DETERMINATION REPORT

ENERGY EFFICIENCY IMPROVEMENT IN REVAMPING OF STEEL PRODUCTION AT SEVERSTAL JSC, CHEREPOVETS, RUSSIA. IRON PRODUCTION EXPANDING.

REPORT NO. 2011-0129

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DETERMINATION REPORT

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Summary:

Project Name: Energy Efficiency Improvement in Revamping of Steel Production at Severstal JSC, Cherepovets, Russia. Iron production expanding.**Country:** Russia

Methodology: ☐ **CDM Methodology** ☒ **JI specific approach**

GHG reducing Measure/Technology: Construction of the coke furnace battery and the coke dry-quenching plant for additional energy generation. Construction of blast furnace and installation of the top-pressure recovery turbine for additional energy generation.

ER estimate: Annual average of 436 762 tCO_2e /year for the crediting period (5 years).

Size

☒ Large Scale
☐ Small Scale

Determination Phases:

☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues

Determination Status

☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and final determination
☐ Rejected

In summary, it is DNV's opinion that the project activity "Energy Efficiency Improvement in Revamping of Steel Production at Severstal JSC, Cherepovets, Russia. Iron production expanding" as described in the PDD, version 1.6 of 10 June 2011, meets all relevant UNFCCC requirements for the JI and all relevant host Party criteria and correctly applies the JI specific approach that is found to be correct and applicable.

Report No.: 2011-0129	Subject Group: Environment
Report title: Energy Efficiency Improvement in Revamping of Steel Production at Severstal JSC, Cherepovets, Russia. Iron production expanding	
Work carried out by: Name of team members: Alexander Osadchiev, Svetlana Kleeva, Vladimir Uglov	
Work verified by: Xiaojun Johnsen Zhang	

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Determination
Joint Implementation

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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
ERU	Emission reduction units
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
LoA	Letter of approval
N_2O	Nitrous oxide
PDD	Project Design Document
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change

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1 EXECUTIVE SUMMARY – DETERMINATION OPINION

DNV Climate Change Services AS (DNV) has performed a determination of the "Energy Efficiency Improvement in Revamping of Steel Production at Severstal JSC, Cherepovets, Russia. Iron production expanding." project. The determination was performed on the basis of UNFCCC criteria for Joint Implementation and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfillment of stated criteria.

The host Party is Russia and the other participating Annex I Party is The Netherlands. Both countries fulfil the participation criteria and have approved the project and authorized the project participants.

By fuel and electricity consumption reduction, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The project applies the project specific approach because no CDM methodology is applicable in the project case. JI specific approach is developed for substitution of existing technology with more energy efficient technology.

The total emission reductions from the project are estimated to be on the average 436 762 tCO_2e per year during 2008 - 2012. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change. Adequate training and monitoring procedures have been implemented.

In summary, it is DNV's opinion that the "Energy Efficiency Improvement in Revamping of Steel Production at Severstal JSC, Cherepovets, Russia. Iron production expanding" project in Russia, as described in the PDD version 1.6 of 10 June 2011, meets all relevant UNFCCC requirements for the JI and all relevant host Party criteria.

2 INTRODUCTION

Global Carbon Rus, LLC has commissioned DNV Climate Change Services AS (DNV) to perform a determination of the "Energy Efficiency Improvement in Revamping of Steel Production at Severstal JSC, Cherepovets, Russia. Iron production expanding" project in Russia (JI reference number 0243). This report summarises the findings of the determination of the project, performed 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 Guidelines for the implementation of Article 6 of the Kyoto Protocol and the subsequent decisions by the JI Supervisory Committee.

2.1 Objective

The purpose of a determination is to have an Accredited Independent Entity (IE) review the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the 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 emission reduction units (ERUs).

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

2.2 Scope

The determination scope is defined as an independent and objective review of the project design document (PDD), the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, JI modalities and procedures and guidance by the JI Supervisory Committee (JISC) including the Guidance on criteria for baseline setting and monitoring /4/ and the Determination and verification manual /3/.

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.

3 METHODOLOGY

The determination of the project commenced in December 2010. The determination consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final determination report and opinion.

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the determination:

/1/ PDD for "Energy Efficiency Improvement in Revamping of Steel Production at Severstal JSC, Cherepovets, Russia. Iron production expanding" version 1.0 of 8 December 2010, version 1.6 of 10 June 2011

/2/ CDM Executive Board Approved "Tool to calculate the emission factor for an electricity system" (version 02, version 2.2.0)

/3/ JI Supervisory Committee, JI Determination and verification manual, version 01 adopted at JISC 19

/4/ JI Supervisory Committee, Guidance on criteria for baseline setting and monitoring, version 02 adopted at JISC18

/5/ The Netherlands Agency, Ministry of Economic Affairs, LoA. Dated 01 March 2011

/6/ JI Supervisory Committee, Guidelines for users of the JI PDD form, version 04 adopted at JISC 18

/7/ Russian state ministry of Industry, Strategy of Russian metal industry development (period up to 2020). Dated 2008, http://www.minpromtorg.gov.ru/ministry/strategic/sectoral/2

/8/ CDM Executive Board: Tool for the demonstration and assessment of additionality, version 05.2

/9/ Cbonds (information agents), Eurobonds Russia, dated 2000, http://www.cbonds.info/ru/rus/emissions/emission.phtml/params/id/242

/10/ Eurostat (statistical agents), Report of annual average inflation rate, dated 2004, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&language=en&pcode=tsieb060&tableSelection=1&footnotes=yes&labeling=labels&plugin=1

/11/ Ministry of Economy of the RF, Ministry of Finance of the RF, State Committee of the RF on Construction, Architecture and Housing Policy of the RF. Methodological recommendations on evaluation of investment projects efficiency. # BK 477. Dated 21 June 1999

/12/ State Technical Regulation Agency. Lab accreditation certificate # POCC RU.0001.51.07.17 dated 18 September 2007. Valid up 08 August 2012

/13/ IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3, Chapter 4, page 25, table 4.1, 2006

/14/ IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 2, page 18, table 2.3, 2006

/15/ IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1, page 18, table 1.2, 2006

/16/ JSC Severstal, Technical report, Power engineering shop, 2006-2008

/17/ Carbon Investments Ltd. (Russia), The study "Development of grid GHG emission factors for power systems of Russia" Ordered by Carbon Trade and Finance SICAR S.A. (Luxemburg). Copies of this report are available in "Carbon Trade & Finance SICAR S.A.", 2008

/18/ Parliament of Russia. Federal Law on the Environmental Expertise #174 –FZ dated 23 November 1995

/19/ Parliament of Russia. Federal Law on Amendments to the Construction Code effective

#80 –FZ dated 2 July 2005

/20/ Parliament of Russia. Federal Law on Environment protection #7 –FZ dated 10 January 2002

/21/ Parliament of Russia. Federal Law on Sanitary and epidemiological wellness of the population. #52-FZ dated 17 March 1999

/22/ State committee of Russia "Goskomgydromet". Methodology of calculation of harmful substances content in free air, contained in plants emissions", dated1987

/23/ Regional State committee of Vologda region "Glavgosexpertiza". Project documentation for the blast furnace construction (Section "Environment Protection"), #09/7523, approved on 14 November 2005

/24/ Regional State committee of Vologda region "Glavgosexpertiza". Project documentation for the coke oven battery construction (Section "Environment Protection"), #09/7677, approved on 18 October 2006

/25/ Russian web-site "InfoMetallGeo", Blast furnace start up at JSC Severstal, dated 2006, http://www.rosinvest.com/news/159784/

/26/ Russian web-site "InfoMetallGeo", Severstal start up the blast furnace, dated 2006, http://www.infogeo.ru/metalls/news/?act=show&news=16257

/27/ Russian web-site of journal "Environmental Systems", GUBT usage, dated 2005, *http://www.esco-ecosys.ru/2005_12/art69.html*

/28/ JSC Severstal, Approved financing of blast furnace # 4 construction by Severstal (Contains information of tentative expenditures of BF#4 construction. Total sum: 4 551.67 mln.Rub), 23 December 2004

/29/ JSC Severstal, Accounting report, Severstal's summary of actual expenditures for BF#4, COB#3 construction (Total expenditures: 6 371.94 mln.Rub including expenditures of BF#4 construction 4 430.00 mln.Rub and expenditures of COB#3 construction 1 941.94 mln.Rub), dated 2007

/30/ Russian national bank web-site, Rates of Foreign currencies, dated 2004, http://www.cbr.ru/eng/currency_base/daily.aspx?C_month=07&C_year=2004&date_req=20.07.2004

/31/ Russian state Government, enactment #1, Classification of fixed capital and amortization groups, dated 1 January 2002, http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=64119

/32/ Russian scientific group GIPROKOKS, Design documentation of project: "Construction of Coke Oven Battery #3", 2003

/33/ LLC "Severstal-Proekt", Design documentation of project: "Construction of Blast Furnace #4", 2004

/34/ Richard A. Brealey, Stewart C. Myers, Principles of Corporate Finance 7th edition, , McGraw-Hill Higher Education, p.168, 2003

/35/ JSC Severstal, Approved financing of Coke Oven # 3 construction by Severstal (Contains information of tentative expenditures of Coke Oven # 3 construction. Total sum: 1 559.00 mln.Rub), 20 July 2004

/36/ Aswath Damodaran. Investment Valuation: Tools and Techniques for Determining the Value of Any Asset. - Wiley, 2002

/37/ Jaime Sabal. A Practical Approach for Quantifying Country Risk. - Revista Journal, Gerorgetown University - Universia, 2008, Vol. 2 #3, p. 52

/38/ LLC "Corporation of ferrous metals manufacturers" annual statistical report "Russian Chermet information", Russia in 2007, chapter 1, operation of blast furnaces and coke oven batteries. 2007

/39/ Giprokoks, Ukrainian State Institute for Designing Enterprises of Coke Oven and By-Products Industry, Reference list of Dry Coke Tecnology in Russia implementation, dated 2011, http://giprokoks.com/en/page/5/3

/40/ JSC Gasprom, JSC Gasprom annual report 2004, p44,47, dated 2004. http://gazprom.com/f/posts/96/956897/annual_report_eng_2004.pdf

/41/ JSC Severstal, Production account of blast furnace shop. February, March, November 2004

/42/ Russian Central bank, The minimum short term loan in Russia, 2004, http://www.cbr.ru/statistics/print.aspx?file=credit_statistics/interest_rates_04.htm&pid=cdps&sid=svodProcStav

/43/ The world bank, International Finace Corporation. Investment risk in Russia. 2004, http://www.doingbusiness.org/Custom-Query/russia

/44/ European Central Bank, Statistical Data Warehouse, Germany, June 2004, http://sdw.ecb.europa.eu/browse.do?node=SEARCHRESULTS&sk=IRS.M.BE.L.L40.CI.0000.EUR.N.Z&sk=IRS.M.DE.L.L40.CI.0000.EUR.N.Z&sk=IRS.M.IE.L.L40.CI.0000.EUR.N.Z&sk=IRS.M.GR.L.L40.CI.0000.EUR.N.Z&sk=IRS.M.ES.L.L40.CI.0000.EUR.N.Z&sk=IRS.M.FR.L.L40.CI.0000.EUR.N.

/45/ Russian prime minister official web site, Iron production in Russia, 24 July 2008, http://www.premier.gov.ru/visits/ru/6050/info/1750/

/46/ Russian state statistics service, Iron production in 2004, http://www.gks.ru/dbscripts/Cbsd/DBInet.cgi?pl=1202001

/47/ JSC Severstal, Annual Report 2004, approved by committee of directors, 21 April 2005, ftp://download.finmarket.ru/Em/SEVERSTAL/report_2004.zip

/48/ Russian Ministry of Industry, Norms of losses during transportation in metal production industry. Order #55, 25 February 2004, http://www.businesspravo.ru/Docum/DocumShow_DocumID_89369.html

/49/ European Central Bank, Euro area economic and financial data, 2004 http://www.ecb.europa.eu/stats/keyind/html/sdds.en.html

/50/ JSC Severstal, Internal memorandum of project realization as a JI activity (Construction of the coke furnace battery and the coke dry-quenching plant for additional energy generation. Construction of blast furnace and installation of the top-pressure recovery turbine for additional energy generation), 23 June 2004

/51/ Russian Central Bank, Book: Economic and financial situation, April 2005, page 1, 48, http://www.cbr.ru/eng/publ/root_get_blob.asp?doc_id=7003

/52/ JSC Severstal, Annual Report 2010, approved by committee of directors, 27 June 2011, page 4, http://www.severstal.com/rus/ir/disclosers/financial_reports/%D0%93%D0%BE%D0%B4%D0%BE%D0%B2%D0%BE%D0%B9%20%D0%BE%D1%82%D1%87%D0%B5%D1%82%20(RUS)2010.doc

/53/ JSC Severstal, Internal report Coke primary cost analysis, June 2004

/54/ JSC Severstal, Internal report, Production and expenses at blast furnace plant, June

2004

/55/ JSC Severatal, Official letter, Pig iron and scrap costs in June 2004, 8 June 2011

/56/ Energy Service Company "Ecological Systems", Electronic journal, #12, December 2005, *http://www.esco-ecosys.ru/2005_12/art69.htm*

/57/ UNFCCC web-site, JI project "Implementation of energy efficiency projects at OJSC "Novolipetsk Steel", Lipetsk area, Russia" (ITL project ID: RU1000263), http://ji.unfccc.int/JIITLProject/DB/98SSHWX77IK8MCY8UEOPEDKDJ5G3CD/details

/58/ Trade system Metal.com.ru, Metallurgical analytic bulletin, Coke prices of Russian producers (mean coke price for 2004 is approximately 7000 Rub/t of coke), http://www.metalltorg.ru/analytics/ores/?id=172

/59/ JSC Severstal, Product catalogue, http://www.severstal.ru/rus/products/catalogue/index.phtml

/60/ Information web-site Newslab.ru, Interview with Russian Industry and Energy Minister about country electricity tariffs (it's stated by Industry and Energy Minister Viktor Krishenko that electricity tariffs in 2004 on average in the country should draw up 846 Rub/MWh), 22 April 2004, http://www.newslab.ru/news/130271

/61/ Federal state statistics service, Average costs of energy-fuel resources in Russian Federation 1998-2010 (electrical power costs: 760 Rub/MWh at the end of the 2003, 838 Rub/MWh at the end of 2004), http://www.gks.ru/wps/wcm/connect/rosstat/rosstatsite/main/price/

/62/ Federal state statistics service, Average prices of industrial producers in Russian Federation 1998-2010 (pig iron: 4 805 Rub/t at the end of the 2003, 8 969 Rub/t at the end of 2004), http://www.gks.ru/wps/wcm/connect/rosstat/rosstatsite/main/price/#

/63/ Information Analysis Magazine "Metallurgical bulletin", #21-22, Article of scarp market tendencies (Dynamic of scarp prices for 2003 and 2004 is described. The average price of scarp for January – October 2004 is 3 915 Rub/t), dated 30 November 2004.

/64/ Russian Ministry for Economic Development and Trade. Order #112 of JI projects approval (contains list of JI projects approved, including "Energy Efficiency Improvement in Revamping of Steel Production at Severstal JSC, Cherepovets, Russia. Iron production expanding" JI project, authorized project participants: JSC Severstal and Global Carbon BV), dated 12 March 2012.

3.2 Follow-up Interviews with Project Stakeholders

27 December – 28 December 2010 DNV performed site visit and interview with project stakeholders to confirm selected information and to resolve issues identified in the document review. Alexander Osadchiev JI Determiner qualified in accordance with DNV's qualification scheme had performed the on-site audit. The personnel interviewed during the site visit are listed below:

	Date	Name	Organization	Topic
/65/	2010-12-27	V.A. Shatunin	Senior manager (chief ecologist) Production and	Approval of the project as JI project between Russia and the Netherlands

			management administration, Severstal JSC	
/66/	2010-12-27	O.V. Riasanov	Chief Engineer of Coke Production Factory, Severstal JSC,	Valid construction permit and environmental licence.
/67/	2010-12-27	P.G. Gorshkov	Technology manager of Coke Production Factory, Severstal JSC,	Baseline monitoring methodology, including carbon emission factor of power plant at the margin.
/68/	2010-12-27	A.V. Voronkov	Foreman for fuel and heat usage of Coke Production Factory, Severstal JSC,	Additionality assessment. Availability of dispatch data to determine the operating margin data.
/69/	2010-12-27	S.K. Skidko	Foreman for fuel and heat usage of Coke Production Factory, Severstal JSC,	Procedures for calibration and maintenance of monitoring equipment
/70/	2010-12-27	S.V. Popov	Metal heat control operator rolling shop	Procedures for calibration and maintenance of monitoring equipment
/71/	2010-12-28	Y.A. Volkov	Deputy Superintendent of Blast furnace shop, Severstal JSC,	Additionality assessment.
/72/	2010-12-28	M.M. Karimov	Deputy Superintendent of Blast furnace shop, Severstal JSC,	Additionality assessment
/73/	2010-12-28	O.L.Gladkich	Foreman for fuel and heat usage of Blast furnace shop, Severstal JSC,	Additionality assessment
/74/	2010-12-28	L.A. Tarakanova	Manager of investment department, Severstal JSC,	Additionality assessment
/75/	2010-12-28	N.A. Nenilina	Head of physicochemical	Procedures for calibration and maintenance of

laboratory monitoring equipment

3.3 Resolution of Outstanding Issues

The objective of this phase of the determination was to resolve any outstanding issues which needed to be clarified by DNV's positive conclusion on the project design. The initial determination identified three Corrective Action Requests (CAR) and twenty eight requests for Clarification (CL).

The response provided by the project participants to DNV's initial determination findings resolved the identified CAR's and requests for Clarification to DNV's satisfaction.

To guarantee the transparency of the validated process, the concerns raised and responses given are documented in Table 3 of the Determination Protocol in Appendix A.

A corrective action request (CAR) is raised if one of the following occurs:

(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.

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

A forward action request (FAR) is raised during determination to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the JI requirements for final determination.

Determination Protocol Table 1: Mandatory Requirements for JI Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**) or a **corrective action request (CAR)** if a requirement is not met.*

Determination Protocol Table 2: Requirement Checklist *This table documents the findings from the desk review of the initial version of the PDD and the follow-up interviews with project stakeholders. For ensuring a transparent determination process, this table is not updated in case the PDD is revised during the process of the determination.*				
Checklist question	***Reference***	***Means of verification (MoV)***	***Assessment by DNV***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the JI-PDD	*Gives reference to documents where the answer to the checklist question or item is found.*	*Means of verification (MoV) are **document review (DR)**, **interview (I)** or any other follow-up actions (e.g., on site visit and telephone or email interviews) and **cross-checking (CC)** with available information relating to projects or technologies similar to the proposed JI project activity under determination.*	*The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.*	*OK is used if the information and evidence provided is adequate to demonstrate compliance with JI requirements. A **corrective action request (CAR)** is raised when project participants have made mistakes, the JI requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A **clarification request (CL)** is raised if information is insufficient or not clear enough to determine whether the applicable JI requirements have been met. A **forward action request (FAR)** during determination is raised to highlight issues related to project implementation that require review during the first verification of the project activity.*

Determination Protocol Table 3: Resolution of Corrective Action and Clarification Requests *This table lists the corrective action requests and clarification requests indentified in Table 2 and documents how these issues raised were resolved. All the issues raised shall be closed before finalising the determination.*			
Corrective action and/ or clarification requests	***Ref. to checklist question in table 2***	***Response by project participants***	***Determination conclusion***
*The **CARs** and/ or **CLs** raised in Table 2 are repeated here.*	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants to address the CARs and/or CLs.*	*The determination team's assessment and final conclusions of the CARs and/or CLs.*

Determination Protocol Table 4: Forward Action Requests		
Forward action request	***Ref. to checklist question in table 2***	***Response by project participants***
The FARs raised in Table 2 are repeated here.	*Reference to the checklist question number in Table 2 where the FAR is explained.*	*Response by project participants on how forward action request will be addressed prior to first verification.*

Figure 1 Determination protocol tables

Internal Quality Control

The final determination report underwent a technical review. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for JI determination and verification.

3.4 Determination Team

				Type of involvement					
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA4.3competence
Team leader (Determiner)	Osadchiev	Alexander	Russia	✓	✓	✓			
Determiner	Kleeva	Svetlana	Russia			✓			
Expert	Uglov	Vladimir	Russia						✓
Technical reviewer	Zhang	Xiaojun Johnsen	China					✓	✓

4 DETERMINATION FINDINGS

The findings of the determination are stated in the following sections. The determination criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the determination protocol in Appendix A.
The final determination findings relate to the project design as documented and described in the revised and resubmitted PDD version1.6 of 10 June 2011.

4.1 Participation Requirements

Referring to Part A and Annex 1 of the PDD the following has been determined concerning Parties and project participants:

- the Parties (Party A: The Russian Federation - Host party, Party B: The Netherlands). The project participants participating in the project: JSC Severstal and Global Carbon BV.
- the participating Parties fulfil the participation requirements (e.g. ratified Kyoto Protocol, etc).
- the endorsement by the Host Party was provided by project participant /64/.
- the endorsement by the Sponsor party was provided by project participant /5/.

4.2 Project Design

The project implies production capacity expansion as old equipment was out of function prior to the project realization. Furnace battery #3 was moved out from service due to full depreciation in 1994 and blast furnace #4 was moved out from service in 1995 as it served all working period.

The project consists of the improvement of the energy efficiency by the implementation of two interrelated subprojects.

Subproject 1: Construction of the coke furnace battery #3 and the coke dry-quenching plant for additional energy generation.

The subproject represents up-to-date engineering practice and makes possible to improve energy efficiency of coke production. The main point of subproject is that the coke making with inert gases quenching allows steam production using thermal energy of red-hot coke. 80% of sensible heat of coke can be recovered for steam production. The steam is used for electricity generation and other needs.

This subproject intends to introduce state-of-art technology from a reputable Russian scientific group GIPROKOKS, resulting in a new technology implementation in Russia. GIPROKOKS developed this technology and received patent. Dry Coke Quenching technology has been introduced in less than 22% of total coke production in Russia /39/. The project design engineering involves the construction of the coke furnace battery #3 which produces coke with improved quality and the coke dry-quenching plant for additional energy generation. The subproject reflects good engineering practice. The technical area of the subproject is metal production.

Subproject 2: Construction of blast furnace #4 and installation of the top-pressure recovery turbine for additional energy generation.

The subproject represents up-to-date engineering practice and makes it possible to improve energy efficiency of metal production. Subproject includes introduction of the top-pressure recovery turbine (GUBT). GUBT allows returning about 40% of spent energy for blast-furnace air and used to generate additional electricity due to utilising off-gas positive pressure.
Construction of the blast furnace is connected with the coke oven battery installation as coke is main raw material for pig iron production. Consequently the project activity consists of two interdependent subprojects. Financing of these two subprojects was approved by JSC Severstal management at different time due to design documents development by different organizations:

1) Design documents for the coke oven battery construction were developed by Russian scientific group GIPROKOKS /32/;
2) Design documents for the blast furnace construction were developed by LLC "Severstal-proekt" /33/.

Coke oven battery financing was approved by JSC Severstal on the 20 July, 2004 /35/. Blast furnace financing was approved by JSC Severstal on the 23 December, 2004 /28/.

As these two sub-projects are considered as one project it is deemed reasonable that the start of the project activity was 20 July 2004 /35/. ERUs will be claimed for the period 1 January 2008 to 31 December 2012.

4.3 Baseline Determination

Project participants have established baseline GHG emission calculation methodology on a project specific basis in line with Annex B to decision 9/CMP.1 (JI Guidelines). The project uses the baseline setting and monitoring approach developed according to the latest version of "Guidance on Criteria for Baseline Setting and Monitoring" /4/ and "Guidelines for users of the JI PDD form" /6/. The baseline setting and monitoring approach meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.
All documentation relevant for establishing the baseline scenario are correctly quoted and interpreted in the PDD. Assumptions and data used by the project participants in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and sectoral policies and circumstances are considered and listed in the PDD.
The following step by step approach ("Guidelines for users of the JI PDD form" /6/) is applied in order to describe and justify the baseline chosen:

Step 1: Indication and description of the approach chosen regarding baseline setting

Project participants have chosen the JI specific approach regarding baseline setting, and baseline is correctly established in accordance with appendix B of the JI guidelines.

The baseline was identified by listing and describing plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one.
The following key factors that affect the baseline are taken into account:

a) **Sectoral reform policies and legislation.** The main development goal of the metallurgical industry is meeting of domestic metal demand /7/. JSC Severstal does not have any obligations for construction of new production capacity;
b) **Economic situation/growth and socio-demographic factors in the relevant sector as well as resulting predicted demand. Suppressed and/or increasing demand that**

will be met by the project can be considered in the baseline as appropriate (e.g. by assuming that the same level of service as in the project scenario would be offered in the baseline scenario). Economic situation and other factors have the same influence on demand in the baseline scenario as well as in project scenario. JSC "Severstal" does not have any obligations to produce certain amount of steel, iron or coke. It was confirmed by JSC "Severstal" management during site visit. Thus in case of demand growth other producers could satisfy the market by increasing the number of run-days, decreasing duration of stops and other measures;

c) **Availability of capital (including investment barriers).** Capital was available but with high interest rates. It was verified that interest rate of the Russian Central Bank for short term loans in June 2004 was 11,6% /42/, /51/. This crediting rate is weighted average rate for Ruble loans to legal entities in credit institutions (including Savings bank of Russia). Long term loan rates were higher. Interest rate on loans for the period of 1 year to 3 years in Rubles to corporate borrowers was equal to 14.2% on June 2004 /51/. The interbank offered rate was also at high level - 6,6% /42/, substantially higher than such rates in Europe.

   According to the World Bank statistic after default which was in Russia in 1998 there was the high level of inflation. It was 12% in 2003 /51/. As result a capital was available but high interest rate on loans to corporate borrowers, high country investment risk and other risks made unprofitable of new equipment introduction in Russia, it was also assessed in the IRR analysis described later in the report. According to the Wold Bank rates for doing business in different countries (which is available for Russia starting from 2010) present rate of doing business in Russia is 123 out of 183 /43/. This rate is not available for 2004, thus comparison of available indicators of 2004 to 2011 demonstrates that nowadays those indicators are much better, which is shows that in 2004 the rate of doing business in Russia was not smaller than today. Thus we can confirm that there was a high country risk and this remains high today.

   All of these aspects were estimated by JSC Severstal management, thereby possibility of project realization as a JI activity was discussed and assessed /50/;

d) **Local availability of technologies/techniques, skills and know-how and availability of best available technologies/techniques in the future.** Pig iron production process by a blast furnace is better-known and applied in Russia;

e) **Fuel prices and availability.** Electricity, natural gas and coke are widely used and available in Russia. All of them are produced inland. Fuel prices in Russia are less than world market price /40/.

The most plausible future scenario has been identified by checking that all alternatives are consistent with mandatory applicable laws and regulations and by performing an investment analysis.

Step 2. Application of the approach chosen

JSC Severstal produces pig iron in a blast furnace. Proposed project concerns construction of new iron and coke production using progressive technology in this field. This means that actual production in the project scenario depends on production of other producers in Russia in the baseline scenario.

The baseline assumptions are based on the current situation in the region and industry while investment analysis is to be implemented as at the moment of taking the decision on the project in 2004.
The coke furnace battery #3 was moved out from service by reason of full depreciation at Severstal in 1994. The blast furnace #4 was moved out from service for similar reasons in 1995.
At JSC Severstal several options for the production are technically feasible and all possible alternatives are discussed below.

1. Coke production capacity:

a. Other coke producers will satisfy coke demand;
b. Construction of coke oven battery #3 implemented not as JI project.

2. Pig iron production capacity:

a. Other pig iron producers which use blast furnaces will satisfy the iron demand of JSC Severstal;
b. Construction of Blast Furnace #4 using progressive technology implemented not as JI project.

Combination of these alternatives results in possible future scenarios at JSC Severstal. The subproject "Construction of coke oven battery" is connected with pig iron production, as coke is used in pig iron production process. Severstal has coke deficiency (10-15% of coke is bought from other coke producers) Coke deficiency was assessed from account documents during site-visit /41/. Moreover, after project realization the deficiency of coke is still in place, it was checked during determination process /52/.
Following alternative scenarios were identified:
Scenario 1: Other pig iron and coke producers will produce the project volume of pig iron and coke.
This scenario is continuation of the situation without the project. It is feasible.
Scenario 2: The coke oven battery #3 construction along with the blast furnace #4 (Project activity not implemented as JI).
Implementation of this scenario without JI requires significant investments and not financially feasible.
Thus this scenario cannot be considered as a baseline scenario (investment analysis is discussed below).
Scenario 3: Only the coke oven battery #3 construction.
Part of the produced coke will be consumed at Severstal pig iron production and part would be sold. This scenario meets a risk of coke demand absence since final product has more demand than a raw material and risk of fuel consumption without coke production in case of hot reserve operation.
Thus, this scenario cannot be accepted as a reasonable scenario.
Scenario 4: Only the blast furnace #4 construction.
This scenario represents the situation when only blast furnace is build that means no coke oven battery will be build. Severstal will consume significant amount of coke produced by the other coke producers because coke is a compulsory material for pig production. During the site visit it was confirmed that JSC Severstal does not have any other available facility for coke production, the plant will buy coke from other producers /47/.This will lead to prime cost increase /58/. Additionally there is a risk of no delivery just in time. Also part of coke

will be lost during transportation /48/. It leads to additional decrease of profitability of this scenario.
In terms of plant size and obligations it is not profitable to construct blast furnace without coke oven battery. Moreover it is common practice to construct blast furnace and coke oven together. Nine big enterprises produce totally more than 80% of Russian iron. Each of these enterprises including JSC Severstal produces coke in parallel /45/, /46/.
Consequently the scenario 4 cannot be accepted as a favourable scenario.

The process of determination of JI project resulted in establishing the baseline in the transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors. Most information was taken from the international publicly available sources and is referenced. Baseline emission factor for displacing pig iron production (tCO_2/tonne of steelmaking pig iron) calculated upon the data from official annual statistical report of steel and iron production and annual fuel and electricity consumption at Russian steel plants /38/. The approach of "Tool to calculate the emission factor for an electricity system", version 02 is used. Changes made in the later version 2.2.0 of this tool didn't touch on project calculations /2/. IPCC default values are used for CO_2 emission factors: emission factor of coke production (tCO_2/tonne coke /13/), emission factor of natural gas (tCO_2/GJ) /14/, emission factor of coke (tCO_2/GJ) /14/, emission factor of COG (tCO_2/GJ) /14/. Net calorific value of coke (GJ/ t) is also defined as IPCC default value /14/,
The default grid emission factors for the regional power systems of Russia are used. They are taken from the study "Development of grid GHG emission factors for power systems of Russia" /17/. In this study the emission factor was defined according to "Tool to calculate the emission factor for an electricity system" (version 01.1 which was applicable in the 2008). Choice, scope and applicability of emission factor calculation method are similar to later tool versions /2/. Therefore the version of tool is indifferent in this case. ERUs are due emission factors based on specific production are used (e.g. tCO_2/t steel).
The baseline for this project is the most plausible future scenario on the basis of conservative assumptions and key factors described above. The basic principle which was applied is that the demand for products (steel, iron, coke) was not influenced by the project and was identical in the project and the baseline scenario (additional amount of steel and coke would be produced by other producers in Russia).
Project participants have correctly made conclusion that scenario 1 is the only remaining plausible scenario. Therefore it was identified as the baseline scenario.

4.4 Additionality

Project participants have chosen the "Tool for the demonstration and assessment of additionality" version 05.2 /8/ for establishing additionality. The additionality of the project has been correctly established with help of this tool using following steps.

Step 1. Indication and description of the approach applied

"Tool for the demonstration and assessment of additionality" was correctly used to demonstrate additionality of the project activity.

Step 2. Application of the approach chosen

The following steps were taken according used tool.

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

Project participants have correctly defined realistic and credible alternatives to the project activity through the following Sub-steps:

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

Project participants have identified the following 4 alternatives (also discussed above):

Alternative 1: Other pig iron and coke producers will produce the project volume of pig iron and coke.
In the absence of project the pig iron would have been supplied from other Russian metallurgical plants. Other metallurgical plants can increase their production in case of demand increase. According to annual (2007) statistical report "Russian Chermet information" /38/ there is the blast furnaces idle time (not connected with repairs) in Russian iron industry. Also there is slow run of blast furnaces. Thus other iron producers can increase their production. Annual displacement of iron production will be about 2 300 thousand tonnes.
Alternative 2: The proposed project activity undertaken without being registered as a JI project activity. The coke oven battery #3 construction along with the blast furnace #4. Coke oven battery #3 will be constructed in view to provide additional coke for pig iron production. Expected total annual pig iron and coke production will be approximately 2.3 and 0.4 million tonnes respectively. The coke oven battery construction along with the blast furnace #4 reduce primary cost of pig iron and allow reducing of investment payback time but still does not provide financial attractiveness of the project as confirmed by the results of investments analysis described below.
Alternative 3: Only the coke oven battery #3 construction. Only coke oven battery construction means investment in a development resource for other iron producers because surplus of coke will be sold, this is not a relevant business of Severstal as their primary goal is steel production /59/. Thus this alternative cannot be considered as a reasonable alternative.
Alternative 4: Only the blast furnace #4 construction. According this alternative only blast furnace #4 could be constructed. Thereby the process would not be supplied with own coke. Pig iron production at Severstal will depend on the third-party coke producers. Thus this alternative cannot be considered as a reasonable alternative.
Outcome of Step 1a: Project participants have identified realistic and credible alternative scenarios to the project activity.

Sub-step 1b: Consistency with mandatory laws and regulations

All of the alternatives identified above are consistent with mandatory laws and regulations of the Russian Federation.

Outcome of Step 1b: Project participants have identified realistic and credible alternative scenarios to the project activities that are in compliance with mandatory legislation and regulations taking into account the enforcement in the Russian Federation.

Step 2. Investment Analysis

The purpose of the investment analysis in the context of additionality is to determine whether the proposed project activity is not:

a) The most economically or financially attractive; or
b) Economically or financially feasible, without the revenue from the sale of emission reductions.

Sub-step 2a: Determine appropriate analysis method

In principle, there are three methods applicable for an investment analysis: simple cost analysis, investment comparison analysis and benchmark analysis.
A simple cost analysis (Option I) shall be applied if the proposed JI project and the alternatives identified in step 1 generate no financial or economic benefits other than JI related income. The proposed JI project results in sales revenues due to the new steel production capacity installed and modernised. Thus, this analysis method is not applicable.
An investment comparison analysis (Option II) compares suitable financial indicators for realistic and credible investment alternatives. As only plausible alternative represents the continuation of existing situation, a benchmark analysis (Option III) is applied.

Sub-step 2b: Option III. Apply benchmark analysis

A benchmark investment analysis was chosen because the project generates income (additional sales revenues due to saleable steel volume increase and in cost savings) without the JI revenues and the alternative does not involve any investments. The benchmark chosen is the result of IRR benchmark estimation on the basis of additionality tool (Substep 2b: Option III, section 6a) /8/ concerning that discount rates and benchmarks shall be derived from government bond rates increased by suitable risk premium (bond rate, inflation, riskfree rate, systematic market risk, country risk Russia, project specific risk). Thereby thedefined benchmark is 13,45% for the IRR analysis. These lending rates refer to the use of project-IRR as the financial indicators. The same approach of benchmark setting was used in already registered JI project verified by DNV /57/. The sources of benchmark IRR data are:risk-free rate (4.31%) /44/, russian interest rate (7.5%) /9/, Euro inflation (2%) /10/, project risk premium (8%) /11/. Total expected return 13.45% /36/.

Financial indicators used to set benchmark

#	Factor	Rate	Description	Source
1	Risk-free rate	4.31%	German long-term interest rate in euro as a secondary market yields of government bonds with remaining maturity close to ten years, June 2004. It deems reasonable to use data in comparison with German economy as the biggest economy in Europe /49/.	/44/
2	Russian interest rate	7.5%	Weighted average interest rate of Russian federal bonds and short-dated bond.	/9/

#	Factor	Rate	Description	Source
3	Country risk premium	3.19%	Non-specific risk associated with investments in Russia. Equals to Russian interest rate less Risk-free rate.	Calculated: = Russian interest rate less Risk-free rate.
4	Euro inflation	2.0%	Inflation in euro zone	/10/
5	Real risk-free rate	2.26%	*Real interest rate=(1+risk free rate)/(1+Euro inflation)-1*	Calculated: *=(1+risk free rate)/(1+Euro inflation)-1*
6	Project risk premium	8%	This type of projects has the medium risk factor of 8-10%. Thus the lowest range is applied to be conservative.	/11/
	Total expected return	13.45%	This rate takes into account real (inflation adjusted) risk-free rate increased by country risk and specific project risk.	/36/

All sources of information /9 - 11/, /36/, /44/ are reliable because they represent widely recognised methods and data. The approach taken reflects classic economic idea of the Capital Asset Pricing Model /36/. According to this model the benchmark for investment decision can be presented as the return that investors require from it. This expected return is estimated as:

$$ExpectedReturn = RiskFreeRate + \sum_{j=1}^{k} \beta_j (RiskPremium_j)$$

Where:

β_j – is the Beta of investment specifically relative to factor j.

From the point of view of the investor the expected return will consist of the risk-free rate increased by the suitable risk premiums. The risk-free rate taken for this assessment is for most representative German T-bills (governmental bonds) rate at the time of investment decision being made. It deems conservative as the risk-free rate for a mature economy (e.g. Germany) would be significantly lower than the risk-free rate for the economy with greater growth potential (e.g. Russia) /36/. Moreover the risk-free rate is cleaned from inflation. The standard approach is to deduct the expected inflation rate from risk-free interest rate to get the real risk-free rate as government bonds offer a risk-free return but they're risky in real terms due to variability of expected inflation /36/.

The suitable risk premiums in our case will include:

- Country risk premium (calculated). This portion of the risk reflects unique risks of investment being made in Russia. The additional return (premium) is required to cover political uncertainty, ownership risks, profit repatriation risk etc.
- Project specific risk. This risk component can be interpreted as the risk of uncertainty in getting projected cash inflows from the project. The data from reputable Russian state organization /11/ were taken.

The project benchmark was calculated as sum of Country risk premium, Real risk free rate and Project risk premium. Country risk premium was calculated as Russian interest rate

deducted Risk-free rate. Real risk-free rate is equal to *(1+risk free rate)/(1+Euro inflation)-1.* After checking of all input values the result of 13.45% was obtained.
All calculation were checked and deems true. Results of the calculations are presented in excel file 20110610_CF_Severstal2.xls.
The benchmark is conservative, because it is risk free rate cleaned from inflation and increased by only two risk premiums which are proved by reputable documentary evidence /9/, /11/.
Additionally it was cross-checked with Russian Central Bank data for June 2004, the national interst rate was equal to 14.2% which show that the chosen benchmark is conservative /51/.
If the proposed project (not being implemented as a JI project) has less favourable indicator, i.e. a lower IRR, than this benchmark then the project cannot be considered as financially attractive.

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

DNV has assessed the financial analysis and found that the used parameters are correct. The values of input parameters were cross-checked against an independent third parties data and they were found enough comparable /58/, /60/, /61/, /62/, /63/. Primary costs of coke and pig iron are sourced from official Severstal reports for June 2004 /53/, /54/. These values are directly related to the project and cannot be compared with third party sources as primary costs are very specific for every particular plant and varies a lot from one plant to another due to dependence on applicable technology, contract conditions with suppliers, etc. Total investments imply estimated investments. The estimation performed by Investment department of Severstal and approved by Chief Engineer /28/, /35/. Estimated investments were double-checked during determination process with actual expenses /29/. Actual expenses are higher on 0.04% than planned one. Thus estimated investments used as a basis for the IRR calculation are deemed reasonable.

Input parameters for financial indicators calculation presented below:

Parameter		Value		Value	Source
Primary cost of coke	Euro/t	81.83	Rub/t	2,961.75	/53/
Primary cost of pig iron (without coke)	Euro/t	87.31	Rub/t	3,160.11	/54/
Coke price	Euro/t	215.55	Rub/t	7,801.63	/54/, /58/
Electricity tariff	Euro/MWh	19.26	Rub /MWh	697.06	/53/, /60/, /61/
Pig iron price	Euro/t	161.69	Rub/t	5,852.00	Severstal's data extracted from internal database indicated in the provided letter /55/, /62/
Scrap price	Euro/t	83.25	Rub/t	3,013.00	Severstal's data extracted from internal database and indicated in the provided letter /55/, and /63/
Total investment	mln Euro	168	mln Rub	6110,67	/28/, /35/, /29/

Other parameters such as pig iron production, coke production by COB#3 and coke consumption at BF#4, steam generation by the dry coke quenching, electricity generation by a steam turbine, electricity generation by the top-pressure recovery turbine are mostly taken from /32/ and /33/.

All the assumption and data used by the project participants are listed in the PDD and supporting documents were checked. All documentation (relevant for establishing the baseline scenario) are correctly quoted and interpreted in the PDD. Assumptions and data used in the identification of the IRR and the benchmark are justified appropriately, supported by evidence and can be deemed reasonable.

The financial analysis refers to the time of investment decision-making.

The following assumptions have been used based on the information provided by the enterprise:

1. Investment decision: 20 July 2004, commissioning date: January 2006;
2. The project investment cost accounts for approximately EUR 168 million during four years /28/, /29/;
3. The calculations are made at constant prices as of November 2004 (The calculation at constant prices as of the time of decision-making provides an objective view of the long-term future. It allows to perform a "pure" sensitivity analysis not impacted by expert estimations of inflation levels, prices etc., and to identify the most important factors really impacting the project's financial performance);
4. The exchange rate (EUR/RUR) 1/36.1936 /30/;
5. The project lifetime is around 20 years (lifetime of the main equipment) /31/;
6. Raw material consumption and electricity for BF is taken into account in line with the technical specifications;
7. Coke and iron bearing material consumptions are the biggest cost component constituting more than 80 % of total operational cost.
8. Annual pig iron production in steelmaking pig iron equivalent is 2 300 000 tonnes of pig iron per year.
9. Annual coke production by the coke oven battery is 432 thousand tonnes, commissioning date: January 2007;
10. Left additional coke (for operation BF#4) is bought from other coke producers.

The project cash flow is formed by revenue flows generated by sales of pig iron. Production of slag and blast furnace gas are taken into account during calculation primary cost.

Cash flow analysis shows IRR of 5.22 %. It is well below the benchmark determined as 13.45 %. Hence, the project cannot be considered as a financially attractive course of action.

Sub-step 2d: Sensitivity analysis

The sensitivity analysis has been correctly applied to show whether the conclusion regarding the financial attractiveness was robust to reasonable variations in the critical assumptions. The sensitivity analysis based on application of the Methodological Tool "Tool for the demonstration and assessment of additionality" (Version 05.2).

All the assumption and data used by the project participants are listed in the PDD and supporting documents. Assumptions and data used in the application of the sensitivity analysis are justified appropriately and can be deemed reasonable.

The following three key indicators were considered in the sensitivity analysis: investment cost, steel prices, metal stock. The other cost components account for less than 20 % of total or operation cost and therefore are not considered in the sensitivity analysis. In line with the Additionality Tool the sensitivity analysis should be undertaken within the corridor of ±10 % for the key indicators.
Regarding statistics of prices pig iron, coke and iron bearing materials price depend one from another so these parameters are considered together. Coke and pellet cost occupies fixed part in iron cost of a pig iron production and gives about 80 % of total operation cost. These two key indicators are depended from each other.

Scenario 1 considers 10% investment cost growth. Scenario 1 shows that this assumption worsened the cash flow performance due to significant cost increase. IRR is equal 4.36%.

Scenario 2 is based on the assumption of 10% investment cost decrease that improves cash flow and performance indicators making IRR the higher on 6.19%.

Scenario 3 implies 10% growth of coke and iron bearing materials cost and pig iron price. It leads that IRR climbing up to 5.94%. Pig iron prices are the most revenue driving indicator. But despite increase in pig iron price proposed scenario is robust.

Scenario 4 implies 10% reduction of coke and iron bearing materials cost and pig iron price. As plant revenues are one of the main components reducing worsens the cash flow performance indicators. But despite reduce in pig iron price proposed scenario is robust. IRR is equal 4.45%.
A summary of the results is presented below.
- Scenario 1 has IRR equal to 4.36%;
- Scenario 2 has IRR equal to 6.19%;
- Scenario 3 has IRR equal to 5.94%;
- Scenario 4 has IRR equal to 4.45%;

The sensitivity analysis consistently supports the conclusion that the project is unlikely to be financially attractive.

Outcome of Step 2: After the sensitivity analysis it is concluded that the proposed JI project activity is unlikely to be financially/economically attractive.

Step 3: Barrier analysis
In line with the Additionality Tool no barrier analysis is needed when investment analysis is applied.

Step 4: Common practice analysis
The common practice analysis has been correctly applied to show whether the proposed project activity is not a common practice. All the assumption and data used by the project participants are listed in the PDD and supporting documents. All documentation relevant for common practice analysis correctly quoted and interpreted in the PDD.
Sub-step 4a: Analyze other activities similar to the proposed project activity:

Subproject 1: Construction of the BF #4 includes introduction of the top-pressure recovery turbine (GUBT). Only seven GUBTs were installed in Russia /56/. Considering that forty-

nine blast furnaces were operating in Russia in 2007, this amount cannot be considered significant. Additionally most of them were installed in the Soviet time under totally different conditions, including regulatory framework, investment climate, and access to financing /56/. The only GUBT installed lately at Cherepovecky MK and is a JI project activity.
Therefore this subproject cannot represent a widely observed practice in the area considered.

Subproject 2: Construction of coke oven battery includes dry-quenching plant installation. The technology used in the project activity was developed by scientific group GIPROKOKS. GIPROKOKS's technology has been implemented less than 22% from total dry-quenching units in Russia /39/. Dry-quenching usage in Russia is about 30 % from total coke production. Also other dry-quenching technologies (no GIPROKOKS) have been implemented in Russia /38/. Therefore this subproject cannot represent a widely observed practice in the area considered.

Sub-step 4b: Discuss any similar Options that are occurring:
It is required to follow Sub-step 4b according to of the Tool when this project is widely observed and commonly carried out. The proposed JI project does not represent a widely observed practice in the area considered (see Sub-step 4a). So, this sub-step is not applied.
Sub-steps 4a and 4b are satisfied, i.e. similar activities cannot be widely observed. Thus proposed project activity, including subprojects is not a common practice.
Given the above, it is DNV's opinion that the project is not a likely baseline scenario and emission reduction resulting from the project thus can be considered as additional to what would have happened without the JI incentive.

4.5 Monitoring

The project applies the JI specific approach.
The monitoring plan in the PDD provides for the collection and archiving of all relevant data:
Subproject 1. The coke furnace battery #3 and the coke dry-quenching plant for additional energy generation.
Project emissions:
- CO_2 emissions associated with total electricity consumption during a coal charge and coke production.
- CO_2 emissions from fuel gas (coke oven gas, blast furnace gas) burning.
- CO_2 emissions from coke oven gas combustion in flaring system.

Subproject 2. The blast furnace #4 and the top-pressure recovery turbine for additional energy generation.
Project emissions:
- CO_2 emissions associated with electricity and steam consumption during the oxygen production.
- CO_2 emissions associated total electricity consumption during an iron production and compressed air production.
- CO_2 emissions from NG burning.
- CO_2 emissions from coke (which is not produced by coke oven constructed due to the subproject 1), pellet and sinter production.
- CO_2 emissions from Limestone and Dolomite (slag-forming materials) production.

Leakage:
Not applicable.
The monitoring plan is in line with JI specific approach.

The sources of data to be monitored to determine the project and baseline emissions are clearly described.
Severstal has quality system for metrology and certified laboratory /12/. It is also mitigates monitoring errors and uncertainties to extend that it reasonably possible. This is underpinned with the monitoring plan which is presented in PDD in Annex 3 and section D.
The plant laboratory is keeping default operational journals and electronic monitoring and archiving system which includes the following information: compilation and description of all data recorded, all corrective action undertaken, manually logged data and calibration protocols. All data should be continuously checked for consistency, completeness and integrity by special laboratory staff.
The monitoring methodology is in line with monitoring plan and it allows a transparent, accurate and complete calculation of baseline and project emissions.
It is deemed reasonable that the monitoring plan provides for the collection and archiving of all relevant data needed to estimate or measure emissions occurring within the project boundary and to determine the baseline emissions.
PDD Table D.1.1.1 contains information of data to be collected in order to monitor emissions from the project, and how these data will be archived. This information had been analyzed and deemed adequate. Metrological equipment and procedures of its use had been assessed during site visit and deemed adequate.
PDD table D.1.1.3 contains information of relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived. This information had been analyzed and deemed adequate. Metrological equipment and procedures of its use had been assessed during site visit and deemed adequate.
PDD Table D.2 contains quality control (QC) and quality assurance (QA) procedures undertaken for data monitored. This information had been analyzed and Quality system had been assessed during site visit.

4.5.1 Parameters determined ex-ante

The following fixed parameters will be used for estimation of emissions in project or baseline scenarios:

- Default emission factor of iron& steel production (IPCC) /13/;
- Default emission factor of coke production (IPCC) /13/;
- Emission factor of natural gas (IPCC) /14/;
- Specific emission factor for oxygen production (fixed ex-ante as average for 2006-2008 years) (IPCC) /14/;
- Emission factor of coke (IPCC) /14/;
- Standardized CO_2 emission factor of the relevant regional electricity grid in year y (tCO_2/MWh), fixed ex-ante (see Annex 2);
- Emission factor of COG (IPCC) /14/;
- Carbon emission factor of electricity grid of Russia (fixed ex-ante for 2008 – 2012, see Annex 2);
- Emission factor of natural gas, usage of gas as fuel in the baseline scenario is conservative (IPCC) /14/.

All parameters are determined in line with the chosen JI specific approach.

4.5.2 Parameters to be monitored ex-post

During monitoring process of the project the following parameters will be measured at Severstal shops:

- Raw material consumption for BF#4 in year *y*;
- Total coke consumption for BF#4 in year *y*;
- Coke production by COB #3 in year *y*;
- Total consumption of natural gas in the blast furnace #4 in year y;
- Net calorific value of natural gas in year y (Annually or Fixed ex-ante /15/);
- Oxygen consumption in month m;
- Net calorific value of coke (Annually or Fixed ex-ante /15/);
- Electricity consumption during iron production by constructed BF#4 in year *y*.
- Carbon monoxide content in blast furnace gas in year *y* (fraction);
- Total blast furnace gas production in BF#4 in year y;
- Blast furnace gas for preheater of BF#4 in year y;
- Total blast furnace gas production in Severstal in year y;
- Total blast furnace gas combustion in Severstal flaring system in year y (BFG from BF#4 cannot be monitored individually, but only total BFG).
- Total consumption of coke oven gas in the coke oven battery #3 and #4 in year y;
- Coke production by COB #3 and #4 in year y;
- Total coke production in Severstal in year y;
- Total COG combustion in Severstal flaring system in year y;
- Net calorific value of fuel of type COG in year y (Annually or Fixed ex-ante /15/);
- Blast furnace gas combustion in COB #3 in year y;
- Electricity consumption during coke production by COB#3, COB#4 and coke quenching in year *y*;
- Electricity consumption during coal charging preparation for all coke oven batteries in Severstal in year *y*;
- Subproject production by BF#4 in year y (pig iron);
- Project electricity generation by Top pressure Recovery Turbine in year y;
- Project steam generation by Dry-Quenching Plant #3-4 in year y.

All parameters are determined in line with the chosen JI specific approach.

4.6 Estimate of GHG Emissions

Project emissions:

Project emissions include emissions from two subprojects. But the estimation formulae for Project emission calculates emissions for the blast furnace #4 subproject. The emission from coke oven battery #3project are included inside calculation for the blast furnace #4 project emission as one of raw material (coke) production emission.

$$PE_y = PE_y^{BF4}$$

Where:

PE_y Project emissions in year *y* (tCO_2);

$PE_y^{BF\,4}$ Project emissions from BF#4 in year y (tCO_2).

Sources of emissions during coke production:

1. Total electricity consumption during a coal charge and coke production. Emissions (from electricity) are calculated using standardized regional electricity factors for Russia /17/.
2. Fuel consumption (coke oven gas, blast furnace gas). Emissions are calculated using IPCC emission factor for a coke oven gas and own emission factors for a blast furnace gas /13/.
3. Coke oven gas combustion in flaring system. Emissions are calculated using IPCC emission factor /14/.

Sources of emissions from the iron making process:

1. Electricity and steam consumption during the oxygen production. Emissions (from electricity) are calculated using standardized regional electricity factors for Russia /17/. Emissions (from steam) are calculated using own emission factors for steam production /16/.
2. Total electricity consumption during an iron production and compressed air production. Emissions (from electricity) are calculated using standardized regional electricity factors for Russia /17/.
3. Natural gas consumption. Emissions are calculated using IPCC and calculated own emission factors (for NG) /14/.
4. Coke, pellet and sinter production. Emissions are calculated using IPCC (for coke, pellet and sinter /14/) and calculated own emission factors (for coke produced by coke oven battery #3).
5. Limestone and Dolomite (slag-forming materials). Emissions are calculated using IPCC /14/.

Baseline emissions:

Baseline emissions include The baseline emissions of the pig iron production are established using the approach as given in Annex 2;

1. The baseline emissions of the coke production are established using the IPCC emission factor for coke production /14/;
2. The baseline emissions of the grid are established using the Russian standardized grid factor /17/.
3. Baseline emission factor of the displacing production fixed ex-ante for three years.

Leakage:

As stated above in section 4.5, no leakage effects needs to be accounted for the proposed project.

The emission reduction forecast has been verified and is deemed likely that the forecast amount of 2 183 811 tCO_2 is achieved over 5 years crediting period of 2008-2012. An additional 2 575 075 tCO_2 can be potentially achieved over 5 years post Kyoto crediting period (2013-2017).

4.7 Environmental Impacts

The following legislations are relevant for the project activity:

- Federal Law on the Environmental Expertise #174 –FZ /18/;
- Federal Law on Amendments to the Construction Code effective #80 –FZ /19/;
- Federal Law on Environment protection #7 –FZ /20/;
- Federal Law on Sanitary and epidemiological wellness of the population #52-FZ /21/.

The influence of the blast furnace and coke oven battery construction on air pollution in Cherepovets City was determined. It was based on the calculation of air pollution which was performed with software UPRZA "PDV-Ekolog" in accordance with appropriate methodology /22/. The air pollution analysis demonstrated absence of excess of allowable concentration for all substances. Project impact is insignificant. Qualitative composition of atmospheric air in residential area after project start up will remain within emission limits. The pollutions connected with burned natural gas are reduced after decommission of OHFs. Non organic dust pollution is reduced due to installation of new gas cleaning units in other equipment at Severstal too.

Project documentation for the blast furnace construction (Section "Environment Protection") was approved on 14th November 2005 /23/. Project documentation for the coke oven battery construction (Section "Environment Protection") was approved on 18th October 2006 /24/. The project does not have any transboundary environmental impacts.

4.8 Comments by Local Stakeholders

The project was introduced to the Vologda region Government and local authorities. The authorities appreciated the project. Construction of the blast furnace #4 and coke oven battery #3 was approved /25/, /26/.

Severstal provided stakeholders with project information. Information regarding Severstal project was published on Russian web-site "InfoMetallGeo" /27/, /28/.

4.9 Global stakeholders consultation

The PDD of "Implementation of energy efficiency projects at JSC "Severstal" version 1.0 /1/ was made publicly available on JI website (http://ji.unfccc.int/JI_Projects/DeterAndVerif/Verification/PDD/index.html) and Parties, stakeholders and observers were through the JI website invited to provide comments during a 30 days period from 14 January 2011 to 12 February 2011.

No comments were received.

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APPENDIX A

JI DETERMINATION PROTOCOL

Table 1 Mandatory requirements for Joint Implementation (JI) project activities

Requirement	Reference	Conclusion
1. The project shall have the approval of the Parties involved	Kyoto Protocol Article 6.1 (a)	OK
2. Emission reductions, or an enhancement of removal by sinks, shall be additional to any that would otherwise occur	Kyoto Protocol Article 6.1 (b)	OK
3. The sponsor Party shall not aquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7	Kyoto Protocol Article 6.1 (c)	OK
4. The acquisition of emission reduction units shall be supplemental to domestic actions for the purpose of meeting commitments under Article 3	Kyoto Protocol Article 6.1 (d)	OK
5. Parties participating in JI shall designate national focal points for approving JI projects and have in place national guidelines and procedures for the approval of JI projects	Marrakech Accords, JI Modalities, §20	OK
6. The host Party shall be a Party to the Kyoto Protocol	Marrakech Accords, JI Modalities, §21(a)/24	OK
7. The host Party's assigned amount shall have been calculated and recorded in accordance with the modalities for the accounting of assigned amounts	Marrakech Accords, JI Modalities, §21(b)/24	OK
8. The host Party shall have in place a national registry in accordance with Article 7, paragraph 4	Marrakech Accords, JI Modalities, §21(d)/24	OK
9. Project participants shall submit to the independent entity a project design document that contains all information needed for the determination	Marrakech Accords,	OK

Requirement	Reference	Conclusion
	JI Modalities, §31	
10. The project design document shall be made publicly available and Parties, stakeholders and UNFCCC accredited observers shall be invited to, within 30 days, provide comments	Marrakech Accords, JI Modalities, §32	OK
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, in accordance with procedures as determined by the host Party shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out	Marrakech Accords, JI Modalities, §33(d)	OK
12. The baseline for a JI project shall be the scenario that reasonably represents the GHG emissions or removal by sources that would occur in absence of the proposed project	Marrakech Accords, JI Modalities, Appendix B	OK
13. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, JI Modalities, Appendix B	OK
14. The baseline methodology shall exclude to earn emission reductions for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, JI Modalities, Appendix B	OK
15. The project shall have an appropriate monitoring plan	Marrakech Accords, JI Modalities, §33(c)	OK

Table 2 Requirements checklist

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A General description of project activity					
A.1 Project boundary *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1 Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR	The project is located at Severstal in Cherepovets city, north-west of Russia, in the Vologda region. Geographical location of Vologda region and Cherepovets are presented in Figure A.4.1.1 (See PDD A.4.1). Please clarify title of the figure with the map. ***Figure A.4.1.1: Map of Russia with location of Khabarovsk Territory (selected by red colour).*** The Severstal production site is located at the north outskirts of Cherepovets (see Figure A.4.1.4.1). The project site coordinates are: longitude 37.58' E, latitude 59.15' N. It was corrected.	~~CL 01~~	OK
A.1.2 Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR, I	The project's system boundaries are defined in description and Schematic Diagrams of Subproject 1 "Construction of the coke furnace battery #3 and the coke dry-quenching plant for additional energy generation" and Subproject 2 "Construction of blast furnace #4 and installation of the top-pressure recovery turbine for additional		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			energy generation" (See PDD A.4.2.2). Please clarify if it is construction or reconstruction of furnace #4. There is construction, because the furnace is constructed completely on the place of old furnace which was dismantled several years year before.	~~CL 02~~	
			Please clarify system boundaries (components and facilities used to mitigate GHGs) in the schematic diagram A.4.2.1. The diagram isn't adequate. The diagram doesn't contain dry quenching and turbain electricity generation. The dry quenching was added in diagram A.4.2.1 and A.4.2.3. Electricity generation turbine is beyond project boundary because steam can be used in steam turbine for electricity generation and other Severstal needs.	~~CL 03~~	
			Please clarify system boundaries (components and facilities used to mitigate GHGs) in the schematic diagram A.4.2.2. The diagram isn't adequate. The diagram doesn't contain the top-pressure recovery turbine for additional energy generation.	~~CL 04~~	

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			The top-pressure recovery turbine was added in diagram A.4.2.2 and A.4.2.3.		
A.2 Participation Requirements *Referring to Part A and Annex 1 of the PDD as well as the JI glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.*					
A.2.1 Which Parties and project participants are participating in the project?	/1/	DR	JSC "Severstal" is the project participant (Party A - Russian Federation). Global Carbon BV is the project participant (Party B – The Netherlands).		OK
A.2.2 Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/	DR	After the PDD has gone through the preliminary determination process, the PDD, a determination report and other related documents will be submitted to JSC "Sberbank" for project approval procedure as a JI Project.	~~CAR 01~~	OK
A.3 Technology to be employed *Determination of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The AIE should ensure that environmentally safe and sound technology and know-how is used.*					
A.3.1 Does the project design engineering reflect current good practices?	/1/	DR	Yes. The project design engineering represents current good practices.		OK
A.3.2 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?	/1/	DR	Please clarify if the project uses the state of the art technology. The subproject represents up-to-date engineering practice and makes possible to improve energy efficiency of coke production. The main point of subproject that the coke making with inert gases quenching	~~CL 05~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			improves coke quality and allow steam production using thermal energy of red-hot coke. 80% of sensible heat of coke can be recovered for steam production. The steam is used for electricity generation and other needs. This subproject intends to introduce state-of-art technology from a reputable Russian scientific group GIPROKOKS, resulting in a new technology implementation in Russia. GIPROKOKS developed this technology and received patent. Dry Coke Quenching technology has been introduced less then 22% from total coke production in Russia /39/. The subproject represents up-to-date engineering practice and makes it possible to improve energy efficiency of metal production. Subproject includes introduction of the top-pressure recovery turbine (GUBT). GUBT allows returning about 40% of spent energy for blast-furnace air and used to generate additional electricity due to utilising off-gas positive pressure. Only seven GUBT were installed in Russia. Considering that forty-nine blast furnaces were operating in Russia in 2007, this amount cannot be considered significant /27/.		
A.3.3 Does the project make provisions for meeting training and maintenance needs?	/1/	DR	The plant trains staff continuously in the metallurgical college of Cherepovets. The	~~CL 06~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			college training covers the main subject areas of (several specialities): • cokemaking; • blast-furnace metallurgist. Please clarify the procedure of training. After installation of equipment, Training program was development. Operation and maintenance trainings were provided by the equipment supplier in accordance with the agreement. Trainings were made with the help of personnel who had working experience on such equipment. All the operational and monitoring personnel is regularly trained and certified in accordance with approved training courses and certification grades. Training and exams schedule is developed and approved yearly. Personnel are regularly passes extensive training courses. The new plant staffs are trained continuously in the metallurgical college of Cherepovets. The college training covers the main subject areas of (several specialities): 1)cokemaking, 2)blast-furnace metallurgist.		
A.4 Small scale project activity *Tit is assessed whether the project qualifies as small-scale JI project activity*					
A.4.1 Does the project qualify as a small scale JI project activity as defined by the Supervisory Committee in its "Provisions for			*N/A*		

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	Joint Implementation small-scale projects"?					
A.4.2	Is the small scale project activity not a debundled component of a larger project activity?			*N/A*		
	B Project Baseline *The determination of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1.1	Does the project apply an approved CDM methodology and the correct version thereof? If yes, please proceed to section B.3. If a JI specific approach is applied, please complete section B.2.	/1/	DR	JI specific approach is applied.		OK
B.2	**Baseline methodology (JI specific approach)**					
B.2.1	Are the proposed applicability conditions appropriate and adequate?	/1/	DR	Yes. The following key factors that affect the baseline are taken into account: Sectoral reform policies and legislation, Economic situation/growth and socio-demographic factors in the relevant sector as well as resulting predicted demand, Availability of capital, Local availability of technologies/techniques, skills and know-how and availability of best available technologies/techniques in the future, Fuel prices and availability. The most plausible future scenario has been identified by checking that all alternatives are consistent with mandatory applicable laws and regulations and by performing an		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				investment analysis. The baselines for each of subproject will be the most plausible future scenario on the basis of conservative assumptions and key factors described above. The methodological "Tool to calculate the emission factor for an electricity system" may be applicable to estimate operating margin when calculating baseline emissions for a project activity that substitutes grid electricity.		
B.2.2	Is the methodological basis for determining the baseline scenario described?	/1/	DR	Yes. The methodological basis for determining the baseline scenario is described. A baseline for the JI project was set in accordance with Appendix B to decision 9/CMP.1 (JI guidelines), and with the "Guidance on Criteria for Baseline Setting and Monitoring" (version 2). To prove the project additionality was used "Tool for the demonstration and assessment of additionality"(version 05.2).		OK
B.2.3	Is the methodological basis for determining the baseline scenario, and whether the basis is appropriate and adequate?	/1/	DR	The methodological basis for determining the baseline scenario is described in Section B.1., Annex 2. The project baseline is grounded on the "Tool to calculate the emission factor for an electricity system" (version 02). The standardized CO_2 emission factors (Annex 2, section: Standardized electricity grid emission factor) were elaborated for Russian power systems in the Study	~~CL 07~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			commissioned by "Carbon Trade and Finance SICAR S.A." grounded on the "Tool to calculate the emission factor for an electricity system" (version 01.1). Need to be commented. The emission factors for electricity consumed from the grid were elaborated for Russian power systems in the Study "Development of grid GHG emission factors for power systems of Russia" commissioned by "Carbon Trade and Finance SICAR S.A.". This Study was verified by CJSC Bureau Veritas Certification Rus in 2008. At that time the "Tool to calculate the emission factor for an electricity system" (version 01.1) was the latest available version of approved tool. The version 02 of the tool was put into force on 16 October 2009. Text of the PDD was amended. The appropriate parts of the Study were submitted to AIE.		
B.2.4 Does the application of the methodology result in a baseline scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity?	/1/	DR	Yes. The application of the methodology result in a baseline scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity. Project participants have established baseline GHG emission calculation methodology on a		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				project specific basis in line with Annex B to decision 9/CMP.1 (JI Guidelines). The project uses the baseline setting and monitoring approach developed according to the latest version of "Guidance on Criteria for Baseline Setting and Monitoring" /4/ and "Guidelines for users of the JI PDD form" /3/. The baseline setting and monitoring approach meets the relevant UNFCCC requirements for the JI and the relevant host country criteria. The step by step approach ("Guidelines for users of the JI PDD form" /3/) is applied in order to describe and justify the baseline chosen in accordance with paragraph 23 through 29 of "Guidance on Criteria for Baseline Setting and Monitoring" /4/. Please refer to PDD Section B.1.		
B.2.5	Can it through the use of the methodology be demonstrated that a project activity is additional and, therefore, not the baseline scenario?	/1/	DR	Yes. The use of the methodology demonstrated that the project activity is additional and, therefore, not the baseline scenario. The additionality of the project has been established using the "Tool for the demonstration and assessment of additionality" version 05.2 /30/. STEP 1. Identification of the alternatives to the project activity consistent with current laws and regulations. STEP 2. A benchmark investment analysis		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			was chosen because the project generates income (additional sales revenues due to saleable steal volume increase and in cost savings) without the JI revenues and the alternative does not involve any investments. The benchmark chosen is the result of IRR benchmark estimation on the basis of additionality tool (Substep 2b: Option III, section 6a) /30/ concerning that discount rates and benchmarks shall be derived from government bond rates increased by suitable risk premium (bond rate, inflation, risk-free rate, systematic market risk, country risk Russia, project specific risk). Thereby IRR defined for benchmark is 13,45% (on the base of data July 2004). This lending rate refer to the use of the project-IRR as the financial indicator. The proposed project (construction of blast furnace #4 and coke jven #3) shall be implemented by JSC Severstal. JSC Severstal has no internal IRR benchmark for its investment decision making IRR benchmark analysis is calculated according to the reliable methodology /34/ and following factors (financial indicators): Risk-free rate (4.31%) /44/, Russian interest rate (7.5%) /9/, Euro inflation (2%) /10/, Project risk premium (8%) /11/. Total expected return 13.45% The IRR benchmark estimation of 13,45% is		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			justified as adequate.		
			Please clarify, why inflation had been taken for European Union but not for Germany. It was made due to conservative reasons. European Union's inflation held constant for that past period (2003-2004). Germany's inflation changed significant at that moment	~~CL 08~~	
			Please clarify the basement for the calculation of country related risk. Country risk is estimated as the difference between the treasury bond rate of the selected country and the corresponding US or EU treasury bond rate (T-Bill). This approach is well-known /36/, /37/.	~~CL 09~~	
			Please clarify the company related risk premium source. This risk was deleted from IRR calculation.	~~CL 10~~	
			Please clarify, why calculation of IRR was not been taken separately for each project. These projects are connected against each other. Because coke is important raw material for ironmaking process. Every project loses its meaning without another.	~~CL 11~~	
			STEP 3. In line with the Additionality Tool		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			no barrier analysis is needed when investment analysis is applied. STEP 4: Common practice analysis. Sub-step 4a: Analyze other activities similar to the proposed project activity: Construction of the BF #4 includes introduction of the top-pressure recovery turbine (GUBT). GUBT allows returning about 40% of spent energy for blast-furnace air and used to generate additional electricity due to utilising off-gas positive pressure. Twenty-two GUBTSs were installed by JSC Turbomotorniy zavod (see below). Only seven of them were installed in Russia. Considering that forty-nine blast furnaces were operating in Russia in 2007, this amount cannot be considered significant. Please clarify modern situation with other activities similar to the proposed subproject 1 activity in Russian coke production industry regarding common practice. Construction of coke oven battery includes dry-quenching plant installation. It has made possible to generate additional electricity due to utilising of coke thermal power. Usually water quenching is usage by Russian coke producers. Because it requires less investment and allows increasing bulk-coke	~~CL 12~~	

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			yield but it leads to insignificant quality reducing. GIPROKOKS developed this technology and received patent. Technology usage is shown in PDD Table B.2.5. GIPROKOKS's technology has been implemented less than 22% from total dry-quenching units in Russia. Dry-quenching usage in Russia is about 30 % from total coke production. Also other dry-quenching technologies (no GIPROKOKS) have been implemented in Russia Sub-step 4b: Discuss any similar Options that are occurring: It is required to follow Sub-step 4b according to of the Tool when this project is widely observed and commonly carried out. The proposed JI project does not represent a widely observed practice in the area considered (see Sub-step 4a). So, this sub-step is not applied. Sub-steps 4a and 4b are satisfied, i.e. similar activities cannot be widely observed. Thus proposed project activity, including subprojects is not a common practice. Given the above, it is DNV's opinion that the project is not a likely baseline scenario and emission reduction resulting from the project thus can be considered as additional to what would have happened without the JI	~~CL 28~~	

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				incentive.		
B.2.6	Is the methodology to calculate the baseline emissions and is the basis for calculating baseline emissions appropriate and adequate?	/1/	DR	Please clarify the method of calculation of Operating Margin for Grid Emission Factor in the Annex 2. In accordance with the paragraph 7.2 of the Study "Development of grid GHG emission factors for power systems of Russia" /26/ the project participants can use Operating Margin in case of reduction of electricity consumption from a grid. The Operating Margin of regional energy system "Centre" was defined using Simple OM method. The appropriate part of the Study was submitted to AIE.	~~CL 13~~	OK
B.2.7	Is the methodology to calculate project emissions appropriate and adequate?	/1/	DR	Project emission calculation according to the following formula: $PE_y = PE_y^{BF¢}$ (1) is not adequate (see PDD D.1.1.2). The project emissions are established for conservative reasons as the emission from blast furnace #4. The emissions from coke oven are included inside the emission from blast furnace #4.	~~CAR 02~~	OK
B.2.8	Is there any potential leakage due to the project activity?	/1/	DR	Please clarify evidently any potential leakage due to the project activity or their absence in section B.3.	~~CL 14~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			The potential leakages are associated with: • Fugitive CH_4 emissions associated with fuel extraction, processing, transportation and distribution of natural gas; • Technical transmission and distribution losses of electricity. ***Subproject 1*** This subproject does not consume natural gas from outside. Own blast furnace gas and oven gas are used. Annual electricity consumption in project scenario is approximately 6,353 MWh. In Russian Federation the electricity losses are 11-13%[1]. The emission factor for electricity consumption is 0.511 tCO_2/MWh (please see Annex 2 of the PDD). And volume of emission is 0.511×6,353×11/100 = 357 tCO_2. Also all Coke oven batteries have similar leakages and it contributes to less than 1 % of the total emissions (CO_2 equivalent). Therefore omitting these leakages for a coke making process is conservative. ***Subproject 2*** For subproject 2, most part of leakages in		

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				project scenario is associated with fugitive CH_4 emission (for natural gas consumption) and losses of electricity. During calculation baseline emission factor for pig iron production, electricity is not taking into account. Project emission includes project electricity consumption (for conservative reasons). Also annual natural gas consumption in project is less than by other pig iron producers. Therefore omitting these leakages for the project ironmaking process is conservative. Thus the leakages in project scenario are less than in baseline scenario for both subprojects 1 and 2 and these emissions have not been taken into account for simplicity and conservatism.		
B.2.9	Is it for all key data and parameters indicated which data sources or default values are used and how the data or the measurements are obtained (e.g. official statistics, expert judgment)?	/1/	DR	Please clarify data source regarding position "Value of data applied" filled with 1.7 (2007) section B.1., table with parameter BEF_y^{iron}. Calculated according to LLC "Korporatsiya proizvoditeley chernih metalov" annual statistical report "Russian Chermet information". This report contains the data of annual steel and iron production and annual fuel and electricity consumption at Russian steel plants. Reference was added /38/.	~~CL 15~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2.10	Are the data sources and measurement procedures (if any) used adequate, consistent, accurate and reliable?	/1/	DR	Yes. Relevant sources are referenced through the text of PDD. The data sources used adequate, consistent, accurate and reliable.	~~See CL 15~~	OK
B.2.11	Is the monitoring frequency for the data and parameters is appropriate?	/1/	DR	Yes. The monitoring frequency for the data and parameters is appropriate. The monitoring methodology allows a transparent, accurate and complete ex-post calculation of baseline emissions. It is also mitigates monitoring errors and uncertainties to extend that it reasonably possible. This is underpinned with the monitoring plan which is presented in PDD in Annex 3 and section D.		OK
B.2.12	Has the methodology been described in an adequate and transparent manner?	/1/	DR	Yes. The methodology described in an adequate and transparent manner.		OK
B.3	**Applicability of methodology** *To be completed in case an approved CDM methodology is applied. Insert a row for each applicability criteria of the applied methodology (and tools)*					
B.3.1	How was it validated that project complies with the following applicability criteria: insert applicability criteria 1?			*N/A*		
B.4	**Project boundary**					
B.4.1	What are the project's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/	DR	The project's system boundaries clearly defined and in accordance with the methodology. Refer to section B.3.		OK
B.4.2	Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/	DR	GHG sources are calculated for subproject 1 as the sum of CO_2 emissions. GHG sources are calculated for subproject 2	~~CL 16~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			as the sum of CO_2 emissions. Please clarify, can it be confirmed that the baseline CH_4 and N_2O emission are insignificant. Only CO_2 emissions are taken into account. Major source of other GHGs such as CH_4 and N_2O at a blast furnace process is the burning of fuel (coke). Given fuel specific consumption in ordinary blast furnace process in Russia, CH_4 emission is 127 g/tonne of pig iron and N_2O emissions is 19 g/tonne of pig iron compared with about 1700 kg of CO_2 per tonne of pig iron (2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, STATIONARY COMBUSTION). Also emissions may be less because blast furnace gas is burnt up in boiler and preheater. Omitting these two pollutants for a ironmaking process is conservative, because they contribute to less than 0.52 % of the total emissions (CO_2 equivalent), far below the confidence level for the CO_2 emission calculation. The CH_4 and N_2O emission reductions will not be claimed. This is conservative.		
B.4.3 Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/	DR	See CL 16	~~CL 16~~	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5	**Baseline scenario determination**					
B.5.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/	DR	The list of baseline scenarios consist of two scenarios for each subproject: 1) Continuation of a situation existing prior to the project, 2) The proposed project activity undertaken without being registered as JI activity. The list of baseline scenarios is complete.		OK
B.5.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/	DR	Elimination of the other baseline scenarios was based on the "Tool for the demonstration and assessment of additionality" version 05.2. Refer to section B.2.		OK
B.5.3	What is the baseline scenario?	/1/	DR	The baseline scenario is "Continuation of a situation existing prior to the project". Refer to section B.2.		OK
B.5.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR	The determination of the baseline scenario is in accordance with the guidance in the methodology.		OK
B.5.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	The baseline scenario determined using conservative assumptions. Refer to section B.2.		OK
B.5.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Yes. The baseline scenario sufficiently take into account relevant national and sectoral policies, macro-economic trends and political aspirations. Refer to sections B.1., B.2., Annex 2.		OK
B.5.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Reference PDD #5 page 13 is inadequate (http://www.minprom.gov.ru/activity/metal/strateg/2).	~~CL 20~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			New reference was added /17/.		
			The project investment cost accounts for approximately EUR 168 million during four years; (PDD page 23). Please make reference/(s). Reference was added /28/, /29/.	~~CL 23~~	
			The exchange rate (EUR/RUR) 1/37.20; (PDD page 23). (PDD page 23). Please make reference/(s). Reference was added /30/.	~~CL 24~~	
			The project lifetime is around 20 years (lifetime of the main equipment); (PDD page 23). Please make reference/(s). Reference was added /31/.	~~CL 25~~	
			Annual pig iron production in steelmaking pig iron equivalent is 2,300,000 tonnes of pig iron per year. (PDD page 23). Please make reference/s. Reference was added /32/.	~~CL 26~~	
			Annual coke production by the coke oven battery is 432 thousand tonnes, commissioning date: January 2007; (PDD page 23). Please make reference/(s). Reference was added /33/.	~~CL 27~~	

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.8	Is the baseline determination adequately documented in the PDD? • All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity	/1/	DR	Why on page 26 Step 3 (before B3 section) is going after step 4? For conclusion need response for CAR 2, CL1-CL28.	~~CL 21~~	
B.6	**Additionality Determination** *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*					
B.6.1	What is the methodology selected to demonstrate additionality?			*N/A*		
B.6.2	Is the project additionality assessed according to the methodology?			*N/A*		
B.6.3	Are all assumptions stated in a transparent and conservative manner?			*N/A*		
B.6.4	Is sufficient evidence provided to support the relevance of the arguments made?			*N/A*		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
C Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*						
C.1.1	Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/, /35/	DR	Proof of the actual starting date should be available in document(s). Please make document reference. Starting date of JI project is the date when construction, implementation or real action takes place for the project. This project consists of two subprojects. Construction of the blast furnace is connected with the coke oven battery construction because coke is main raw material for pig iron production. Coke oven battery financing was approved by JSC Severstal on the 20 July, 2004. Blast furnace financing was approved by JSC Severstal on the 23 December, 2004. After approved financing, equipment purchase taken place. Thus project start date is taken 20 July 2004 /35/.	~~CAR 04~~ ~~CL 17~~	OK OK
C.1.2	Is the start of the crediting period clearly defined and reasonable?	/1/	DR	Yes. The start of the crediting period clearly defined and reasonable. Please refer to C.3.		OK
D Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*						
D.1.1	Is the monitoring plan documented according to the chosen methodology and in a complete and transparent manner?	/1/	DR	In Annex 3 the monitoring plan is absent. The monitoring plan is added. The monitoring	~~CAR 03~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				plan is adequate.		
D.1.2	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of ERUs, for this project activity, whichever occurs later?	/1/	DR	Monitoring, data collection and archiving is done by Severstal laboratory. Collected and archived Data will be stored for more than five years in hardcopy and electronically.		OK
D.2	**Monitoring of Project Emissions** *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR, I	Yes.		OK
D.2.2	Are the choices of project GHG indicators reasonable and conservative?	/1/	DR, I	Yes. The choices of project GHG indicators reasonable and conservative. Refer to D.1.1.1		OK
D.2.3	Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR, I	See CAR 03.	~~CAR 03~~	OK
D.2.4	Is the measurement equipment described and deemed appropriate?	/1/	DR, I	See CAR 03.	~~CAR 03~~	OK
D.2.5	Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR, I	See CAR 03.	~~CAR 03~~	OK
D.2.6	Is the measurement interval identified and deemed appropriate?	/1/	DR, I	The measurement interval identified and deemed appropriate. Refer to D.1.1.1.		OK
D.2.7	Is the registration, monitoring, measurement and reporting procedure defined?	/1/	DR, I	See CAR 03.	~~CAR 03~~	OK
D.2.8	Are procedures identified for maintenance of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR, I	See CAR 03.	~~CAR 03~~	OK
D.2.9	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and	/1/	DR, I	See CAR 03.	~~CAR~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	how to process performance documentation)				~~03~~	
D.3	**Monitoring of Baseline Emissions** *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
D.3.1	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR, I	See CAR 03.	~~CAR 03~~	OK
D.3.2	Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR, I	Yes. The choices of baseline GHG indicators reasonable and conservative. Refer to D.1.1.3.		
D.3.3	Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR, I	See CAR 03.	~~CAR 03~~	OK
D.3.4	Is the measurement equipment described and deemed appropriate?	/1/	DR, I	See CAR 03. Yes. The measurement equipment described and deemed appropriate	~~CAR 03~~	OK
D.3.5	Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR, I	See CAR 03. Yes. The measurement accuracy is addressed and deemed appropriate. The procedures are in place on how to deal with erroneous measurements.	~~CAR 03~~	OK
D.3.6	Is the measurement interval for baseline data identified and deemed appropriate?	/1/	DR, I	The measurement interval identified and deemed appropriate. Refer to D.1.1.3.		OK
D.3.7	Is the registration, monitoring, measurement and reporting procedure defined?	/1/	DR, I	See CAR 03. Yes. The registration, monitoring, measurement and reporting procedure is defined.	~~CAR 03~~	OK
D.3.8	Are procedures identified for maintenance of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR, I	See CAR 03. Yes. The procedures are identified for maintenance of monitoring equipment and	~~CAR 03~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			installations. The calibration intervals are being observed.		
D.3.9 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR, I	See CAR 03. Yes. The procedures are identified for day-to-day records handling.	~~CAR 03~~	OK
D.4 Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.4.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?			N/A		
D.4.2 Are the choices of project leakage indicators reasonable and conservative?			N/A		
D.4.3 Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?			N/A		
D.5 Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.5.1 Is the authority and responsibility of overall project management clearly described?	/1/	DR, I	See CAR 03.	~~CAR 03~~	OK
D.5.2 Are procedures identified for training of monitoring personnel?	/1/	DR, I	See CAR 03. Yes. The procedures are identified for training of monitoring personnel. JSC "Severstal" has ISO 14001:2004 certificate.	~~CAR 03~~	OK
D.5.3 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR, I	See CAR 03. Yes. The procedures are identified for emergency preparedness for cases where emergencies can cause unintended emissions. JSC "Severstal" has ISO 14001:2004 certificate.	~~CAR 03~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.5.4	Are procedures identified for review of reported results/data?	/1/	DR, I	See CAR 03. Yes. The procedures are identified for review of reported results/data. JSC "Sevrstal" has ISO 14001:2004 certificate.	~~CAR 03~~	OK
D.5.5	Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR, I	See CAR 03. Yes. The procedures are identified for corrective actions in order to provide for more accurate future monitoring and reporting. JSC "Severstal" has ISO 14001:2004 certificate.	~~CAR 03~~	OK
E Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*						
E.1 Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*						
E.1.1	Are the calculations documented according to the chosen methodology and in a complete and transparent manner?	/1/	DR	Yes. Calculations performed in a complete and transparent manner in line with the chosen approach.		OK
E.1.2	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Please clarify directly if the conservative assumptions have been used when calculating the project emissions.	~~CL 18~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			The following assumptions for calculation of both baseline and project emissions were used (for conservative reasons): • The pig iron and coke production are the same in the project and baseline scenario (ER calculations could not be made due to steel production reduction); • The type of fuel combusted and raw material consumed is not influenced by the project (In case fuel change it will allow to calculate ER correct); • The emissions from electricity consumption/generation are established using the relevant regional Russian standardized grid emission factor, as described in Annex 2 (This Russian standardized grid emission factor was calculated according to CDM tool and was determined by Bureau Veritas). The project emissions are established in the following way (for conservative reasons): • The project emission is the emission from blast furnace #4; • The emission from coke oven battery #3are included as coke production emission factor in calculation BF project emission (for double calculation excluding);		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			• Greenhouse emissions for 2008-2009 are determined using actual production data for these years(for calculation actual ER in this period); • Greenhouse emissions during 2010-2012 are determined using performance data of 2009 (for calculation ER on the ground of achieved data). The baseline emissions are established in the following way (for conservative reasons): • The baseline emissions of the pig iron production are established using the approach as given in Annex 2; • The baseline emissions of the coke production are established using the IPCC emission factor for coke production; • The baseline emissions of the grid are established using the Russian standardized grid factor as described in Annex 2 (This Russian standardized grid emission factor was calculated according to CDM tool and was determined by Bureau Veritas); • Baseline emission factor of the displacing production may be fixed ex-ante for three years.		
E.1.3 Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Please clarify directly if the uncertainties in the project emission estimates are properly	~~CL 19~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			addressed. For the project electricity, fuel and coke has defined parameters which variations are included in the estimates from conservative point of view (see CL 18).		
E.2 Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
E.2.1 Are the calculations documented according to the chosen methodology and in a complete and transparent manner?	/1/	DR	See CAR 2	~~CAR 2~~	OK
E.2.2 Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Yes. The conservative assumptions have been used when calculating the baseline emissions		OK
E.2.3 Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Yes. The uncertainties in the baseline emission estimates are properly addressed.		OK
E.3 Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
E.3.1 Are the leakage calculations documented according to the chosen methodology and in a complete and transparent manner?	/1/	DR	N/A		
E.3.2 Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	N/A		
E.3.3 Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	N/A		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.4 Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*						
E.4.1	Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	Yes. The emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.		OK
F Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the AIE.*						
F.1.1	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	The analysis of the environmental impacts of the project activity sufficiently described.		OK
F.1.2	Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	All Host Party requirements for an Environmental Impact Assessment approved.		OK
F.1.3	Will the project create any adverse environmental effects?	/1/	DR	The project doesn't create any adverse environmental effects.		OK
F.1.4	Are transboundary environmental impacts considered in the analysis?	/1/	DR	N/A		
F.1.5	Have identified environmental impacts been addressed in the project design?	/1/	DR	N/A		
F.1.6	Does the project comply with environmental legislation in the host country?	/1/	DR	Yes. The project complies with environmental legislation in the host country.		OK
For Small-scale projects						
F.1.7	Does host country legislation require an analysis of the environmental impacts of the project activity?			*N/A*		
F.1.8	Does the project comply with environmental legislation in the host country?			*N/A*		

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
F.1.9	Will the project create any adverse environmental effects?			*N/A*		
F.1.10	Have environmental impacts been identified and addressed in the PDD?			*N/A*		
G Stakeholder Comments *If required by the host country, the AIE should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*						
G.1.1	Have relevant stakeholders been consulted?	/1/	DR	Yes. Proposed JI project is not required to go through a local stakeholder consultation process, therefore public hearing was not organised. 14th November 2005 and 18th October 2006 "The Main Agency of the State expertise" (FGU "Glavgosexpertiza" in Russian abbreviation) approved construction of the blast furnace #4 and coke oven battery, positive conclusion of FGU "Glavgosexpertiza" #09/7523 and #09/7677 corresponding. Severstal provided stakeholders with project information. Severstal had publications about the project in mass media. Please refer to G.1.		OK
G.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Yes. Appropriate media were invited comments by local stakeholders. Please refer to G.1.		OK
G.1.3	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with	/1/	DR	Yes. The stakeholder consultation process been carried out in accordance with such regulations. Please refer to G.1.		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	such regulations/laws?					
G.1.4	Is a summary of the received provided?	/1/	DR	Yes. The summary of the received was provided. Please refer to G.1.		OK
G.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	Yes. All necessary stakeholder comments were received. Please refer to G.1.		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
CAR 1: Letters of Approval haven't been issued both by sponsor and by host country Focal Points	Table 1	LoA from the Host Party and LoA from the Sponsor party are provided.	The host Party (Russia) and the Annex I Party (the Netherlands) LoAs of "Energy Efficiency Improvement in Revamping of Steel Production at Severstal JSC, Cherepovets, Russia. Iron production expanding" JI project were provided by the PP /5/, /64/. Both countries fulfil the participation criteria and have approved the project and authorized the project participants. CAR 1 is closed.
CAR 2: Project emission calculation according to the following formula: $PE_y = PE_y^{BF4}$ (1) is inadequate (see PDD D.1.1.2).	Table 2. B.2.7.	Project emission calculated for the blast furnace #4. The emission from coke oven battery #3 are included as coke production emission factor in calculation the blast furnace #4 project emission. The emission from coke oven battery #3 was calculated as emissions factor for coke production	OK Project emission were correctly calculated using formulae D.1.1.2 which takes into account both coke oven battery #3 and blast furnace #4. Finally the emission from coke oven battery #3 are included as coke production emission factor inside calculation the blast furnace #4 project emission. CAR closed
CAR 3: In Annex 3 the monitoring plan is absent.	Table 2. D.1.1.	Monitoring plan was added in PDD.	OK The monitoring plan is in accordance with the JI specific approach and is in a complete and transparent manner. CAR closed

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Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
CAR 4: Starting date of the project.23 December 2004 is not correct. This project consists of two subprojects. Coke oven battery financing was approved by JSC Severstal on the 20 July, 2004. Blast furnace financing was approved by JSC Severstal on the 23 December, 2004. The change of starting date effects the IRR calculation.	Table 2. C.1.1.	Starting date of JI project is the date when construction, implementation or real action takes place for the project. This project consists of two subprojects. Construction of the blast furnace is connected with the coke oven battery construction because coke is main raw material for pig iron production. Coke oven battery financing was approved by JSC Severstal on the 20 July, 2004. Blast furnace financing was approved by JSC Severstal on the 23 December, 2004*. After approved financing, equipment purchase taken place /28/. Thus project start date is taken 20 July 2004. IRR was recalculated regarding another starting date.	OK The starting date is 20 July 2004. IRR was recalculated. CAR closed
CL 1: Please clarify title of the figure with the map. Figure A.4.1.1: Map of Russia with location of Khabarovsk Territory (selected by red colour).	Table 2. A.1.1.	This mistake was corrected.	OK The project is located at Severstal in Cherepovets city, north-west of Russia, in the Vologda region. Geographical location of Vologda region and Cherepovets are presented in Figure A.4.1.1 (See PDD A.4.1). Please clarify title of the figure with the map. ***Figure A.4.1.1: Map of Russia with***

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Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
			location of Khabarovsk Territory (selected by red colour). The Severstal production site is located at the north outskirts of Cherepovets (see Figure A.4.1.4.1). The project site coordinates are: longitude 37.58' E, latitude 59.15' N. It was corrected. CL closed
CL 2: Please clarify if it is construction or reconstruction of furnace #4.	Table 2. A.1.2.	There is construction, because the furnace is constructed completely on the place of old furnace which was dismantled several years year before.	OK There is construction, because the furnace is constructed completely on the place of old furnace which was dismantled several years year before. CL closed
CL 3: Please clarify system boundaries (components and facilities used to mitigate GHGs) in the schematic diagram A.4.2.1. The diagram isn't adequate. The diagram doesn't contain dry quenching and turbine electricity generation.	Table 2. A.1.2.	The dry quenching was added in diagram A.4.2.1 and A.4.2.3. Electricity generation turbine is beyond project boundary because steam can be used in steam turbine for electricity generation and other Severstal needs.	OK The dry quenching was added in diagram A.4.2.1 and A.4.2.3. CL closed
CL 4: Please clarify system boundaries (components and facilities used to mitigate GHGs) in the schematic diagram A.4.2.2. The diagram isn't adequate. The diagram doesn't contain the top-pressure recovery turbine for additional energy generation.	Table 2. A.1.2.	The top-pressure recovery turbine was added in diagram A.4.2.2 and A.4.2.3.	OK System boundaries is OK. The top-pressure recovery turbine was added in diagram A.4.2.2 and A.4.2.3. CL closed
CL 5: Please clarify if the project uses the state of the art technology.	Table 2. A.3.2.	Description was added.	OK The subproject represents up-to-date

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
			engineering practice and makes possible to improve energy efficiency of coke production. The main point of subproject that the coke making with inert gases quenching improves coke quality and allow steam production using thermal energy of red-hot coke. 80% of sensible heat of coke can be recovered for steam production. The steam is used for electricity generation and other needs. This subproject intends to introduce state-of-art technology from a reputable Russian scientific group GIPROKOKS, resulting in a new technology implementation in Russia. GIPROKOKS developed this technology and received patent. Dry Coke Quenching technology has been introduced less then 22% from total coke production in Russia /39/. The subproject represents up-to-date engineering practice and makes it possible to improve energy efficiency of metal production. Subproject includes introduction of the top-pressure recovery turbine (GUBT). GUBT allows returning about 40% of spent energy for blast-furnace air and used to generate additional electricity due to utilising off-gas positive pressure. Only

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
			seven GUBT were installed in Russia. Considering that forty-nine blast furnaces were operating in Russia in 2007, this amount cannot be considered significant /27/. CL closed
CL 6: Please clarify if there are available training records concerning project activity.	Table 2. A.3.3.	After installation of equipment, Training program was development. Operation and maintenance trainings were provided by the equipment supplier in accordance with the agreement. Trainings were made with the help of personnel who had working experience on such equipment. All the operational and monitoring personnel is regularly trained and certified in accordance with approved training courses and certification grades. Training and exams schedule is developed and approved yearly. Personnel are regularly passes extensive training courses. The new plant staffs are trained continuously in the metallurgical college of Cherepovets. The college training covers the main subject areas of (several specialities): • cokemaking; • blast-furnace metallurgist.	OK Adequate training was conducted after installation of equipment. Operation and maintenance trainings were provided by the equipment supplier in accordance with the agreement. All the operational and monitoring personnel is regularly trained and certified in accordance with approved training courses and certification grades. Training and exams schedule is developed and approved yearly and covers the main subject areas of (several specialities): 1)coke making, 2)blast-furnace metallurgist. CL closed
CL 7: The project baseline is grounded on the "Tool to calculate the emission factor for an	Table 2. B.2.3.	The emission factors for electricity consumed from the grid were elaborated	OK The "Tool to calculate the emission

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
electricity system" (version 02). The standardized CO_2 emission factors (Annex 2, section: Standardized electricity grid emission factor) were elaborated for Russian power systems in the Study commissioned by "Carbon Trade and Finance SICAR S.A." grounded on the "Tool to calculate the emission factor for an electricity system" (version 01.1). Need to be commented.		for Russian power systems in the Study "Development of grid GHG emission factors for power systems of Russia" commissioned by "Carbon Trade and Finance SICAR S.A.". This Study was verified by CJSC Bureau Veritas Certification Rus in 2008. At that time the "Tool to calculate the emission factor for an electricity system" (version 01.1) was the latest available version of approved tool. The version 02 of the tool was put into force on 16 October 2009. Text of the PDD was amended. The appropriate parts of the Study were submitted to AIE.	factor for an electricity system" (version 01.1) was the latest available version of approved tool. The version 02 of the tool was put into force on 16 October 2009. Text of the PDD was amended. Regarding to the latest version. CL closed
CL 8: Please clarify, why inflation had been taken for European Union but not for Germany.	Table 2. B.2.5.	It was made due to conservative reasons. European Union's inflation held constant for that past period (2003-2004). Germany's inflation changed significant at that moment	OK Inflation had been taken for European Union but not for Germany. It was made due to conservative reasons. European Union's inflation held constant for that past period (2003-2004). CL closed
CL 9: Please clarify the basement for the calculation of country related risk.	Table 2. B.2.5.	Country risk is estimated as the difference between the treasury bond rate of the selected country and the corresponding US or EU treasury bond rate (T-Bill). This approach is well-	OK Country risk is estimated regardin traditional approach /36/, /37/ as the difference between the treasury bond

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		known /36/, /37/.	rate of the selected country and the corresponding US or EU treasury bond rate. CL closed
CL 10: Please clarify the company related risk premium source.	Table 2. B.2.5.	This risk was deleted from IRR calculation.	OK This risk was deleted from IRR calculation. So this change makes the approach more conservative. CL closed
CL 11: Please clarify, why calculation of IRR was not taken separately for each project.	Table 2. B.2.5.	These projects are connected against each other. Because coke is important raw material for ironmaking process. Every project loses its meaning without another.	OK Construction of coke oven battery includes dry-quenching plant installation. It has made possible to generate additional electricity due to utilising of coke thermal power. Usually water quenching is usage by Russian coke producers. Because it requires less investment and allows increasing bulk-coke yield but it leads to insignificant quality reducing. GIPROKOKS developed this technology and received patent. Technology usage is shown in PDD Table B.2.5. GIPROKOKS's technology has been implemented less than 22% from total dry-quenching units in Russia. Dry-quenching usage in Russia is about 30 % from total coke production. Also other dry-quenching technologies (no GIPROKOKS) have

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
			been implemented in Russia. CL closed
CL 12: Please clarify modern situation with other activities similar to the proposed subproject 2 activity in Russian coke production industry regarding common practice.	Table 2. B.2.5.	It was added in PDD.	OK CL closed
CL 13: Please clarify the method of calculation of Operating Margin for Grid Emission Factor in the Annex 2.	Table 2. B.2.6.	In accordance with the paragraph 7.2 of the Study "Development of grid GHG emission factors for power systems of Russia" /26/ the project participants can use Operating Margin in case of reduction of electricity consumption from a grid. The Operating Margin of regional energy system "Centre" was defined using Simple OM method. The appropriate part of the Study was submitted to AIE.	OK In accordance with /26/ the project participants can use Operating Margin in case of reduction of electricity consumption from a grid. The Operating Margin of regional energy system "Centre" was defined using Simple OM method. CL closed
CL 14: Please clarify evidently any potential leakage due to the project activity or their absence in section B.3.	Table 2. B.2.8.	The following information was added to Section B.3: **Leakages** The potential leakages are associated with: • Fugitive CH_4 emissions associated with fuel extraction, processing, transportation and distribution of natural gas; • Technical transmission and distribution losses of electricity.	OK. The potential leakages are associated with: 1. Fugitive CH_4 emissions associated with fuel extraction, processing, transportation and distribution of natural gas; 2. Technical transmission and distribution losses of electricity. Subproject 1 does not consume natural

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		Subproject 1 This subproject does not consume natural gas from outside. Own blast furnace gas and oven gas are used. Annual electricity consumption in project scenario is approximately 6,353 MWh. In Russian Federation the electricity losses are 11-13%. The emission factor for electricity consumption is 0.511 tCO_2/MWh (please see Annex 2 of the PDD). And volume of emission is 0.511×6,353×11/100 = 357 tCO_2. Also all Coke oven batteries have similar leakages and it contributes to less than 1 % of the total emissions (CO_2 equivalent). Therefore omitting these leakages for a coke making process is conservative. ***Subproject 2*** For subproject 2, most part of leakages in project scenario is associated with fugitive CH_4 emission (for natural gas consumption) and losses of electricity. During calculation baseline emission factor for pig iron production, electricity is not taking into account. Project	gas from outside. Annual electricity consumption in project scenario is approximately 6,353 MWh. In Russian Federation the electricity losses are 11-13%*. The volume of emission is 357 tCO_2. All Coke oven batteries have similar leakages which contributes less than 1 % of the total emissions (CO_2 equivalent). Therefore omitting these leakages for a coke making process is conservative. For subproject 2, most part of leakages in project scenario is associated with fugitive CH_4 emission (for natural gas consumption) and losses of electricity. Project emission includes project electricity consumption (for conservative reasons) and natural gas consumption which is less than by other pig iron producers. Therefore omitting these leakages for the project ironmaking process is conservative. The leakages in project scenario are less than in baseline scenario for both subprojects 1 and 2 and these emissions have not been taken into account for

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		emission includes project electricity consumption (for conservative reasons). Also annual natural gas consumption in project is less than by other pig iron producers. Therefore omitting these leakages for the project ironmaking process is conservative. Thus the leakages in project scenario are less than in baseline scenario for both subprojects 1 and 2 and these emissions have not been taken into account for simplicity and conservatism.	simplicity and conservatism. CL closed
CL 15: Please clarify data source regarding position "Value of data applied" filled with 1.7 (2007) section B.1., table with parameter BEF_y^{iron}.		Calculated according to LLC "Korporatsiya proizvoditeley chernih metalov" annual statistical report "Russian Chermet information". This report contains the data of annual steel and iron production and annual fuel and electricity consumption at Russian steel plants. Reference was added /38/.	OK Reference was added /38/. CL closed
CL 16: GHG sources are calculated for subproject 1 as the sum of CO_2 emissions. GHG sources are calculated for subproject 2 as the sum of CO_2 emissions. Please clarify, can it be confirmed that the baseline CH_4 and N_2O emission are insignificant.	Table 2. B.4.2., B.4.3.	Only CO_2 emissions are taken into account. Major source of other GHGs such as CH_4 and N_2O at a blast furnace process is the burning of fuel (coke). Given fuel specific consumption in ordinary blast furnace process in Russia, CH_4 emission is 127 g/tonne of pig iron and N_2O emissions is 19 g/tonne of pig	OK Only CO_2 emissions are taken into account. Major source of other GHGs such are CH_4 and N_2O at a blast furnace process is the burning of fuel (coke). Omitting these two pollutants is conservative, because they contribute to

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		iron compared with about 1700 kg of CO_2 per tonne of pig iron (2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, STATIONARY COMBUSTION). Also emissions may be less because blast furnace gas is burnt up in boiler and preheater. Omitting these two pollutants for a ironmaking process is conservative, because they contribute to less than 0.52 % of the total emissions (CO_2 equivalent), far below the confidence level for the CO_2 emission calculation. The CH_4 and N_2O emission reductions will not be claimed. This is conservative. Calculation was added in excel file.	less than 0.52 % of the total emissions (CO_2 equivalent), far below the confidence level for the CO_2 emission calculation. The CH_4 and N_2O emission reductions were not claimed. This is conservative. CL closed
CL 17: Proof of the actual starting date should be available in document(s). Please make document reference.	Table 2. C.1.1.	Starting date of JI project is the date when construction, implementation or real action takes place for the project. This project consists of two subprojects. Construction of the blast furnace is connected with the coke oven battery construction because coke is main raw material for pig iron production. Coke oven battery financing was approved by JSC Severstal on the 20 July, 2004. Blast furnace financing was approved	OK. Starting date of JI project regarding JI defifnition is the date when construction, implementation or real action takes place for the project. Coke oven battery financing was approved by JSC Severstal on the 20 July, 2004. Blast furnace financing was approved by JSC Severstal on the 23 December, 2004. After approved financing, equipment purchase taken place /35/.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		by JSC Severstal on the 23 December, 2004*. After approved financing, equipment purchase taken place /28/. Thus project start date is taken 20 July 2004.	CL closed
CL 18: Please clarify directly if the conservative assumptions have been used when calculating the project emissions.	Table 2. E.1.2.	It was added in Section D.1. The following assumptions for calculation of both baseline and project emissions were used (for conservative reasons): • The pig iron and coke production are the same in the project and baseline scenario (ER calculations could not be made due to steel production reduction); • The type of fuel combusted and raw material consumed is not influenced by the project (In case fuel change it will allow to calculate ER correct); • The emissions from electricity consumption/generation are established using the relevant regional Russian standardized grid emission factor, as described in Annex 2 (This Russian standardized grid emission factor was calculated according to CDM tool and was	OK. For calculation of both baseline and project emissions were used following assumptions (for conservative reasons): 1. The pig iron and coke production are the same in the project and baseline scenario; 2. The type of fuel combusted and raw material consumed is not influenced by the project. 3. The emissions from electricity consumption/generation are established using the relevant regional Russian standardized grid emission factor. The project emissions are established in the following way (for conservative reasons): 1. The project emission is the emission from blast furnace #4; 2. The emission from coke oven battery #3 are included as coke

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Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		determined by Bureau Veritas). The project emissions are established in the following way (for conservative reasons): • The project emission is the emission from blast furnace #4; • The emission from coke oven battery #3are included as coke production emission factor in calculation BF project emission (for double calculation excluding); • Greenhouse emissions for 2008-2009 are determined using actual production data for these years(for calculation actual ER in this period); • Greenhouse emissions during 2010-2012 are determined using performance data of 2009 (for calculation ER on the ground of achieved data). The baseline emissions are established in the following way (for conservative reasons): • The baseline emissions of the pig iron production are established using the approach as given in Annex 2; • The baseline emissions of the coke	production emission factor in calculation blast furnace project emission; 3. Greenhouse emissions for 2008-2009 are determined ~~using actual~~ production data for these years; 4. Greenhouse emissions during 2010-2012 are determined using performance data of 2009. The baseline emissions are established in the following way: 1. The baseline emissions of the pig iron production are established using the approach as given in Annex 2; 2. The baseline emissions of the coke production are established using the IPCC emission factor for coke production; 3. The baseline emissions of the grid are established using the Russian standardized grid factor as described in Annex 2; 4. Baseline emission factor of the displacing production may be fixed ex-ante for three years. CL closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		production are established using the IPCC emission factor for coke production; • The baseline emissions of the grid are established using the Russian standardized grid factor as described in Annex 2 (This Russian standardized grid emission factor was calculated according to CDM tool and was determined by Bureau Veritas); • Baseline emission factor of the displacing production may be fixed ex-ante for three years.	
CL 19: Please clarify directly if the uncertainties in the project emission estimates are properly addressed.	Table 2. E.1.3.	For the project electricity, fuel and coke has defined parameters which variations are included in the estimates from conservative point of view (see CL 18).	OK. The uncertainties in the project emission estimates and properly addressed. For the project electricity, fuel and coke has defined parameters which variations are included in the estimates from conservative point of view (see CL 18). CL closed
CL 20: Reference PDD #5 page 13 is inadequate (http://www.minprom.gov.ru/activity/metal/strateg/2).	Table 2. B.5.7.	This reference does not work. New reference was added /17/. http://www.minpromtorg.gov.ru/ministry/strategic/sectoral/2	OK. The reference was corrected. CL closed
CL 21: Why on page 26 Step 3 (before B3	Table 2. B.5.8.	It was deleted (mistake).	OK

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
section) is going after step 4?			The PDD text was corrected. CL closed
CL 22: Please correct the mistake: page 21, 5th line from below (furnace #1). Should be #4.	Table 2. B.5.8.	It was corrected.	OK The PDD text was corrected. CL closed
CL 23: The project investment cost accounts for approximately EUR 168 million during four years; (PDD page 23). Please make reference/(s).	Table 2. B.5.8.	Reference was added /28/, /29/.	OK The appropriate references were added /28/, /29/. CL closed
CL 24: The exchange rate (EUR/RUR) 1/37.20; (PDD page 23). (PDD page 23). Please make reference/(s).	Table 2. B.5.7.	Reference was added /30/.	OK The appropriate reference was added /30/. CL closed
CL 25: The project lifetime is around 20 years (lifetime of the main equipment); (PDD page 23). Please make reference/(s).	Table 2. B.5.7.	Reference was added /31/.	OK. The appropriate reference was added /31/. CL closed
CL 26: Annual pig iron production in steelmaking pig iron equivalent is 2,300,000 tonnes of pig iron per year. (PDD page 23). Please make reference/s.	Table 2. B.5.7.	Reference was added /32/.	OK. The appropriate reference was added /32/. CL closed
CL 27: Annual coke production by the coke oven battery is 432 thousand tonnes, commissioning date: January 2007; (PDD page 23). Please make reference/(s).	Table 2. B.5.7.	Reference was added /33/.	OK. The appropriate reference was added /33/. CL closed
CL 28: Please clarify the method of	Table 2.	Dry-quenching usage in Russia was	OK.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
calculation (PDD Table B.2.5) regarding GIPROKOKS's technology has been implemented less than 22% from total dry-quenching units in Russia. Dry-quenching usage in Russia is about 30 % from total coke production.	B.2.5.	calculated according to data presented by LLC "Korporatsiya proizvoditeley chernih metalov" annual statistical report 2010 /38/. Usage frequency of GIPROKOKS's technology was calculated as part of GIPROKOKS's project capacity in total coke industry in Russia. Calculation was sent AIE. PDD was corrected.	Calculation deems reasonable. Dry-quenching usage was calculated based on /38/. Usage frequency of GIPROKOKS's technology was calculated as part of GIPROKOKS's project capacity in total coke industry in Russia. PDD was corrected. CL closed

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
No FAR is raised.	-	-

APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Alexander Osadchiev

Mr. Osadchiev holds a PhD's Degree in Power Engineering. He has an overall experience of around thirty years. Prior to joining DNV he had around fifteen years experience in Power Engineering industry covering energy efficiency improvement, energy distribution and demand. His experience also covers the fields of quality, environmental and OHSAS management. He has also been actively involved in implementation and auditing of Management Systems such as ISO 9001, ISO 140001 and OHSAS 18001 standards in Power Engineering industry for more than three years.
He has experience of around 2 years in validation and verification of several CDM/JI projects in DNV, both in Russia & abroad.
His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in: Termal energy generation, Electricity distribution, Heat distribution, Energy demand.

Xiaojun Johnsen Zhang

***Xiaojun Johnsen Zhang**, holds a Master Degree in Metallurgical Physical Chemistry and obtained his MBA in project management. Also he majored in Chemistry, which involves organic, inorganic, structure and analysis chemistry as bachelor degree. He has an overall experience of 26 years. Prior to joining DNV, Johnsen had an overall experience of 4 years in glass manufacturing industry covering production, energy efficiency improvement and commissioning. Later on he gained combined experience of more than 15 years in the iron and steel industry, while he worked as researcher and management personnel in Central Iron and Steel Institute, the sector covering the refractory, iron & steel, waste heat recovery, solid waste disposal, waste fuel treatment, waste energy efficiency and relevant environmental affairs. His experience also covers the fields of environmental management, resource conservation and cleaner production in various manufacturing and metallurgical industries. He has also gained the experience in Management System Audits such as ISO 9001, ISO 140001 standards in various industrial sectors for more than 3 years for industrial plants.*

For financial analysis and investment, he has gained the relevant knowledge through his MBA course; and through the feasibility case study in the iron and steel sector while he worked as management personnel, he gradually gained concerted experience in cost accounting, financial analysis and investment input parameter assessment.

He has experience of more than 3 years in validation and verification of numerous CDM projects in DNV in China.

His qualification, industrial and investment experience and experience in CDM demonstrate him sufficient sectoral competence in "Glass", "Iron and Steel" and "Energy Generation from Renewable Energy Sources".

Svetlana Kleeva

Ms. Shevnina holds an Engineer Degree in Environmental Sciences. Having an overall experience of around seven years. Prior to joining DNV having around two years experience

in metal production industry covering management of aluminium production plant environmental effects and environmental (including JI) projects.
She has experience of around 3 years in validation and verification of numerous CDM and JI projects, both in Russia and abroad.
Her qualification, industrial experience and experience in CDM/JI demonstrate her sufficient sectoral competence in Metal production.

Vladimir A. Uglov

Mr. Vladimir A. Uglov holds PhD Degree in Iron and Steel Production. He has an overall experience of around twenty five years in Russian Metallurgy Institutes. His experience covers Iron and Steel production process.
Education: Moscow Engineering Physics Institute. Qualification: Engineer – Physicist.
In 1986- 2005 was working at Metallurgy Institute of Russian Academy of Sciences named after A.A. Baykov. His position was Lead scientist of the Institute.
In 2005- 2011 is working at Federal state unitary enterprise «Central Scientific Research Institute of Ferrous Metallurgy named after I.P. Bardin». His position is deputy General Director. Dr Uglov was engaged in several projects dealing with coke and iron production.