DETERMINATION REPORT

Implementation of energy efficiency projects at OJSC "Novolipetsk Steel" in Russia

REPORT NO. 2010-1474

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DET NORSKE VERITAS

DETERMINATION REPORT

DNV CLIMATE CHANGE AS

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Client: Global Carbon Rus, LLC		Client ref.: Alexey Varfolomeev

Summary:
Project Name: Implementation of energy efficiency projects at OJSC "Novolipetsk Steel"
Country: Russia
Methodology: ☐ **CDM Methodology:** AMXXXX, **Version:** XX ☒ **JI specific approach**
GHG reducing Measure/Technology: Retrofitting furnaces and hydrogen production from steam reforming of natural gas
ER estimate: Annual average of 492.840 tCO_2e /yr 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 "Implementation of energy efficiency projects at OJSC "Novolipetsk Steel", as described in the PDD, version 3.1 of 14 March 2011, meets all relevant UNFCCC requirements for the JI and all relevant host Party criteria and correctly applies a JI specific approach that is found to be correct and applicable.

Report No.: 2010-1474	Subject Group: Environment
Report title: Implementation of energy efficiency projects at OJSC "Novolipetsk Steel" Project in Russia	
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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)
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
JISC	Joint Implementation Supervisory Commitee
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
GWP	Global Warming Potential

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1 EXECUTIVE SUMMARY – DETERMINATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a determination of the "Implementation of energy efficiency projects at OJSC "Novolipetsk Steel" project in Russia. 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 The Russian Federation and the other participating Annex I Party is The Netherlands. . The host Party, The Russian Federation, fulfil the participation criteria and have approved the project and authorized the project participants /39/. The Netherlands fulfil the participation criteria and have approved the project and authorized the project participants /29/.

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 one CDM methodology is applicable in 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 492.840 tCO2e 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 "Implementation of energy efficiency projects at OJSC "Novolipetsk Steel" project in Russia, as described in the PDD of 14 March 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 AS (DNV) to perform a determination of the "Implementation of energy efficiency projects at OJSC "Novolipetsk Steel" project in Russia (JI reference number 0233). 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 /38/.

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.

2.3 Energy efficiency project at OJSC "Novolipetsk Steel" in Russia

The "Implementation of energy efficiency projects at OJSC "Novolipetsk Steel" determination scope is intended to be designated as JI project between Russia and The Netherlands. The project location is in the town Lipetsk (the European part of Russia).

The proposed project consists of two main activities:

- Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop,
- Commissioning the hydrogen plant based on steam reforming of natural gas technology.

The project is forecasted to reduce 2.464.199 tCO2 in the years 2008 to 2012.

3 METHODOLOGY

The determination of the project commenced in July 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 (Corrective Actions or Clarification Requests) 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 "Implementation of energy efficiency projects at OJSC "Novolipetsk Steel" version 2.1 of 22 July 2010, version 2.4 of 05 October 2010 and version 3.1 of 14 March 2011.

/2/ CDM Executive Board Approved "Tool to calculate the emission factor for an

electricity system" (version 02).

/3/ JI Supervisory Committee, Guidelines for users of the JI PDD form, version 04 adopted at JISC 18

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

/5/ Statement of the Government the Russian Federation No. 843 "On Measures to Implement Article 6 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change".

/6/ NLMK Technical Centre, Feasibility study #012.02.01: "Reconstruction of heating furnaces #5 at the Hot Sheet-Rolling Shop". 11.05.2001.

/7/ NLMK Technical Centre, Feasibility study #012.07.04/1: "Reconstruction of heating furnaces #4 at the Hot Sheet-Rolling Shop". 17.12.2004.

/8/ State ecological expert commission, Consolidated conclusion #191 concerning project "Reconstruction of heating furnaces #4 at the Hot Sheet-Rolling Shop" dated 22.06.2006.

/9/ State ecological supervisory agency (Lipetsk area), Order #0459 with Approval of Consolidated conclusion #191dated 22.06.2006.

/10/ State ecological expert commission, Consolidated conclusion #49 concerning project "Reconstruction of heating furnaces #5 at the Hot Sheet-Rolling Shop" dated 26.03.2002.

/11/ State ecological expert commission, Consolidated conclusion #149 concerning project "Commissioning the hydrogen plant based on steam reforming of natural gas technology" dated 04.10.2004.

/12/ TUV Rheinland Cert GmbH, Certificate ISO 14001:2004 of OJSC "Novolipetsk Steel", dated 01.11.2008.

/13/ Contract between OJSC "Novolipetsk Steel" and OJSC "Novokramatorski machine shop" for the equipment of heating furnaces #5 at the Hot Sheet-Rolling Shop. #18363 dated 16.02.2001.

/14/ Contract between OJSC "Novolipetsk Steel" and AG "STINOL" for the equipment of heating furnaces #5 at the Hot Sheet-Rolling Shop. #19167 dated 16.02.2001.

/15/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3: Industrial Processes and Product Use, Chapter 4: Metal Industry Emissions, TABLE 4.1, p. 4.25 (see V3_4_Ch4_Metal_Industry-eng)

/16/ Corporation "Iron Industry", Statistical collection "Iron furnaces and equipment working parameters", Moscow, 2008.

/17/ Published PDD of project with similar technology; http://ji.unfccc.int/UserManagement/FileStorage/PLJMKW8H5AYCRENIXQZ6BTG74VF03O

/18/ Bank of Russia, Quarterly Inflation Review, 2004, Quarter 4, page 3. http://www.cbr.ru/eng/publ/main.asp?Prtid=Infl&Y=2004

/19/ Bank of Russia website, Moscow InterBank Offered Rate, October 2001.

/20/ European Central Bank website, Long-Term Interest Rate of Germany, October 2001 and October 2002.

/21/ European Commission website, Eurostat , Average Inflation Rate of Germany in 2001 and 2002

/22/ Principles of Corporate Finance 7th edition, Richard A. Brealey, Stewart C. Myers, McGraw-Hill Higher Education, 2003 – p. 168

/23/ New York University, Leonard N. Sterm School of Business, Costs of Capital by Industry Sector in 2001 and 2002 http://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html)

/24/ New York University, Leonard N. Sterm School of Business, Risk Premiums for Other Markets in 2001 and 2002. http://www.stern.nyu.edu/~adamodar/pc/archives/ctryprem01.xls

/25/ Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Chapter 2: Stationary Combustion (corrected chapter as of April 2007), IPCC, 2006

/26/ 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.

/27/ State Technical Regulation Agency. Lab accreditation certificate # POCC RU.0001.510334 dated 04.06.08. Valid up 21.05.13.

/28/ Order of General Manager of NLMK, Starting of heating furnaces #5 reconstruction at the Hot Sheet-Rolling Shop, dated 09.10.2001

/29/ NL Agency, Ministry of Economic Affairs, LoA,, dated 08.09.2010.

/30/ CDM Executive Board: Tool for the demonstration and assessment of additionality, verion 05.2.

/31/ State Committee of the RF on Construction, Architecture and Housing Policy of the RF "Methodological recommendations on evaluation of investment projects efficiency", 21.06.1999 N BK 477.

/32/ Industry standard, GasProm GHG emissions cadastre, requirements, 06.04.2005.

/33/ Magazine "Eurasian Metals", "Activities for the Metallurgy Industry Development until 2010", Chapter 2.

/34/ Magazine "Eurasian Metals", "Activities for the Metallurgy Industry Development until 2010", Chapter 4.

/35/ Index Mundi, Monthly survey of Russian natural gas prices. http://www.indexmundi.com/commodities/?commodity=russian-natural-gas

/36/ Assessment on electricity tariff evolution:

Energy regulators region association, Annual reports on Russia up to 2009 http://www.erranet.org/AboutUs/Members/Profiles/Russia

State Tariff committee, Officical data of electicity tariffs 2001-20010 http://www.fstrf.ru/tariffs , http://www.newsru.com/finance/12Jan2001/moscow_tarif.html

/37/ Trading Economics, Russian inflation rate http://tradingeconomics.com/Economics/Inflation-CPI.aspx?symbol=RUB

/38/ JI Supervisory Committee, Determination and verification manual version 1 adopted at JISC 19.

/39/ Ministry of Economic Development of Russian Federation, Letter of approval - Order #709, dated 30 December 2010

/40/ General Director of NLMK. Construction the hydrogen plant based on steam reforming of natural gas technology. Order #707, dated 07.10.2002.

/41/ General Engineer of NLMK. Heating furnace #5 Schedule of balancing and

commissioning, dated 22.11.2002.

3.2 Follow-up Interviews with Project Stakeholders

Identify any personnel who have been interviewed and/or provided additional information to the presented documentation.

	Date	Name	Organization	Topic
/42/	2010-08-11	Y.I. Larin	Vice-president NLMK	Approval of the project as JI project between Russia and the Netherlands
/43/	2010-08-11	A.V. Luznikov	Head of EE Centre NLMK	Valid construction permit and environmental licence.
/44/	2010-08-11	V.M. Chizikova	Chief ecologist of the NLMK	Baseline monitoring methodology . Availability and processing of necessary data to determine carbon emission factor of power plant at the margin
/45/	2010-08-11	A.I. Perepelitsa	Chief specialist for fuel efficiency usage, EE Centre NLMK	Additionality assessment. Availability of dispatch data to determine the operating margin data.
/46/	2010-08-11	S.A. Ekimov	Mechanic of rolling shop	Procedures for calibration and maintenance of monitoring equipment
/47/	2010-08-11	S.V. Popov	Metal heat control operator rolling shop	Procedures for calibration and maintenance of monitoring equipment
/48/	2010-08-11	Y.A. Kasmin	Head of hydrogen plant	Additionality assessment.
/49/	2010-08-11	A.I. Sedelev	Electronic engineer of hydrogen plant	Additionality assessment
/50/	2010-08-11	I.A. Mironov	Power engineer of hydrogen plant	Additionality assessment
/51/	2010-08-11	M.A. Gorelov	Power engineer of hydrogen plant	Additionality assessment
/52/	2010-08-12	Y.N. Komarova	Head of physicochemical lab	Procedures for calibration and maintenance of monitoring equipment

/53/	2010-08-12	O.A. Yartseva	Leading engineer of physicochemical lab	Procedures for calibration and maintenance of monitoring equipment
/54/	2010-08-12	N.A. Shebina	Laboratory assistant of physicochemical lab	Procedures for calibration and maintenance of monitoring equipment
/55/	2010-08-12	T.A. Efremova	Engineer of physicochemical lab	Procedures for calibration and maintenance of monitoring equipment
/56/	2010-08-12	T.M. Averchenkova	Chef specialist of corporate development Direction	Additionality assessment
/57/	2010-08-12	E.V. Fonchenkova	Specialist of corporate development Direction	Additionality assessment

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 five Corrective Action Requests (CAR) and eleven requests for Clarification (CL).

The response provided by the projects participants on DNV's initial determination findings resolved the identified 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.

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

3.4 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.

3.5 Determination Team

				Type of involvement						
Role	***Last Name***	***First Name***	***Country***	Administrative	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
Project manager	Svetlana	Shevnina	Russia	✓						
Technical team leader/JI validator	Osadchiev	Alexander	Russia		✓	✓	✓	✓		✓
GHG auditor	Trotsuk	Igor	Russia		✓	✓				
Sector expert	Shevnina	Svetlana	Russia		✓					✓
Sector expert	Chernov	Pavel	Russia							✓
Sector expert	Osadchiev	Alexander	Russia							✓
Sector expert input to technical review	Van Evercooren	Jan	Belgium							✓
Technical reviewer	Flagstad	Ole A.	Norway						✓	✓

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 project design documentation of September 2010.

4.1 Participation Requirements-

Referring to Part A and Annex 1 of the PDD. The conclusions regarding:

- the Parties (Party A: The Russian Federation - Host party, Party B: The Netherlands). The project participants participating in the project: OJSC "Novolipetsk Steel" and Global Carbon BV.
- the participating Parties fulfil the participation requirements (e.g. ratified Kyoto Protocol, etc).
- the endorsement by host Party was provided by project participant /39/.
- the endorsement by the Sponsor party was provided by project participant /29/.

4.2 Project Design

The project activity is based on pioneering implementation in Russian metal industry of up-to date furnaces and hydrogen production shop with reduced energy consumption by switching to steam reforming of natural gas as basis for hydrogen production. The project consists of the improvement of the energy efficiency by the implementation of two subprojects.

Subproject 1: Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop (Hot-rolling mill 2000).
The subproject represents up-to-date engineering practice and makes possible to improve energy efficiency of Hot Sheet-Rolling production. This subproject intends to introduce state-of-art technology from a reputable Swiss supplier group, resulting in a technology transfer from Switzerland to Russia. The project design engineering for the reconstruction of the heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop reflects good engineering practice. The technical area of the subproject is classified as energy demand by DNV.

Subproject 2: Commissioning the hydrogen production installations based on steam reforming of natural gas technology (Gas shop).

The subproject represents up-to-date engineering practice and makes it possible to improve energy efficiency of hydrogen production. This subproject intends to introduce state-of-art technology from a reputable Danish supplier group, resulting in a technology transfer from Denmark to Russia. The subproject consist of the hydrogen plant construction and implementation. Technology of hydrogen production is based on steam reforming of natural gas. The new shop of hydrogen production was commissioned in December 2004. It is using the steam reforming of natural gas technology for hydrogen production. The new installations partly replace the hydrogen production at the two old hydrogen stations which use method of water electrolysis. It means that significant less electricity consumption is required for hydrogen production. The technical area of the subproject is classified as metal production by DNV.

The start of the project activity was June 2002 based on the plan for project implementation at heat furnace 5 (subproject 1) /41/. In addition it was verified that subproject 2 also was initiated in 2002 /40/. 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" /3/. The baseline setting and monitoring approach meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.
The following 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/.

STEP 1. Indication and description of the theoretical approach chosen regarding baseline setting

Taking into account the above criteria JI specific approach baseline establishment has been identified by listing and describing plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one.
The project was considered for 2001 (subproject 1 – October 2001 and subproject 2 – October 2002). The following key factors that affect the baseline are taken into account:

a) **Sectoral reform policies and legislation.** The Russian metal market is free market. Therefore there isn't special legislation for the metal industry in Russia. However any project must be approved by a local administration (permission for construction) and by a local conservancy. Also the most of metallurgical plants in Russia are very big enterprises which are important for region where they are located. Especially in a social aspect because of workplaces and environmental impact;
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).** In the beginning of 2002 in Russia the metal production decreased. It was related to the reduction of the metal demand within Russia and in the world (more 50% of metal production at the Russian metallurgical plants is supplied to other countries). Financial indicators of metallurgical plants decreased as a result /33/. Then the USA, European Union and other countries introduced the restrictive measures against the metal import from the Russian metallurgical companies' /34/. The situation was changed in the beginning of 2003 because the metal demand was beginning to grow;
c) **Cost of capital.** After default which was in Russia in 1998 there was the high level of inflation. It was 18.6% in 2001 and 15.1% in 2002 (Bank of Russia data /18/). As result a capital was available but high bank rate (the interbank offered rate was more than 20% /19/), high country investment risk and other risks made unprofitable of new equipment introduction in Russia;

d) **Local availability of technologies/techniques, skills and know-how and availability of best available technologies/techniques in the future.** All technologies applied in proposed project were well known and available. Some local and foreign companies could provide technology and equipment and implement project and construction works for the project implementation;
e) **Fuel prices and availability**. The natural gas and electricity prices were regulated by Russian Government in 2001-2002. In Russia they were lower than world market price. In 2002 the tariff of natural gas price was approximately 26 EUR/1000 m^3 /35/ and the tariff of electricity was approximately 16 EUR/MWh /36/. The most recent statistics /36/ shows that the growth of tariffs have been approximately 15-25% a year with inflation included. Electricity and natural gas are available, widely used and produced domestically. Blast furnace and coke oven gases are produced and utilized at the different shops of NLMK.

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. For investment analysis was used Feasibility study /6/ and /7/ prepared by NLMK Technical Centre. This Centre is separate with NLMK Units which take place in the project.
Independent third party State commission confirmed Feasibility study with the documents /8/, /9/, /10/, /11/". In the investment analysis was used contract information between NLMK and providers of equipment /13/, /14/

STEP 2. Application of the approach chosen

Plausible scenarios have been identified in order to establish a baseline.
The project developer has discussed the following alternatives to proposed project:
Subproject 1. Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop
Alternative 1: Continuation of a situation existing prior to the project i.e. the heating furnaces No 4-5 are maintained with routine and capital repairs, DNV considers that this is sufficient to maintain the operations throughout the proposed crediting period. This scenario has been selected as baseline scenario as it doesn't face any barrier and also is in compliance with national laws and regulations.
Alternative 2: The proposed project activity undertaken without being registered as a JI project activity. This alternative has not been selected as the baseline scenario as it is not financially attractive (refer to additionality discussion).
Subproject 2. Commissioning the hydrogen plant based on steam reforming of natural gas technology
Alternative 1: Continuation of a situation existing prior to the project. Hydrogen is produced at the installations of two hydrogen stations by electrolysis of water. These installations will be maintained with routine and capital repairs DNV considers that this is sufficient to maintain the operations throughout the proposed crediting period. This scenario has been selected as baseline scenario as it doesn't face any barrier and also is in compliance with national laws and regulations.
Alternative 2: The proposed project activity undertaken without being registered as a JI project activity. This alternative has not been selected as the baseline scenario as it faces barriers (refer to additionality discussion).

The project's system boundaries which include components and facilities used to mitigate GHGs (see PDD section B.3) is clearly defined.
The baseline sufficiently takes into account relevant national and sectoral circumstances: sectoral reform policies and legislation, economic situation/growth and socio-demographic factors, availability of capital (including investment barriers), local availability of technologies/techniques, fuel prices and availability.
Conservative assumptions have been used to determine baseline emissions. The selected baseline scenario is conservative. The project has following conservative assumptions.
Subproject 1. Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop
Default emission factor for BOF (1,46 tCO2/tonne of steel) was used /15/. This parameter in Russia is higher and average equal to 1,61 /16/, /17/. NLMK has this parameter about 1,87 according to calculations.
Energy for water purification to maintain cooling system in the baseline wasn't accounted.
Subproject 2. Commissioning the hydrogen plant based on steam reforming of natural gas technology
Baseline doesn't take account of electricity transmission losses inside project boundaries. Also baseline doesn't take account of heat transmission losses from the NLMK CHP to the electrolysis installations (see PDD sections D.1, D.3, E1, Annex 2).
The emission factor of electricity consumption from electricity grid was used in PDD. The value of the emission factor was taken from the study "Development of grid GHG emission factors for power systems of Russia" /26/. 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 both tool versions (names of options were changed only). In the tool of version 02 the conception of an off-grid power plant/unit was added. However, the project electricity system (regional electricity system "Centre") don't include such type of power plants/units. Therefore the version of tool is indifferent in this case.

The system boundaries can be presented in tabular format:

	GHGs involved	*Description*
Baseline emissions	*CO_2*	*t CO_2 equivalent*
Project emissions	*CO_2*	*t CO_2 equivalent*
Leakage	*N/a*	

The baseline is established in a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors. Uncertainties are taken into account and conservative assumptions are used. ERUs cannot be earned for decreases in activity levels outside the project activity or due to force majeure as emission factors based on specific production are used (e.g.
GJ/t steel).
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 basic principle applied is that the saleable steel output (subproject 1), and hydrogen production (subproject 2) are identical in the project and the baseline scenario.

4.4 Additionality

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 is described in section 4.3.

STEP 2. 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) /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 17,18% (for both subprojects on the base of data 2002). These lending rates refer to the use of project-IRR as the financial indicators. The sources of benchmark IRR data are: for bond rate /20/, inflation /21/, risk-free rate /22/, systematic market risk /23/, country risk Russia /24/, project specific risk /31/. The IRR benchmark estimations of 16,71% and 17,18% are justified as adequate.
DNV has assessed the financial analysis and found that the used parameters are correct.
Main parameters for subproject 1 is taken from /6/ and /7/. The input values are confirmed by /8/, /9/ and /10/. The parameters (Steel (slabs) output (No 4-5), fuel consumption, steam generation, waste of metal, NG tariffs, cost of BOF steel production, steam tariffs, property tax rate, income tax rate) used were compared with receipts and found correct. Cash flow analysis shows IRR of 2.50%. It is less than the benchmark determined of 17.18%. Hence, the subproject cannot be considered as a financially attractive course of action.
Main parameters for subproject 2 is taken from /6/ and /7/. The input values are confirmed by /11/. The parameters (H2 generation, electricity consumption, steam consumption, NG consumption, NG tariffs, steam tariffs, electricity tariffs, property tax rate, income tax rate) used were compared with receipts and found correct. Cash flow analysis shows IRR of 13.35%. It is less than the benchmark determined of 17.18%. Hence, the subproject cannot be considered as a financially attractive course of action.
The sensitivity analysis has been carried out for each of subprojects.

Subproject 1.
Cost from steam generation is less than 20% of total revenues and in line with the Additionality Tool. The sensitivity analysis is not done for this component.
Scenario 1 considers a 10% investment cost growth and shows that this assumption worsened the cash flow performance due to significant cost increase.
Scenario 2 is based on the assumption of a 10% investment cost decrease that improves cash flow.
Scenario 3 and 4 implies natural gas price raise/reduce by 10%.
Scenario 5 and 6 implies BOF steel production cost raise/reduce by 10%.

DNV considers that higher variations than this is not realistic for the project as described at the time of the project start.

Scenario	IRR (%)
Scenario 1	1.32%
Scenario 2	3.88%
Scenario 3	3.18%
Scenario 4	1.81%
Scenario 5	3.28%
Scenario 6	1.70%

The highest IRR is found to be 3.88% for a 10% decrease in the investment costs. This is clearly lower than the benchmark value 17,18%, which can be considered a conservative for investments, thereby it can be concluded that the project activity is not financially attractive without the revenue from sale of ERUs.

Subproject 2.
Revenues from steam cost savings and cost from natural gas buying are less than 10% of total revenues and in line with the Additionality Tool the sensitivity analysis is not made for this component.
Scenario 1 and 2 implies investment cost changes ± 10, respectively.
Scenario 3 considers a 10% electricity tariff growth.
Scenario 4 is based on the assumption of a 10% electricity tariff decrease.

Scenario	IRR (%)
Scenario 1	11.80%
Scenario 2	15.20%
Scenario 3	15.11%
Scenario 4	11.54%

The highest IRR is found to be 15.20% (scenario 2) for a 10% decrease in the investment costs. This is clearly lower than the benchmark value 17.18%.
Scenario 3 gives an IRR of 15.11% based on a 10% increase (inflation excluded) in the electricity tariff . This has been compared against data available on real tariff evolution /36/ that shows 15-25% increase with inflation included. DNV has checked that the benchmark would have been reached by 22% increase in the electricity tariff (inflation excluded). Throughout 2001 and 2002 the inflation rate in Russia was higher than 15% /37/ and it is considered that an expectation of a higher tariff increase than 10% (inflation excluded) was unrealistic at the time of project decision. Thereby it can be concluded that the project activity was not financially attractive without the revenue from sale of ERUs.

STEP 3. In line with the Additionality Tool 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:

Subproject 1. Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop
In 2004-2005 Russian metallurgical company "Severstеel" reconstructed two heating furnaces. However, these furnaces have less capacity (120 tonnes of steel per hour) than the heating furnaces at NLMK (320 tonnes of steel per hour). Also the proposed subproject takes into account the individual feature of heating furnaces at NLMK: reconstructed furnaces use new modern energy-saving hot load/unload of slabs technology.
Therefore this subproject can not represent a widely observed practice in the area considered.

Subproject 2. Commissioning the hydrogen plant based on steam reforming of natural gas technology
Usually in Russia hydrogen at metallurgical plants is produced at hydrogen stations by electrolysis of water. Proposed subproject is first which was implemented at a metallurgical plant. Therefore this subproject can not 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 that is well described in the PDD.
The monitoring plan in the PDD provides for the collection and archiving of all relevant data:
Subproject 1.
Project emissions:
- CO2 emissions from NG burning.
- CO2 emissions from blast furnace gas burning.
- CO2 emissions associated with additional heat generation.

Subproject 2.
Project emissions:
- CO2 emissions from NG burning.
- CO2 emissions associated electricity consumption.

Subproject 1.
Baseline emissions:
- CO2 emissions from NG burning.
- CO2 emissions from blast furnace gas burning.
- CO2 emissions associated with heat generation.

Subproject 21.
Baseline emissions:
- CO2 emissions associated with heat generation.

- CO2 emissions associated electricity consumption.

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. The plant special centre 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 Eco-Alliance. A detailed plausibility check should be carried out at least monthly. Training and maintenance is deemed reasonable. Routines are described and technology is in place for safety of the personnel and equipment in case of emergencies.

The monitoring methodology is in line with monitoring plan and it allows a transparent, accurate and complete calculation of baseline and project emissions. NLMK has quality system for metrology and certified laboratory /27/. It is also mitigates monitoring errors and uncertainties till a reasonably possible level. This is underpinned with the monitoring plan which is presented in PDD in Annex 3 and section D.

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 has been analyzed and Quality system has been assessed during site visit.

4.5.1 Parameters determined ex-ante

Subproject 1. Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop

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

- The default IPCC CO2 emission factors of natural, blast furnace gases and heavy fuel oil;
- Specific fuel consumption of furnaces No 1-5 before the reconstruction of the furnaces No 4 and 5;
- The default IPCC CO2 emission factor for Basic Oxygen Furnace;
- Specific waste of steel of the furnaces No 1-5 before the reconstruction of the furnaces No 4 and 5.

Subproject 2. Commissioning the hydrogen plant based on steam reforming of natural gas technology

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

- The default IPCC CO2 emission factors of natural, blast furnace gases and heavy fuel oil;
- The CO2 emission factor for electricity consumption from grid;
- Specific electricity consumption per 1000 m3 of hydrogen for electrolysis installations;
- Specific steam consumption per 1000 m3 of hydrogen for electrolysis installations;
- The CO2 emission factor for electricity consumption from grid.

All parameters are determined in line with JI specific approach.

4.5.2 Parameters to be monitored ex-post

Subproject 1. Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop

During monitoring process of the subproject 1 the following parameters will be measured at NLMK shops:

- Steel output from heating furnaces No 1-5;
- Waste of metal;
- Natural and blast furnace gases consumption at heating furnaces No 1-5;
- Net calorific value of blast furnace gas;
- Heat generation at NLMK CHPP and at the heat recovery boilers of furnaces No 1-5;
- Fuel consumption for heat generation at NLMK CHPP.

Subproject 2. Commissioning the hydrogen plant based on steam reforming of natural gas technology

During monitoring process of the subproject 2 the following parameters will be measured at NLMK shops:

- Generated volume of hydrogen at new hydrogen plant;
- Natural gas consumption at new hydrogen plant;
- Electricity consumption at new hydrogen plant;
- Total electricity consumption at NLMK from grid;
- Electricity generation at NLMK CHPP;
- Fuel consumption for electricity generation at NLMK CHPP;
- Heat generation at NLMK CHPP;
- Fuel consumption for heat generation at NLMK CHPP.

All parameters are determined in line with JI specific approach

4.6 Estimate of GHG Emissions

Estimate of GHG emissions are in accordance with formulae given in the baseline and monitoring ji specific approach.

Project emissions.

Subproject 1:

The project emission includes emissions associated with fuel combustion in the furnaces $PE_{spl\_f,\,y}$, emissions associated with additional heat generated at the NLMK CHPP $PE_{spl\_h,\,y}$.

Subproject 2:

The project emission includes emissions associated with natural gas consumption $PE_{sp2\_NG,\ y}$, emissions associated with electricity consumption $PE_{sp2,EC,\ y}$.

For the calculation of the emissions associated with fuel combustion in the furnaces the average net calorific value per volume unit of all types of fuel type and default IPCC CO_2 emission factor per unit of energy of fuel are used. For the calculation of the emissions associated with additional heat generated at the NLMK CHPP CO_2 emission factor of heat generation at the NLMK CHPP, total volume of fuel each type combusted at the NLMK CHPP for heat generation, the specific fuel consumption per tonne of steel in the baseline and steam (1.3 MPa) consumption at NLMK are used.

Baseline emissions.

Subproject 1:

The baselibe emission includes emissions associated with fuel combustion in the furnaces $BE_{sp1\_f,\ y}$, emissions associated with additional BOF steel production in baseline scenario $BE_{sp1\_s,\ y}$.

Subproject 2:

The baseline emission includes emissions with electricity consumption $BE_{sp2\_e,\ y}$, associated with steam consumption $BE_{sp2\_s,\ y}$.

For the calculation of the emissions associated with electricity consumption the weighted average CO_2 emission factor for electricity consumption, (tCO_2/MWh). It is calculated according to formulae $EF_{ELEC,aver,\ y} = w_{grid,y} \times EF_{grid,y} + w_{CHP,y} \times EF_{el\_CHP,y}$.

Where:

$w_{grid,y}$ - is part of electricity consumption from the grid at NLMK for the year *y*, (MWh);

$EF_{grid,y}$ - is the CO_2 emission factor for electricity consumption, (tCO_2/MWh);

$w_{CHP,y}$ - is part of electricity consumption from the CHPP at NLMK for the year *y*, (MWh);

$EF_{el\_CHP,y}$ - is the CO_2 emission factor for electricity generation at NLMK CHPP in project for the year *y*, (tCO_2/MWh).

$EF_{el\_CHP,y}$ is obtained as:

$$EF_{el\_CHP,y} = \frac{\sum_i 29{,}308 \times FC_{eg,\ i,y} \times EF_{fuel\_i,y}}{EG_{CHPP,y}}$$

Where:

$FC_{eg,\ i,y}$ - is the total volume of fuel type *i* combusted the NLMK CHPP for electricity generation in year *y* (t.c.e);

$EG_{CHPP,y}$ - is the electricity which is generated at NLMK CHPP in project scenario in comparison with the baseline in year *y*, (MWh).

The calculations are transparently documented and conservative assumptions were used, where applicable, regarding expected (see section 4.3).

Uncertainties concern measuring result and IPCC data:
Measuring result obtained on the basis of national standards and has uncertainty estimation about +/- 3% /32/;
IPCC data concerning emission coefficient estimated as +/- 5% /32/.

All estimates are checked during determination of the project including all figures in excel. The miscalculation have been discovered and corrected by PP. The estimated project emissions were corrected.
Different reference periods are adequate and used for real periods of subproject1 and subproject2 implementation.

The emission reduction forecast has been verified and deemed likely that the forecast amount of 2464199 tCO_2 is achived over 5 years crediting period between 2008 and 2012. An additional 4537924 tCO_2 can potentially be achieved over 8 years post Kyoto period (2013-2020).

4.7 Environmental Impacts

According to the national law no EIA has been required. The possible environmental effects are discussed in the Environmental Audit Report. As the project involves only energy decreasing effect of the existing capacities, no significant direct environmental impacts can be expected either during the construction or the operation phase. This was also confirmed in the documents /10/, /11/.

4.8 Comments by Local Stakeholders

Proposed projects were submitted and approved by State ecological expert commission /10/. The series of public hearings are not obligatory for these types of project. Nevertheless NLMK published the project information on the NLMK website: http://www.nlmk.ru/media_centre/press_releases/. Also NLMK prepared annual reports "Corporative Stability and Social Responsibility" in 2006, 2007 and 2008 (http://www.nlmk.ru/social/srep/).

4.9 Global stakeholders consultation

The PDD of "Implementation of energy efficiency projects at OJSC "Novolipetsk Steel" version 2.1 /1/ was made publicly available on JI website and Parties, stakeholders and observers were through the JI website invited to provide comments during a 30 days period from 12 August 2010 to 10 September 2010.

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 acquire 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 NLMK in Lipetsk town in the Lipetsk area. The geographical location of the Lipetsk town in Russia is presented in Figure A.4.1.1. (See PDD A.4.1). Please clarify designation on the map. Conventional signs "Lipetsk area" and "Russia" are absent. NLMK is located in Lipetsk town boundaries in its south-east part and has an area of approximately 25 square kilometres (See PDD A.4.1.4). Please, give more exact detail of physical location, including information allowing the unique identification of the project.	~~CL 1~~ ~~CL 2~~	OK 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 of Subproject 1 "Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop" and Subproject 2 "Commissioning the hydrogen plant based on steam reforming of natural gas technology" (A.4.2. and A.4.3.). Please clarify:	~~CL 3~~	OK

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

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			1) The Figure A.4.2.1. "Hydrogen station scheme" contains flows of different gases and liquids. Why lines with Natural Gas and Hydrogen have the same colour designation? 2) The interaction of processes in the heating furnace in graphic scheme (subproject 1).		
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	OJSC "Novolipetsk Steel" 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	The endorsement by the Sponsor party was provided by project participant /29/. The endorsement by host Party was provided by project participant /39/.	See: CAR 01	~~CAR01~~
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	Yes. The project uses the state of the art technology (Subproject 1: New technology from Europe of steel heating furnaces. Subproject 2: The time such kind of technology was implemented at a Russian metallurgical plant.)		OK

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

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.3.3 Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Yes. Please clarify if provisions for meeting training needs as regards monitoring are made if appropriate.	~~CL 4~~	OK
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 Joint Implementation small-scale projects"?			*N/A*		
A.4.2 Is the small scale project activity not a depended 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	Please clarify evidently applicability conditions of project specific approach. Yes. The following key factors that affect the baseline are taken into account: Sectoral reform policies and legislation, Economic situation/growth and socio-demographic	~~CL5~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			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 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		OK

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

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				of additionality"(version 05.2).		
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. Why the "Tool to calculate the emission factor for an electricity system" (version 01.1) is used, but it is not latest applicable version of approved tool. The substantiation is absent. Yes. Choice, scope and applicability of emission factor calculation method are similar to both tool versions 01.1 and 02. In the tool of version 02 the conception of an off-grid power plant/unit was added. However, the project electricity system (regional electricity system "Centre") don't include such type of power plants/units. Therefore the version of tool is indifferent in this case.	~~CAR 02~~	OK
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 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		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				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 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.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			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 16,71% (for subproject 1 on the base of data 2001) and 17,18% (for subproject 2 on the base of data 2002). These lending rates refer to the use of project-IRR as the financial indicators. The sources of benchmark IRR data are: for bond rate /20/, inflation /21/, risk-free rate /22/, systematic market risk /23/, country risk Russia /24/, project specific risk /31/. The IRR benchmark estimations of 16,71% and 17,18% are justified as adequate. DNV has assessed the financial analysis and found that the used parameters are correct. Main parameters for subproject 1 (Steel (slabs) output (No 4-5), fuel consumption, steam generation, waste of metal, NG tariffs, cost of BOF steel production, steam tariffs, property tax rate, income tax rate) used were compared with receipts and found correct. Cash flow analysis shows IRR of 0.77%. It is less than the benchmark determined of		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			16.71%. Hence, the subproject cannot be considered as a financially attractive course of action. Main parameters for subproject 2 (H2 generation, electricity consumption, steam consumption, NG consumption, NG tariffs, steam tariffs, electricity tariffs, property tax rate, income tax rate) used were compared with receipts and found correct. Cash flow analysis shows IRR of 13.35%. It is less than the benchmark determined of 17.18%. Hence, the subproject cannot be considered as a financially attractive course of action. The sensitivity analysis has been carried out for each of subprojects. STEP 3. In line with the Additionality Tool 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: Subproject 1. Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop In 2004-2005 Russian metallurgical company "Severstеel" reconstructed two heating furnaces. However these furnaces have less capacity (120 tonnes of steel per hour) than the heating furnaces at NLMK (320 tonnes of steel per hour). Also the proposed subproject		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			takes into account the individual feature of heating furnaces at NLMK: reconstructed furnaces use new modern energy-saving hot load/unload of slabs technology. Therefore this subproject can not represent a widely observed practice in the area considered. Subproject 2. Commissioning the hydrogen plant based on steam reforming of natural gas technology Usually in Russia hydrogen at metallurgical plants is produced at hydrogen stations by electrolysis of water. Proposed subproject is first which was implemented at a metallurgical plant. Therefore this subproject can not 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.		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				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.		
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. Yes. The project participants can use the methodologe of JI specific approach including using 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.	~~CL6~~	OK
B.2.7	Is the methodology to calculate project emissions appropriate and adequate?	/1/	DR	The methodology to calculate project emissions is found appropriate and adequate. Project emissions. Subproject 1: The project emission includes emissions associated with fuel combustion in the furnaces $PE_{sp1\_f,\ y}$, emissions associated with additional heat generated at the NLMK CHPP $PE_{sp1\_h,\ y}$. Subproject 2: The project emission includes emissions associated with natural gas consumption		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			$PE_{sp2\_NG,\ y}$, emissions associated with electricity consumption $PE_{sp2,EC,\ y}$. For the calculation of the emissions associated with fuel combustion in the furnaces the average net calorific value per volume unit of all types of fuel type and default IPCC CO_2 emission factor per unit of energy of fuel are used. For the calculation of the emissions associated with additional heat generated at the NLMK CHPP CO_2 emission factor of heat generation at the NLMK CHPP, total volume of fuel each type combusted at the NLMK CHPP for heat generation, the specific fuel consumption per tonne of steel in the baseline and steam (1.3 MPa) consumption at NLMK are used. Please refer to PDD Section B.2.		
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. 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.	~~CL7~~	OK
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	/1/	DR	Yes. Please clarify position "Justification of the choice …" filled with "It is based on historical data" in key data tables section B.1.	~~CL8~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	judgment)?					
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.		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.		
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	/1/	DR	GHG sources are calculated for subproject 1 as the sum of CO2 emissions from fuel consumption during the steel heating, fuel	~~CL9~~	OK

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

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	arrive at this conclusion.			consumption associated with additional heat generation, emission associated with additional BOF steel production. GHG sources are calculated for subproject 2 as the sum of CO2 emissions from electricity consumption, fuel consumption associated with heat generation, natural gas consumption. Please clarify, can it be confirmed that the baseline CH4 and N2O emission are insignificant.		
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	N_2O and CH_4 emissions are not taken into account for baseline and project emissions calculation because their share of total is equal to 0.093%.	~~CL9~~	OK
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

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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	Yes. The baseline scenario determination compatible with the available data and are all literature and sources clearly referenced. Refer to sections B.1., B.2., Annex 2.		OK
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	/1/	DR	*For conclusion need response for CAR 2, CL5-CL9.* Yes. The baseline determination adequately documented in the PDD	~~CAR 2, CL5-CL9.~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
CDM project activity						
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*		
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/	DR	Proof of the actual starting date should be available in document(s). Please make document reference.	~~CL 10~~	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.	~~CAR 03~~	OK
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	/1/	DR	Please clarify if monitored data required for	~~CL11~~	OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	the last issuance of ERUs, for this project activity, whichever occurs later?			verification and issuance be kept for two years after the end of the crediting period or the last issuance of ERUs.		
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	See CAR 03. Yes. 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	~~CAR 03~~	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. Yes. The measurement method clearly stated for each GHG value to be monitored and deemed appropriate.	~~CAR 03~~	OK
D.2.4	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.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. Yes. The measurement accuracy addressed and deemed appropriate and procedures are in place.	~~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. Yes. The registration, monitoring,	~~CAR 03~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				measurement and reporting procedure defined		
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. Yes. The procedures are identified for maintenance of monitoring equipment and installations. The calibration intervals are being observed.	~~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 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.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.		OK
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. Yes. The measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate	~~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	~~CAR 03~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				in place on how to deal with erroneous measurements.		
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 installations. The calibration intervals are being observed.	~~CAR 03~~	OK
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		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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. The authority and responsibility of overall project management is clearly described. OJSC "Novolipetsk Steel" has ISO 14001:2004 certificate.	~~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. OJSC "Novolipetsk Steel" 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. OJSC "Novolipetsk Steel" has ISO 14001:2004 certificate.	~~CAR 03~~	OK
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. OJSC "Novolipetsk Steel" 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. OJSC "Novolipetsk Steel" has ISO 14001:2004 certificate.	~~CAR 03~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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	The estimated project emissions aren't correct due to the mistake during calculations.	~~CAR 04~~	OK
E.1.2 Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Yes. The conservative assumptions have been used when calculating the project emissions.		OK
E.1.3 Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Yes. The uncertainties in the project emission estimates are properly addressed.		OK
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	The estimated baseline emissions aren't correct due to the mistake during calculations.	~~CAR 05~~	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

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

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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		
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

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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*		
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. Relevant stakeholders were consulted. 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.		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 such regulations/laws?	/1/	DR	Yes. The stakeholder consultation process been carried out in accordance with such regulations/laws		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
G.1.4	Is a summary of the received provided?	/1/	DR	Yes. The summary of the received was provided.		OK
G.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	Yes. All necessary stakeholder comments were received.		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 01: Letters of Approval haven't been issued both by sponsor and by host country Focal Points	Table 1	The Letters of Approval by the Sponsor party was provided by project participant /29/. The Letters of Approval by host Party was provided by project participant /39/.	OK
CAR 02: The methodological basis for determining the baseline scenario is described in Section B.1., Annex 2. The "Tool to calculate the emission factor for an electricity system" (version 01.1) why is used, but it is not latest applicable version of approved tool.	Table 2. B.2.3.	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.	OK The additional information provided by the project participant sufficiently justified the use of selected approach to calculate baseline CO_2 emissions.
CAR 03: In Annex 3 the monitoring plan is absent.	Table 2. D.1.1.	Description of monitoring plan was added in Annex 3.	OK The additional information provided by the project participant sufficiently justified the monitoring plan.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
CAR 04: The estimated project emissions aren't correct due to the mistake during calculations.	Table 2. E.1.1.	The estimated project emissions were corrected. Text of the PDD was amended.	OK The additional information provided by the project participant sufficiently justified the result of baseline CO_2 emissions estimation.
CAR 05: The estimated baseline emissions aren't correct due to the mistake during calculations.	Table 2. E.2.1.	The estimated baseline emissions were corrected. Text of the PDD was amended.	OK The additional information provided by the project participant sufficiently justified the result of project CO_2 emissions estimation.
CL 1: The project is located at NLMK in Lipetsk town in the Lipetsk area. The geographical location of the Lipetsk town in Russia is presented in Figure A.4.1.1. (See PDD A.4.1). Please clarify designation on the map. Conventional signs "Lipetsk area" and "Russia" are absent.	Table 2. A.1.1.	The text of Section A.4.1 was changed: The project is located at NLMK in Lipetsk town in the Lipetsk area of the Russian Federation. The geographical location of the project is presented in Figure A.4.1.1 below. And the map and its name were changed also. The changed name map: ***Figure A.4.1.1: Location of the project on the Russian Federation map.***	OK The designation on the map are complete.
CL 2: NLMK is located in Lipetsk town boundaries in its south-east part and has an area of approximately 25 square kilometres (See PDD A.4.1.4). Please, give more exact detail of physical location, including information allowing the unique identification of the project.	Table 2. A.1.1.	The following information was added in Section A.4.1.4: The project is located at NLMK in Lipetsk town boundaries in its south-east part and has an area of approximately 25 square kilometres. NLMK business address is Lipetsk town, Metallurgists square, building 1. The coordinates of NLMK are 52°57'N,	OK The details of physical location include information allowing the unique identification of the project.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		39°62'E and coordinates of: • Subproject 1 are 52°55'N, 39°63'E; Subproject 2 are 52°57'N, 39°64'E.	
CL 3: The project's system boundaries are defined in description of Subproject 1 "Reconstruction of heating furnaces No 4 and 5 at the Hot Sheet-Rolling Shop" and Subproject 2 "Commissioning the hydrogen plant based on steam reforming of natural gas technology" (A.4.2. and A.4.3.). Please clarify: 1) The Figure A.4.2.1. "Hydrogen station scheme" contains flows of different gases and liquids. Why lines with Natural Gas and Hydrogen have the same colour designation? 2) The interaction of processes in the heating furnace in graphic scheme (subproject 1).	Table 2. A.1.2.	The colour designation of the lines with Natural Gas, Hydrogen and other gases were changed (and the number of the figure was changed from A.4.2.1 to A.4.2.2). The Figure (A.4.2.1) of the scheme of the interaction of processes in the heating furnaces is added in Section A.4.2.	OK The project's system boundaries (components and facilities used to mitigate GHGs) is clearly defined.
CL 4: Please clarify if provisions for meeting training needs as regards monitoring are made if appropriate.	Table 2. A.3.3.	The following information was added in Section A.4.2 on page 10: The specialists of new equipment suppliers conducted the NLMK personnel (engineers, operations and maintenance personnel) trainings during starting-up works at project site. The necessary trainings concerning monitoring process (including the personnel certification by Roctechnadzor – Russian reviewing authority) are prescribed in the existing quality management systems at NLMK. NLMK has ISO 9001:2000 certificate. Also Global Carbon BV will provide a staff training on monitoring	OK The provisions for training needs as regards monitoring are appropriate.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		procedures, ERU calculation and preparation of annual monitoring report.	
CL 5: Please clarify evidently applicability conditions of project specific approach.	Table 2. B.2.1.	The emission factor of electricity consumption from electricity grid was used in PDD. The value of the emission factor was taken from the study "Development of grid GHG emission factors for power systems of Russia" (it was developed in 2008). In this study the emission factor was defined according to "Tool to calculate the emission factor for an electricity system" (version 01.1*). Scope and applicability of the tool for emission factor definition is described on page 11 of the study. The following information was added in Annex 2 on page 62: The Study was verified by Bureau Veritas Certification (BVC) in 2008. BVC confirmed an applicability of the Tool and the emission factor calculation accuracy.	OK The applicability conditions of project specific approach are adequate.
CL 6: 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	OK The mentioning that Simple OM method of Operating Margin Emission Factor calculation is used was added in Annex 2 on page 63 of PDD (ver.3).

* This version of the tool was applicable in 2008

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		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 7: 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; • Transmission and distribution of blast furnace gas at NLMK; • Technical transmission and distribution losses of electricity. ***Subproject 1*** For subproject 1 fuel consumption (including amount of fuel for additional heat generation) in the project scenario is reduced by 25% in comparison with	OK 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.

* Approved baseline methodology AM0029 "Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas", Version 03, CDM – Executive Board. 2008
† IPCC AR4. 2007a. The Physical Science Basis. Working Group I Report of the intergovernmental Panel on Climate Change..Editors: Solomon. S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller . Cambridg University Press, Cambridge, United Kingdom and New York, NY, USA.
‡ http://www.abok.ru/for_spec/articles/14/2833/tb.htm

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		the baseline scenario. Therefore the fugitive CH_4 emission (for natural gas extraction, processing, transportation and distribution) and the losses of blast furnace gas at NLMK are decreased and therefore leakages are not taken into account. This 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. Annual natural gas consumption is approximately 690,000 GJ. Default emission factors for fugitive CH_4 emission is 961 tCH_4/PJ (for Eastern Europe and former USSR)* and the Global Warming Potential of CH_4 is 21†. And volume of emission is $21 \times 650{,}000 \times 961/10^6 = 13{,}924\ tCO_{2\text{-eq}}$. Annual electricity consumption in project scenario is approximately 5,300 MWh. In Russian Federation the electricity losses are 11-13%‡. The emission factor for electricity consumption is 0.526 tCO_2/MWh (please see Annex 2	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		of the PDD). And volume of emission is $0.526 \times 5,300 \times 11/100 = 307$ tCO_2. In project scenario the total leakages are 14,231 $tCO_{2\text{-eq}}$. The most part of leakages in baseline scenario is associated with losses of electricity. Annual electricity consumption in baseline scenario is approximately 243,000 MWh. And leakages amount to $0.526 \times 243,000 \times 11/100 = 14,059$ tCO_2. Other leakages are fugitive CH_4 emission (natural gas consumption for heat generation). Annual steam (heat) consumption in baseline at electrolysis installations is about 170,000 GJ. And natural gas consumption for heat generation is $170,000 \times 0.9$ (heat generation efficiency)$\times 0,22$ (part of natural gas in fuel balance at NLMK CHPP) = 42,558 GJ. Leakages are associated with fugitive CH_4 emission is $21 \times 42,558 \times 961/10^6 = 858$ $tCO_{2\text{-eq}}$. Therefore the leakages in project scenario are less than in baseline scenario for both subprojects 1 and 2	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		and these emissions have not been taken into account for simplicity and conservatism.	
CL 8: Please clarify position "Justification of the choice …" filled with "It is based on historical data" in key data tables section B.1.	Table 2. B.2.9.	The appropriate cells of the tables in PDD Section B.1 were corrected.	OK
CL 9: GHG sources are calculated for subproject 1 as the sum of CO2 emissions from fuel consumption during the steel heating, fuel consumption associated with additional heat generation, emission associated with additional BOF steel production. GHG sources are calculated for subproject 2 as the sum of CO2 emissions from electricity consumption, fuel consumption associated with heat generation, natural gas consumption. Please clarify, can it be confirmed that the baseline CH4 and N2O emission are insignificant.	Table 2. B.4.2., B.4.3.	The following information was added in Section B.3: **N_2O and CH_4 emissions** GHG emissions of the proposed subprojects are associated with fuels consumption during the steel heating, additional heat generation, additional BOF steel production (for subproject 1) and electricity consumption, natural gas consumption and fuels consumption for heat generation (for subproject 2). All of these processes are related to fuels combustion. For stationary fuel combustion the CO_2 emission is more than 99.9% and, respectively, N_2O and CH_4 emissions are less than 0.1%. For example, in accordance with the IPCC Guidelines for National Greenhouse Gas Inventories* for natural gas the default CO_2 emission factor is 56,100	OK N_2O and CH_4 emissions are not taken into account for baseline and project emissions calculation because their share of total is equal to 0.093%.

* Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Chapter 2: Stationary Combustion, Table 2.2, IPCC, 2006

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		$kgCO_2/TJ$, the default N_2O emission factor is 0.1 kgN_2O/TJ and the default CH_4 emission factor is 1.0 $kgCH_4/TJ$. Global Warming Potential of N_2O is 310 and CH_4 is 21. Then the share of total N_2O and CH_4 emissions is: $100\%\times(21\times1.0+310\times0.1)/(56,100+21\times 1.0+310\times0.1) = 0.093\%$. Therefore N_2O and CH_4 emissions are not taken into account for baseline and project emissions calculation.	
CL 10: Proof of the actual starting date should be available in document(s). Please make document reference.	Table 2. C.1.1.	Confirmation documents were submitted to AIE /41/ and /40/.	OK Starting date June 2002 is correctly set according JI Glossary definition of the Starting Date as "the start date of a JI project activity is the earliest of the dates at which the implementation or construction or real action of the project activity begins". The real action took place in June 2002 which is shown in the "Heating furnace #5 Schedule of balancing and commissioning" /41/.
CL 11: Please clarify if 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.	Table 2. D.1.2.	The following statement was added into Section D.1: "Monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of	OK

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Determination conclusion
		ERUs."	

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants