropriate?	The delineation of the project boundary and gases and sources are described and justified in a proper manner using a figure which depicts in details the project boundary under baseline and project scenarios.	OK	OK
32 (d)	Are all gases and sources included explicitly stated, and the exclusions of any sources related to the baseline or the project are appropriately justified?	All gases and sources are stated explicitly in the table 6 in section B.3 of the PDD and exclusions are justified appropriately.	OK	OK
Approved CDM methodology approach only				
33	Is the project boundary defined in accordance with the approved CDM methodology?	The JI specific approach is used, the section is not applicable.	N/A	N/A
Crediting period				
34 (a)	Does the PDD state the starting date of the project as the date on which the implementation or construction or real action of the project will begin or began?	**CAR 24.** The information regarding starting date of the project is inappropriate. According to the Glossary of JI terms the starting date of the project is the date on which the implementation or construction or real action of the project begins. Thus, if the project set off in August 2008 with commissioning of the CCM 1 the 1st October 2008 can not be considered as the date of project commencement. Please make respective corrections in the PDD (in all relevant section, i.e. A.2, C.1 etc.). **CAR 25.** The scheme with project implementation schedule containing in the section A.4.2 of the PDD indicates that the project started in 2007 which contradicts the information about project	CAR 24 CAR 25	OK OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		commencement stated in other sections of PDD, e.g. section A.2. Please make the information consistent.		
34 (a)	Is the starting date after the beginning of 2000?	See CAR 24 above.	Pending on response to CAR 24	OK
34 (b)	Does the PDD state the expected operational lifetime of the project in years and months?	The expected operational lifetime of the project indicated in the PDD is 40 years. **CAR 26**. Project operation lifetime should be indicated in years and months. **CL 04.** Please provide a justification of the project operational lifetime of 40 years.	CAR 26 CL 04	OK OK
34 (c)	Does the PDD state the length of the crediting period in years and months?	The length of the crediting period is not stated in the PDD ver. 1 (see CAR 26 in 34 (b) above). **CAR 27**. It should be noted that if ERU estimates are provided up to 2020, then the length of the whole period from 2008 to 2020 and separately length of Kyoto and post-Kyoto periods are to be stated. Please indicate the length of the crediting period in years and months for periods during (2008-2012) and after (2013-2020) the 1st commitment period (see section C.3 of the PDD).	CAR 27	OK
34 (c)	Is the starting date of the crediting period on or after the date of the first emission reductions or enhancements of net removals generated by the project?	The crediting period commences with the start of operation of the first project stages, so it is after the first emission reduction generated by the project.	OK	OK
34 (d)	Does the PDD state that the crediting	The crediting period for issuance ERUs starts after	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	period for issuance of ERUs starts only after the beginning of 2008 and does not extend beyond the operational lifetime of the project?	the beginning of 2008 (on 01/10/2008). The crediting period stated in PDD does not extend beyond the operational lifetime of the project which is assumed to be 40 years.		
34 (d)	If the crediting period extends beyond 2012, does the PDD state that the extension is subject to the host Party approval? Are the estimates of emission reductions or enhancements of net removals presented separately for those until 2012 and those after 2012?	In the section C.3 of the PDD it is clearly stated that the extension of the crediting period beyond 2012 is subject to the host Party approval. **CAR 28.** In section A ER estimates are given for 2008-2020, but in the section E estimates are provided only for 2008-2012. Please supplement the section E with estimates for 2013-2020 and provide Excel spreadsheets with detailed calculations for this period.	CAR 28	OK
Monitoring plan				
35	Does the PDD explicitly indicate which of the following approaches is used? − JI specific approach − Approved CDM methodology approach	It is explicitly stated that JI specific approach is used for establishing the monitoring plan.	OK	OK
JI specific approach only				
36 (a)	Does the monitoring plan describe: − All relevant factors and key characteristics that will be monitored? − The period in which they will be monitored? − All decisive factors for the control and reporting of project performance?	The monitoring plan in sufficient manner describes all relevant key factors and characteristics that will be monitored and the period in which they will be monitored. All assumption and decisive factors for project monitoring are described appropriately. **CAR 29.** The project implies that pig iron consumption will be reduced due to the project activity, but the section D.1, item 9, contained the	CAR 29 CAR 30	OK OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		controversial statement: "Under the baseline scenario, pig iron consumption will be equal to the amount of pig iron used in steel production under the project scenario". Please correct. **CAR 30.** The information provided under section D.1.5 is irrelevant. Please supplement the section with appropriate information.		
36 (b)	Does the monitoring plan specify the indicators, constants and variables used that are reliable, valid and provide transparent picture of the emission reductions or enhancements of net removals to be monitored?	All constants and variables used are reliable and valid and transparently described in the section D of the PDD.	OK	OK
36 (b)	If default values are used: − Are accuracy and reasonableness carefully balanced in their selection? − Do the default values originate from recognized sources? − Are the default values supported by statistical analyses providing reasonable confidence levels? − Are the default values presented in a transparent manner?	Constants used are the default values of the parameters as follows: emission factor for fuels (e.g., natural gas), reducing agents (coke, anthracite, coal electrodes) and other inputs (limestone, dolomite, pellets) used, electricity emission factor. The default values originate from recognized sources and are presented in a transparent manner. However, some requests for corrections were raised. **CAR 31.** Please provide more detailed information on the default emission factors used for limestone, dolomite and pellets, including clear reference to the data source and explanation on how factors for limestone and dolomite will be adjusted for the amount of additives (incl. information on how	CAR 31 CL 05	OK OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		amount of additives is determined). **CL 05.** Please provide evidences confirming that the anthracite is used as reducing agent at DIISW and the application of relevant emission factor is reasonable.		
36 (b) (i)	For those values that are to be provided by the project participants, does the monitoring plan clearly indicate how the values are to be selected and justified?	Yes, required information is included in the monitoring plan. **CAR 32.** Information regarding monitoring and accounting of the electricity consumed from the grid and self generated in unclear. Please clarify if self generated electricity is accounted into ER calculation, what factor is applied etc. **CL 06.** As verifiers were informed in course of interviews with DIISW's representatives during site visit, coal electrodes and carbon bricks are used in furnace process; however, no information about consumption of this material is absent in the PDD. Please clarify and justify if usage of coal electrodes and carbon bricks is included in the project monitoring. **CL 07.** Please clarify what is implied under primary and secondary production needs for each process covered by the project.	CAR 32 CL 06 CL 07	OK OK OK
36 (b) (ii)	For other values, − Does the monitoring plan clearly indicate the precise references from which these	Clear references for data sources are indicated in the monitoring plan, mainly there are IPCC materials. The use of the values as well as their	CAR 33 CAR 34	OK OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	values are taken? − Is the conservativeness of the values provided justified?	conservativeness is justified. **CAR 33.** As IPCC 2006 has not been officially approved please use IPCC 1996 for reference and make appropriate amendments to the PDD and emission calculation spreadsheets. **CAR 34.** The parameter indicating the emission factor of each fuel is not transparent, especially in respect of gas transportation wastes. Please provide more detailed information on how the parameter is determined, which data of those used to define the parameter's value are measures and which are default factors. For default values clear references should be provided (section B.1).		
36 (b) (iii)	For all data sources, does the monitoring plan specify the procedures to be followed if expected data are unavailable?	Quality assurance and quality control procedures ensuring data availability and credibility are described in the monitoring plan in a proper manner.	OK	OK
36 (b) (iv)	Are International System Unit (SI units) used?	Yes, the ISU is used	OK	OK
36 (b) (v)	Does the monitoring plan note any parameters, coefficients, variables, etc. that are used to calculate baseline emissions or net removals but are obtained through monitoring?	Yes, the amount of fuels used in each process, quantity of materials and reducing agents and electricity consumed in the baseline are monitored ex-post; all monitored parameters used for baseline emission calculation are described and justified in the monitoring plan.	OK	OK
36 (b) (v)	Is the use of parameters, coefficients, variables, etc. consistent between the baseline and monitoring plan?	The monitoring approach developed for this project is consistent with the assumptions and procedures adopted in the baseline approach. The monitoring	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		approach requires monitoring and measurement of variables and parameters necessary to quantify the baseline emissions and project emissions in a conservative and transparent way. All parameter, default coefficients, variables are consistent between baseline and monitoring plan.		
36 (c)	Does the monitoring plan draw on the list of standard variables contained in appendix B of "Guidance on criteria for baseline setting and monitoring"?	The monitoring plan uses some standard variables contained in appendix B of the "Guidance".	OK	OK
36 (d)	Does the monitoring plan explicitly and clearly distinguish: (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination? (ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination? (iii) Data and parameters that are monitored throughout the crediting period?	**CAR 35.** The monitoring plan should clearly and explicitly indicate: (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination? (ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination? (iii) Data and parameters that are monitored throughout the crediting period. Please provide.	CAR 35	OK
36 (e)	Does the monitoring plan describe the methods employed for data monitoring (including its frequency) and recording?	The method employed for data monitoring including monitoring frequency and recording is described in sufficient details.	OK	OK
36 (f)	Does the monitoring plan elaborate all	All necessary algorithms and formulas are	CAR 36	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	algorithms and formulae used for the estimation/calculation of baseline emissions/removals and project emissions/removals or direct monitoring of emission reductions from the project, leakage, as appropriate?	elaborated in the monitoring plan. **CAR 36.** Please include and describe in the monitoring plant formulae used for calculation of the project emissions.		
36 (f) (i)	Is the underlying rationale for the algorithms/formulae explained?	The justification for all formulas and algorithms are provided.		OK
36 (f) (ii)	Are consistent variables, equation formats, subscripts etc. used?	Mainly, all formulas, variable etc. are consistent. **CAR 37.** In order to eliminate the duplication on the same data please use one parameter for default values which are identical for each process under baseline as well as the project line (e.g., electricity emission factor, emission factors for fuels etc.).	CAR 37	OK
36 (f) (iii)	Are all equations numbered?	Yes, all formulas are numbered. See section B and D of the PDD.	OK	OK
36 (f) (iv)	Are all variables, with units indicated defined?	All variables are defined, described and units indicated.	OK	OK
36 (f) (v)	Is the conservativeness of the algorithms/procedures justified?	The algorithms and procedures are conservative which is justified appropriately.	OK	OK
36 (f) (v)	To the extent possible, are methods to quantitatively account for uncertainty in key parameters included?	The level of uncertainty of the key parameters is indicated in the section D.2 of the PDD.	OK	OK
36 (f) (vi)	Is consistency between the elaboration of the baseline scenario and the procedure for calculating the emissions or net removals of the baseline ensured?	The consistency between identified baseline scenario and baseline emission calculation procedure is available. The monitoring approach developed for the project is consistent with the	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		assumptions and procedures adopted in the baseline approach.		
36 (f) (vii)	Are any parts of the algorithms or formulae that are not self-evident explained?	All formulas and algorithms are described in sufficient details.	OK	OK
36 (f) (vii)	Is it justified that the procedure is consistent with standard technical procedures in the relevant sector?	The data collected is rigorously monitored as part of normal operation process of the plant. Data required for the monitoring plan for the project will be closely tracked as integral part of the steel plant's core business, and the monitoring procedures used are standard technical procedures for the steel-making sector in Ukraine.	OK	OK
36 (f) (vii)	Are references provided as necessary?	In most cases references are provided. Some information left unreferenced. **CAR 38.** Please indicate more precise references to the documentation used, e.g. for IPCC the Volume, Chapter, table should be stated, and provide the web-links to the JISC/EB documentation referred in the PDD (e.g., Guidance on criteria for baseline setting and monitoring, Additionality Tool etc.). **CAR 39.** The reference to the source of standard IPCC factors for reducing agents, i.e. coke, anthracite and coal, is inappropriate: the stated referenced document does not contain indicated values. Please provide adequate reference.	CAR 38 CAR 39	OK OK
36 (f) (vii)	Are implicit and explicit key assumptions explained in a transparent manner?	The detailed explanation of all assumptions is provided in a sufficient and transparent manner	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
		under the section D.1 of the PDD.		
36 (f) (vii)	Is it clearly stated which assumptions and procedures have significant uncertainty associated with them, and how such uncertainty is to be addressed?	The level of uncertainty of key parameters is identified and described D.2 of the PDD.	OK	OK
36 (f) (vii)	Is the uncertainty of key parameters described and, where possible, is an uncertainty range at 95% confidence level for key parameters for the calculation of emission reductions or enhancements of net removals provided?	See 36 (f) (vii) above	OK	OK
36 (g)	Does the monitoring plan identify a national or international monitoring standard if such standard has to be and/or is applied to certain aspects of the project? Does the monitoring plan provide a reference as to where a detailed description of the standard can be found?	No special national or international monitoring standard is applied, although project monitoring complies with Ukrainian norms and regulations and specific industry standard in metering equipment calibration, measurements etc.	OK	OK
36 (h)	Does the monitoring plan document statistical techniques, if used for monitoring, and that they are used in a conservative manner?	Statistical techniques are not used in course of current project monitoring.	N/A	N/A
36 (i)	Does the monitoring plan present the quality assurance and control procedures for the monitoring process, including, as appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept and made available upon request?	The appropriate information regarding quality assurance and control procedures as to the project monitoring in the whole and separate monitoring parameters is reflected in the monitoring plan and provided under the section D.2 of the PDD.	OK	OK
36 (j)	Does the monitoring plan clearly identify	The monitoring plan clearly identifies the	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	the responsibilities and the authority regarding the monitoring activities?	responsibilities and the authority regarding the monitoring activities. The data required to monitor the ERs is routinely collected within the normal operations of the DIISW therefore monitoring is integral part of routine monitoring. The Monitoring Plan will be implemented by different specialists of the DIISW under supervision of Head of Technical Directorate's Technical Department and managed by top management of the Plant. All the main production shops and specialists of the plant will be involved into the preparation of monitoring report under coordination of Head of Technical Directorate's Technical Department. The assigned roles and responsibilities for project monitoring as well as a comprehensive organization chart of DIISW JI project management at DIISW is presented in the PDD.		
36 (k)	Does the monitoring plan, on the whole, reflect good monitoring practices appropriate to the project type? If it is a JI LULUCF project, is the good practice guidance developed by IPCC applied?	The current monitoring plan reflects good monitoring practices and is appropriate to the project type. The identical monitoring methods were used under the similar registered JI project implemented on the Alchevsk Steel Mill.	OK	OK
36 (l)	Does the monitoring plan provide, in tabular form, a complete compilation of the data that need to be collected for its application, including data that are measured or sampled and data that are collected from other sources but not including data that are calculated with	Yes, the compilation in tabular form on monitoring parameters are provided using format of the tables from Guidelines for JI PDD user. **CAR 40.** Some of the stated parameters are determined whereby calculations which include measured values, however no detailed information	CAR 40	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	equations?	on data source, time of determination etc. for such measured values is presented. In order to ensure transparent project monitoring please provide detailed information on all values which are measured or collected from other sources in course of monitoring under the project (in the tabular format prescribed by the Guidance for JI PDD form users or JI PDD form), see sections B.1 and D.1. Data which are calculated with equations should not be included into compilation.		
36 (m)	Does the monitoring plan indicate that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project?	It is indicated that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project. **FAR 01:** In order to ensure that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project a special documented instruction on monitoring data storage must be issued.	FAR 01	To be checked in course of the 1st verification.
37	If selected elements or combinations of approved CDM methodologies or methodological tools are used for establishing the monitoring plan, are the selected elements or combination, together with elements supplementary developed by the project participants in line with 36 above?	No approved CDM methodology is available for the project type, however, the monitoring plan for the given project is identical to the one used for the "Revamping and Modernisation of the Alchevsk Steel Mill" JI Project (Registration Number UA 1000022).	OK	OK
Approved CDM methodology approach only				
38 (a)	Does the PDD provide the title, reference number and version of the approved CDM	The JI specific approach is used, the section is not applicable.	N/A	N/A

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	methodology used?			
38 (a)	Is the approved CDM methodology the most recent valid version when the PDD is submitted for publication? If not, is the methodology still within the grace period (was the methodology revised to a newer version in the past two months)?	N/A	N/A	N/A
38 (b)	Does the PDD provide a description of why the approved CDM methodology is applicable to the project?	N/A	N/A	N/A
38 (c)	Are all explanations, descriptions and analyses pertaining to monitoring in the PDD made in accordance with the referenced approved CDM methodology?	N/A	N/A	N/A
38 (d)	Is the monitoring plan established appropriately as a result?	N/A	N/A	N/A
Applicable to both JI specific approach and approved CDM methodology approach				
39	If the monitoring plan indicates overlapping monitoring periods during the crediting period: (a) Is the underlying project composed of clearly identifiable components for which emission reductions or enhancements of removals can be calculated independently? (b) Can monitoring be performed independently for each of these components (i.e. the data/parameters monitored for one component are not dependent on/effect data/parameters to be	The monitoring plan does not indicate overlapping monitoring periods during the crediting period.	N/A	N/A

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	monitored for another component)? (c) Does the monitoring plan ensure that monitoring is performed for all components and that in these cases all the requirements of the JI guidelines and further guidance by the JISC regarding monitoring are met? (d) Does the monitoring plan explicitly provide for overlapping monitoring periods of clearly defined project components, justify its need and state how the conditions mentioned in (a)-(c) are met?			
Leakage				
JI specific approach only				
40 (a)	Does the PDD appropriately describe an assessment of the potential leakage of the project and appropriately explain which sources of leakage are to be calculated and which can be neglected?	The PDD appropriately describes an assessment of the potential leakage of the project and appropriately explains which sources of leakage are to be calculated, and which can be neglected. The leakage analysis showed that there should be no leakages expected from the project as long as the old technology employed is decommissioned and not used again somewhere else. The project developer will document that the previous equipment is decommissioned. The emissions from installing the new equipment will not be significant. The emissions from transport of materials will not be significantly higher for the baseline; however, this will not be taken into account to secure conservativeness of the analysis.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
40 (b)	Does the PDD provide a procedure for an ex ante estimate of leakage?	Refer to 40 (a) above.	Refer to 40 (a) above.	OK
Approved CDM methodology approach only				
41	Are the leakage and the procedure for its estimation defined in accordance with the approved CDM methodology?	The JI specific approach is used, the section is not applicable.	N/A	N/A
Estimation of emission reductions or enhancements of net removals				
42	Does the PDD indicate which of the following approaches it chooses? (a) Assessment of emissions or net removals in the baseline scenario and in the project scenario (b) Direct assessment of emission reductions	The assessment of emissions in baseline scenario and in the project scenario is chosen which corresponds to the monitoring Option 1, thus the approach 42 (a) is chosen.	OK	OK
43	If the approach (a) in 42 is chosen, does the PDD provide ex ante estimates of: (a) Emissions or net removals for the project scenario (within the project boundary)? (b) Leakage, as applicable? (c) Emissions or net removals for the baseline scenario (within the project boundary)? (d) Emission reductions or enhancements of net removals adjusted by leakage?	The approach in 42 (a) is chosen for emission reduction calculation. The PDD provides ex ante estimates of: (a) Emissions for the project scenario (Section E.1); (b) Leakage (Section E.2); (c) Emissions for the baseline scenario (Section E.4); (d) Emission reductions adjusted by leakage (Section E.6).	OK	OK
44	If the approach (b) in 42 is chosen, does the PDD provide ex ante estimates of: (a) Emission reductions or enhancements of net removals (within the project boundary)?	The approach (a) in 42 is chosen.	N/A	N/A

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	(b) Leakage, as applicable? (c) Emission reductions or enhancements of net removals adjusted by leakage?			
45	For both approaches in 42 (a) Are the estimates in 43 or 44 given: (i) On a periodic basis? (ii) At least from the beginning until the end of the crediting period? (iii) On a source-by-source/sink-by-sink basis? (iv) For each GHG? (v) In tones of CO2 equivalent, using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5 of the Kyoto Protocol? (b) Are the formula used for calculating the estimates in 43 or 44 consistent throughout the PDD? (c) For calculating estimates in 43 or 44, are key factors influencing the baseline emissions or removals and the activity level of the project and the emissions or net removals as well as risks associated with the project taken into account, as appropriate? (d) Are data sources used for calculating the estimates in 43 or 44 clearly identified, reliable and transparent? (e) Are emission factors (including default	The estimates are given for each year from the beginning until the end of the crediting period (starting from 2008 ending 2020) on a source-by-source basis for each gas in tones of CO2 eq. The formulas used for estimate calculation and estimates per se are consistent throughout the PDD. The key factors having impact on baseline and activity level as well as risks were considered appropriately. All data sources are reliable are indicated in transparent manner. The choice of the emission factors (carbon emission factor for grid electricity consumption for Ukraine, emission factors for fuels, reducing agent and other inputs used) are justified. The accuracy and reasonable of the factor is ensured. The values are taken from identified sources. All estimations are made using conservative assumption and are consistent throughout the PDD. The annual average of estimated emission reductions are calculated by dividing the total estimated emission reductions over the crediting period by the total months of the crediting period and multiplying by twelve.	CAR 41	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	emission factors) if used for calculating the estimates in 43 or 44 selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice? (f) Is the estimation in 43 or 44 based on conservative assumptions and the most plausible scenarios in a transparent manner? (g) Are the estimates in 43 or 44 consistent throughout the PDD? (h) Is the annual average of estimated emission reductions or enhancements of net removals calculated by dividing the total estimated emission reductions or enhancements of net removals over the crediting period by the total months of the crediting period and multiplying by twelve?	**CAR 41.** Please update the GHG emission calculation data with regard to indicators of LF1 operation as data in PDD ver.1 do not reflect the actual situation observed during site visit.		
46	If the calculation of the baseline emissions or net removals is to be performed ex post, does the PDD include an illustrative ex ante emissions or net removals calculation?	The baseline emissions are determined based on monitored amounts of fuels, materials, reducing agents and electricity used for each process attributable to the project. Thus, the ex ante emission calculation for baseline are provided in the PDD.	OK	OK
Approved CDM methodology approach only				
47 (a)	Is the estimation of emission reductions or enhancements of net removals made in accordance with the approved CDM methodology?	The JI specific approach is used, the section is not applicable.	N/A	N/A
47 (b)	Is the estimation of emission reductions or enhancements of net removals presented	N/A	N/A	N/A

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	in the PDD: − On a periodic basis? − At least from the beginning until the end of the crediting period? − On a source-by-source/sink-by-sink basis? − For each GHG? − In tones of CO_2 equivalent, using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5 of the Kyoto Protocol? − Are the formula used for calculating the estimates consistent throughout the PDD? − Are the estimates consistent throughout the PDD? − Is the annual average of estimated emission reductions or enhancements of net removals calculated by dividing the total estimated emission reductions or enhancements of net removals over the crediting period by the total months of the crediting period and multiplying by twelve?			
Environmental impacts				
48 (a)	Does the PDD list and attach documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in	The PDD (sections F.1 and F.2) provides the information on documentation containing the analysis of the environmental impacts of the project, including transboundary impacts, in	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	accordance with procedures as determined by the host Party?	accordance with procedures as determined by the host Party, such as project's Environmental Impact Assessment (EIA). EIA was developed by Ukrainian State Steelworks Design Institute (Ukrdipromez) and provides assessment of impact of the project activity on various components of natural, social, and manmade environment. Recognizing the incremental nature of the overall project's implementation covering the installation of Ladle Furnaces (LFs) and seven-strand billet Continuous Casting Machines (CCMs), the EIA was undertaken for each project phase as the first and the second parts of the design and engineering documents were prepared for the mandatory technical approvals, one step in which was the formal State Environmental Due Diligence. As a result, the EIA for DIISW was presented in two volumes: one as part of the project proposal for refurbishment of the Converter shop and installation of LF 1, and the other one as part of the project proposal for refurbishment of Continuous Casting section at the converter shop with installation of two billet CCMs and LF 2.		
48 (b)	If the analysis in 48 (a) indicates that the environmental impacts are considered significant by the project participants or the host Party, does the PDD provide conclusion and all references to supporting documentation of an environmental impact assessment undertaken in accordance with	The PDD provides conclusion and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party. The general environmental impact opinion derived via the procedure endorsed by the Ukrainian government is that the project will have a positive	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft conclusion	Final conclusion
	the procedures as required by the host Party?	environmental impact and its foreseeable emergency negative impacts will be insignificant and easily repaired. Moreover, the project activity will cause no harmful transboundary impacts. Positive opinions and relevant permits received by the project from the number of government agencies evidence that the proposed project activity will have comprehensive positive impact on various aspects of activity of the local community, and that decisions that were made were transparent and independent to the extent required by the Ukrainian law.		
Stakeholder consultation				
49	If stakeholder consultation was undertaken in accordance with the procedure as required by the host Party, does the PDD provide: (a) A list of stakeholders from whom comments on the projects have been received, if any? (b) The nature of the comments? (c) A description on whether and how the comments have been addressed?	Information about the project was published in Dniprodzerzhynsk media. The relevant consultations with local stakeholders were conducted in May 2010 by representatives of the Institute for Environment and Energy Conservation jointly with DIISW personnel. No negative comments toward project implementation were received. Relevant information on stakeholder comments is included in the project's environmental impact assessment completed in accordance with Ukrainian statutory requirements. The required information is provided in the section G.1 of the PDD.	OK	OK
Determination regarding small-scale projects (additional elements for assessment)_Paragraphs 50 - 57_Not applicable				
Determination regarding land use, land-use change and forestry projects _Paragraphs 58 – 64(d)_Not applicable				
Determination regarding programmes of activities_Paragraphs 66 – 73_Not applicable				

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Determination team conclusion
CAR 01. Please clearly describe the baseline of the proposed project in section A.2 of the PDD as required by Guidelines for JI PDD form users.	Description of the project	*Response #1:* The modifications to the PDD version 2 of 14.12.2010 were done. The baseline of the proposed project was described as follows: Annual output increase to 4.2 – 4.5 million tons was planned to be achieved using existing equipment base, without any additional investments; workflows were expected to be distributed among existing facilities based on their available capacity. Therefore the baseline of the proposed project activity is steel production based on utilization of the existing process lines (Blooming Mill 1150, Blooming Mill 1050 with a structural mill, mill 500 and continuous bloom casters nos. 2 and 3 delivering billets for billet mill and other mills) based on steelmaking technology currently used in the iron and steel works.	*Conclusion on response #1:* In A.2 (2nd paragraph) wrong abbreviation of continuous bloom casters (CSC vs. CBS) *Final conclusion:* The issue is closed based on appropriate information and corrections provided.

		Response #2: Was modified as requested in the PDD version 3 of 11/01/2011.	
CAR 02. The Institute for Environment and Energy Conservation is indicated as a project participant in the section A.3, however, in the sections B.4, D.4 it is stated that this organization is not a project participant. Please make the information consistent.	Project participants	*Response #1:* The Institute for Environment and Energy Conservation is not a project participant. The section A.3 was modified accordingly in the PDD version 3 of 11/01/2011. *Response #2*: The PDD was modified accordingly.	*Conclusion on response #1:* Please exclude Institute for Environment and Energy Conservation from Annex 1. *Final conclusion:* The revised PDD was reviewed; the information on project participants was found consistent. The issue is closed.
CAR 03. The format of the table in section A.3 prescribed by the Guidelines for JI PDD form users is not followed. Please correct.	Project participants	The table in section A.3. is now modified in accordance with the Guidelines for JI PDD form users. Please see modified PDD, version 2, dated 14.12.2010.	The issues is closed based on due corrections made.
CAR 04. Please provide more exact details of project site physical location, including information allowing the unique identification of the project in the section A.4.1.4 of the PDD.	Location of the project	More exact details of project site physical location have been provided. The relevant corrections have been made in the PDD version 2, dated 14.12.2010.	The required information was presented in the revised PDD. It was reviewed and found to be sufficient. The issue is closed.

CAR 05. In the section A.4.3.1 of the PDD please provide separate tables with estimated amount of emission reductions for Kyoto protocol commitment period and for the period following commitment period with data for each year of the crediting period. Please make the table format compliant with the Guidelines for JI PDD form users.	Project technology	*Response #1:* Separate tables with estimated amount of emission reductions for Kyoto protocol commitment period and for the period following commitment period with data for each year of the crediting period are now included in the modified PDD (version 2, dated 14.12.2010). The tables are in accordance with the Guidelines for JI PDD form users. *Response #2*: The total amount of emission reductions for the period 2008-2012 together with annual average for 2008-2012 is now modified. Please see PDD, version 3, dated11/01/2011. *Response #3* Tables in Section A.4.3.1 are now modified (please see PDD version 3). Project emissions, baseline emissions together with emission reductions (which are provided in this section) are rounded to the whole figure (1t) and are based on calculations which are demonstrated in attached excel file.	*Conclusion on response #1:* The total amount of emission reductions for the period 2008-2012 stated in the section A.4.3.1 does not represent the sum of annual values for this period. Furthermore, the indicated annual average for 2008-2012 is incorrect. *Conclusion on response #2:* In section E of the PDD the arithmetic sums of values are not consistent. Please correct. *Final conclusion:* The undertaken corrections and clarification made to the PDD was found adequate. The issue is closed.

CAR 06. The project has no approval of the host Party (Ukraine) no by other Party involved (Spain) were provided.	19	The letter of endorsement (LoE) from the Ukrainian government was issued on 21st of January 2010. According to the national regulations in Ukraine, the letter of approval (LoA) for the proposed JI project activity can be issued only after completion of determination report.	The conclusion on the CAR is pending the written project approvals by the Parties involved.
CAR 07. The authorizations of the legal entities project participant by the Parties involved are absent.	21	The official authorization of each legal entity listed as project participant in the PDD by Parties involved will be provided in the written project approvals which will be received after submission of the determination report to the Ukrainian DFP.	The conclusion on the CAR is pending the written project approvals (refer to CAR 06) and authorization by the Parties involved.
CAR 08. Please provide the summary of rundown of the technical steelmaking potential currently existing in Ukraine in the given PDD.	23	The summary of rundown of the technical steelmaking potential currently existing in Ukraine was modified in the PDD version 2, dated 14.12.2010 .	The information provided in the PDD comprehensively describe of rundown of the technical steelmaking potential currently existing in Ukraine. The issue is closed.

CAR 09. The tables containing key information and data used for establishing baseline (section B.1) do not include the information on justification of the choice of data or description of measurement methods and procedures applied. The data sources should be stated more precisely. Moreover, the format of the tables does not correspond to the Guidelines for JI PDD form users. Please make appropriate corrections.	23	The tables containing key information and data used for establishing baseline are now modified in accordance with Guidelines for JI PDD form users. Together with this, more detailed information concerning data sources and justification of the choice of data or description of measurement methods and procedures applied is now included in the tables containing key information and data used for establishing baseline. Please see modified PDD, version 2, dated 14.12.2010.	The revised PDD was reviewed and the corrections made and additional information provided was found sufficient. The issue is closed.

CAR 10. The electricity emission factor indicated in the PDD does not correspond to the factor used for emission calculations in Excel spreadsheets. Please make the information and calculations consistent in the PDD and supporting documentation. If in the calculations an emission factor for electricity consumption is used which has never been applied before in any approved JI project, a detailed information/references on the factor as well as justification for its application must be provided.	25	Response #1: Information regarding new emission factor together with its justification is now included in the text of PDD. Please see modified PDD version 2, dated 14.12.2010. Detailed references on the factor used are now provided to the verifier. Response #2: During 2008 the carbon emission factor for electricity consumption is based on the order of the National environmental investment agency of Ukraine #62 dated 15th of April 2011. During 2009 the carbon emission factor for electricity consumption is based on the order of the National environmental investment agency of Ukraine #63 dated 15th of April 2011. During 2010 the carbon emission factor for electricity consumption is based on the order of the National environmental investment agency of Ukraine #43 dated 28th of March 2011. Starting from year 2011 the carbon emission factor for electricity consumption is based on the order of the National environmental investment agency of Ukraine #75 dated 12th of May 2011. If any other emission factors will be officially approved, the project developer will make an appropriate modification at the stage of monitoring report development. The changes were introduced in the PDD ver.8 .	Conclusion on response #1: The PDD indicates that the emission factor for electricity consumption is used from the study "Development of the electricity carbon emission factors for Ukraine" elaborated by the consultant Lahmeyer International under assignment from the European Bank for Development and Reconstruction (EBRD) dated 14/10/2010. However, during the determination process on 28 March 2011 the Order of the National environmental investment agency of Ukraine #43 on approval of CO2 factors for Ukraine in 2010 was issued, therefore, the PDD must be revised according to the new factor approved at national level for JI projects. Final conclusion: The updated PDD and emission reduction estimation in Excel spreadsheets were reviewed. The information was found appropriate.

CAR 11. In the section B.2 of the PDD please describe why and how the Additionality Tool is applicable for assessing additionality of the proposed JI project.	29 (a)	The modifications have been done to the section B.2 of the PDD version 2 dated 14.12.2010 as follows: The following stepwise approach is used to demonstrate that the project provides reductions in emissions by sources that are additional to any that would occur otherwise: Step 1. Indication and description of the approach applied A JI specific approach is used, therefore one of the approaches, defined in paragraph 2 of the annex I to the "Guidance on criteria for baseline setting and monitoring", to demonstrate additionality of the project shall be used. As suggested by paragraph 2 (c) of the annex I to the "Guidance on criteria for baseline setting and monitoring" the most recent version of the Tool for the Demonstration and Assessment of Additionality approved by CDM Executive Board (version 05.2) is used to demonstrate the additionality of the project. Step 2. Application of the approach	The issue is closed based on corrections made to the 1st version of the PDD.

		chosen This section includes analysis of project additionality and is intended to demonstrate that the project scenario is not part of the identified baseline scenario and that the project will lead to reductions of GHG emissions in comparison to the baseline. The analysis below is performed following steps of the latest version (version 05.2) of the Tool for the Demonstration and Assessment of Additionality approved by CDM Executive Board, which accordingly may be fully applied to Joint Implementation Projects.	

CAR 12. The use of benchmark analysis for the present project is the valid method for the present project. However, the benchmark introduced can not be considered as the proper measure as the benchmark is derived from integral loan interest rate calculated by the NBU using the pool of the loans issued in all currencies including UAH as well. All calculations in the present project financial model are made in USD, thereby the interest rates for the loans issued in foreign currency shall be used instead (the relevant data is available from NBU web site). Please correct.	29 (b)	*Response #1:* All calculations in the present project financial model were realized in USD. But the investment for the project activity was partly realized in USD and partly in UAH. Therefore interest rate calculated by NBU using the pool of the loans issued in all currencies was used as a benchmark for the benchmark analysis of the proposed project activity. Nevertheless, the project developer has removed Step 2 of the additionality tool from the PDD. Therefore the following CAR is not applicable for the PDD version 2 dated 14.12.2010 as the investment analysis is not used as a tool to prove the additionality of the project. *Response #2:* For the demonstration and assessment of additionality the barrier analysis was used; the investment analysis is presented only for the informational purpose in order to show the whole picture related with the project activity implementation. Nonetheless, the CAR was addressed in the PDD ver.6 of 08/04/2011.	*Conclusion on response #1:* Based on the ITR, the investment analysis for demonstration and assessment of the proposed project's additionality must be performed by the project participants. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

CAR 13. The use of the benchmark as of 2007 is correct as it complies with the article 6. of the Guidance on the Assessment of Investment Analysis. At the same time, presented financial calculations are based on financial data available as of July 2010 i.e. much later than investment decision date. Taking into account the requirement of the Guidance on the Assessment of Investment Analysis the calculations shall be based on the data available as of project starting date. Please make appropriate adjustments.	29 (b)	*Response #1:* The project at DIISW is considered to be quite complicated and long-duration project, which cannot be financed at once or during one year. Also the investment decision does not mean and require the immediate mobilization of investment resources. As it is described in the PDD the project is realised step by step. Each further step requires mobilization of investment. Therefore the data used in the financial calculations of 2010 presents more fair and justified assessment of investment barriers. If the project developer uses the data of 2007 for financial calculations, this could be challenged by observers at any time if any changes with current market data are observed. For simplicity we consider that the data of the year of 2007 are identical to the ones that have been observed in 2010. Nevertheless, the project developer has removed Step 2 of the additionality tool from the PDD. Therefore the following CAR is not applicable for the PDD version 2 dated 14.12.2010 as the investment analysis is not used as a tool to prove the additionality of the project.	*Conclusion on response #1:* Based on the ITR, the investment analysis for demonstration and assessment of the proposed project's additionality must be performed by the project participants. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

		Response #2: For the demonstration and assessment of additionality the barrier analysis was used; the investment analysis is presented only for the informational purpose in order to show the whole picture related with the project activity implementation. Nonetheless, the CAR was addressed in the PDD ver.6 of 08/04/2011.	

CAR 14. Financial model itself represents the analysis of the business operation activities after implementation of the project rather than estimate of the financial effect of the project activities, while the proper method shall be based on comparison of the operational expenses for after-project and before the project situation (the project does not have any significant impact on sales so comparison of expenses ought to be sufficient). The difference of the expenses before and after project will constitute the actual financial effect of the project implemented. Please rework the model accordingly.	29 (b)	*Response #1:* The additionality of the proposed project activity has been proven by step 3 of the "Tool for the demonstration and assessment of additionality". In the PDD version 1 of 16.08.2010 Step 2 of the additionality tool was used only for demonstration purposes. Nevertheless, the project developer has taken into account CAR of AIE and has removed Step 2 of the additionality tool from the PDD. Therefore the following CAR is not applicable for the PDD version 2 dated 14.12.2010 as the investment analysis is not used as a tool to prove the additionality of the project. *Response #2:* For the demonstration and assessment of additionality the barrier analysis was used; the investment analysis is presented only for the informational purpose in order to show the whole picture related with the project activity implementation. Nonetheless, the CAR was addressed in the PDD ver.6 of 08/04/2011.	*Conclusion on response #1:* Based on the ITR, the investment analysis for demonstration and assessment of the proposed project's additionality must be performed by the project participants. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

CAR 15. The project financial model does not contain proper adjustment for inflation during the project period. Taking into account the fact that calculations are made in USD the US inflation rate shall be used for this purpose and for adjusting all future incomes and expenses on yearly basis. Please make appropriate corrections.	29 (b)	*Response #1:* The following CAR is not applicable for the PDD version 2, dated 14.12.2010 as the investment analysis is not used as a tool to prove the additionality of the project. The additionality of the project was proven by the barrier analysis. *Response #2:* For the demonstration and assessment of additionality the barrier analysis was used; the investment analysis is presented only for the informational purpose in order to show the whole picture related with the project activity implementation. Nonetheless, the CAR was addressed in the PDD ver.6 of 08/04/2011.	*Conclusion on response #1:* Based on the ITR, the investment analysis for demonstration and assessment of the proposed project's additionality must be performed by the project participants. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

CAR 16. The Guidance on the Assessment of Investment Analysis, article 4, requires the fair value of the assets at the end of assessment period to be included in the cash flow for the final year. In the case of proposed project the liquidation value of the assets for the final year is not included in the cash flow. Please add reasonable market value of the assets to the cash flow for the final year.	29 (b)	*Response #1:* The following CAR is not applicable for the PDD version 2 dated 14.12.2010 as the investment analysis is not used as a tool to prove the additionality of the project. The additionality of the project was proven by the barrier analysis. *Response #2:* For the demonstration and assessment of additionality the barrier analysis was used; the investment analysis is presented only for the informational purpose in order to show the whole picture related with the project activity implementation. Nonetheless, the CAR was addressed in the PDD ver.6 of 08/04/2011.	*Conclusion on response #1:* Based on the ITR, the investment analysis for demonstration and assessment of the proposed project's additionality must be performed by the project participants. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

CAR 17. In the investment analysis spreadsheet the IRR calculation formula in cell D76 does not account for the years 2021 and 2022. Please correct.	29 (b)	*Response #1:* The following CAR is not applicable for the PDD version 2 dated 14.12.2010 as the investment analysis is not used as a tool to prove the additionality of the project. The additionality of the project was proven by the barrier analysis. *Response #2:* For the demonstration and assessment of additionality the barrier analysis was used; the investment analysis is presented only for the informational purpose in order to show the whole picture related with the project activity implementation. Nonetheless, the CAR was addressed in the PDD ver.6 of 08/04/2011.	*Conclusion on response #1:* Based on the ITR, the investment analysis for demonstration and assessment of the proposed project's additionality must be performed by the project participants. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

CAR 18. The depreciation rate applied for calculation of the pre-tax income does not meet the requirements of the Ukrainian tax legislation (please refer to the Law of Ukraine "On taxation of enterprises' income No.334/94-VR".	29 (b)	*Response #1:* The following CAR is not applicable for the PDD version 2 dated 14.12.2010 as the investment analysis is not used as a tool to prove the additionality of the project. The additionality of the project was proven by the barrier analysis. *Response #2:* For the demonstration and assessment of additionality the barrier analysis was used; the investment analysis is presented only for the informational purpose in order to show the whole picture related with the project activity implementation. Nonetheless, the CAR was addressed in the PDD ver.6 of 08/04/2011.	*Conclusion on response #1:* Based on the ITR, the investment analysis for demonstration and assessment of the proposed project's additionality must be performed by the project participants. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

CAR 19. When calculating EBT the profit for the losses suffered during 2009-2010 was not adjusted thereby overstating the income taxes for 2011. Please correct.	29 (b)	*Response #1:* The following CAR is not applicable for the PDD version 2 dated 14.12.2010 as the investment analysis is not used as a tool to prove the additionality of the project. The additionality of the project was proven by the barrier analysis. *Response #2:* For the demonstration and assessment of additionality the barrier analysis was used; the investment analysis is presented only for the informational purpose in order to show the whole picture related with the project activity implementation. Nonetheless, the CAR was addressed in the PDD ver.6 of 08/04/2011.	*Conclusion on response #1:* Based on the ITR, the investment analysis for demonstration and assessment of the proposed project's additionality must be performed by the project participants. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

CAR 20. In order to ensure transparency and possibility to reproduce stated results of the investment analysis presented please submit the spreadsheets with calculation of sensitivity analysis indicating formulas.	29 (b)	*Response #1:* The following CAR is not applicable for the PDD version 2, dated 14.12.2010 as the investment analysis is not used as a tool to prove the additionality of the project. The additionality of the project was proven by the barrier analysis. *Response #2:* For the demonstration and assessment of additionality the barrier analysis was used; the investment analysis is presented only for the informational purpose in order to show the whole picture related with the project activity implementation. Nonetheless, the CAR was addressed in the PDD ver.6 of 08/04/2011.	*Conclusion on response #1:* Based on the ITR, the investment analysis for demonstration and assessment of the proposed project's additionality must be performed by the project participants. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

CAR 21. Please note that the facts represented in step 3 as the justification of the low credit rating is often referred to the facts of 2009-2010 which is not correct taking into account the fact that the project decision has been made in 2007 and the project started in 2008. In addition the barriers arising from the crisis in Ukrainian metallurgy starting September 2008 did not hinder implementation of at least the first stage of the present project. Please make appropriate adjustments.	29 (b)	*Response #1:* The facts represented in step 3 as the justification of the low credit rating are referred to the facts of 2007, 2008 and 2009. Although the investment decision was taken in 2007, the investment of the project was realized step-by-step, which means that loans for the proposed project activity were not attracted at once. The facts of 2008 and 2009 were presented to show that continuation of the proposed project activity was under the risk, as described below. The world economic crisis began in 2007 and has resulted in the collapse of large financial institutions, the bailout of banks by national governments, and downturns in stock markets around the world. In many areas, the housing market has also suffered. It contributed to the failure of key businesses, declines in consumer wealth estimated in the trillions of U.S. dollars, substantial financial commitments incurred by governments, and a significant decline in economic activity. Being aware of the situation in the world and understanding its consequences, IUD corporation would not implement the modernization of DIISW, as it was too risky.	*Conclusion on response #1:* The developer is correct emphasizing the fact the project is ongoing activity with several discrete block that can be implemented separately, step-by-step. At the same time the reference that the “Being aware of the situation in the world and understanding its consequences, IUD corporation would not implement the modernization of DIISW” is obviously contradicts with the fact that during 2007-2008 combined net profit of DIISW (UAH 538,4 mln. and 91,6 mln.) has been sufficient to finance the first half of the project. Please clarify the statement regarding “low debt-to-income ratio in comparison to Russian and other foreign companies”. Low debt to income ratio usually indicates that the company’s activities are mainly financed by its equity and its loan portfolio is comparatively small so it has Debt/Equity ratio rather attractive for external investors.

		The JI mechanism of the Kyoto protocol gave the possibility to IUD to implement the modernization of the plant. Implementing simultaneously modernization of other enterprises ("Revamping of sintering and blast-furnace production at AISW" from 2003-till now, "Revamping of sintering and blast-furnace production at DIISW" from 2004 till now and "Revamping and modernization of the Alchevsk Steel Mill" from 2005 to 2009) IUD corporation was forced to use borrowed funds. As a result in 2008 the impact of global economic crisis lead to IUDs inability to solve and therefore put under the risk not only accomplishment of the proposed project activity, but also of other mentioned JI projects. DIISW, as part of IUD, was unable to take new loans amid financial and economy hurdles, neither in the form of project finance nor as a way to make up its operating capital requirements, which eventually lead to IUDs inability to complete several initiated JI projects at other sites.	*Final conclusion:* The issue is closed based on due amendments made to the PDD.

		Therefore, it will be fair to say that the world economic crisis, which began in 2007 and therefore the crisis in Ukrainian metallurgy hindered implementation of all phases of the proposed project activity. Also, in 2007 Fitch agency stated the following about IUD corporation: IUD corporation has a low debt-to-income ratio in comparison to Russian and other foreign companies. This may restrict financial flexibility of the corporation. *Response #2:* The following information was added to the PDD of 11/01/2011: During the years 2007 – 2008 DIISW spent UAH 1,4 billion on modernization of the plant. At the same time, during the same years net profit of the plant and attracted financing were much lower, therefore it was difficult for DIISW to complete even the first phase of the project activity due to the envisaged other investments, for instance into construction of two CCGTs with a capacity of 303 MWe (estimated USD 300 mio. and around USD 180 mio. were already spent), project has been initiated as a potential JI project and has received the LoE,	

		however was not started due to lack of investments to cover the local works) as well as into revamping of sintering and pig iron production (by the end of 2007 the total investments for the project reached almost 200 mio. USD. The project has been also developed as the JI one and it has already received a positive determination report. Therefore the general conclusion is that DIISW did not have enough financial resources to finance even the first part of the project activity facing financial barriers. As a result DIISW relied on financing from IUD Corporation which, in turn, started to feel difficulties with attraction of additional financing for DIISW as in 2007 it had already spent more than USD 1 billion on modernization of its other enterprises.	

CAR 22. No publicly available sources confirming high debt burden of IUD are presented when IUD unattractive credit profile is described. Please provide the reference and details, for example D/E, EBITDA/Debt Servicing ratios.	29 (b)	*Response #1:* The sources confirming high debt burden of IUD are not available as this information is confidential. IUD is not a public company and the requested information can be provided only upon AIE personal request to IUD under conditions of severe confidentiality. *Response #2:* Official information regarding high debt burden of IUD cannot be published at publicly available sources as it may have negative consequences for IUDs public image. However, there are independent and reliable sources which give evidence of IUDs hard situation. The sources are presented as follows: 1. http://www.ukrrudprom.com/digest/ISD_dogovarivaetsya_o_restrukturizatsii.html	*Conclusion on Response #1:* Please note that Tool for the demonstration and assessment of additionality requires to "provide transparent and documented evidence, and offer conservative interpretations of this documented evidence" in order to prove the presence of the barrier. I kindly ask you to provide documented confirmation supporting the presence of the investment barrier for the present project. *Final conclusion:* The issue is closed based on due amendments made to the PDD.

		2. http://af.reuters.com/article/metalsNews/idAFLDE66Q19B20100727 3. http://www.ft.com/cms/s/0/bdb0f1d4-fa22-11de-beed-00144feab49a.html Therefore we consider that information from these sources show transparently that the project activity faced and still faces investment barriers. The following sources are now indicated in the PDD version 3, dated 11/01/2011.	
CAR 23. Please apply the structure of Additionality Tool for demonstration and assessment of additionality, i.e., outcomes for each step and sub-step shall be clearly stated (refer to section B.2). Additionally, please provide overall conclusion on whether proposed project is proved to be additional.	30	The structure of Additionality Tool was applied as requested.	The revised PDD was reviewed. The corrections made were found adequate. The issue is closed.

CAR 24. The information regarding starting date of the project is inappropriate. According to the Glossary of JI terms the starting date of the project is the date on which the implementation or construction or real action of the project begins. Thus, if the project set off in August 2008 with commissioning of the CCM 1 the 1st October 2008 can not be considered as the date of project commencement. Please make respective corrections in the PDD (in all relevant section, i.e. A.2, C.1 etc.).	34 (a)	On the assumption of documents in the annex the starting date of the project shall be considered as 5th of April 2007. The relevant corrections have been made in the PDD version 2 of 14.12.2010.	The issue is closed based on due corrections made to the 1st version of the PDD.
CAR 25. The scheme with project implementation schedule containing in the section A.4.2 of the PDD indicates that the project started in 2007 which contradicts the information about project commencement stated in other sections of PDD, e.g. section A.2. Please make the information consistent.	34 (a)	*Response #1:* On the ground of refined data the scheme with project implementation schedule containing in the section A.4.2 of the PDD and project commencement stated in other sections of PDD, e.g. section A.2 was adjusted. The information was made consistent in the PDD version 2, dated 14.12.2010. *Response #2:* In the section A.2 a mistake was made. The project started with the construction works on LF1. The corrections were done in the PDD version 3 of 11/01/2011.	*Conclusion on response #1:* In the section A.2 it is stated that the project started with the beginning of construction works of CCM 1, but from the table 1 (project implementation schedule) in the section A.4.2 it can be understood that 1st activities under the project related to LF 1. Please clarify/correct. *Final conclusion:* The updated PDD was reviewed and found appropriate with regards to the required corrections. The issue is closed.
CAR 26. Project operation lifetime should be indicated in years and months.	34 (b)	The modifications have been done to the PDD as requested. Please see PDD version 3 of 11/01/2011.	The issue is closed based on due amendments made to the PDD.

CAR 27. It should be noted that if ERU estimates are provided up to 2020, then the length of the whole period from 2008 to 2020 and separately length of Kyoto and post-Kyoto periods are to be stated. Please indicate the length of the crediting period in years and months for periods during (2008-2012) and after (2013-2020) the 1st commitment period (see section C.3 of the PDD).	34 (c)	*Response #1:* The modifications have been done to the PDD as requested. Please see PDD version 3 of 11/01/2011. *Response #2:* Further modifications have been done.	*Conclusion on response #1:* Crediting period starts from Q3 2008, but in the section C it is 01/01/2008, which is not correct, and in respect of this the length of the crediting period during 1st commitment period is indicated incorrectly. *Final conclusion:* The modifications made were found adequate. The issue is closed.
CAR 28. In section A ER estimates are given for 2008-2020, but in the section E estimates are provided only for 2008-2012. Please supplement the section E with estimates for 2013-2020 and provide Excel spreadsheets with detailed calculations for this period.	34 (d)	Information regarding emission reductions after 2012 is now included in the PDD version 3	The CAR is closed on the basis of required information provide and corrections made to the PDD.
CAR 29. The project implies that pig iron consumption will be reduced due to the project activity, but the section D.1, item 9, contained the controversial statement: "Under the baseline scenario, pig iron consumption will be equal to the amount of pig iron used in steel production under the project scenario". Please correct.	36 (a)	Corrections have been done in paragraphs 9, of Section D.1 in PDD ver.3.	The correction made to the PDD was found sufficient. The issue is closed.
CAR 30. The information provided under section D.1.5 is irrelevant. Please supplement the section with appropriate information.	36 (a)	The information required in Section D.1.5. of the PDD is now included in the PDD version 3.	The provided information was found adequate. The CAR is closed based on due amendments made to the PDD.

CAR 31. Please provide more detailed information on the default emission factors used for limestone, dolomite and pellets, including clear reference to the data source and explanation on how factors for limestone and dolomite will be adjusted for the amount of additives (incl. information on how amount of additives is determined).	36 (b)	More detailed information on the default emission factors used for limestone, dolomite and pellets is now included in the PDD. Please see PDD, version 2 dated 14.12.2010. Taking into account that the data regarding the amount of additives in limestone and dolomite is received on irregular basis and also to follow the conservativeness of JI specific approach, the carbon emission factors are applied based on default IPCC 1996 values.	The additional information provided and included to the PDD was found sufficient. The issue is closed.
CAR 32. Information regarding monitoring and accounting of the electricity consumed from the grid and self generated in unclear. Please clarify if self generated electricity is accounted into ER calculation, what factor is applied etc.	36 (b) (i)	Information regarding potentially self-generated electricity is now included in the PDD version 3.	The updated PDD was reviewed; the provided explanations were found to be appropriate. The issue is closed.

CAR 33. As IPCC 2006 has not been officially approved please use IPCC 1996 for reference and make appropriate amendments to the PDD and emission calculation spreadsheets.	36 (b) (ii)	Carbon emission factors from anthracite, coke, natural gas, limestone, and dolomite combustion are now modified in accordance with Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC 1996). Please see modified PDD, version 2 dated 14.12.2010. Apart from this, IPCC 1996 and National Greenhouse Gas Inventory for Ukraine have a lack of data regarding the project parameters that are used in PDD. Therefore, in case of data absence in IPCC 1996 some parameters are covered by IPCC 2006 Guidelines for National Greenhouse Gas Inventories (IPCC 2006), because it is developed more precisely and considered to be more conservative. In accordance with the text mentioned above, emission factor for anthracite combustion is identified based on net calorific value (NCV) which is provided in the IPCC 2006 because IPCC 1996 does not have any data regarding NCV of anthracite.	The information provided and amendments made were analysed. The justification of application of IPCC 2006 was found appropriate and reasonable. The issue is closed.

		Together with this, 2 already registered JI projects (At Azovstal (UA1000223 – http://ji.unfccc.int/JIITLProject/DB/SH8R5WAZQ92CWBIXEZPJMSGCVXT2KS/details) and at Zaporozhstal (UA1000266 – http://ji.unfccc.int/JIITLProject/DB/G5P4Z3P4PMAT334JESD6O99RW4258V/details) are using emission factors for different fuel and energy resources production which are based on IPCC 2006 guidelines in their calculations. Alternatively, we believe that that the mentioned above emission factors can be calculated based on actual production data from coke and pellets producers in Ukraine, but it is too complicated to conduct this process. Accordingly and taking into account that IPCC 1996 does not have any data concerning CO_2 emissions from different fuel and energy resources production, it is decided to use emission factors from coke and pellets production based on IPCC 2006 guidelines.	

CAR 34. The parameter indicating the emission factor of each fuel is not transparent, especially in respect of gas transportation wastes. Please provide more detailed information on how the parameter is determined, which data of those used to define the parameter's value are measures and which are default factors. For default values clear references should be provided (section B.1).	36 (b) (ii)	*Response #1:* Emission factors for each fuel together with additional emissions from gas transportation losses are now described and indicated more precisely. Please see Section B.1 and Annex 2 of the modified PDD, version 2 dated 14.12.2010 *Response #2:* Information regarding net calorific values of fuels is now included in the PDD version 3.	*Conclusion on response #1* The data source for NCV used for fuel emission factor determination is not transparent. It is unclear whether the issue is fixed or measured periodically. Please clarify and make appropriate corrections. *Final conclusion:* The clarifications provided and corrections made to the PDD were found appropriate. The issue is closed.
CAR 35. The monitoring plan should clearly and explicitly indicate: (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination? (ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination? (iii) Data and parameters that are monitored throughout the crediting period. Please provide.	36 (d)	The corresponding information is now included in the PDD. Please see modified PDD, version 3, dated 11/01/2011.	The revised PDD was analysed in respect of modifications made and found appropriate. The issue is closed.

CAR 36. Please include and describe in the monitoring plant formulae used for calculation of the project emissions.	36 (f)	The formulae for project emission calculations were added to the monitoring plan description in the section D PDD ver.3.	The issue is closed based on amendments made to the PDD and appropriate information provided.
CAR 37. In order to eliminate the duplication on the same data please use one parameter for default values which are identical for each process under baseline as well as the project line (e.g., electricity emission factor, emission factors for fuels etc.).	36 (f) (ii)	*Response #1:* The PDD is now modified by using one parameter for each of default values which are identical for each process under baseline as well as the project line. Please see PDD, version 2 dated 14.12.2010. *Response #2:* Multiple ID numbers for 1 parameter are only used for carbon emission factors in order to demonstrate each specific carbon emission factor below each volume of fuel and energy resource consumption (in emission reductions calculation spreadsheets). The mentioned above approach is used in order to simplify tracking of the emission reductions calculations.	*Conclusion of response #1:* Please clarify where multiple ID numbers indicated in brackets for 1 parameter (e.g., P-10, P-17, P-30, P-44, P-52 for EFe,p) are used, for what purpose they are included. *Conclusion of response #2:* The modifications made and clarifications provided are accepted. The issue is closed.
CAR 38. Please indicate more precise references to the documentation used, e.g. for IPCC the Volume, Chapter, table should be stated, and provide the web-links to the JISC/EB documentation referred in the PDD (e.g., Guidance on criteria for baseline setting and monitoring, Additionality Tool etc.).	36 (f) (vii)	More precise reference of documentation used is now included in the text of PDD. The web-links were provided as requested in the PDD to the JISC/EB documentation, which can be seen in the PDD version 2, dated 14.12.2010	The CAR is closed on the basis of due corrections and supplementing information added to the PDD.

CAR 39. The reference to the source of standard IPCC factors for reducing agents, i.e. coke, anthracite and coal, is inappropriate: the stated referenced document does not contain indicated values. Please provide adequate reference.	36 (f) (vii)	The references to the sources of standard IPCC factors are now modified. Please see PDD, version 2 dated 14.12.2010.	The adequate references were provided in the PDD. The issue is closed.
CAR 40. Some of the stated parameters are determined whereby calculations which include measured values, however no detailed information on data source, time of determination etc. for such measured values is presented. In order to ensure transparent project monitoring please provide detailed information on all values which are measured or collected from other sources in course of monitoring under the project (in the tabular format prescribed by the Guidance for JI PDD form users or JI PDD form), see sections B.1 and D.1. Data which are calculated with equations should not be included into compilation.	36 (l)	*Response #1:* The table that provides detailed information on all values which are measured or collected from other sources in course of monitoring under the project is now included in the PDD. The table is in accordance with Guidelines for JI PDD form. Please see Annex 2 of the modified PDD, version 2 dated 14.12.2010. *Response #2:* Modifications have been done on page 118, Recording frequency column. Modifications have been done in Section B.1, D.1 of the PDD version 3, Key Information and Data Used for Baseline Identification (key parameter boxes)	*Conclusion on response #1:* Please provide in the PDD more detailed information on the data recording frequency. *Final conclusion:* The issue is closed based on appropriate modification made to the PDD and required information provided.

CAR 41. Please update the GHG emission calculation data with regard to indicators of LF1 operation as data in PDD ver.1 do not reflect the actual situation observed during site visit.	45	*Response #1:* GHG emission calculations are now updated with regard to LF-1 operation. Please see modified PDD, version 2, dated 14.12.2010. *Response #2:* Detailed emission reductions calculation spreadsheets are now provided to the verifier.	*Conclusion on response #1:* Please provide for review the updated detailed emission reduction calculation spreadsheets (Excel file). *Final conclusion:* The provided information and supporting documentation was reviewed and found appropriate. The issue is closed.
CL 01. Please provide documented evidences confirming that the replaced CBC 3 and CBC 2 which is used for monitoring of baseline parameters are identical.	23	The information has been provided on the request of verifier.	The provided documentation was analysed and found satisfactory. The clarification is accepted.
CL 02. Please submit the evidences which confirm that the CBC 2 will be in operation at least until 2020 and that the LF 1 started operation in January 2010	23	The information has been provided on the request of verifier.	The provided documented evidences were reviewed and found sufficient. The clarification is accepted.
CL 03. Please provide for review the opinion of the Ukrainian Ministry of Industrial Policy on the new CCMs installed in Ukraine.	23	The review of the opinion of the Ukrainian Ministry of Industrial Policy on the new CCM installed in Ukraine was provided to the verification team.	The submitted documentation was reviewed and found appropriate. The issue is closed.
CL 04. Please provide a justification of the project operational lifetime of 40 years.	34 (b)	Letter from supplier of project equipment which confirms project operational lifetime of 40 years (Continuous Casting Machines operational lifetime) is now provided to the verifier.	The confirmation letter issued by equipment supplier was reviewed. The provided justification was found sufficient.

CL 05. Please provide evidences confirming that the anthracite is used as reducing agent at DIIWS and the application of relevant emission factor is reasonable.	36 (b)	Documents which demonstrate anthracite quality data were provided to the verifier.	The data on quality of coal (anthracite quality) used at DIISW was checked. It was confirmed that anthracite is used as a reducing agent and suggested emission factor was proved to be applicable to the current project.
CL 06. As verifiers were informed in course of interviews with DIISW's representatives during site visit, coal electrodes and carbon bricks are used in furnace process; however, no information about consumption of this material is absent in the PDD. Please clarify and justify if usage of coal electrodes and carbon bricks is included in the project monitoring.	36 (b) (i)	Graphite electrodes are indicated as coal electrodes in the PDD. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories provide fixed carbon emission factor for this reducing agent, which is anticipated at the level of 3,6 tCO_2 per 1 t. of coal electrodes. Carbon bricks have identical carbon content and net calorific value as the anthracite, which is consumed under the project activity. Therefore the total volume of consumed carbon bricks is included into the amount of anthracite consumption where fixed carbon emission factor for anthracite combustion is applied.	The clarification is accepted. The modification made to the PDD was found appropriate.

CL 07. Please clarify what is implied under primary and secondary production needs for each process covered by the project.	36 (b) (i)	Primary production implies such facilities as: Sinter Plant, Blast Furnaces, LD Converters, Ladle Furnaces, Continuous Casting Machines in the project line scenario and Sinter Plant, Blast Furnaces, LD Converters, Continuous Bloom Casters together with the other production facilities that would have been required to produce the necessary amount of square billets in case of project activity absence (baseline scenario). Secondary production implies such facilities that are required in the technological process as: CHP-BH (that produces blast-furnace blowing, heat and, potentially, self-generated electricity), Oxygen Plant (that produces oxygen, nitrogen and argon) and Compressed Air Shop that produces compressed air. Together with this, Primary production implies consumption of primary and secondary energy resources. Primary energy resources include such fuel and energy resources as: fuels (natural gas), electricity,	The information provided was found sufficient. The issue is closed.

		reducing agents (coke, anthracite etc.), other inputs (limestone, dolomite, pellets etc.) etc. Secondary energy resources (oxygen, compressed air, water, steam, chemically treated water etc.) are consumed in Primary production facilities and produced mainly from electricity; therefore the amount of secondary energy resources that are consumed during the project activity is transformed into amount of electricity that was consumed during its production. In addition to that, the component 4 of the project "Balance of process needs" implies consumption of fuel-and energy resources which are required to ensure supply of all secondary energy resources to the technological process. Double counting is avoided.	
FAR 01: In order to ensure that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project a special documented instruction on monitoring data storage must be issued.	36 (m)	According to Ukrainian legislation and regulations all monitored data are to be kept for at least 5 years from the monitoring start. An instruction will be prepared for the 1st verification.	The issue will be checked in course of the 1st verification under the project.