JI DETERMINATION REPORT

JSC "ZAPORIZHSTAL"

RECONSTRUCTION OF THE OXYGEN COMPRESSOR PLANT AT THE JSC "ZAPORIZHSTAL", UKRAINE.

Report No.: 8000361502 – 08/193

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Approved by: Mr. Eric Krupp	Organisational unit: TÜV NORD JI/CDM Certification Program
Client: JSC "ZAPORIZHSTAL"	Client ref.: Mr. Lykov Alexandr Abramovich

Summary:
The JSC "ZAPORIZHSTAL" has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Determination PDD for the JI Track 1 project: "Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine" with regard to the relevant requirements for the Joint Implementation project activities of the host country, as well as the criteria for consistent project operations and monitoring.
The retrofit of the Oxygen Compressor Plant at the JSC "Zaporizhstal" within the proposed project activity will result in the decrease of the electricity consumption and in the corresponding reduction of the anthropogenic GHG emissions.
A risk-based approach has been followed to perform this determination. In the course of the determination 12 Corrective Action Requests (CARs) and 12 Clarification Requests (CRs) were raised and successfully closed.
The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria. In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (Ukraine) and all relevant UNFCCC requirements for JI project activities.
- An analysis as provided by the applied project specific "Methodology" demonstrates that the proposed project activity is not a likely baseline scenario.
  An analysis as provided by the applied project specific "Methodology" demonstrates that the project activity will result in a reduction of anthropogenic emissions by sources that is additional to any that would otherwise occur;
- The monitoring plan is transparent, adequate and provides for the collection and archiving of all relevant data necessary for determination project and baseline emissions within the project boundary during the crediting period;
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 518,814 t CO2e is most likely to be achieved within the 5 years crediting period.

The conclusions of this report show, that the JI project, as it was described in the project documentation is in line with all criteria applicable for the determination of JI project activities.

Report No.: 8000361502-08/193	Subject Group: Environment
Report title: "Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine".	
Work carried out by: Mr. Rainer Winter Mr. Evgeni Sud	
Work verified by: Mr. Eric Krupp	

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Indexing terms

Climate change
JI
Determination
Kyoto Protocol

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Abbreviations

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
ERU	Emission Reduction Unit
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CR	Clarification Request
DFP	Designated Focal Point
FAR	Forward Action Request
EB	CDM Executive Board
EIA	Environmental Impact Assessment
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
NCV	Net Calorific Value of Fuel
ODA	Official Development Assistance
OCP	Oxygen Compressor Plant
PDD	Project Design Document
PP	Project Participant
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change

Table of Contents *Page*

1 INTRODUCTION

JSC "Zaporizhstal" has commissioned TÜV NORD JI/CDM Certification Program (CP) to make a determination of the

"Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine"

project with regard to the relevant requirements for Track 1 JI project activities

1.1 Objective

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

UNFCCC criteria refer to the Kyoto Protocol Article 6 criteria and the Guidelines for the implementation of Article 6 of the Kyoto Protocol as agreed in the Marrakech Accords.

1.2 Scope

The determination scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. Determination team has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the determination, focusing on the identification of significant risks for project implementation and the generation of ERUs.

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.

The items covered in the validation are described below:

- **UNFCCC & Host Country Criteria**
  - UNFCCC/Kyoto Protocol requirements, in particular, the requirements of the JI as set out in decision 9/CMP.1 (Marrakech Accords), the present annex, and relevant decisions by COP/MOP & JI Supervisory Committee.
  - Host country requirements / criteria

- **JI Project Description**
  - Project design
  - Project boundaries
  - Predicted JI project GHG emissions
- **Project Baseline**
  - Baseline methodology
  - Baseline GHG emissions
- **Monitoring Plan**
  - Monitoring methodology
  - Indicators/data to be monitored and reported
  - Responsibilities
- **Background investigation and follow up interviews**
- **Stakeholder consultation**
  - Publishing the PDD
  - Review of comments
- **Draft validation reporting with CARs, CRs and FARs, if any**
- **Final determination reporting.**

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

1.3 GHG Project Description

1.3.1 Project Scope

The considered GHG project can be classified as a JI project in the sector given in Table 1-1 (according to List of Sectoral Scopes of UNFCCC).

Table 1-1: Project Scope(s)

No.	Project Scope
3	Energy demand

1.3.2 Project Parties

Ukraine as a Annex-I party is involved in the project activity.

Investor party will be determined at later stage of project implementation.

1.3.3 Project Entities

The following entities are involved in the developing of the project:

Project Participant 1	**JSC "ZAPORIZHSTAL"** Yuzhnoye shosse 72 Zaporizhzhya Ukraine
Contact person:	Mr. Lykov Alexandr Abramovich Telephone: +38 (061)218-33-01 Fax. +38 (061) 213-18-58 Telephone: +38 03477 61729

1.3.4 Project location

The project site is located in Zaporizhzhya in Zaporizhzhya region in the eastern part of Ukraine. The details of the project location are given in table 1-2:

Table 1-2: Project Location

No.	Project Scope
Host Country	Ukraine
Region:	Zaporizhzhya region
Project location:	Zaporizhzhya
Latitude:	47°52' N.;
Longitude:	35°09' E.

1.3.5 Technical project description

The project is carried out on the JSC "Zaporizhstal" - one of the largest metallurgical works in Ukraine. The project activity involves reconstruction of the oxygen compressor plant. Oxygen is produced in air separation units installed in the premises of JSC "Zaporizhstal". Oxygen generated is used for production purposes – in particular in blast-furnace and open-hearth furnace for iron and steel smelting processes.

Within the implementation of the project activity a new air separation unit has been installed at JSC "Zaporizhstal". The project has been commissioned in December 2007 and is already operational.

Furthermore there are three other existing air separation units currently installed at the plant. However these units are rather out-dated air separation constructed and commissioned approx. 25 years ago. However they have been appropriately maintained and are still in a working condition. For this reason the three out-dated air separation units will be kept only as reserve. For detailed key parameters of the air separation Units please refer to the table below.

Table 1-3: Key technical parameters of the project activity

Key parameters:	**Project Activity**	**Equipment kept as reserve**		
Unit	**VRU-60**	**Kar-30**	**KtK-35-3**	**BR-2**
Manufacturer:	Air Liquide (France)	JSC "Kriogenmash" (Russia).	JSC "Kriogenmash" (Russia).	JSC "Kriogenmash" (Russia).
Type:	Air separation unit with **adjustable** capacity	Air separation unit with **non-adjustable** capacity	Air separation unit with **non-adjustable** capacity	Air separation unit with **non-adjustable** capacity
Capacity				
Capacity max	60.000 m^3/h	30.000 m^3/h	30.000 m^3/h	30.000 m^3/h
Capacity min	30.000 m^3/h			
Commissioning Date:	2007	1980	1976	1968
Operation	Main equipment	Reserved	Reserve	Reserved

2 DETERMINATION TEAM

The determination team is led by:

- **Rainer Winter**. Mr. Winter works at TÜV NORD CERT GmbH as ISO 9001/ 14001 Auditor and environmental verifier for EMAS. He is also an approved emission verifier within the European Emission Trading Scheme. Mr. Winter is an authorized JI/CDM assessor and is in charge of the TÜV NORD JI/CDM Certification Program.

For this determination he was assisted by:

- **Evgeni Sud**, TÜV NORD CERT GmbH, is an appointed JI/CDM Expert in the JI/CDM Certification Program of TÜV NORD.

The technical review and the final approval of this project activity was done by:

- **Eric Krupp.** Mr. Krupp works at TÜV NORD as an approved emission verifier within the European Emission Trading Scheme. Mr. Krupp is an authorized JI/CDM assessor and deputy head of the JI/CDM Certification Program of TÜV NORD.

3 METHODOLOGY

The determination PDD of the project was carried out from 2008-07-26 till 2009-09-18. The project was switched from JI Track-2 to JI Track-1 procedures. The final PDD version 3 (dated 03.08.2009) serves as the basis for the final assessment presented herewith.

The determination consisted of the following three phases:

- A desk review of the PDD (incl. annexes) and supporting documents with the use of a customised determination protocol according to the Validation and Verification Manual;
- Background investigation and follow-up interviews with personnel of the project proponent, the consultant, legal authorities and other stakeholders;
- Reporting of validation findings taking into account the public comments received on TUV NORD website.

The report includes Corrective Action Requests, Clarification Requests and Forward Action Requests (CAR, CR and FAR) identified in the course of this determination.

A **Corrective Action Request** is established if

- mistakes have been made in assumptions or the project documentation which directly will influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered by the UNFCCC or that emission reductions cannot be verified and certified.

A **Clarification Request** is issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request** is issued when certain issues related to project implementation should be reviewed during the first verification.

After resolution of these CARs and CRs by the project proponent the determinator will issue the (final) determination report and opinion.

3.1 Determination Protocol

In order to ensure transparency, a determination protocol was customised for the project, according to the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The determination protocol serves the following purposes:

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

The determination protocol consists of three tables. The different columns in these tables are described in Figure 1.

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

Determination Protocol Table 1: Mandatory Requirements			
Requirement	***Reference***	***Conclusion***	***Cross reference***
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)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the determination report.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent determination process.*

Determination Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***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 six different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification** is used when the independent entity has identified a need for further clarification.*

Determination Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Determination conclusion***
If the conclusions from the draft determination are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the Client or other project participants during the communications with the independent entity should be summarised in this section.*	*This section should summarise the independent entity's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1: Determination protocol tables

3.2 Review of Documents

The draft and final PDD submitted by JSC "Zaporishstal". and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the determination team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

3.3 Follow-up Interviews

On 2008-10-09 the TÜV NORD JI/CDM CP performed on-site visits. During these visits, as well as earlier and after, interviews with the project proponent, the consultant and project stakeholders were carried out to confirm selected information and to resolve issues identified in the document review.

The main topics of the interviews are summarized in **Table 3-1.**

Table 3-1: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project participant representatives	- Chronological description of the project activity with documents of key steps of phased implementation. - Technical details of the project realization, project feasibility, designing, engineering, operational life time, Instrumentation details for GHG monitoring of the project - Host Government Approval - Post registration involvement of Annex-I Party - Approval procedures and status - Monitoring and measurement equipment and system. - Financial aspects, Government policy for oxygen equipment, equity: loan; fuel costs. - Crediting period - Project activity starting date - ERU allocation / ownership - Baseline study assumptions - EIA Study - Oxygen Generation, Evacuation, Metering system - Analysis of local stakeholder consultation - Salient operational data – technical specification (capacity), load factor, operating parameters of oxygen equipment. - Roles & responsibilities of the staff members w.r.t project management, monitoring, calibration and reporting - Emergency Response Plan

Interviewed Persons / Entities	Interview topics
Consultant (NCSF)	- Editorial aspects of PDD - Methodology selection aspects - Baseline study, leakage and additionality - Details of emission reduction calculation

3.4 Resolution of Clarification and Corrective Action Requests

In order to remedy any mistakes, problems or any other outstanding issues which needed to be clarified for positive conclusion on the project design, CARs and CRs were raised. These requests can be resolved or "closed out" by the project proponent by providing the corresponding response in the column 3 of the table three as meant in Figure 1 and submission of revised PDD and supporting documents.

A Forward Action Request related to project implementation should be reviewed during the first verification.

In this validation report 12 CARs, 12 CRs and no FARs were raised.

The CAR(s) / CR(s) / FAR(s) are documented in Annex I and addressed in section 4.

3.5 Public Stakeholder Comments

The PDD was made publicly available on official UNFCCC website. Comments on the PDD were invited within 30 days. The results are documented in chapter 5 of this report. On 18.05.2009 upon request, the project design document (PDD) for "Reconstruction of the oxygen compressor plant at the JSC Zaporizhstal" has been withdrawn in accordance with the Procedures for the withdrawal of submissions under the verification procedure under the Joint Implementation Supervisory Committee.

3.6 Finalising the report

The draft validation report was submitted to the project proponents. After reviewing the revised and resubmitted project documentation; resolving the CRs & CARs raised and outstanding concerns TÜV NORD JI/CDM CP issued the final validation report and opinion.

4 DETERMINATION FINDINGS

In the following table the findings from the desk review of the draft PDD, visits, interviews and supporting documents are summarised in **Table 4-1:**

Table 4-1: Summary of CARs, CRs and FARs issued

Validation topic [1)]	No. of CAR	No. of CR	No. of FAR
General description of project activity (A) - Project boundaries - Participation requirements - Technology to be employed - Contribution to sustainable development	1	3	-
Project baseline (B) - Baseline Methodology - Baseline scenario determination - Additionality determination - Calculation of GHG emission reductions Project emissions Baseline emissions - Leakage	6	2	-
Duration of the Project / Crediting Period (C)	-	-	-
Monitoring Methodology (D) - Monitoring of Project emissions Baseline emissions Leakage Sustainable development indicators / environmental impacts Project management planning	5	5	-
Estimation of greenhouse gas emission reductions (E)	-	1	
Environnemental impacts (F)	-	-	-
Stakeholder Comments (G)	-	1	-
SUM	**12**	**12**	**0**

[1)] The letters in brackets refer to the determination protocol

For an in depth evaluation of all determination items it should be referred to the determination protocol (Annex). This annex also includes all CARs, CRs and FARs.

4.1 General Description of the Project Activity

4.1.1 Project Boundaries

The project´s spatial and system boundaries are clearly defined in the project documentation. The spatial extent of the project boundary includes the project site, and all the power plants connected physically to the baseline Grid (i.e. National grid of Ukraine). The boundary definition is in line with the JI Guidelines.

All equipment used within the project activity has been indicated in the PDD including the information about its purpose and the technical specification. The main components of the air-separation unit are turbo-compressor; gas-expansion machine intended for compressed air expansion and unit for liquefied air separation. A schematic diagram of the air separation plant is shown and explained in the PDD. Furthermore project boundary is clearly described in words and a visualisation of the physical project boundary as well as a table defining all significant GHG gases has been included in the PDD. Determination team came to a conclusion that technology description in the PDD has been presented appropriately and in a detailed manner. Furthermore all equipment indicated in the PDD is clearly defined and attributable to the considered project activity.

In the course of the on-site-visit the technical specification of the installed equipment has been proved and it could be verified that the project has been implemented in line with provided evidences and in accordance with description in the PDD. (For details pl. refer also to A.5.1.)

To validate whether spatial extent of the project boundary has been appropriately identified determination team has assessed whether the technological process required for oxygen generation is complete and reflects good current practices. For this purpose determination team has considered technologies for oxygen generation as provided by relevant scientific literature. In particular the best available techniques (BAT) and best available technique reference notes (BREF) for iron and steel production as published by the Institute for Prospective Technological Studies of the European Commission and further scientific literature on this sector[/BI-1//BI-2//BI-3//asu/]. It has been verified that the project boundary has been appropriately identified based on the applied technology.

4.1.2 Participation Requirements

The project is a unilateral project involving Ukraine (Host Country). The project developer is the JSC "Zaporizhstal".

Ukraine is a Party to the Kyoto Protocol since April 12th, 2004 and already has installed national procedures for the approval of JI projects.

4.1.3 Technolog y to be employed.

The project is carried out on the JSC "Zaporizhstal" - one of the largest metallurgical works in Ukraine. The project activity involves reconstruction of the oxygen compressor plant. Oxygen is produced in air separation units installed in the premises of JSC "Zaporizhstal". The technical specification of the installed equipment has been provided/TS-PA/. During the site-visit it has been verified that the installed equipment is in line with provided technical specification.

Furthermore there are three other existing air separation units currently installed at the plant. These are rather out-dated air separation units constructed and commissioned approx. 25 years ago. However the three units have been appropriately maintained and are still in a working condition/TS-Res/. For this reason these three out-dated air separation units will be kept only as reserve.

The new air separation unit has been installed at JSC "Zaporizhstal". The project has been commissioned in December 2007. The corresponding evidences have been provided and the commissioning date has been verified/ESD/.

The manufacturer of the new equipment is Air Liquide (France). project equipment can be operated within a relatively wide capacity range (30,000 – 60,000 m^3/hour). The capacity can be varied in a range between 50-100% of the max. capacity. Thus the oxygen generation can be adjusted to the oxygen need of the whole plant. The possibility to adjust the operation of the oxygen plant enables to reduce energy consumption.[1]

The project design engineering of the new oxygen equipment reflects also is current good practices.

To validate whether the new oxygen equipment reflects current good practices determination team has assessed whether the technological process required for oxygen generation is complete and in line with best avail technologies. For this purpose determination team has considered technologies for oxygen generation as provided by relevant scientific literature. In particular the best available techniques (BAT) and best available technique reference notes (BREF) for iron and steel production as published by the Institute for Prospective Technological Studies of the European Commission and further scientific literature on this sector/BI-1//BI-2//BI-3//asu/. It has been verified that the project boundary has been appropriately identified based on the applied technology.

[1] The baseline equipment can be operated only at the designed capacity level

4.1.4 General Topics

CAR A1 and CR A3 have been raised because the geographical coordinates and the contact person should be indicated in the PDD. CAR A1 and CR A3 have been successfully closed.

4.2 Application of Baseline and Monitoring Methodology

4.2.1 Baseline Methodology

The developed project specific approach for identification of the Baseline scenario draws upon the step-wise approach of the **"Combined tool to identify the baseline scenario and demonstrate additionality**" Version 02.1 ("Combined Tool"). The incorporation of the main steps of the Combined Tool is considered to be appropriate because this tool also defines a procedure to identify the baseline scenario and simultaneously demonstrate the additionality.

Furthermore as explained below it could be assessed that the applicability criteria of the Combined Tool are met.

Table 4-2 Applicability criteria assessment

Applicability Criteria	Assessment
All potential alternative scenarios to the proposed project activity are available options to project participants.	Yes, the identified alternative scenarios incorporate either the reconstruction of the old oxygen generation equipment or installation of the one. Project participant may carry out both a reconstruction of his own facilities and installation of the new equipment on the own premises. As the furthermore all oxygen generation technologies are available to project participant, determination team agrees that all potential alternative scenarios to the proposed project activity are available options to project participants.
Construction of new facilities if all alternative scenarios to the project activity are available options to project participants,	The project activity is the installation of the new facility – oxygen generation unit. As already indicated all alternative scenarios to the project activity are available options to project participants.

determination team has reviewed the developed project specific methodology applied in the PDD and it could be proved that the particular steps of the Combined Tool has been

appropriately incorporated and carried out. All provisions of the Combined as well as its applicability criteria, assumptions and choice of approaches have been appropriately applied.

In particular the developed project specific methodology is in line with requirements of the "Guidance on criteria for baseline setting and monitoring". These criteria require to identify a list of plausible future scenarios on the basis of conservative assumptions and to identify the most plausible one. In order to justify the baseline on the basis of conservative assumptions project participant has duly taken into account the special oxygen demand of the particular oxygen consumers within the entire plant. The forecasted oxygen generation has been carried out based on the steel demand outlook till 2012. A constant oxygen generation has been assumed. The forecast has been done in March 2008 at the time of steady increase of the steel demand or in other words before the decrease of production due to the financial crisis (end of 2008). In this context it is important to mention that assuming a constant level of oxygen production at the time of increasing steel demand has been assessed as appropriate and carried out using conservative assumptions.

Furthermore as per the "Guidance on criteria for baseline setting and monitoring" the key factors that affect a baseline shall be taken into account, e.g.: Local availability of technologies, skills and know-how and availability of best available technologies in the future. In order to meet this criterion project participant has elaborated on the technologies which could be in general suitable to provide similar output/service (i.e. oxygen generation). In this context project participant has duly investigated what are the technologies which have been implemented in comparable cases. By doing this participant has considered other oxygen generation plants installed in other steel mills in Ukraine. In this context Ukraine (Host Country) has been appropriately identified as a geographical area and the iron-and-steel sector has been also appropriately identified as the relevant industrial sector.

Furthermore the "Guidance on criteria for baseline setting and monitoring" requires to take into account relevant national and/or sectoral policies and circumstances. In order to meet this criterion the developed project specific methodology requires to evaluate legal aspects and to exclude plausible alternatives which are not in line with current laws and regulations from further consideration. Hence determination team is of the opinion that this criterion of the "Guidance on criteria for baseline setting and monitoring" has been also met.

As per the "Guidance on criteria for baseline setting and monitoring" the economic situation/growth in the relevant sector as well as resulting predicted demand should be taken into account. 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 order to comply with this requirement project participant has also carried out a detailed analysis of future oxygen demand and took this into account for the baseline scenario determination/ER-OP/. As already indicated the forecasted oxygen generation has been assumed to remain constant and thus has been carried out based on the conservative assumption and appropriately.

The identification of the most plausible alternative – baseline scenario – is carried out through barrier or investment analysis. Within the barrier analysis particular barriers which would prevent the implementation of the project activity and identified alternative scenarios are defined and examined. Alternatives which are prevented by the identified barriers are eliminated from further consideration.

The developed methodology assumes that if there is only one alternative scenario that is not prevented by any barrier, and if this alternative is not the proposed project activity undertaken without being registered as a JI project activity, then this alternative scenario is identified as the baseline scenario. Otherwise alternatives which are not prevented by the barriers should be examined within the investment analysis. In case it can be explained how JI alleviates the identified barriers that prevent the proposed project activity from occurring the project activity can be considered as additional.

Finally common practice analysis should analyse the extent to which the proposed project type has already diffused in the relevant sector and geographical area. This serves as a credibility check to demonstrate additionality which complements the barrier analysis and/or the investment analysis. If similar activities cannot be observed or similar activities are observed but essential distinctions between the proposed project activity and similar activities can reasonably be explained, then the proposed project activity is additional.

Hence it can be concluded that through identifying and listing plausible future scenarios on the basis of conservative assumptions and identifying the most plausible one. Furthermore, through the appropriate application of Combined Teach the baseline determination procedure can be assessed as transparent with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors.

Furthermore the application of the Combined Tool is in line with provisions of Annex 1 of the "Guidance on criteria for baseline setting and monitoring" and hence provides an appropriate method for justification of the additionality.

Determination team has also carried out an analysis of the baseline approaches already taken in comparable cases. By doing determination team has carried out a background investigation w.r.t. comparable projects with the same GHG mitigation measure (Oxygen generation unit), same country (Ukraine), similar technology. Projects that have been made publicly available on the UNFCCC website have been reviewed. At the time the determination has been carried out comparable registered JI project activities which have been positively determined by an AIE have not been observed.

The project participants has justified the choice of baseline taking into account annex 1 of the "Guidance on criteria for baseline setting and monitoring" and has demonstrated that the project activity is additional to any that would otherwise occur. For details please refer to assessment of addionality approach.

Summarizing the mentioned above it could be verified that the developed project specific methodology for baseline determination and assessment of the additionality is in line with the provisions of the Combined Tool and with JI Guidelines.

4.2.2 Baseline Scenario / Additionality Determination

In order to determine the baseline scenario project participant has applied a developed project specific methodology as described and assessed in the section 4.2.2. This methodology draws upon the step-wise approach as per the "*Combined tool to identify the baseline scenario and demonstrate additionality"* Version 02.1 ("Combined Tool").

STEP 1 Within the first step following scenarios have been considered:

A1 - Retrofitting of the existing air-separation units (KtK-35-3, KAr-30) and continuing their operation.

A2 - Reconstruction of the OCP by constructing two air-separation units KAAr-32 which are identical in design to the existing equipment

A3. Implementation of the Project (construction of the unit VRU-60) without it being registered as a JI Project

A.4. Reconstruction of the OCP by construction of two air-separation unit with adjustable output capacity (with total capacity 60,000m^3(O_2)/hour

The identification of the plausible alternatives has been based on the consideration of the all realistic technologies which are suitable to provide the oxygen and other technological gases. By doing project participant has considered other oxygen generation plants installed in other steel mills in Ukraine. In this context Ukraine (Host Country) has been appropriately identified as a geographical area and the iron-and-steel sector has been also appropriately identified as the relevant industrial sector. Different oxygen generation technologies with different oxygen output have been analysed in this context. All data source and literature where the indicated information can be found is appropriately referenced in the PDD. Determination team could verify the appropriateness of the provided information. Provided analysis can be further substantiated through information provided on the website of the Ukraine iron and steel sector of Ukraine/steel-ua/.

In order to validate that the list of alternatives is complete determination team has investigated all possible alternatives which are in general suitable to deliver oxygen and other technological gases. By doing this determination team has investigated what are other technologies and measures already applied in JI project activities in Ukraine available on the UNFCCC website. It was concluded that the list of plausible alternatives is complete. This conclusion has been also supported by the in-house technical experts.

Under the Sub-step1b project participant has evaluated which alternatives are not in line with **current laws and regulations**. By doing this project participant has duly taken into account the operating rules and regulations PTE PPRV-89/PTE-89/.

In particular it was concluded that retrofit and further operation of the existing units does not comply with the regulations. Hence **retrofitting of the existing units** should be excluded from further consideration. The regulation has been provided for determination and determination team was able to prove the referred provisions. It could be verified that the argumentation is appropriate and retrofit and further operation of the existing units has been duly excluded from consideration.

The reconstruction of the OCP by constructing **two air-separation units KAAr-32** which are identical in design to the existing equipment has been identified as a plausible option. The determination team has examined the provided evidences/TS-BL/. and it could be concluded that PP has seriously considered (planed) to reconstruct the OCP with equipment that is identical in design to the existing equipment. This technology has been applied by PP since 20 years. During this time the technology has demonstrated its technical reliability and compliance with the specific oxygen demand of the entire steel plant.[2]. Thus a sufficient confidence has been gained that the construction of units KAAr-32 has been scheduled at the JSC "Zaporizhstal".

During the site-visit it could be observed that a construction of these blocks has been started and the foundation has been already built. For this reason this alternative has been appropriately identified as a plausible and realistic option.

Also the reconstruction of the OCP by construction of two air-separation unit with adjustable output capacity (with total capacity 60,000$m^3(O_2)$/hour has been duly identified as plausible.

The **project activity itself** has been also duly identified as a plausible alternative because this option has been already implemented.

Summarizing the mentioned above it could be verified that Step 1 has been carried out in line with requirements of the Combined Tool and all plausible alternatives have been duly identified.

Step 2 – Barrier analysis.

Within the barrier analysis project participant has examined the barriers that would prevent the implementation of alternative scenarios.

Risk of technological failure has been identified as technological barrier in accordance with Combined Tool. In the PDD project participant has demonstrated that the risk of the technological failure of the applied technology in the specific local circumstances of the project participant is significantly higher than for other technologies esp. that of the baseline technology.

In order to justify this barrier project participant has at first analyzed in a very detail manner what are the particular consumers of oxygen. Blast-furnace plant and open-hearth plant have been appropriately identified as the main oxygen consumers. This could be proved during the on-site visit and substantiated through the examination of the iron and steel production of as published by reputed data sources/BI-1//BI-2//BI-3/.

Within the next step PP has analysed the specific oxygen demand of the oxygen consumers and the corresponding operation mode. The oxygen needs of particular consumers have been discussed and verified during the on-site-visit. The data source and literature applied to substantiate the oxygen needs of particular consumers has been provided and technical specification as indicated in the PDD could be proved. In

[2] Furthermore the application of the machines of the similar design decreases risks of technological failure and can be considered as a common practice in various industrial sectors. Also from this point of view this alternative seems to be very reasonable.

particular the use of oxygen in the open-hearth furnace of Zaporizhstal can be further substantiated by the detailed information as provided on the website of Zaporizhstal and by the scientific literature.

As per the assessment carried out in accordance with Technological instruction ТИ 226-Д-06-2006 "Operation of blast-furnace plant" the blast-furnace can be operated without oxygen in extreme emergency case. This would have a negative impact on reduction of pig-iron and increase of coke consumption. The corresponding evidences have been provided and their appropriateness could be verified. This conclusion could be further substantiated by the examination of the technological processes as defined in scientific literature/BI-1//BI-2//BI-3/.

Furthermore it has been demonstrated that the open-hearth furnace cannot be operated without oxygen due its specific technological specification. As per the PDD the open-hearth plant cannot be operated without oxygen because the open-hearth plant has been refurbished for the work with the oxygen injection. This issue has been discussed during the on-site-visit. PP has provided a detailed explanation of the technological characteristic of the open-hearth plant including the justification why the oxygen-plant cannot be operated without oxygen. The analysis of oxygen demand has been also included in the PDD. In the course of determination it could be verified that open-hearth furnaces of the plant was refurbished for the work with the oxygen injection/BI-3//z.stal/. Determination team has analysed the technology of oxygen injection and the justification has been assessed as conclusive, appropriate and presented in detailed manner.

Afterwards PP has considered what can in general cause a technological failure of an air separation unit. A list of reasons that could lead to an outage of the air separation unit have been identified. Determination team has considered the technology of the air separation units as applied by different manufacturers and agreed that the definition of the technological failure has been elaborated irrespective of manufacturer and capacity/asu/. Bearing in mind that the technological process of the air separation and has not been changed significantly since using membrane based technology for air separation determination team agreed with the definition of the technological failure[3].

Within the **Sub-step 2b** project participant has eliminated alternatives which are prevented by the identified barrier.

In this context PP has appropriately concluded that in case of the installation of two air separation units the technological failure of two units at the same time is almost impossible. Hence the risk of technological failure does not exist. It has been appropriately demonstrated that in case one ASU-unit would be out of order the second unit will be able to supply oxygen at a minimum required level.

In the context of the project activity it was concluded that in case one air separation unit will be out of order the capacity of the reservoir and the time to take in operation the reserved ASU will be not sufficient to provide oxygen at minimum level.

The capacity of the reservoir would be able to meet the minimum oxygen requirement for 20 hours. Furthermore the reserved equipment requires 50-60 hours till the start of

[3] http://www.dechema.de/achema2009_media/Downloads/Presse/Trendberichte+AA+09/tb_10_d_Industriegase-p-976.rtf

oxygen production. Hence in case the technological failure cannot be repaired within the 20 hours it will lead to significant consequences for the entire steel production route. By doing this transparent and documented evidences have been referenced in the PDD and were proved by the determination team. Though the reserve equipment is in a good working condition and has been appropriately maintained it is already more than 30 years in operation and has already exceed its maximum technical lifetime. For this reason the time required to put reserve equipment in operation has been estimated in a conservative manner.

Taking into account the above mentioned determination team is of the opinion that PP has duly defined the risk and elaborated on plausible reasons for the technological failure. Based on the historical information about the emergency shutdown it could be demonstrated that this risk of technological failure is not a theoretical one but has already occurred within the first year of operation the VRU-60 unit. Furthermore PP has appropriately examined and specified the specific local circumstances of the project participant - the specific oxygen demand for the open hearth plant and the potential of the back-up technology to meet the required minimum oxygen demand. All evidences have been provided and could be proved in the course of determination. Taking this into account the determination team is of the opinion that PP was able to justify that in the specific local circumstances the installation of one air separation unit is significantly higher than for other technologies. For this reason determination team agrees that the risk of technological failure as explained in the PDD is significant and sufficient enough to prevent the implementation of the project activity.

Investment analysis

With the investment analysis PP has investigated which of the remaining two alternatives is more financial attractive. For this purpose the specific cost of oxygen production has been calculated and compared. It has been demonstrated that specific cost of oxygen of the Alternative 2 (KAAr-32 scenario) are lower than that of the Alternative 4 (Two ASUs with adjustable capacity). Thus it has been correctly concluded that the Alternative 2 is the most attractive one and hence is the baseline scenario.

The underlying assumptions made within the investment analysis have been evidenced by the information as provided by different technology suppliers of the/I-ASU/. Techno-commercial propositions of different technology suppliers, maintenance regulations, registers and instruction and norms of ferrous metallurgy sector have been provided/I-ASU//PTE-89/ and the conclusions made in the PDD could be verified.

Additionality

Subsequently in order to explain how the registration of the JI project activity may alleviate the barriers (that prevent the proposed project activity from occurring in the absence of the JI) project participant has carried out a cost-benefit analysis. In this context PP has evaluated the cost which would occur in case of technology failure that can not be corrected within 30-40 hours. This is the difference between the period the oxygen may be supplied by reservoir (20 hours) and the time required to put into operation reserved equipment (50-60 hours). These costs have been compared with possible benefits from the sale of the generated ERUs. It could be demonstrated that

the benefits might be sufficient to overcome the economical losses due to technological failure.

The analysis has been carried out taking into account the corresponding prices and production of the hot-rolled and cold-rolled steel. The underlying assumptions could be verified in the course of determination. Furthermore it was assumed that the oxygen generation can be covered by the reserve equipment. Hence it was assumed that the stoppage will continue 30-40 hours – time between shutdown of reservoir and the time required to put into operation reserve equipment. As already indicated though the reserve equipment is in a good working condition and has been appropriately maintained it is already more than 30 years in operation and has already exceed its maximum technical lifetime. For this reason the time required to put reserve equipment in operation has been estimated in a conservative manner.

Considering above-mentioned determination team came to an opinion that PP was able to appropriately explain – using qualitative and quantitative arguments – how the registration of the JI project activity will alleviate the barriers that prevent the proposed project activity from occurring in the absence of the JI.

As the JI alleviates the identified barriers that prevent the proposed project activity from occurring, one can proceed to Step 4 Common practice analysis.

Step 4 Common practice analysis.

Finally common practice analysis has been carried out. Within the common practice analysis project participant has properly defined the metallurgical sector of Ukraine as the corresponding geographical area. Afterwards PP has identified similar activity in the defined geographical area. The analysis of similar activities – installation of air separation units has been done in a complete and detailed manner. Similar activities have been identified and the essential differences have been explained. In particular it could be demonstrated that the technological failure might be alleviated through operation of the additional units. The data source where this information has been taken from has been appropriately referenced for all particular activities. The references and data sources could be verified checked (in most cases by following the corresponding links) and the information provided could be proved.

Though similar activities have been observed but the essential distinctions between the proposed project activity and similar activities could be reasonably be explained, the proposed project activity can be considered as additional.

4.2.3 Monitoring Methodology

The monitoring methodology has incorporated the main steps of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01) that provides procedures to estimate GHG emissions associated with the consumption of electricity. As the project activity aims to reduce electricity consumption the application of this tool deemed to be reasonable.

The particular applicability criteria of this tool are met:

(a) the developed project specific methodology clearly specifies that project and baseline emission sources due to electricity consumption should be calculated with this tool.

(b) the necessary procedures, equations and monitoring provisions to determine the quantity of electricity that is consumed by each identified source are provided ; and

(c) necessary procedures to determine the most likely baseline scenario for each source of baseline electricity consumption is also provided. (please refer to section 4.2.2)

Furthermore the electricity consumption from the grid has been appropriately identified as the baseline scenario.

Leakage

The determination team has examined all potential leakage emissions that could occur due to the project activity outside the project boundary. Theoretically leakage may occur in case the outdated equipment would be installed somewhere else and replaces less GHG intensive oxygen generation technology. However the existing oxygen generation units will remain in reserve for the unforeseen situations and will be not installed on other sites outside the project boundary. Moreover project participant has included CO2 emissions from electricity consumption of the reserved equipment.

In opposite negative leakage will occur because in the course of the implementation of the project activity the water supply plant will be reconstructed. After the reconstruction the electricity consumption of the water supply plant will significantly decrease.

However for conservativeness purpose these emission reductions will be not claimed by the project participants.

4.2.4 Monitoring Plan

1. Project emissions

The CO_2 project emissions arise from the electricity consumption of the oxygen compressor plant (OCP). The project emissions are determined based on the electricity consumption of OCP multiplied with CO2 emission factor for the power grid of Ukraine. This is in line with provisions of the applied "Tool to calculate baseline, project and/or leakage emissions from electricity consumption".

1a) Electricity consumption

The monitoring of the net power generation is based on meter readings installed at plant's substations. During the on-site-visit the sub-station has been inspected. The specification of the metering equipment/MR-EQ/ and the detailed installation plan of particular meters/MR-E/ were provided. Based on this the physical installation of the meters as given in the Annex 3 of the PDD has been verified. The power consumption of different consumers within the OCP is measured by 28 electricity meters. It has been observed that the all meters are clearly numbered so that the meters can be clearly allocated to relevant consumers of the OCP/MR-E/. In the course of the determination it

could be verified that equipment attributable to the oxygen generation has been duly included in the monitoring plan.

The manufacturer and the type of the metering equipment as well as the compliance with national standards could be verified and supported through the technical specification as provided by the manufacturer/euro-alfa/. The calibration is performed every 4 years. Calibration has been also assessed as appropriate for the corresponding meter types and in line the relevant norms and procedures as well as with the manufacturer requirements/euro-alfa/.

Monitoring frequency.

Based on the provided log books it could be verified that the daily electric power consumption is recorded by the responsible personnel and archived in electronic and paper form. Determination team has reviewed the log books and checked the plausibility of the recorded figures. The **daily handling** of the monitoring parameters has been assessed as accurate and appropriate.

QA/QC Procedures

The recorded daily figures are summarized in monthly reports and are submitted to the chief power engineer department. Chief power engineer department proves the plausibility and correctness of the reported figures based on the daily measurements. In addition the reported data are submitted to the deputy of the chief engineer for approval. Hence sufficient confidence could be gained that the monitoring procedures provide procedures for **crosschecking** and ensure high level of quality assurance. The personnel of in charge of the metering have been interviewed. Sufficient confidence has been gained that the personnel has sufficient competence for operating equipment.

It could be concluded that monitoring procedures have been duly elaborated.

1b) CO2 emission factor for the power grid of Ukraine

Grid emission factor for the Ukrainian grid (0.896 tCO2/MWh) is based on the standardized emission factors for the Ukrainian electricity grid as determined by the Global Carbon B.V. and verified by TUV SÜD/EF/. The documents have been checked and the value applied in the calculation could be proved.

2 Baseline Emissions

The baseline emissions are determined as electric power consumption of OCP in the Baseline scenario multiplied with CO2 emission factor. The electric power consumption of the OCP in the Baseline is calculated as oxygen output of the ASUs (KAAr-32) in the baseline scenario multiplied with specific electricity consumption. The oxygen output of the ASUs (KAAr-32) in the baseline scenario is defined as a product of the specific oxygen production of the baseline equipment and the operation time (in hours). The specific oxygen production of the equipment in the baseline scenario is determined based on the actual amount of the oxygen generation by the OCP in the project scenario.
By doing this the different operation conditions of the equipment in the baseline scenario have been taken into account. The operation conditions have been defined in accordance with the technical characteristics of the baseline equipment and the operation of the OCP as per the corresponding norms and regulations. The operation conditions are given in the PDD. The specific oxygen production in the baseline scenario has taken into account that baseline units (KAAr-32) can be adjusted in the range between 30,000 – 32,000 m^3/hour. This has been done for conservative purposes to reflect the situation where the oxygen demand can be covered by increasing capacity of the two KAAr-32 units without putting into operation the reserved units. This has been assessed as conservative and appropriate and in line with provided technical specification of the baseline equipment/TS-BL/. As per the operation conditions in case the oxygen demand is higher than the total capacity of the two units the reserve equipment is put into operation. However also in the project scenario the reserve equipment has to be put into operation, so that the operation of reserve equipment in the baseline corresponds to that in the project scenario.

Furthermore it is important to mention that even in case where oxygen demand of the steel plant would correspond to the specific oxygen production of one air separation unit the operation of two air separation units is required according to the norms of operation of the OCP as given in the technical reference of ASUs operation/TRAO/. The main reasons why the operation of two units is required even in case when the oxygen demand can be theoretically covered by only one air separation unit is

- the safety steel plant operation in case of technological failure of one ASU and
- the need to cover periodical peaks protection of the steel plant.

In this context it should be taken into account that hourly oxygen demand may vary up to 15,000 m^3/hour within the 24 hours. This has been further substantiated by the carried out analysis of the OCP operation in the previous years[4]. It could be demonstrated that in all cases when the oxygen demand could be covered by one unit at least two units were in operation due to the above mentioned reasons. The analysis could be proved based on the provided technical reference of ASUs operation /TRAO/.

Oxygen distribution

The monitoring of the total oxygen distribution is based on the flow meter readings installed at the input to the particular consumers, so that the total oxygen distributed to different consumers is measured. The different operation conditions will be determined

[4] As already indicated the baseline equipment (KAAr-32) is similar to the equipment installed before the project implementation (KAr-30 and Ktk-35-3). Hence it has been considered as appropriate to substantiate the analysis of the hypothetical baseline equipment on the previous installed equipment.

based on the measured oxygen distribution. This is appropriate and allows are directly determination of the relevant operating condition.

The meters for the oxygen distribution are given in Annex 3. The metering equipment has been assessed as appropriate for the measurement of the volume of the distributed oxygen. It has been observed that the all meters are clearly numbered so that the meters can be clearly allocated to relevant consumers. The calibration of the measurement equipment is performed every year. Calibration has been also assessed as appropriate for the considered metering equipment.

During the on-site visit it could be verified based on the provided log books that the daily distribution is recorded by the responsible personnel and archived in electronic and paper form. Determination team has reviewed the log books and checked the plausibility of the recorded figures. The daily handling of the monitoring procedures for the power generation has been assessed as accurate and appropriate

The recorded daily figures are summarized in monthly reports and are submitted to the chief power engineer department. Chief power engineer department prove the plausibility and correctness of the reported figures based on the daily measurements. In addition the reported data are submitted to the deputy of the chief engineer for approval. Sufficient confidence could be gained that the monitoring procedures ensure high level of quality assurance.

The monthly figures are used for calculation of the emission reductions. This has been assessed as appropriate. Hence it could be concluded that monitoring procedures have been duly elaborated.

Specific electricity consumption

Specific electricity consumption is calculated as the actual electric power consumption by the OCP divided by the oxygen production output in the project scenario. For the assessment of the electricity consumption in the project scenario please refer to the comments the sub-section 1a) of this chapter.

The oxygen production output is determined as a sum of the oxygen production in the ASU (VRU-60) and in the reserved ASUs. The determination of the total oxygen generation measured directly at particular air separation units allows an accurate calculation of the specific electricity consumption.

In this context it is important to mention that the specific electricity consumption of the baseline units (KAAr-32) is higher than that of the VRU-60. For this reason the use of the actual data for computing electricity consumption is conservative as it leads to lower baseline emissions.

Taking above mentioned into account it has been concluded that the monitoring plan has been elaborated in accordance with JI-Guidelines.

4.2.5 Calculation of GHG Emission Reductions

Project emissions

As already indicated the CO2 project emissions arise from the electricity consumption of the oxygen compressor plant (OCP). The project emissions are determined based on the electricity consumption of OCP multiplied with CO2 emission factor for the power grid of Ukraine.

The **electricity consumption** has been estimated based on the assumed oxygen demand/ER-OP/ of 390,000 thousand m^3 per annum as per the forecast carried out in 2008 based on the data of the steel production. The corresponding evidence has been provided and the applied values could be proved. In order to calculate the oxygen production the oxygen losses have been taken into account. The applied value has been based on the information as given in the instruction and norms for technological design of the oxygen supply system in the metallurgical sector/ER-OL/. The applied figures have been further substantiated based on the production reports in 2008/ER-OP/. Based on these values the oxygen distribution has been estimated. Specific electricity consumption has been estimated based on the actual figures as given in the production reports and electricity consumption monitoring reports/ELC/ in 2008.

Grid emission factor for the Ukrainian grid (0.896 tCO2/MWh) is based on the standardized emission factors for the Ukrainian electricity grid as determined by the Global Carbon B.V. and verified by TUV SÜD/EF/. The documents have been checked and the value applied in the calculation could be proved

The CO2 project emissions have been correctly computed as product of the Oxygen distribution with CO2 emission factor.

Baseline emissions

The oxygen production in the baseline scenario has been correctly estimated based on the constant total output (60,000 m^3/hour) of the two baseline units (KAAr-32). This is in line with the baseline scenario and technical specification of the baseline units. The specific electricity consumption in the baseline scenario has been assumed equal to that of the project scenario. This is in line provisions of the monitoring plan and conservative.

Afterwards the CO2 baseline emissions have been correctly computed as product of the oxygen generation with CO2 emission factor.

Leakage: No Leakage have been identified within the project activity.

Emission reductions

Emission reductions have been appropriately calculated as difference between the baseline and project emissions.

4.2.6 Project Management Planning

The responsibilities for the project management are defined.

The training of monitoring personnel is addressed in the PDD. The issue was discussed during the site visit and sufficient confidence was gained that sufficient effort has been spent on this issue.

4.2.7 Crediting Period

Project starting date (19.11.2004) has been defined as a date of management to go ahead with the project activity. This is in line with JI Guidelines. Supporting evidences/MD-JI//ESD/ have been provided and the starting has been verified. The start of crediting period is 19.02.2008. This is the date when the project plant became operational. For this reason the definition deemed to be reasonable.

4.2.8 Environmental Impacts

The project activity complies with environmental legislation of Ukraine. Section F of the PDD provides a sufficient analysis of the environmental impacts of the project activity. An analysis of the Environmental impact of the project "Reconstruction of the OCP at the JSC "Zaporizhstal" was performed as integral part of the project design documentation. This has been done in accordance with the requirements of the law of Ukraine "On environment protection". The EIA results are available in the design documentation for the construction of the unit VRU-60 (DT – 346135, Volume 3). The EIA has been provided and the appropriateness as well as the analysis of the environmental impacts as documented int the PDD has been proved/EIA-A/.

4.2.9 Comments by Local Stakeholders

In accordance with regulations and legislation it isn't necessary for this type of projects to provide the consultation with stakeholders and interested person:

1). Order of Environmental Protection Ministry of the Ukraine "Statute of society participation in environmental decision making process" #168, from 18.12.2003, Official report of the Ukraine,2004,#6 , art.357.

2). DBN A.2.2-1-2003 "Structure and content of Environmental Impact assessment (EIA) in process of planning and construction of plants and buildings" Approved by order of state contraction committee (Gosstroy) of the Ukraine from12.2003, # 214 and implemented from 01.04.2004.

It could be verified that the information on the construction of the VRU-60 at the JSC "Zaporizhstal" was published in the mass media – Newspaper "Sem' Dney" dated 22.11.2007. The material comprises a brief description of technical, economic and ecological aspects of the Project. The publication led to no comments from the readers.

5 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to the modalities for the determination of JI projects according to Track1 procedures the draft PDD has been made publicly available on website of UNFCCC on 26 June 2008 and comments could be submitted within 30 days, until 27 July 08 by parties, stakeholders and UNFCCC accredited non-governmental organisations. No comments were received. In case comments would have been received, they would be addressed in the Determination report.

However it should be noted that the project has switched to the Track 1 procedures.

6 DETERMINATION OPINION

The JSC "ZAPORIZHSTAL" has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Determination PDD for the JI Track 1 project: "Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine" with regard to the relevant requirements for the Joint Implementation project activities of the host country, as well as criteria for consistent project operations and monitoring.

The retrofit of the Oxygen Compressor Plant at the JSC "Zaporizhstal" within the JI Track 1 project activity will result in the decrease of the electricity consumption and in the corresponding reduction of the anthropogenic GHG emissions.

A risk-based approach has been followed to perform this validation. In the course of the determination 12 Corrective Action Requests (CARs) and 12 Clarification Requests (CRs) were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (Ukraine) and all relevant UNFCCC requirements for JI project activities.
- An analysis as provided by the applied project specific "Methodology" demonstrates that the proposed project activity is not a likely baseline scenario.

  An analysis as provided by the applied project specific "Methodology" demonstrates that the project activity will result in a reduction of anthropogenic emissions by sources that is additional to any that would otherwise occur;
- The monitoring plan is transparent, adequate and provides for the collection and archiving of all relevant data necessary for determination project and baseline emissions within the project boundary during the crediting period;
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 518,814 t CO2e is most likely to be achieved within the 5 years crediting period.

The conclusions of this report show, that the JI project, as it was described in the project documentation is in line with all criteria applicable for the determination of JI project activities.

Essen 2009-09-18	Essen, 2009-09-18
Rainer Winter	Eric Krupp
TÜV NORD JI/CDM Certification Program	TÜV NORD JI/CDM Certification Program
Determination Team Leader	Final Approver

7 REFERENCES

Table 7-1: Documents provided by the project proponent

Reference	Document
/**BL-LR**/	Laws and Regulations related to the Baseline – Regulation for commissioning and operation of the air separation units
/**BL-Rec**/	Proof for reconstruction schedule for two air-separation units KtK-32-3 and KAr-30 and installation of KAAr-32 *(if such exists)*
/**CPA**/	Proof for common practice analysis.
/**EIA**/	Environment Impact Assessment
/**EIA-A**/	Environmental expertise from Ministry for protection of Natural Environment of Ukraine
/**ELC**/	Electricity consumption monitoring reports
/**ELWS**/	Justification for assumption related to Electricity consumption of the Water supply system
/**EF**/	Standardized emission factors for the Ukrainian electricity grid as determined by the Global Carbon B.V. and verified by TUV SÜD
/**ER-OP**/	Proof for assumption - **Forecast Oxygen production** and Oxygen production in March 2008.
/**ER-OL**/	Instruction and norms for technological design and technical and economic indices of the energy supply system in the metallurgical sector, Oxygen supply system.
/**ESD**/	Evidences regarding project starting date
/**LoE**/	Letter of Endorsement from the Host Country
/**I-ASU**/	Investment cost for the ASU units with adjustable capacity.
/**MD-JI**/	Management Decision related to installation of ASU and proof that **JI was seriously** considered in the Management decision.

/MD-W/	Management decision related to reconstruction of the water supply system
/MR-E/	Detailed meter installation including information of particular meters
/MR-Eq/	Specification of the Monitoring equipment related to electricity consumption
/PDD/	Project Design Document "*Reconstruction of the oxygen compressor plant at the JSC "Zaporizhstal", Ukraine."* Version 1 (published version) Project Design Document "*Reconstruction of the oxygen compressor plant at the JSC "Zaporizhstal", Ukraine."* Version 3 , dated 03.08.2009
/PTE-89/	operating rules and regulations PTE PPRV-89
/SPM/	Operating rules (PTEPPRV) -Safety precautions and measures for operation of air separation units.
/SW/	Technical specification and Scheme of the Water Supply System
/TRAO/	Technical reference of ASUs operation
/TS-PA/	Technical specification for Air Separation Unit in the Project scenario (VRU-60)
/TS-Res/	Technical specification and assessment of technical condition of the **out-dated** Air Separation Units installed before the project activity. (**Ktk-35-3, KAr-30, BR-2)**
/TS-BL/	Technical specification for Air Separation Unit in the Baseline scenario (KAAr-32)
/WC/	Justification for assumption related to Water consumption

Table 7-2: Background investigation and assessment documents

Reference	Document,
/BI-1/	Integrated Pollution Prevention and Control (IPPC) Reference Document on

Reference	Document,
	Best Available Techniques in the Ferrous Metals Processing Industry, December 2001
/**BI-2**/	Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Ferrous Metals Processing Industry December 2001
/**BI-3**/	StahlFibel published by German Iron and Steel Institute 2007
/**BI-4**/	Operation of an open-hearth furnace with oxygen injection, V.I. Grankovskii, B.L. Yupko, P.M. Shchastnyi and E.Ya.Shvets. Zaporozh'e Branch of the Dnepropetrovsk Metallurgical Institute. Zaporozhstal' Plant. Translated from Metallurg, No. 1, pp. 18–21, January, 1971
/**BI-4**/	Air Separation Units, Design and Future Development A. R. Smith, J. C. Sorensen and V. E. Stein Air Products and Chemicals, Inc.
/**JI-G**/	JI Guidelines: UNFCCC/Kyoto Protocol requirements, in particular, the requirements of the JI as set out in decision 9/CMP.1 (Marrakech Accords), the present annex, and relevant decisions by COP/MOP & JI Supervisory Committee
/**H-1**/	Order Nr. 718, dated 10 August 2008. On Approval of the Procedure of Drafting, Review, Approval and Implementation of Projects Aimed at Reduction of Anthropogenic Emissions of Greenhouse Gases.
/**H-2**/	Order Nr. 341, dated 17.07.2006 On approval of the Requirements to the documents in which the volumes of anthropogenic emissions and absorption of greenhouse gases are substantiated for the receiving of the Letter of Endorsement by the owner of the emissions source, where the implementation of the joint introduction project is intended to be.
/**H-3**	Order Nr. 342, dated 17.07.2006 On approval of requirements to preparation of the joint implementation projects.
/**H-4**/	Decree Nr. 206, dated February 22, 2006 Cabinet of Ministers of Ukraine, “On Approval of the Procedure of Drafting, Review, Approval and Implementation of Projects Aimed at Reduction of Anthropogenic Emissions of Greenhouse Gases”
/**H-5**/	Order Nr. 33, dated June 25, 2008 National Environmental Investment Agency of Ukraine, “On approval of Requirements to preparation of the joint implementation projects”

Reference	Document,
/**CT**/	Combined tool to identify the baseline scenario and demonstrate additionality (Version 02.1)
/**VVM**/	IETA, PCF Validation and Verification Manual (V. 4)

Table 7-3: Websites used

Reference	Link	Organisation
/**unfccc**/	http://unfccc.int/2860.php	United Nations Framework Convention on Climate Change
/**dna-ukr**/	National Environmental Investment Agency of Ukraine	National Environmental Investment Agency of Ukraine
/**asu**/	http://www.linde-kca.com/ http://www.messergroup.cn/en/info/in4.asp www.airliquide.com http://www.cryogenmash.ru/en/content/news/index.php?news=1979	Information about air separation units as provided by differrent technology suppliers.
/**euro-alfa**/	http://www.eu.sama.ru/meter-ea.html	Technical specification of the electricity meters as per manufacturer information.
/**steel-ua**/	http://metallurgy.at.ua/	Iron and steel sector of Ukraine
/**z.stal**/	http://www.zaporizhstal.com/off-line/news/essay/essay-2003/Zaporizhstal%20turns%20to%20the%20future_ru.pdf	Website of the project participant – Zaporizhstal

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/**IM01**/	V	☐ Mr. ☒ Ms.	Holina I.W	Head of the environment protection labour

Reference	MoI[1]		Name	Organisation / Function
/**IM01**/	V	☒ Mr. ☐ Ms.	Shejgus R.W.	Deputy of the fuel and energy resources technology department
/**IM01**/	V	☒ Mr. ☐ Ms.	Jarish W.N.	Deputy of head energy engineer.
/**IM01**/	V	☒ Mr. ☐ Ms.	Romanko N.N.	Head of the oxygen compressor plant.
/**IM01**/	V	☒ Mr. ☐ Ms.	Akimov Ju.L.	Deputy of the oxygen compressor plant.
/**IM01**/	V	☒ Mr. ☐ Ms.	Zemenkov R.W.	Head of financial and planning department
/**IM01**/	V	☒ Mr. ☐ Ms.	Grabko A.W.	Head of the automation and metrology department
/**IM02**/	V	☒ Mr. ☐ Ms.	Roman Kazakov	JI Consultant National Carbon Sequestration Foundation

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

ANNEX

Determination Protocol

ANNEX: DETERMINATION PROTOCOL

Table 1: Mandatory Requirements for Joint Implementation Project Activities

REQUIREMENT	Reference	CONCLUSION
The project shall have the approval of the Parties involved – at least the Host country approval is required at this stage of the project.	Kyoto Protocol Article 6.1 (a)	Will be provided with Final Determination Opinion
Emission reductions, or an enhancement of removal by sinks, must be additional to any that would otherwise occur	Kyoto Protocol Article 6.1 (b)	Conclusion on this issue will be provided with Final Determination Opinion
The sponsor Party shall not aquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7	Kyoto Protocol Article 6.1 (c)	Currently not to be determined by the IE
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)	Currently not to be determined by the IE
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	National Environmental Investment Agency of Ukraine is designated as national focal pint for JI-Projects
The host Party shall be a Party to the Kyoto Protocol	Marrakech Accords, JI Modalities, §21(a)/24	Ukraine ratified Kyoto Protocol in 12 April 2004

* * MoV = Means of Verification, DR= Document Review, I= Interview

REQUIREMENT	Reference	CONCLUSION
The host Party's assigned amount has been calculated and recorded in accordance with the modalities for the accounting of assigned amounts	Marrakech Accords, JI Modalities, §21(b)/24	Currently not to be determined by the IE
The host Party has in place a national registry in accordance with Article 7, paragraph 4	Marrakech Accords, JI Modalities, §21(d)/24	Currently not to be determined by the IE
Project participants shall submit to the independent entity a project design document that contains all information needed for the determination	Marrakech Accords, JI Modalities, §31	The PDD including all information required for the determination has been provided
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	This is relevant for Track 2 procedures. Under track 2 the PDD has been made publicly available for 30 days on the website of UNFCCC. On the later stage the project has switched to Track 1 procedure.
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)	An appropriate analysis of the environmental impacts has been carried out and evidenced.

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REQUIREMENT	Reference	CONCLUSION
The baseline for a JI project is 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	An analysis as provided by the applied project specific "Methodology" demonstrates that the proposed project activity is not a likely baseline scenario.
A baseline must 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	Baseline has been established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances
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	The baseline methodology excludes to earn emission reductions for decreases in activity levels outside the project activity or due to force majeure
The project shall have an appropriate monitoring plan	Marrakech Accords, JI Modalities, §33(c)	The project has have an appropriate

* * MoV = Means of Verification, DR= Document Review, I= Interview

REQUIREMENT	Reference	CONCLUSION
		monitoring plan

* * MoV = Means of Verification, DR= Document Review, I= Interview

Table 2: Requirements Checklist

CHECKLIST QUESTION	Ref.	Mo V*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	PDD A.4.1.4.	DR, I	Full address of both locations as well as geographical coordinates (Longitude and Latitude) should be provided. CAR A1 has been raised in this context. The required information has been provided and CAR A1 has been closed.	~~CAR A1~~	OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	PDD A.2. A.4.2.	DR, I	The project´s spatial and system boundaries are clearly defined in the project documentation. The spatial extent of the project boundary includes the project site, and all the power plants connected physically to the baseline Grid (i.e. National grid of Ukraine). The boundary definition is in line with the applied methodology. The required information has been provided and corresponding CAR B6 and Cr A2 have been closed.	~~CAR B6~~ ~~CR A2~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.2. Participation requirements *Referring to Part A and Annex 1 of the PDD as well as the JI glossary with respect to terms Party, Letter of Approval, Authorization and Project Participant.*					
A.2.1. Which Parties and project Participants are participating in the project?	PDD A.3.	DR, I	The project is a unilateral project involving Ukraine (Host Country). The project developer is the JSC "Zaporizhstal". Ukraine is a Party to the Kyoto Protocol since April 12th, 2004 and already has installed national procedures for the approval of JI projects.	OK	Ok
A.2.2. Have the involved Parties provided a valid and complete letter of approval and have all private / public project participants been authorized by an involved Party? At this stage of the project at least the Host country approval is required.	PDD A.5. /Loe/	DR, I	Positive opinion of the AIE is a prerequisite for issuance Letter of Approval through Ukrainian Ministry. Letter of Endorsement has been issued through the Designated Focal Point - National Environmental Investment Agency of Ukraine of Ukraine/LoE/. The Letter of Approval can be issued on request by the after positive approval by the Designated Focal Point.	LoA will be applied	OK

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CHECKLIST QUESTION	Ref.	Mo V*	COMMENTS	Draft Concl.	Final Concl.
A.3. Technology to be employed *Determination of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator 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?	PDD A.4.2. /TS/ /BI-1/ /BI-2/ /BI-3/ asu/	DR, I	Yes. Within the implementation of the project activity a **new air separation unit** has been installed at JSC "Zaporizhstal". The project has been commissioned in December 2007. The project activity incorporates the **latest/state-of-the-art technology** for air separation and oxygen production. The installed equipment will replace the out-dated equipment. The manufacturer of the new equipment is **Air Liquide (France).** As compared to the "old" equipment, the "new" equipment can be operated within a relatively wide capacity range. The capacity can be varied in a range between 50-100% of the max. capacity. The "old" equipment could be operated only at the designed capacity level. Thus the oxygen generation can be adjusted to the oxygen need of the whole plant. The possibility to adjust the operation of the oxygen plant enables to reduce energy consumption. Determination team has considered technologies for oxygen generation as provided by relevant	~~CR A1~~	OK

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CHECKLIST QUESTION	Ref.	Mo V*	COMMENTS	Draft Concl.	Final Concl.
			scientific literature. In particular the best available techniques (BAT) and best available technique reference notes (BREF) for iron and steel production as published by the Institute for Prospective Technological Studies of the European Commission and further scientific literature on this sector[/BI-1//BI-2//BI-3//asu/]. It could be concluded that the project design engineering of the new oxygen equipment reflects also is current good practices. CR A1 has been raised in order to clarify the date of commissioning of the VRU-60. The decision to approve the act of commissioning of OCP in the JSC "Zaporizhstal" was made on 27.12.2007. The Copy of decision has been provided and the date of commissioning could be proved.		
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?	PDD A.4.2. B.2. /BI-1/ /BI-2/ /BI-3/ /asu	DR , I /	The project activity intends to incorporate the latest/state-of-the-art oxygen generation technology. The project activity is expected to meet international standards for environmental quality and safety. Commonly used oxygen generation on technologies do not provide a possibility for to adjust oxygen generation. For this reason, the project activity would result in a decrease of grid based electricity generation in Ukraine. Please also refer to the comment above.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.3.3. Does the project make provisions for meeting training and maintenance needs?	PDD	DR, I	The issue was discussed during the site visit. Training and maintenance procedures related to this technology will be provided by project owner and manufacturer in the time before the power plant has become operational. Sufficient confidence was gained that enough effort has been spent on this issue.	OK	OK
A.4. Small Scale Project Activity *It 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"?	PDD	DR, I	N/A. This is a large scale project		
A.4.2. Is the small scale project activity not a debundled component of a larger project activity?	PDD	DR, I	N/A. This is a large scale project		
A.5. General topics					
A.5.1. Has the PDD been duly filled?	PDD	DR, I	The PDD is as per JI- PDD version 01. CAR A1 and CR A3 have been successfully closed. The contact person has been appropriately included in Annex I of the PDD The required information has been provided and	~~CAR A1, CR A3,~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			corresponding CAR B6 and Cr A2 have been closed.		
A.5.2. Has all necessary information been made available to the independent entity?	PDD	DR, I	Yes, all necessary information has been provided.	OK	OK
A.5.3. Is all literature and sources clearly referenced?	PDD	DR, I	Yes, the literature and sources have been clearly referenced in the PDD. The sources referenced could be verified in the course of determination. All relevant CARs and CRs could be successfully closed.	~~CAR B1~~ ~~CAR B3~~ ~~CAR B4~~ ~~CAR B5~~	OK
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. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. What kind of methodology has been used?	PDD	DR, I	Name: Baseline Methodology has been established on a project specific basis in accordance with JI Guidelines.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Type: ☐ CDM Approved Methodology –latest version 2 ☐ CDM Approved Methodology –older version ☐ Combination of Approved Methodology ☒ Project specific Methodology		
B.1.2. Has the methodology assessment form (S01-VA 30 – A3) been used?	PDD	DR, I	☒ Yes ☐ N/A (only in case of latest version of approved CDM methodology)	OK	OK
B.1.3. Is the discussion and selection of the baseline methodology transparent? Can the applied methodology be assessed as appropriate?	PDD	DR, I	☒ Yes ☐ No Comment: Yes applied methodology be assessed as appropriate. For details please refer to Assessment of the methodology.	~~CAR B1~~ ~~CAR B3~~	OK
B.1.4. Is the chosen methodology applied correctly?	PDD	DR, I	Yes, the chosen methodology has been applied correctly. For details please refer to assessment of the basline/additionality as well as of the monitoring.	~~CAR B1~~ ~~CAR B2~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.1.5. Does the baseline methodology specify data sources and assumptions?	PDD	DR, I	Yes the baseline methodology provides both the data to be provided by the project participant (electricity consumption and oxygen generation)and data from external sources (CO2 emission factor)	OK	OK
B.1.6. Does the baseline methodology sufficiently describe the underlying rationale for the algorithm/formulae used to determine baseline emissions (e.g. marginal vs. average, etc.)	PDD	DR, I	Yes, the baseline methodology sufficiently describes the underlying rationale for the algorithm/formulae used to determine baseline emissions. For details please refer to Assessment of the methodology.	OK	OK
B.1.7. Does the baseline methodology specify types of variables used (e.g. fuels used, fuel consumption rates, etc)?	PDD	DR, I	Yes please refer to the comment under B.1.5.	OK	OK
B.1.8. Does the baseline methodology specify the spatial level of data (local, regional, national)?	PDD	DR, I	Yes please refer to the comment under B.1.5.	OK	OK
B.2. Baseline Scenario Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner?*					
B.2.1. What is the baseline scenario?	PDD /TRAO/ /TS-PA/ /TS-BL/	DR, I	As per the PDD Baseline is the installation of two new air separation units (Kaar-32) of identical design as installed equipment (Cryogenmash) with a fixed oxygen output 30.000 m^3/hour.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	PDD /SPM/ /TRAO/ /TS-PA/ /TS-BL/	DR, I	Following scenarios have been considered: A1. Retrofitting of the existing air-separation units (KtK-35-3, KAr-30) and continuing their operation. A2 Reconstruction of the OCP by constructing two air-separation units KAAr-32 which are identical in design to the existing equipment A3. Implementation of the Project (construction of the unit VRU-60) without it being registered as a JI Project. A.4. Reconstruction of the OCP by construction of two air-separation unit with adjustable output capacity (with total capacity 60,000m3(O2)/hour	OK	OK
B.2.3. Has the baseline scenario been determined using conservative assumptions where possible?	PDD /SPM/ /TRAO/ /TS-PA/ /TS-BL/	DR, I	The corresponding CARs has been closed. The baseline scenario has been determined in accordance with provisions of the "Combined Tool" in a transparent and conservative manner For details on assessment please refer to the section 4.2.2. of the determination report.	~~CAR B1~~ ~~CAR B2~~ ~~CAR~~	OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	PDD /SPM/ /TRAO/ /TS-PA/ /TS-BL/ /PTE-	DR, I	Under the Sub-step1b project participant has evaluated which alternatives are not in line with current laws and regulations. Project participant has duly taken into account the operating rules and regulations PTE PPRV-89. It was concluded that operating of retrofitted units does not comply with the regulations. Hence	~~CAR B1~~ ~~CAR B2~~ ~~CAR B3~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	89/		retrofitting of the existing units should be excluded from further consideration. The regulation/PTE-89/ has been provided for determination and determination team was able to prove the provisions of the regulation. It could be verified that the argumentation is appropriate and retrofitting of the existing units has been duly excluded from consideration. For details on assessment please refer to the section 4.2.2. of the determination report.	~~CAR B4~~ ~~CAR B5~~	
B.2.5. Is the baseline scenario determination compatible with the available data??	PDD /SPM/ /TRAO/ /TS-PA/ /TS-BL/	DR, I	All data source and literature where the indicated information can be found is appropriately referenced in the PDD. determination team could verify the appropriateness of the provided information. Provided analysis can be further substantiated through information provided on the website of the Ukraine iron and steel sector of Ukraine/steel-ua/. For details on assessment please refer to the section 4.2.2. of the determination report.	~~CAR B1~~ ~~CAR B2~~ ~~CAR B3~~ ~~CAR B4~~	OK
B.2.6. Have the major risks to the baseline been identified?	PDD /SPM/ /TRAO/ /TS-PA/ /TS-BL/	DR, I	Yes, for details on assessment please refer to the section 4.2.2. of the determination report.	~~CAR D3~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.3. Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario?*					
B.3.1. What is the methodology selected to demonstrate additionality?	PDD /TRAO/ /SPM/ /TS-PA/ /TS-BL/	DR, I	Demonstration of additionality has been established on a project specific basis in accordance with JI Guidelines. Within the demonstration of additionality the latest approved version of the "Combined tool to identify the baseline scenario and demonstrate additionality (Version 02.1) has been applied.	OK	OK
B.3.2. Is the project additionality assessed according to the methodology?	PDD /TRAO/ /TS-PA/ /SPM/ /TS-BL/	DR, I	Yes, the justification of the project additionality is in line with provisions of the "Combined Tool" For details on assessment please refer to the section 4.2.2. of the determination report.	~~CAR B1~~ ~~CAR B2~~ ~~CAR B3~~ ~~CAR B4~~ ~~CAR B5~~	OK
B.3.3. Are all assumptions stated in a transparent and conservative manner?	PDD /TRAO/	DR, I	Yes, all assumptions stated in a transparent and conservative manner and have been appropriately justified. For details on assessment	~~CAR B1~~	OK

* * MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/TS-PA/ /TS-BL/		please refer to the section 4.2.2. of the determination report.	~~CAR B2~~ ~~CAR B5~~ ~~CR B1~~	
B.3.4. Is sufficient evidence provided to support the relevance of the arguments made?	PDD /TRAO/ /TS-PA/ /TS-BL/	DR, I	The corresponding evidences have been provided and were proved in the course of determination. For details on assessment please refer to the section 4.2.2. of the determination report.	~~CAR B1~~ ~~CAR~~ ~~CAR B5~~ ~~CR B1~~	OK
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?	PDD /MD-JI/ /ESD/	DR, I	Yes, project starting date (19.11.2004) has been defined as a date of management to go ahead with the project activity. This is in line with JI Guidelines. Supporting evidences have been provided and the starting has been verified/MD-JI//ESD/.	OK	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	PDD /MD-JI/	DR, I	Yes, the start of crediting period is 19.02.2008. This is the date when the project plant become operational. For this reason the definition	~~CR B1~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/ESD/		deemed to be reasonable.		
D. Monitoring Plan *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. What kind of methodology has been used?	PDD	DR, I	Name: Monitoring methodology has been established on a project specific basis in accordance with JI Guidelines. Type: ☐ CDM Approved Methodology –latest version ☐ CDM Approved Methodology –older version ☐ Combination of Approved Methodology ☒ Project specific Methodology	~~CR D1~~	OK
D.1.2. Has the methodology assessment form (S01-VA 30 – A3) been used?	PDD	DR, I	☒ Yes ☐ N/A (only in case of latest version of approved CDM methodology)	OK	OK

* * MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.1.3. Is the discussion and selection of the monitoring methodology transparent? Can the applied methodology be assessed as appropriate?	PDD	DR, I	☒ Yes ☐ No Comment: Conclusion on this issue can be provided after successful closure of all relevant CARs and CRs Yes please refer to the methodology checklist.	OK	OK
D.1.4. Is the chosen methodology applied correctly?	PDD	DR, I	Yes the determination of the project emissions, baseline emissions and leakage has been appropriately defined and incorporated in the monitoring plan. For details please refer to the assessment of the monitoring carried out in section 4.2.4. of this report. The monitoring methodology has incorporated the main steps of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01). This methodological tool provides procedures to estimate the baseline, project and/or leakage emissions associated with the consumption of electricity. As the project activity aims to reduce electricity consumption the application of this tool deemed to be reasonable.	~~CAR D1~~ ~~CAR D2~~ ~~CAR D3~~ ~~CAR D4~~ ~~CAR D5~~ ~~CR D2~~ ~~CR D3~~ ~~CR D4~~ ~~CD D5~~	OK
D.1.5. Is the monitoring plan documented according to the chosen methodology and in complete and transparent manner?	PDD	DR, I	Yes, for details please refer to the assessment of the monitoring carried out in section 4.2.4 of this report.	~~CAR D1~~ ~~CAR D2~~ ~~CAR~~	

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				~~D3~~ ~~CAR D4~~ ~~CAR D5~~ ~~CR D2~~ ~~CR D3~~ ~~CR D4~~ ~~CD D5~~	
D.1.6. Will all monitored date required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of ERUs for this project activity, whichever occurs later?	PDD	DR, I	Yes, such provision is included in the monitoring plan.	~~OK~~	
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	The CO2 emissions due to the electricity consumption of the installed equipment are the main emission source. The electricity consumption will be measured directly by the electricity meters installed at the plant. Afterwards the electricity consumption will be multiplied with CO2 emission factor. It has been concluded that the monitoring plan	~~CAR D1~~ ~~CAR D2~~ ~~CAR D5~~ ~~CR D3~~	OK

* * MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			provides 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. For details please refer to the assessment of the monitoring carried out in section 4.2.4. of this report.		
D.2.2. Are the choices of project GHG indicators reasonable and conservative?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, the choices are reasonable, please refer to the comment above.	~~CAR D2~~ ~~CAR D5~~ ~~CR D3~~	OK
D.2.3. Is the measurement *method* clearly stated for each GHG value to be monitored and deemed appropriate?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, the electricity consumption will be measured directly by the electricity meters installed at the plant.	~~CAR D2~~ ~~CAR D5~~ ~~CR D3~~	OK
D.2.4. Is the measurement *equipment* described and deemed appropriate?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, the electricity consumption will be measured directly by the electricity meters installed at the plant. Electricity meters are appropriate equipment for the measurements of the electricity consumption.	~~CAR D1~~ ~~CAR D2~~	OK
D.2.5. Is the measurement *accuracy* addressed and deemed appropriate?	PDD /MR-E/ /MR-EQ/	DR, I	Yes, a sufficient confidence could be gained that the accuracy provision are in line with national requirements.	~~CAR D1~~ ~~CAR D2~~	OK

* * MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/EF/			~~CAR D5~~ ~~CR D3~~	
D.2.6. Is the measurement *interval* identified and deemed appropriate?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	The electricity consumption will be measured continuously, daily meter readings will carried out and recorded in paper and electronic form. Afterwards the electricity consumption will be summarized in monthly reports. Hence it was concluded that the measurements interval deemed appropriate.	~~CAR D1~~ ~~CAR D2~~ ~~CAR D5~~ ~~CR D3~~	OK
D.2.7. Is the *registration*, *monitoring*, *measurement* and *reporting* procedure defined?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, the registration, monitoring, measurement and reporting procedure are defined and were assessed as appropriate. For details please refer to the assessment of the monitoring carried out in section 4.2.4. of this report.	~~CAR D1~~ ~~CAR D2~~	OK
D.2.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	PDD /euro-alfa/	DR, I	The calibration of the electricity meters will be carried every four years. Calibration has been also assessed as appropriate for the corresponding meter types and in line the relevant norms and procedures as well as with the manufacturer requirements/euro-alfa/.	~~CAR D1~~ ~~CR D3~~	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)?	PDD /MR-E/ /MR-EQ/	DR, I	Yes, procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) are defined and already adhered	~~CAR D1~~ ~~CAR D2~~	OK

* * MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/EF/		by the personnel for the company internal purposes. For details please refer to the assessment of the monitoring carried out in section 4.2.4. of this report.	~~CAR D5~~ ~~CR D3~~	
D.3. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					OK
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining the baseline emissions during the crediting period?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	The CO2 emissions due to the electricity consumption of the baseline equipment are the main emission source. The electricity consumption will be determined based on the measured oxygen production of the installed equipment by using specific operation modes. Operation modes have been elaborated in a conservative manner. For details please refer to the assessment of the monitoring carried out in section 4.2.4. of this report. The oxygen generation will measured directly by the flow meters installed at the plant. It has been concluded that the monitoring plan provides 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. For details please refer to the assessment of the monitoring carried out in section 4.2.4. of this	~~CAR D3~~ ~~CAR D4~~ ~~CR D3~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			report.		
D.3.2. Are the choices of baseline GHG indicators, reasonable and conservative?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, the choices are reasonable, please refer to the comment above.	~~CAR D3~~	OK
D.3.3. Is the measurement *method* clearly stated for each baseline indicator to be monitored and also deemed appropriate?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, for details please refer to the assessment of the monitoring carried out in section 4.2.4. of this report.	~~CAR D3~~ ~~CAR D4~~ ~~CR D3~~	OK
D.3.4. Is the measurement *equipment* described and deemed appropriate?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, the oxygen distribution will be measured directly by the flow meters installed at the plant. Flow meters are an appropriate equipment for the measurements of the oxygen generation..	~~CAR D3~~ ~~CAR D4~~ ~~CR D3~~	OK
D.3.5. Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, a sufficient confidence could be gained that the accuracy provision are in line with national requirements.	~~CAR D3~~ ~~CAR D4~~ ~~CR D3~~	OK
D.3.6. Is the measurement *interval* for baseline data identified and deemed appropriate?	PDD /MR-E/	DR, I	The oxygen generation will be measured continuously, daily meter readings will carried out	~~CAR D3~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/MR-EQ/ /EF/		and recorded in paper and electronic form. Afterwards the daily figures will be summarized in monthly reports. Hence it was concluded that the measurements interval deemed appropriate.	~~CAR D4~~ ~~CR D3~~	
D.3.7. Is the *registration*, *monitoring*, *measurement* and *reporting* procedure defined?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, the registration, monitoring, measurement and reporting procedure are defined and were assessed as appropriate. For details please refer to the assessment of the monitoring carried out in section 4.2.4. of this report.	~~CAR D3~~ ~~CAR D4~~ ~~CR D3~~	OK
D.3.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	The calibration of the flow meters will be carried once a year. Calibration has been also assessed as appropriate for the corresponding meter types and in line the relevant norms and procedures as well as with the manufacturer requirements.	~~CAR D3~~ ~~CAR D4~~ ~~CR D3~~	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)?	PDD /MR-E/ /MR-EQ/ /EF/	DR, I	Yes, procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) are defined and already adhered by the personnel for the company internal purposes. For details please refer to the assessment of the monitoring carried out in section 4.2.4. of this report.	~~CAR D3~~ ~~CAR D4~~ ~~CR D3~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.4. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					OK
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	PDD	DR, I	To assess this determination team has examined all potential leakage emissions that could occur due to the project activity outside the project boundary. Theoretically potential leakage emissions may occur in case where the outdated equipment would be installed on other sites and replace less GHG intensive oxygen generation technology. (e.g. adjustable ASUs). However the existing oxygen generation units will remain in reserve for the unforeseen situations and will be not installed on other sites outside the project boundary. Moreover project participant has included CO2 emissions from electricity consumption of the reserved equipment. In opposite negative leakage will occur because in the course of the implementation of the project activity the water supply plant will be reconstructed. After the reconstruction the electricity consumption of the water supply plant will significantly decrease. However for conservativeness purpose these emission reductions will be not claimed by the project participants.	~~CR D5~~	OK
D.4.2. Are the choices of project leakage indicators reasonable and conservative?	PDD	DR, I	Please refer to the comment D.4.1.	~~CR D5~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.4.3. Is the measurement *method* clearly stated for each leakage value to be monitored and deemed appropriate?	PDD	DR, I	Please refer to the comment D.4.1.	~~CR D5~~	OK
D.5. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					OK
D.5.1. Is the authority and responsibility of overall project management clearly described?	PDD	DR, I	Yes, in Section D.3. of the PDD and Annex 5 of the PDD the management structure of overall project activity is clearly described. JSC "Zaporozhstal" is project owner.	~~OK~~	OK
D.5.2. Are procedures identified for training of monitoring personnel?	PDD	DR, I	Yes, there is a clear operational and management structure that the project operator already applies. Within the site visit a sufficient confidence was gained that enough effort has been spent to provide appropriate training and procedures for monitoring personnel.	~~OK~~	OK
D.5.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	PDD	DR, I	Unintended emissions are not foreseeable in the framework of the regular project performance. Within the project activity no energy generation technology is considered. Air Separation Units consume electrical power. Hence emergency case would lead to stop of operation and thus to interruption of power consumption.	~~OK~~	OK
D.5.4. Are procedures identified for review of reported results / data?	PDD	DR, I	Yes, the monitoring procedures as well as procedures for review reported data is described in the PDD.	~~OK~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Clear operational and management structure daily monitoring and reviewing of reported data has been also observed during the site visit.		
D.5.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	PDD	DR, I	Please refer to the comment above.	~~OK~~	OK
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					OK
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 the default factors and values – where applicable – is justified.*					OK
E.1.1. Are the calculations documented according to the chosen methodology and in a complete and transparent manner?	PDD /ER-OP/ /ELC/ /ER-OL/	DR, I	Yes, the calculations are documented according to the chosen methodology and in a complete and transparent manner. All relevant formulae and algorithms have been applied within the determination of emission reductions. **Project emissions** Project emissions arise from the electricity consumption of the oxygen compressor plant (OCP). The project emissions are determined based on the electricity consumption of OCP	~~CAR D1~~ ~~CAR D2~~ ~~CAR D3~~ ~~CAR D4~~ ~~CAR~~	OK

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CHECKLIST QUESTION	Ref.	Mo V*	COMMENTS	Draft Concl.	Final Concl.
			multiplied with CO2 emission factor for the power grid of Ukraine. **1a) Electricity consumption** The electricity consumption has been estimated based on the assumed oxygen demand/ER-OP/ of 390,000 thousand m^3 per annum as per the forecast carried out in 2008 based on the data of the steel production. The corresponding evidence has been provided and the applied values could be proved. In order to calculate the oxygen production the oxygen losses have been taken into account. The applied value has been based on the information as given in the instruction and norms for technological design of the oxygen supply system in the metallurgical sector/ER-OL/. The applied figures have been further substantiated based on the production reports in 2008/ER-OP/. Based on these values the oxygen distribution has been estimated. Specific electricity consumption has been estimated based on the actual figures as given in the production reports and electricity consumption monitoring reports/ELC/ in 2008. Grid emission factor for the Ukrainian grid (0.896 tCO2/MWh) is based on the standardized emission factors for the Ukrainian electricity grid as determined by the Global Carbon B.V. and verified by TUV SÜD/EF/. The documents have been checked and the value applied in the	~~D5~~ ~~CR D2~~ ~~CR D3~~ ~~CR D4~~ ~~CD D5~~ ~~CR E1~~	

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			calculation could be proved The CO2 project emissions have been correctly computed as product of the Oxygen distribution with CO2 emission factor.		
E.1.2. Have conservative assumptions been used when calculating the project emissions?	PDD /ER-OL/ /ER-OP/ /ELC/	DR, I	Yes, the project and baseline emissions are based on the electricity consumption which is in its turn depends on the oxygen demand and steel production. The electricity consumption has been estimated based on the assumed oxygen demand/ER-OP/ of 390,000 thousand m^3 per annum as per the forecast carried out in 2008 based on the data of the steel production. The corresponding evidence has been provided and the applied values could be proved. In order to calculate the oxygen production the oxygen losses have been taken into account. The applied value has been based on the information as given in the instruction and norms for technological design of the oxygen supply system in the metallurgical sector/ER-OL/. The applied figures have been further substantiated based on the production reports in 2008/ER-OP/. Based on these values the oxygen distribution has been estimated.	~~CAR D1~~ ~~CAR D2~~ ~~CAR D3~~ ~~CAR D4~~ ~~CAR D5~~ ~~CR D2~~ ~~CR D3~~ ~~CR D4~~ ~~CD D5~~	OK
E.1.3. Are uncertainties in the project emission estimates properly addressed.	PDD /ER-OL/ /ELC/	DR, I	Yes, Please refer to the comment above.	~~CD D5~~	OK

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CHECKLIST QUESTION	Ref.	Mo V*	COMMENTS	Draft Concl.	Final Concl.
	/ER-OP/				
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 the default factors and values – where applicable – is justified.*					OK
E.2.1. Are the calculations documented according to the chosen methodology and in a complete and transparent manner?	PDD /ER-OL/ /ELC//ELC/ /ER-OP/	DR, I	**Baseline emissions** The oxygen production in the baseline scenario has been correctly estimated based on the constant total output (60,000 m3/hour) of the two baseline units (KAAr-32). This is in line with the baseline scenario and technical specification of the baseline units. The specific electricity consumption in the baseline scenario has been assumed equal to that of the project scenario. This is in line provisions of the monitoring plan and (as already indicated) conservative. The CO2 baseline emissions have been correctly computed as product of the oxygen generation with CO2 emission factor.	~~CAR D1~~ ~~CAR D2~~ ~~CAR D3~~ ~~CD D5~~	OK
E.2.2. Have conservative assumptions been used when calculating the baseline emissions?	PDD	DR, I	The specific electricity consumption in the baseline scenario has been assumed equal to that of the project scenario. This is in line provisions of the monitoring plan and conservative.	~~CAR D1~~ ~~CAR D2~~ ~~CAR~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Please refer to the comment above and to the assessment in the section 4.2.5. of the report.	~~D3~~	
E.2.3. Are uncertainties in the baseline emission estimates properly addressed?	/ER-OL/ /ELC/ /ER-OP/	DR, I	Yes, Please refer to the comment above.	~~CAR D1~~	OK
E.3. Calculation of GHG Emission Reductions - Leakage *It is assessed whether the leakage emissions are stated according to the methodology and whether the argumentation for the choice of the default factors and values – where applicable – is justified.*					OK
E.3.1. Are the leakage calculations documented according to the chosen methodology and in a complete and transparent manner?	PDD	DR, I	No leakage emissions have been identified. Please refer to the comment under D.4.	OK	OK
E.3.2. Have conservative assumptions been used when calculating the leakage emissions?	PDD	DR, I	No leakage emissions have been identified. Please refer to the comment under D.4.	OK	OK
E.3.3. Are uncertainties in the leakage emission estimates properly addressed?	PDD	DR, I	No leakage emissions have been identified. Please refer to the comment under D.4.	OK	OK
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?	PDD	DR, I	Yes, taking into account the above mentioned assessment of the baseline/additionality and the monitoring plan it could be concluded that the emission reductions real, measurable and give	~~Yet not ok~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			long-term benefits related to the mitigation of climate change		
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 validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	PDD /EIA/ /EIA-A/	DR, I	Yes, the section F of the PDD provides a sufficient analysis of the environmental impacts of the project activity.	~~OK~~	OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	PDD /EIA/ /EIA-A/	DR, I	An EIA was carried out by the project proponent. The EIA is in line with the regulations on environmental protection in Ukraine. In particular with Ukrainian Law "Environment Protection Law" and "Environmental Assessment Law"	~~OK~~	OK
F.1.3. Will the project create any adverse environmental effects?	PDD /EIA/ /EIA-A/	DR, I	Oxygen generation always leads to environmental effects. However these effects can be assessed as insignificant.	~~OK~~	OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	PDD /EIA/ /EIA-A/	DR, I	No transboundary environmental impacts are envisaged out of this project activity.	~~OK~~	OK
F.1.5. Have identified environmental impacts been addressed in the project design?	PDD /EIA/ /EIA-A/	DR, I	Please refer to the comments above	~~OK~~	OK
F.1.6. Does the project comply with environmental	PDD	DR	Please refer to the comments above	~~OK~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
legislation in the host country?	/EIA/ /EIA-A/	, I			
For Small-Scale Projects					OK
F.1.7. Does the country legislation require an analysis of the environmental impacts of the project acitvity?	PDD		Not applicable		OK
F.1.8. Does the project comply with environmental legislation in the host country?	PDD		Not applicable		OK
F.1.9. Will the project create any adverse environmental effects?	PDD		Not applicable		OK
F.1.10. Have environmental impacts been identified and addressed in the PDD?	PDD		Not applicable		OK
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.*					OK
G.1.1. Have relevant stakeholders been consulted?	PDD	DR , I	Stakeholder consultation has been carried out and the project information has been made appropriately publicly available. No comments have been received from stakeholders. CR G1 has been raised under this context	~~CR G1~~	OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	PDD	DR , I	Please refer to the comment above	~~OK~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
G.1.3. If a stakeholder consultation process is required by regulation / laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations / laws?	PDD	DR, I	Please refer to the comment above	~~OK~~	OK
G.1.4. Is a summary of the stakeholder comments received provided?	PDD	DR, I	Please refer to the comment above	~~OK~~	OK
G.1.5. Has due account been taken of any stakeholder comments received?	PDD	DR, I	Please refer to CR G1	~~CR G1~~	OK

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Table 3: Resolution of Corrective Action and Clarification Requests

Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
Correction Action Requests			
CAR A1 The geographical coordinates (Longitude and Latitude) should be provided in the PDD.	A.5.1.	47°52' N.; 35°09' E.	OK The geographical coordinates (Longitude and Latitude) have been provided in the PDD. The coordinates have been crosschecked via GoolgeEarth and found ok.
CAR B1 – Step 1a) Combined Tool a) Please provide an **overview of other technologies** or practices that provide comparable outputs or services (and that have been implemented previously or are currently underway in the **relevant geographical area** as per "Combined Tool". b) In the context of Step 1a) please indicate the **remaining technical lifetime** of the installed equipment. c) Please provide relevant documentation to support the results of the analysis as required by the "Combined Tool".	A.3.2., A.5.2., B.1.3., B.1.4., B.2.3., B.2.4., B.2.5., B.3.2., B.3.3., B.3.4.	a) The overview of other technologies or practices that provide comparable outputs or services is presented in section B.1. under the Sub-step 1a. "Determination of alternative scenarios in respect to the present Project". The following technologies and practices are considered: 1. Construction of new Air-separation units with different output. 2. Retrofitting of the existing air-separation units and continuing their operation. 3. Oxygen and other technological gases supply from the outside. 4. Reconstruction of the OCP by construction of two air-separation unit with adjustable output capacity (with total	OK Overview of other technologies has been appropriately provided in the PDD. The remaining technical lifetime of the installed equipment has been also appropriately justified. The requirements of the Combined Tool have been appropriately taken into account. For details on assessment please refer to the section 4.2.2. of the determination report.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		capacity 60,000m3(O2)/hour These technologies and practices have been implemented previously or are currently underway in the **relevant geographical area.** b) The remaining **technical lifetime** of the installed equipment is determined from equipment producer and commission of expert in compliance with technical regulatory requirements (The Rules for technical operating of equipment for production of products of air separation for metallurgical plants (PTE PPRV-89). The remaining **technical lifetime** of the installed equipment is determined by commission of expert till 2007. So the scenario "Retrofitting of the existing air-separation units (KtK-35-3, KAr-30) and continuing their operation" is excluded from the analysis by Sub-step 1b as that is not in compliance with technical regulatory requirements (In accordance with PTE PPRV-89 the lifetime of ASUs can be extended to 30 years). c) In Section B.1. is provided documentation to support the results of the analysis including: - Relevant legislation, regulatory information or industry norms;	

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		- Documents prepared by the project developer, contractors or project partners in the context of the proposed project activity or similar previous project implementation; - Publication in the independent reviewed journal; - Information from technology supplier; - Project design documentation of other JI projects.	
CAR B2 - Water Supply System As per "Combined Tool" in case where the project activity includes two different facilities an analysis of alternative scenarios should be carried out separately. Please include **separate analysis** of replacement of **water supply system** in accordance with "Combined Tool" requirements, (i.e. baseline, additionality, etc.). In this context, please bear in mind that technical design of the pumps in the baseline scenario should be **consistent with baseline** scenario of air separation units.	B.1.4., B.2.3., B.2.4., B.2.5., B.3.2., B.3.3., B.3.4.	Water supply plant (WSP) is included in the project boundary as the electricity for pumping of manufacturing water for OCP is consumed in the WSP. The analysis of technical design of the pumps in baseline scenario for two ASUs KAAr-32 (provided in comments to CAR D5) shows that the technical design of the pumps would be the same as in the project scenario (for VRU-60). Therefore the replacement of water supply system is excluded from consideration in PDD and the analysis in accordance with "Combined Tool" is not acceptable in this case. The technical design of the pumps in the baseline scenario is consistent with **baseline** scenario of air separation units (see CAR D5).	The replacement of the water supply system has been excluded from further consideration. This leads to a conservative estimation of emission reductions and thus could be assed as appropriate.
CAR B3 - Step 2a Combined Tool	A.5.2., B.1.3.,	The Definition of the **Technological barrier** is corrected in	Ok. The Definition of the

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
The Definition of the **Technological barrier** is not in line with requirements of "Combined Tool". Please provide a more clear definition of the barrier using (if appropriate) definitions as presented in Combined Tool".	B.1.4., B.2.3., B.2.4., B.2.5., B.3.2., B.3.3., B.3.4.	accordance with Combined Tool (Version 02.1): "The Risk of technological failure: the process/technology failure risk in the local circumstances is significantly greater than for other technologies that provide services or outputs comparable to those of the proposed CDM project activity, as demonstrated by relevant scientific literature or technology manufacturer information." The technological barrier is considered how Risk of technological failure, that can arisen by operation of definite type of equipment in OCP (in accordance with determined alternative scenario) and that may cause to break of plant's basic technological processes (production of pig iron-steel-rolled steel), despite of using of all possibilities for the risk prevention. The break of plant's basic technological processes is unacceptable as it brings to large economical losses.	**Technological barrier** has been corrected and appropriately justified. For details on assessment please refer to the section 4.2.2. of the determination report.
CAR B4 - Step 2b Combined Tool a) **Exclusion of scenario 3** under the Step 2b in the PDD is not in line with requirements of Combined Tool. **Lack of common practice** should be more detailed elaborated and justified. In this context the **source of documents** should be indicated. b) **Exclusion of scenario 1** because under the Step 2b in the PDD is not in line with requirements of Combined Tool. **Insufficient**	A.5.2., B.1.3., B.1.4., B.2.3., B.2.4., B.2.5., B.3.2., B.3.3., B.3.4.	a) The analysis of scenario 3 under the Step 2b is provided with regard to identified technological barrier "Risk of technological failure". The analysis in section B1 make clear that there is a technological barrier for scenario 3 implementation – scenario 3 is not the baseline. The analysis is supported through technical documentation. b) The scenario 1 "Retrofitting of the existing air-separation units (KtK-35-3, KAr-30) and continuing their operation" is excluded on Step 1b as that is not in compliance with technical regulatory (see comments to CAR B1 and Section B1 of PDD).	OK, barrier analysis has been appropriately carried out in the PDD in accordance with requirements of the Combined Tool. For details on assessment please refer to the section 4.2.2. of the determination report.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
level of reliability should be more detailed elaborated and justified. In this context the **source of documents** should be indicated. Please take into account that economic attractiveness is an issue to be considered within the investment analysis.			
CAR B5 Please investigate within the **Common practice** analysis in the PDD whether projects **similar to project activity** have been observed in Ukraine, i.e. technologies similar to that of Air Liquide. Please indicate their data sources.	A.5.2., B.1.3., B.1.4., B.2.3., B.2.4., B.2.5., B.3.2., B.3.3., B.3.4., D.1.3.	The Common practice analysis is provided in accordance with Combined tool in Section B.1. There are presented the similar activities to the proposed project and the explain of difference between project activity and similar activities. The data sources are indicated in accordance with Combined tool.	OK, similar activities have been observed but the essential distinctions between the proposed project activity and similar activities could be reasonably be explained. Thus the proposed project activity can be considered as additional. For details on assessment please refer to the section 4.2.2. of the determination report.
CAR B6 **Project boundary** should be presented more clearly. In particular: (a) Please define (or list) which emission **sources** and gases are included in the project boundary. Please indicate **equipment** (like compressors, pumps, etc.) that	A.1.2., B.1.4., D.2.2.	Sources of greenhouse gas emissions as well as greenhouse gases included in the project boundary are clearly presented in Table B.3-2. The List of equipment that consumes electricity in Oxygen compressor plant and Water supply plant (including compressors and pumps) is presented in Annex 3.	OK The project´s spatial and system boundaries are clearly defined in the project documentation. The spatial extent of the project boundary includes the project site, and all the power plants connected

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
consumes energy and causes CO2 emissions.			physically to the baseline Grid (i.e. National grid of Ukraine). The boundary definition is in line with the applied methodology. All equipment used within the project activity has been indicated in the PDD including the information about its purpose and the technical specification. TUV came to an opinion that technology description in the PDD has been prepared appropriately and in a detailed manner and all equipment mentioned in the PDD is clearly defined and attributable to the considered project activity. Furthermore project boundary is clearly described in words and a visualisation of the physical project boundary as well as a table defining all significant GHG gases has been included in the PDD.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
			Furthermore the technical specification of the installed equipment is in line with provided documentation and is in line the indication in the PDD.
CAR D1 (PE - Electricity consumption of OCP) Please specify how electric consumption of OCP will be measured. In particular, please provide a clear description **(list) of equipment and corresponding meters** that are included to the monitoring plan in this context.	D.1.4., D.1.5., D.2.1., D.2.2., D.2.3., D.2.4., D.2.5., D.2.6., D.2.7	The operational and management structure of the measurement of electric consumption in OCP is clearly described in section D.3 of PDD. The list of equipment and corresponding meters for measurement electric consumption in OCP is prepared and presented in Annex 3 of PDD.	Ok The presented list is in line with provided documentation.
CAR D2 (PE - Grid emission factor) Please apply for grid emission factor the most recent data.	A.5.1., D.1.4., D.1.5., D.2.1., D.2.2., D.2.3., D.2.4., D.2.5., D.2.6., D.2.7.., D.2.8.,	For new calculation of Baseline and Project emissions is used the grid emission factor 0.896 tCO_2/MWh. This is the emission factor for the Ukrainian grid in years 2006-2012 for projects reducing electricity consumption from the grid. Data source: "Ukraine - Assessment of new calculation of CEF" - http://ji.unfccc.int/UserManagement/FileStorage/46JW2KL36KM0GEMI0PHDTQF6DVI514	OK The grid emission factor applied is for the projects reducing electricity consumption and thus it has been appropriately selected.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
	D.2.9., E.1.1., E.1.2., E.1.3..		
CAR D3 (BL – Total oxygen generation) The determination of the total oxygen generation in the Baseline scenario is not clear.	B.2.6., D.3.1., D.3.2., D.3.3., D.3.4., D.3.5., D.3.6., D.3.7.., D.3.8., D.3.9., E.1.1., E.1.2., E.1.3..	In the boundary of Baseline scenario are considered the new air-separation units (two units KAAr-32) and the reserved units (KAr-30, KtK-35-3, BR-2). So we must use for estimation of baseline emission an equation where **all ASUs (electricity consumption in all ASUs) are taken into account**. We use the equation (D.2) $$BE_{EC,y} = EC_{OCP,BL,y} * EF_{CO2,ELEC,y}$$ *$BE_{EC,y}$ - Baseline emissions from electric power consumption, tCO_2* *$EC_{OCP,BL,y}$ - electric power consumption by the OCP according to the Baseline, MWh* *$EF_{CO2,ELEC,y}$ - emission factor during electric power generation supplied by the power system of Ukraine, tCO_2/MWh* The electric power consumption from the power system by the OCP ($EC_{OCP,BL,y}$) includes electricity consumption **in all ASUs - new and reserved** of OCP. The total electric power consumption in OCP ($EC_{OCP,BL,y}$) depends on number of ASUs that are at the same time	OK The determination of the total oxygen generation in the Baseline scenario is presented in a clear and transparent manner. For further details pl. refer to the assessment in the section 4.2.4 of the report.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		operated. The order of how particular units should be **put into operation** is described below and presented in table D.1-1. in the PDD. We can not monitor the electricity consumption in ASUs in Baseline directly even in reserved ASUs as the consumption of electricity monitored in Project scenario include all ASUs in project boundary (VRU-60, KAr-30, KtK-35-3, BR-2) and cannot be divided between the new ASU (VRU-60) and reserved ASUs. So the electricity consumption in OCP in Baseline scenario ($EC_{OCP,BL,y}$) can be **calculated only based** on total oxygen production in OCP in Baseline ($P_{oxygen,BL,y}$) and specific electric consumption ($SEC_{oxygen,\ BL}$) – equation (D.2.1): $$EC_{OCP,BL,y} = P_{oxygen,BL,y} * SEC_{oxygen,BL}$$ $P_{oxygen,BL,y}$ - *total oxygen production according to the Baseline, thousand* m^3 $SEC_{oxygen,BL}$ - *specific electric power consumption for production in the OCP according to the Baseline, MWh/thousand* $m^3(O_2)$ The specific electric consumption ($SEC_{oxygen,BL}$) will be estimated by equation D.2.4 based on actual data (*see comments to CAR D4*).	

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		The total oxygen generation in the Baseline scenario ($P_{oxygen,BL,y}$) will be determined by equation (D.2.2) $$P_{oxygen,BL,y} = \Sigma (SP_{oxygen,BL,j} * T_{OCP,j}) + P_{oxygen,RASU,y}$$ $SP_{oxygen,BL,j}$ - *output of the air-separation units (KAAr-32) according to the Baseline in operating conditions j, thousand* $m^3(O_2)$*/hour* $T_{OCP,j}$ - *operational time for the air-separation units in operating conditions j, hours* $P_{oxygen,RASU,y}$ - *oxygen production output in the reserved air-separation units, thousand* $m^3(O_2)$ This equation include: 1) Oxygen production **in new ASUs** (two ASUs KAAr-32): $\Sigma (SP_{oxygen,BL,j} * T_{OCP,j})$ 2) Oxygen production **in reserved ASUs** ($P_{oxygen,RASU,y}$) – will be monitored directly if the reserved ASUs will be taken into operation (*ID-3)* a) The operational time for the air-separation units ($T_{OCP,y}$) will be determined by equation D.2.3 for each operational conditions of OCP:	

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
a) It is not clear how the **operational time** for the air-separation units in the Baseline scenario (T_{OP}) will be determined? If applicable, please include it to the monitoring.		$T_{OCP,j} = N_{day,j} * 24$ *$N_{day,j}$ - number of days then the OCP was operated in operating conditions j (table D.1-1.), day* *24 - hours per day, hour* The number of days when the OCP was operated in operating conditions j will be determined based on actual data of Distributed oxygen (ID-4 - $D_{oxygen,PJ,day}$) in accordance with Table D.1-1. of the PDD. b) The conservative **order** of how particular units should be **put into operation** was developed and presented in table D.1-1. of PDD. The OCP is an auxiliary factory in the steel works so the operation of the OCP is determined from the operation (to be exact from oxygen needs for steel production) of the basic plants (Blast-furnace plant, Open-heart plant, etc.). Based on rate of oxygen that can be consumed in the steel plant it was developed 6 operating conditions of OCP in Baseline scenario including the **output value of the air-separation units in the Baseline scenario for each of operating conditions.** The operating conditions was defined in accordance with technical characteristic of KAAr-32 and optimal combination of ASUs operation including **reserved** ASUs (see comments below).	a) OK The determination of the operational time has been elaborated in a clear and appropriate manner. For further details pl. refer to the assessment in the section 4.2.4 of the report.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
b) The **output value of the air-separation units in the Baseline scenario** ***($fc_{OP,BL}$)*** is assumed to be constant **60.000m^3/hour**. How this assumption remains conservative in cases where the Total oxygen need decreases to the level where **principally <u>one</u> air-separation** unit would be sufficient to cover oxygen needs of the steel plant? Please provide an appropriate and conservative approach.		In accordance with table D.1-1. if the Total oxygen need decreases to the level where **principally <u>one</u> air-separation** unit would be sufficient to cover oxygen needs of the steel plant, then the total oxygen production in Baseline scenario will be determined **<u>on level 30 000 m^3(O_2)/hour</u>** or **<u>32 000 m^3(O_2)/hour</u>** (performance of one unit KAAr-32 with an output of 30 000 – 32 000 m^3(O_2)/hour) - **Operating conditions # 1, # 2 (depended on the rate of distributed oxygen - $D_{oxygen,PJ,day}$ (ID-4).** If **oxygen need increases** to level where **reserved** ASUs should be **put into operation** (this situation could occur with an increase in the requirement of the production units of the JSC "Zaporizhstal" of more than 1,459,200 m^3(O_2)/day – operating conditions # 6); the total oxygen production in the Baseline scenario will be determined by equation (D.2.2). The output of the air-separation units (KAAr-32) according to the Baseline ($SP_{oxygen,BL,j}$) will be 60,000 m^3(O_2)/hour. The oxygen production output in the reserved air-separation units ($P_{oxygen,RASU,y}$) will be monitored directly – ID-3. The order of ASUs operating (table D.1-1.) and estimating of oxygen production in Baseline is **conservative as**: 1. The operational conditions (1-6) was defined in accordance with **the best technical characteristic of KAAr-32** and **optimal combination of ASUs** operation including reserved	b) A conservative order of operating the baseline units has been elaborated and deemed appropriate. The order has been substantiated by the provided documents. For further details pl. refer to the assessment in the section 4.2.4 of the report.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
In this context please explain how the total oxygen production on the Baseline scenario will be determined in cases where **oxygen need increases** to level where **reserved** ASUs should be **put into operation**. Please provide also a conservative nature of the determination method. In this context, please define the **order** how particular units should be **put into operation**. (for example for oxygen need less than m^3 operation of only one KAAr-32 unit is sufficient. Please provide a **conservative approach** in this context, i.e. a **conservative spread/order.** For example in case the oxygen need is a little bit more than 30.000m3, it does not automatically mean that next unit will be put into operation).		ASUs. 1.1. The production of oxygen in ASU KAAr-32 can be regulated from 30,000 to 32,000 $m^3(O_2)$/hour. In practice the oxygen output in ASUs can be less than the output in accordance with technical documentation for ASU for maximal output (32,000 $m^3(O_2)$/hour). That would be provided to putting into operation an auxiliary ASU and as a result of this to increase of electricity consumption and GHG emissions in Baseline. Also the oxygen output in ASUs can be more than the output in accordance with technical documentation for ASU for minimal output (30,000 $m^3(O_2)$/hour). That would be provided to more electricity consumption and GHG emissions in Baseline. 1.2. The combination of two KAAr-32 and reserved ASUs operation is developed for different operation conditions (OC) taking into that the production of oxygen in ASU KAAr-32 can be regulated from 30,000 to 32,000 $m^3(O_2)$/hour. These combinations provide to minimal oxygen production for covering of oxygen needs. OC #3 – 2 x KAAr-32 (30,000 $m^3(O_2)$/hour); OC #4 – 1 x KAAr-32 (30,000 $m^3(O_2)$/hour) and 1 x KAAr-32 (32,000 $m^3(O_2)$/hour);	

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		OC #5 – 2 x KAAr-32 (32,000 $m^3(O_2)$/hour); OC #6 – 2 x KAAr-32 (30,000 $m^3(O_2)$/hour). 2. The practice of only one ASU operation is absence at the JSC "Zaporizhstal" even in case where the Total oxygen need decreases to the level where principally one air-separation unit would be sufficient to cover oxygen needs (see comments to CAR B-3). However for conservative estimating of GHG emissions are considered operation conditionals #1, #2 (table D.1-1.). 3. The total oxygen production in Baseline scenario will be the same as in Project scenario in cases of oxygen production in VRU-60 in maximal volume (60,000 $m^3(O_2)$/hour) or minimal volume (30,000 $m^3(O_2)$/hour). The total oxygen production is used for electricity consumption calculation (equation D.2.1) by multiplication with Specific electricity consumption that will be determined based on actual data. So by oxygen production in maximal or minimal level for VRU-60 the Baseline and the Project scenario will be the same. This is a conservative approach. 4. As test for choice of operating conditions in Baseline is used the Distributed oxygen **per day** that is estimated as oxygen production per hour (30, 32, 60, 62 or 64 thousand $m^3(O_2)$/hour) * 24 hour * (1-losses) and that will be directly	

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		monitored. So in case the oxygen need is a little bit more than maximal oxygen production **per hour in one ASU**, it does not mean that the second ASU will be put into operation. Although in practice it signifies that an auxiliary ASU should be put into operation for covering periodical peaks of oxygen consumption. For example the oxygen need of the steel plant during 12 hours 26 000 $m^3(O_2)$/hour and during next 12 hours 33 000 $m^3(O_2)$/hour so the average oxygen consumption is 29 500 $m^3(O_2)$/hour or 708 000 $m^3(O_2)$/day (ID-4 $D_{oxygen,PJ,day}$). In accordance to table D.1-1.: if $D_{oxygen,PJ,day}$ > 684,000 $m^3(O_2)$/day and $D_{oxygen,PJ,day}$ < 729,600 $m^3(O_2)$/day the estimation must be implemented for operating condition #2 (operating of one KAAr-32 with output 32,000 $m^3(O_2)$/hour). But in practice two ASUs KAAr-32 must be operated for covering the oxygen needs in rate 33,000 $m^3(O_2)$/hour (operating condition #3).	
CAR D4 (BL – specific electric power consumption OCP**)** Please provide **conservative nature** of the specific electric power consumption. In particular, a) The assumed value has been calculated based on data obtained from the out-dated	D.3.1., D.3.2., D.3.3., D.3.4., D.3.5., D.3.6., D.3.7.., D.3.8.,	For a conservative nature of specific electric power consumption in OCP it was developed a new approach to calculation of this parameter. a). Specific electric power consumption in OCP ($SEC_{oxygen,BL}$) for baseline scenario will be determined by the equation (D.2.4):	OK **The specific** electric power consumption in the baseline scenario is based on the specific electricity consumption in the project scenario. It also results in conservative calculation of emission reductions. Hence

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equipment. However the baseline involves two "new" air separation units. Please justify the conservative nature of assumed value. b) Please clarify the conservative nature of the value with regard to the **mode of equipment operation**.	D.3.9., E.1.1., E.1.2., E.1.3	$SEC_{oxygen,BL} = EC_{OCP,PJ,y} / (P_{oxygen,VRU-60,y} + P_{oxygen,RASU,y})$ $EC_{OCP,PJ,y}$ - *electric power consumption by the OCP due to the Project activity, MWh* $P_{oxygen,VRU-60,y}$ - *oxygen production output in the air-separation unit VRU-60, thousand* $m^3(O_2)$ $P_{oxygen,RASU,y}$ - *oxygen production output in the reserved air-separation units, thousand* $m^3(O_2)$ The oxygen production in ASUs ($P_{oxygen,VRU-60,y}$, $P_{oxygen,RASU,y}$) are added to monitoring plan (points ID-2, ID-3) and will be directly monitored. This approach for the estimating of Specific electric power consumption in OCP ($SEC_{oxygen,BL}$) for baseline scenario based on the operating data of OCP (Project scenario) **is conservative:** 1). This approach is corresponded to the **"new"** air separation unit. 2). The value of $SEC_{oxygen,BL}$ estimated based on this approach (average for 2008 year = **1.108 MWh/thousand** $m^3(O_2)$) is lesser that the value of $SEC_{oxygen,BL}$ estimated based on historical data (average for 2005-2007 years = **1.137**	it was assessed as appropriate.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		MWh/thousand $m^3(O_2)$). 3). This approach takes into account that new air-compressors can be installed in OCP bath in the project scenario and in the baseline scenario. This approach let consider the reduction of Specific electric power consumption in OCP ($SEC_{oxygen,BL}$) not only in project scenario but also in baseline scenario. b) The approach for estimating of specific electric power consumption in OCP in accordance with the equation (D.2.4) **is conservative regarding mode of equipment operation:** 1). The electricity consumption in OCP generally depends on the air compressors of OCP that consume the most volume of electricity consumed in OCP (more that 60 %) so the specific electric power consumption in OCP don't generally depend on mode of equipment operation (types of Air separation units in baseline and project scenario). The Air compressors in Project scenario are identical with Baseline scenario. 2). In VRU-60 oxygen is produced without subsequent compression so in project scenario there are lesser number of equipments that consume electricity. So this is conservative to estimate SEC for baseline based on operating data for project scenario.	
CAR D5 (PE - Electricity consumption of WSP)	A.5.1., D.1.4., D.1.5.,	a) In accordance with analysis provided below the electricity consumption in WSP in baseline scenario would be the same	OK As already indicated the exclusion of the replacement

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
a) Please specify how electric consumption of Water Supply Plant will be measured/monitored. In particular, please provide a clear description **(list) of equipment and corresponding meters** that are included to the monitoring plan in this context. b) Please provide a conservative approach for calculation of the electricity consumption of WSP with regard to **deviation in the total oxygen output in the baseline** scenario. Please bear in mind that technical design of the pumps in the baseline scenario should be **consistent with baseline** scenario for air separation unit.	D.2.1., D.2.2., D.2.3., D.2.4., D.2.5., D.2.6., D.2.7., D.2.8., D.2.9., E.1.1., E.1.2., E.1.3.	as in the project scenario. Therefore the electricity consumption of WSP is excluded from the monitoring plan. b) The technical water in OCP is used for cooling of: 1) Air compressors, 2) Equipments in ASU. 1) The number and type of air compressors used in Baseline and Project scenario for air supply to ASUs is the same as the quantity of air used for production of air separation products (oxygen, nitrogen, etc.) is not depended on type of ASU and would be equal for baseline and project scenarios. The List of air compressors is provided in Annex 3 of PDD. Therefore as the number and type of air compressors for baseline and project scenario are the same than the volume of technical water for cooling of air compressors would be the same in each case. 2) In ASU the water is used for cooling of equipments (compressors, pumps, etc.). In Project scenario (operation of VRU-60) the consumption of technical water for production of oxygen in rate 40,000 m^3/hour is 1,100 m^3/hour (determined in accordance with technical	of the water supply system has been assessed as appropriate. Hence the achieved emission reductions from further consideration has been assessed as appropriate.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		documentation for VRU-60). The technical water consumption in Baseline scenario in two ASUs KAAr-32 for production of oxygen in rate 40,000 m^3/hour would be 1,032 m^3/hour (determined in accordance with technical documentation КЛ 0031.000.000.ИЭ-03, 1.407.001 ИЕ, 1.407.001 ИЕ). Therefore the consumption of technical water in ASUs in baseline and in project scenario would be approximate the same. The consumption of technical water in the baseline scenario and in the project scenario would be the same therefore the technical design of the pumps in WSP may be also equal. The electricity consumption in baseline scenario and in the project scenario will be the same as: 1. the technical design of the pumps are equal in baseline and in the project scenarios, 2. the pumps in WSP have not the adjustable drive therefore the electricity consumption will be constant and not depend on deviation in the total oxygen output. The electricity consumption in WSP is excluded from consideration in section D and E of PDD.	

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
Clarification requests			
CR A1 – Oxygen plant Please clarify in the PDD the implementation stage of the project, i.e. whether the project is already operational.	A.3.1., A.3.2.	The air-separation unit VRU-60 was putted into operation December 2007. There is the acceptance certificate.	OK The decision to approve the act of commissioning of OCP in the JSC ”Zaporizhstal” was made on 27.12.2007. The Copy of decision has been provided and the date of commissioning could be proved.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
CR A2 – Water Supply System Please clarify in section A technology used within the replacement water supply system. In particular, a) Please clarify **how many pumps** are going to be replaced, including capacity related information. b) Please clarify whether water supply plant serves only air separation unit or also other facilities of Zaporizhstal? c) Please clarify what would happen otherwise, i.e. just a brief justification of the additionality. d) Please clarify the implementation stage of the project, i.e. replacement of pumps.	A.1.2.	a) Only one pump (capacity 1000 kW) will be replaced in the Water Supply System of OCP with two pumps (common capacity 160 kW). b) The Water Supply Plant serves Oxygen Compressor Plant (OCP) and other facilities of Zaporizhstal. But in the project boundary is considered **only** the re-circulating water supply for the OCP. The equipment of WSP that serves the re-circulating water supply for the OCP are specified in Annex 3. c) In absence of the Project (Reconstruction of OCP with VRU-60) the installation of two new pumps (common capacity 160 kW) would be possible also for ASUs KAAr-32. The replace of water pumps in WSP is excluded from consideration in PDD as it would happen in Baseline and Project scenarios. d) The technical documentation for replacement of pump (1000 kW) with pumps (160 kW) was prepared, but the project isn't implemented because of absence of financing.	OK In response to CR A2 project participant has assumed that installation of new pumps would occur both in the baseline and project scenario. This assumption is very conservative because it leads to a decreased amount of the emission reductions claimed by the project activity. Hence the emission reduction through replacement of water pumps has been excluded from consideration. The corresponding equipment has been also excluded from the project boundary
CR A3 Please include the **contact person** in the Annex 1	A.5.1.	The contact person was included in the Annex 1 of PDD.	OK The contact person has been appropriately included in Annex I of the PDD
CR B1	B.3.3., B.3.4.	The Management decision to go ahead with the project was adopted in May 2004 in stage of selection of equipment	OK Project participant has

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
Date of Management decision to go ahead with the project due to additional income from ERUs is not clear. Please, if possible, provide a chronological description of project implementation stages and clarify how benefit from registration as a JI project has been seriously considered within the Management decision.		supplier for new Air Separation unit in Oxygen Compressor Plant. This decision was based on decision concerning development of project in the JSC "Zaporizhstal" with flexibility Mechanisms of Kyoto Protocol adopted in April 2004. The protocols of these decisions are provided in the files "Protocol-1-2004.pdf" and "Protocol-2-2004.pdf" as Annex to the answers to the Resolution of Corrective Action and Clarification Requests.	provided the corresponding company internal documents/TS-BL/. TUV has examined the provided evidences and the date of management decision could be verified. Furthermore based on the provided evidences the historica development of the project activity has been proved.
CR B2 (Baseline determination) How many times an overhaul as mentioned under Alternative scenario 1 can be carried out, i.e. only once to extend their lifetime for up ten years or several times.	B.1.4	The times on overhaul isn't specified by producer of Air Separation Unit (ASU) – JSC "Cryogenmash". The possibility of overhaul depends on technical state of equipment und can be determined only after technical analysis of ASU. Sources: http://www.cryogenmash.ru/production/cryogenic_launches/upgrade.php and http://www.regnum.ru/expnews/237102.html The operating period of ASUs can be prolonged only till 30 years in compliance with the operating rules (PTE PPRV-89). Accordingly the overhaul for prolongation of lifetime for up ten years can be carried out only once.	OK Under the Sub-step1b project participant has evaluated which alternatives are not in line with current laws and regulations. Project participant has duly taken into account the operating rules and regulations PTE PPRV-89. It was concluded that operating of retrofitted units does not comply with the regulations. Hence retrofitting of the existing units should be excluded

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			from further consideration. The regulation has been provided for determination and TUV was able to prove the provisions of the regulation. It could be verified that the argumentation is appropriate and retrofitting of the existing units has been duly excluded from consideration.
CR D1 Please clarify in section D.1. what kind of monitoring methodology has been used?	D.1.1.	In section D.1. was clarified that the monitoring of the Baseline and Project GHG emissions from electric power consumption is based on the generic approach of the Methodological tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01).	OK The monitoring methodology has incorporated the main steps of the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01). This methodological tool provides procedures to estimate the baseline, project and/or leakage emissions associated with the consumption of electricity. As the project activity aims to reduce electricity consumption the application

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
			of this tool deemed to be reasonable.
CR D2 Clarification is required **where emission reduction** will be achieved through implementation of the project activity. In this context please specify **equipment where electricity consumption will be decreased** through the new technology and explain why.	D.1.4., D.1.5., D.2.2.,	The technology proposed in the project let save electric power in equipment in Oxygen compressor plant (compressors) and in Water Supply Plant (pumps). The list of equipment that consumes electricity in Oxygen compressor plant and in Water Supply Plant was added in Annex 3 of PDD. Electric power saving in the Project scenario is to be achieved as a result of reduction of oxygen losses, oxygen production without subsequent compression. The emissions reductions will be achieved in the Ukraine Power System as the electricity for JSC "Zaporizhstal" is supplied from the grid (Section A.4.3, B.3).	OK The clarification is appropriate.
CR D3 Please **specify all meters** included in the monitoring plan, including information about their place and purpose, i.e. where they are installed and what they will measure.	D.1.4., D.1.5., D.2.1., D.2.2., D.2.3., D.2.4., D.2.5., D.2.6., D.2.7.. , D.2.8., D.2.9.,	The list of all meters used for Monitoring including information about their place and purpose is added to Annex 3 of PDD "Monitoring plan".	OK All meters have been provided in the PDD. The appropriateness has been proved based on provided evidences/MR-E/ and verified during the on site visit.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
CR D4 Please clarify responsibility for meter **calibration.**	D.1.4., D.1.5.,	Metrology and Automation Department of JSC "Zaporizhstal" is responsibility for meter calibration.	OK The required information has been appropriately provided and included in the PDD.
CR D5 - Leakage Please clarify how the Leakage is in line with Leakage definition in JI-Guidelines.	D.4.1., D.4.2., D.4.3.	In the JI-Guidelines is Leakage defined as "the net change of anthropogenic emissions by sources and/or removals by sinks of greenhouse gases which occurs outside the project boundary, and that is measurable and attributable to the Article 6 project". In section D of PDD are defined the following basic sources of anthropogenic emissions that are attributable to project and occurs outside the project boundary: 1. physical leakages while supplying natural gas via the gas transmission system; 2. fuel utilization during TPR transportation by motor-vehicle and railway transport. The GHG emissions of these sources are not measurable. Besides how described in PDD the Leakage in the Baseline are greater than in the Project activity. So we find this conservative don't estimate the Leakage in the Project. In addition for the proof of concept of Leakage in PDD are to provide the provisions of ACM0002: "The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as … fuel handling (extraction, processing, and transport) ... . Project participants do not need to consider these emission sources as leakage …".	OK To assess this TUV has examined all potential leakage emissions that could occur due to the project activity outside the project boundary. One theoretically potential leakage source identified is the leakage emissions in case where the outdated equipment would be installed on other project sites and replaces less GHG intensive oxygen generation technology. (e.g. adjustable ASUs). However the existing oxygen generation units will remain in reserve for the unforeseen situations and will be not installed on other sites outside the project boundary. Moreover project

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			participant has included CO2 emissions from electricity consumption of the reserved equipment. In opposite negative leakage will occur because in the course of the implementation of the project activity the water supply plant will be reconstructed. After the reconstruction the electricity consumption of the water supply plant will significantly decrease as compared tothat of the baseline scenario. However for conservativeness purpose these emission reductions will be not claimed by the project participants.
CR E1 (Estimation of Project emissions) In section E.1. it is mentioned that for estimation of electricity consumption **formula**	E.1.1.	In accordance with "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01): "**In the generic approach,** project, baseline and leakage emissions from consumption of electricity are calculated based	The estimation of electricity consumption has been reviewed by the determination team. It could be concluded that it is has

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
in accordance with provisions of the "Tool to calculate project emissions from electricity consumption". However neither particular provisions (e.g. grid emission factor and transmission and distribution losses) are addressed, nor have been considered within monitoring plan. Please clarify this issue.		on the quantity of electricity consumed, an emission factor for electricity generation and a factor to account for transmission losses", as follows (Equation 1, page 3 of Tool): $$PE_{EC,y} = \Sigma\, EC_{PJ,j,y} \times EF_{EL,j,y} \times (1+TDL_{j,y})$$ *$PE_{EC,y}$ = Project emissions from electricity consumption in year y (tCO2/yr)* *$EC_{PJ,j,y}$ = Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)* *$EF_{EL,j,y}$ = Emission factor for electricity generation for source j in year y (tCO2/MWh)* *$TDL_{j,y}$ = Average technical transmission and distribution losses for providing electricity to source j in year y* *j = Sources of electricity consumption in the project* All parameters in Equation 1 of Tool (to be exact: 1) quantity of electricity consumed, 2) an emission factor for electricity generation, 3) a factor to account for transmission losses) are considered and included in the estimating of project and baseline emissions in PDD. On the bases of these we write in PDD that the estimation is "in accordance with the provisions of the Methodological tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption"	been carried out based on the in line with maincarried out in accordance with the provisions of the Methodological tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01)". For further details pl. refer to the assessment in the section 4.2.4 of the report.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		(Version 01)". The explanation to these is provided below. For estimating the project emission in PDD we use the Equation E.1.1.: $PE_{EC,y} = EC_{PJ,y} \times EF_{CO2,ELEC,y}$ *$PE_{EC,y}$ = Project emissions from electric power consumption, tCO_2* *$EC_{PJ,y}$ = total electric power consumption (1) for the OCP needs from the power system within the Project activity, MWh* *$EF_{CO2,ELEC,y}$ = CO_2 emission factor during electric power generation (2) supplied by the power system of Ukraine, tCO_2/MWh* Emission factor ($EF_{CO2,ELEC,y}$) we interpret as Emission factor for projects reducing electricity in Ukrainian grid. The value of the Emission factor ($EF_{CO2,ELEC,y}$) is 0.896 tCO_2/MWh. This is the emission factor for the Ukrainian grid in years 2006-2012 for projects reducing electricity consumption from the grid. Data source: "Ukraine - Assessment of new calculation of CEF" http://ji.unfccc.int/UserManagement/FileStorage/46JW2KL36KM0GEMI0PHDTQF6DVI514). The technical losses (3) are considered in "Ukraine - Assessment of new calculation of CEF" and included in the emission factor for the Ukrainian grid	

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		for projects reducing electricity consumption from the grid. The technical losses for the Ukrainian grid are assessed conservative in rate 10% for 2006-2012 years. In order to avoid lack of understanding and taking into account that not **all provisions** of the Methodological tool was used by estimation, we are corrected the wording in PDD: The estimation is based on the generic approach of the Methodological tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01)".	
CR G1 Please provide further information w.r.t clarify how sufficient time for the preparation and citing of the appropriate comments has been provided within the stakeholder consultation process. Please also clarify the way the interested person could submit their comments.	G.1.1., G.1.5.	In accordance with regulations and legislation it isn't necessary for this type of projects to provide the consultation with stakeholders and interested person: 1). Order of Environmental Protection Ministry of the Ukraine "Statute of society participation in environmental decision making process" #168, from 18.12.2003, Official report of the Ukraine,2004,#6 , art.357. 2). DBN A.2.2-1-2003 "Structure and content of Environmental Impact assessment (EIA) in process of planning and construction of plants and buildings" Approved by order of state contraction committee (Gosstroy) of the Ukraine from12.2003, # 214 and implemented from 01.04.2004. Information on the construction of the VRU-60 at the JSC "Zaporizhstal" was published in the mass media – Newspaper	OK The clarifications given are acceptable. Furthermore the stakeholder consultation process has been appropriately described in the PDD.

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Draft report clarification requests and corrective action requests by determination team	Ref. To check-list in table 2	Summary of project owner response	Determination team conclusion
		“Sem’ Dney” dated 22.11.2007. The material comprises a brief description of technical, economic and ecological aspects of the Project. The publication led to no comments from the readers.	

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Table 4: Methodology checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General requirements for baseline and monitoring methodologies					
A.1. Is the methodology internally consistent (i.e. the applicability, project boundary, baseline emissions estimation procedure, project emission estimation procedure, leakage and monitoring)?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	Project participant has developed a project specific methodology. The developed methodology is applicable for determination of emission reductions which result from the retrofit of the oxygen compressor plant. By doing this project participant has applied the Combined tool to identify the baseline scenario and demonstrate additionality" Version 02.1 ("Combined Tool"). The incorporation of the main steps of the Combined Tool is considered to be appropriate because this tool also defines a procedure to identify the baseline scenario and simultaneously demonstrate the additionality. The determination team has reviewed the methodology and it could be concluded that the elaborated methodology defines the project boundary the applicability, project boundary, baseline emissions estimation procedure, project emission estimation procedure, leakage and monitoring. This structure of the methodology reflects the requirements of the Guidance for criteria for baseline setting and monitoring and hence is considered to be consistent.	OK	OK
A.2. Has the baseline scenario identification a clear and concise presentation of methodological steps?	PDD /CT/ /JI-G/ /H-1/	DR	Yes, the baseline scenario identification follows a clear and transparent algorithm. It has been concluded that baseline scenario identification has a clear and concise presentation of methodological steps.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/H-2/ /H-3/				
A.3. Has the additionality section a clear and concise presentation of methodological steps?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	Ok The additionality is in line with provisions of the Combined tool to identify the baseline scenario and demonstrate additionality" Version 02.1 ("Combined Tool").	OK	OK
A.4. Has the emission reduction calculation section provided all relevant formula and are all used variables adequately explained?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	Yes, in the section D the algorithm to calculate emission reduction has been provided in a clear manner. The formulae to be applied for calculation of baseline, project and leakage emissions have been provided in the corresponding sections of the PDD. The calculation approach has been assessed by the determination team and it could be proved that the applied formula lead to a appropriate and conservative determination of emission reductions.	OK	OK
B. Baseline Setting *1. The baseline is assessed to be a scenario that reasonably represents the anthropogenic*					

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
emissions by sources or anthropogenic removals by sinks of GHGs that would occur in the absence of the JI project. The baseline shall cover emissions from all gases, sectors and source categories listed in Annex A of the Kyoto Protocol, and anthropogenic removals by sinks, within the project boundary.					
B.1. Establishing of a baseline					
B.1.1. Is the baseline established in a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	The step-wise approach to identify the baseline scenario has been developed by the project participant on a **project specific basis.** The developed methodology for baseline setting and additionality justification has been established in a transparent manner with regard to the **choice of approaches**. By doing this project participant has applied the Combined tool to identify the baseline scenario and demonstrate additionality" Version 02.1 ("Combined Tool"). The incorporation of the main steps of the Combined Tool is considered to be appropriate because this tool also defines a procedure to identify the baseline scenario and simultaneously demonstrate the additionality.	OK	OK
B.1.2. Is the baseline established taking account of uncertainties and using conservative assumptions?	PDD /CT/ /JI-G/ /H-1/ /H-2/	DR	Yes, the project specific methodology takes into account uncertainties and using conservative assumptions. This is mainly subject to the interpretation of the scientific literature and other data sources applied within the baseline/additionality justification. The determination team has reviewed the corresponding	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/H-3/ /H-4/ /H-5/		documents and could verify the conservative nature of the analysis. For details please refer to the assessment of the baseline/additionality justification.		
B.1.3. Is the baseline established in such a way that ERUs cannot be earned for decreases in activity levels outside the project activity or due to force majeure?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	Yes, The determination team is of the opinion that the baseline is determined in such a way that emission reduction units (ERUs) cannot be earned for **decreases in activity levels** outside the project activity or due to force majeure. The emission reduction is determined based on the comparison of the electricity consumption between the project and baseline scenario. The operation of the equipment in the baseline scenario has been elaborated in a conservative manner taking into account rules and regulations relevant for operation of the oxygen compressor plant. The provided operation conditions has been substantiated by the corresponding evidences and assessed as reasonable.	OK	OK
B.1.4. Is the baseline scenario established by identifying and listing plausible future scenarios on the basis of conservative assumptions and identifying the most plausible one?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Yes, please refer to the assessment under B.1.1. The procedure for baseline identification is presented in the PDD.	OK	OK
B.1.5. Is the baseline established on a project specific basis and/or using a	PDD	DR	The baseline established on a project specific basis.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
multi-project emission factor?	/CT/ /JI-G/ /H-1/ /H-2/ /H-3/				
B.1.5.1. If a multi-project emission factor is applied, is it ensured that: (a) the physical characteristics of the sector justify the application of a standard emission factor across the sector (e.g. in the case of an integrated electricity network with no major transmission constraints, the physical characteristics of the system may imply that the impact of a project on emissions can be assessed irrespective of its location); and/or (b) The emissions intensity does not vary significantly across the sector (e.g. in the	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	N/A	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
case of diesel power generation in off-grid electricity systems, the emission factor for electricity generation may be based on standard factors with a reasonable degree of accuracy)?					
B.1.5.2. If a project specific emission factor is applied, is it ensured that the baseline is established in accordance of appendix B of the JI guidelines?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	Yes the baseline is established in accordance with requirements of Appendix B of the JI Guidelines. In particular, - in a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors; - taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector; - in such a way that emission reduction units (ERUs) cannot be earned for decreases in activity levels outside the project activity or due to force majeure; - taking account of uncertainties and using conservative assumptions. For details please refer to the comments under B.1.1. Furthermore particular provisions of the Guidance on criteria for baseline setting and monitoring as per the Annex 6 of JISC 4 have been appropriately addressed. For details please refer to the comments made already in this section.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.1.6. Is the baseline established in a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	For details please refer to the comments under B.1.1.	OK	OK
B.1.7. Is the baseline established by use of the standard variables contained in appendix B of the "Guidance on criteria for baseline setting and monitoring"?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Yes, in the course of determination team has reviewed the **variables** as indicated in the PDD and it could be proved that standard variables as indicated in appendix B of the "Guidance on criteria for baseline setting and monitoring" have been applied.	OK	OK
B.1.8. Is the baseline established taking national and/or sectoral policies and circumstances into account like:	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	OK The project specific methodology makes provisions for taking into account **relevant national and/or sectoral policies** and circumstances. Evaluation of legal aspects (i.e. laws and regulations for associated operation of the air separation units) is a obligatory in the context of baseline identification.	OK	OK
B.1.8.1. Sectoral reform policies?	PDD /CT/	DR	OK the project participant has investigated the laws and regulation which were valid at the time of the project starting date. Furthermore project participant has evaluated the legal	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/		aspects valid at the time of determination of the project activity. Laws, licences, (industrial) agreements and standards which regulate, prohibit or implicitly restrict alternative scenarios have been addressed in the context of baseline and additionality justification. All identified baseline alternatives are in compliance with all applicable legal and regulatory requirements.		
B.1.8.2. 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)?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	Establishing of the baseline has been made on a detail analysis and projection of the future oxygen demand for the steel making process. The forecast has been carried out by the in-house experts of the project participant and the main results are provided in the PDD. Within the site visit determination team has reviewed this analysis based on the documentation as provided by the project participant and it a sufficient confidence could be gained that the analysis has been appropriately carried out.	OK	OK
B.1.8.3. Availability of capital?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Baseline has been established based on the examination of barriers. Within the barrier analysis project participant has demonstrated that without ERU benefits the project activity would not be implemented. It could be shown that the impact of ERU benefit makes the project activity alleviates the barriers subject to the risk of the technological failure. Availability of capital has a less significant effect on the baseline justification.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.1.8.4. Local availability of technologies, skills and know-how and availability of best available technologies in the future?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Local availability of technologies has been taken into account within the baseline determination. Project participant has demonstrated that at the time where the project has started similar technologies or practices for oxygen generation have not been diffused in the relevant sector and geographical area. Though similar activities have been observed the essential distinctions between the proposed project activity and similar activities could be reasonably be explained, the proposed project activity can be considered as additional.	OK	OK
B.1.8.5. Fuel prices and availability?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Baseline scenario is the construction of the air separation units of a similar design. For details please refer to the assessment of the baseline determination.	OK	OK
B.1.8.6. National and/or subnational expansion plans for the energy sector, as appropriate?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	National and/or subnational expansion plans for the energy sector are directly or indirectly reflected within the national laws and regulations. For this reason they have been also indirectly taken into account within evaluation of legal aspects and the baseline determination.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.1.8.7. National and/or subnational forestry or agricultural policies, as appropriate?	PDD /CT/	DR	National and/or subnational forestry or agricultural policies are not relevant in the context of the project activity.	OK	OK
B.1.9. Have the project participants justified the choice of the baseline?	PDD	DR	Yes, please refer to the assessment of the baseline determination in the determination report.	OK	OK
B.1.10. In case the baseline approach differs from approaches already chosen in comparable projects (same GHG mitigation measure, same country, similar technology, similar scale) positively determined by an AIE, are the differences clearly explained and reasonably justified?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Determination team has reviewed a list of already registered CDM project activities which involve similar measures for reducing electricity consumption. It could be concluded that neither the baseline approach, nor the identified baseline differs significantly from approaches already chosen in comparable projects.	OK	OK
B.2. Project boundary					
B.2.1. Does the project boundary encompass all anthropogenic emissions by sources that are (a) under the control of the project participants (b) reasonably attributable to the project activity (c) significant (i.e. emissions should account for more than 1 % or exceed	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	The project´s spatial and system boundaries are clearly defined in the project documentation. The spatial extent of the project boundary includes the project site, and all the energy consumers connected physically to the power grid. The boundary definition encompasses all anthropogenic emissions by sources that are under the control of the project participants.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
an amount of 2000 tCO_{2e}/a)					
B.2.2. Is the delineation of the project boundary and the gases and sources/sinks included described and justified in the relevant JI PDD by use of a figure or flow chart?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	Definition of the project boundary as presented in section B.3. in **text form** (explanations), table form and as schematic illustration has been reviewed . Both the relevant equipment and the GHG emissions have been appropriately identified and included in the project boundary The delineation of the project boundary is defined in the PDD (section B.3.) All GHG emissions have been appropriately and transparent summarized in the corresponding **table**. The table applied in the PDD summarizes the source, GHG type, information whether included or not and a commentary. The table form and information to be provided is consistent with table templates used within the CDM methodologies. For this reason it is considered as appropriate. Furthermore a **schematic illustration** of the project activity including the information about the equipment has been provided in the section B.3. of the PDD. Schematic illustration is clear and transparent.	OK	OK
B.2.3. Are all gases and sources/sinks included explicitly stated?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Yes, all gases and GHG emission sources attributable to the project activity have been appropriately identified. Determination team has come to an opinion that all relevant GHG emission sources have been appropriately included in the project boundary.	OK	OK
B.2.4. Are exclusions of any	PDD	DR	OK, the main emission source are the CO2 emissions within the	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
sources/sinks related to the baseline or the project justified?	/CT/		Ukranian power grid.		
B.3. Assessment of leakage					
B.3.1. Is leakage (i.e. the net change of anthropogenic emissions by sources and/or removals by sinks of GHGs which occurs outside the project boundary, and that can be measured and is directly attributable to the JI project.) clearly addressed or the negligence of leakage clearly justified?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	According to the PDD leakage emissions have not been identified. The determination team has examined all potential leakage emissions that could occur due to the project activity outside the project boundary. It could be concluded that leakage has been appropriately exceluded from further consideration	OK	OK
B.3.2. In case leakage is attributable to the project, is a procedure provided for ex ante calculation and is the leakage quantified?	PDD	DR	N/A	OK	OK
C. Additionality *2. In accordance with Article 6 of the Kyoto Protocol a joint implementation project has to provide a reduction in emissions by sources, or an enhancement of net removals by sinks that is additional to any that would otherwise occur.* 3.					
C.1. Is the additionality of the proposed JI project activity demonstrated and justified?	PDD /CT/	DR	OK The developed project specific approach draws upon the step-	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/		wise approach as per the "**Combined tool to identify the baseline scenario and demonstrate additionality**" ("Combined Tool"). The incorporation of the main steps of the Combined Tool is considered to be appropriate because this tool also provides for a step-wise approach to identify the baseline scenario and simultaneously demonstrate additionality. Also a similar approach is required by methodologies developed for similar project activities. It has been concluded that the additionality has been justified in a appropriate manner and in line with provisions of the Combined Tool.		
C.2. Is one of the following approaches applied:					
C.2.1. Application of the most recent version of the "Tool for the demonstration and assessment of additionality" approved by the CDM Executive Board?					
C.2.2. Application of any other method for proving additionality approved by the CDM Executive Board?	PDD /CT/ /JI-G/ /H-1/	DR	Ok Please refer to the comment under C.1. and the additionality assessment in the report.	OK	OK
C.2.3. Provision of traceable and transparent information showing that	PDD /CT/	DR	Yes, the baseline identification is based on the basis of conservative assumptions. These are the evaluation of legal aspects and evaluation of the barriers in comparison to the	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to reductions of anthropogenic emissions by sources or enhancements of net anthropogenic removals by sinks of GHGs?	/JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/		baseline scenario.		
C.2.4. Provision of traceable and transparent information that an accredited independent entity has already positively determined that a comparable project (to be) implemented under comparable circumstances (same GHG mitigation measure, same country, similar technology, similar scale) would result in a reduction of anthropogenic emissions by sources or an enhancement of net anthropogenic removals by sinks that is additional to any that would otherwise occur and a justification why this determination is relevant for the project at hand?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	DR	The determination team has reviewed a list of already registered CDM project activities which involve similar measures for reduction of the electricity consumption. It could be concluded that neither the baseline/additionality approach, nor the identified baseline differs from approaches already chosen in comparable projects.	OK	OK
D. Crediting Period 4.					
D.1. Has the project started on or after 2000-01-	PDD	DR	Project has been commissioned in 2007 – after 2000-01-01. The	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
01?	/CT/ /JI-G/ /H-1/ /H-2/ /H-3/		starting date as per the PDD is 2004. In the course of determination project participant has provided sufficient evidences for the project starting date. These evidences have been reviewed and the accurateness of the project starting date could be proved/FS/*.		
D.2. Will the crediting period start after 2008-01-01?	PDD /CT/ /JI-G/	DR	Yes, as per the PDD crediting period starts on 2008-02-19 and hence is appropriate.	OK	OK
D.3. Will the crediting period start on or after the date the first emission reductions or enhancements of net removals are generated by the project activity?	PDD /CT/ /JI-G/	DR	The crediting period starts not after the date of commissioning and testing phase. Hence not before the first emission reduction.	OK	OK
E. Monitoring *5. A monitoring plan for the monitoring and reporting of GHG emissions, emission reductions and/or removals of emissions by sinks acc. to para 4 – 6 JI Guidelines has to be provided.* 6.					
E.1. Is a monitoring plan in place that provides for the collection and archiving of all relevant data necessary for estimating or measuring anthropogenic emissions by	PDD /CT/ /JI-G/	DR	A project specific monitoring has been developed for this project activity. During the on-site visit the accurate measurement and recording frequency (i.e. archiving in log book) could be observed. The	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
sources and/or anthropogenic removals by sinks of GHGs occurring within the project boundary during the crediting period?	/H-1/ /H-2/ /H-3/ /H-4/ /H-5/		determination team has reviewed the log books and checked the plausibility of the recorded figures. The monitoring of the power consumption could be assessed as accurate and appropriate. The recorded figures have been cross checked with aggregated data in electronic form and it could be verified that the monitoring of net power consumption has been established in an appropriate and accurate manner. In the course of determination it could be proved that the accuracy class and the calibration procedures of the electricity meters are as per the provided technical specification and calibration norms for power meters. This data is also in line with information provided in the PDD. Calibration has been also assessed as appropriate for the corresponding meter types and in line with provided calibration and maintenance norms and procedures. It could be concluded that the monitoring plan provides for the collection and archiving of all relevant data necessary for estimating or measuring anthropogenic emissions by sources. For details please refer to the assessment in the section 4.2.4 of the report.		
E.2. Is a monitoring plan in place that provides for the identification of all potential sources of, and the collection and archiving of data on increased anthropogenic emissions by sources and/or reduced anthropogenic removals by sinks of GHGs outside the project	PDD /CT/ /JI-G/ /H-1/ /H-2/	DR	OK Please refer to the comment above	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
boundary that are significant and reasonably attributable to the project during the crediting period?	/H-3/				
E.3. Is a monitoring plan in place that provides for the collection and archiving of information on environmental impacts, in accordance with procedures as required by the host Party, where applicable?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Collection and archiving of information on environmental impacts after implementation of the project activity is not required. Assessment of environmental impacts before project implementation is required and has been also appropriately carried out.	OK	OK
E.4. Is a monitoring plan in place that provides for quality assurance and control procedures for the monitoring process?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Yes, the monitoring plan provides for quality assurance and control procedures for the monitoring process and equipment. The accuracy class of all metering equipment is in line with national standards and norms. Technical specification for the metering equipment has been provided and the consistence could be proved.	OK	OK
E.5. Is a monitoring plan in place that provides for procedures for the periodic calculation of the reductions of anthropogenic emissions by sources and/or enhancements of anthropogenic removals by sinks by the proposed JI project, and for leakage effects, if any?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Yes, monitoring plan is in place that provides for procedures for the periodic calculation of the reductions of anthropogenic emissions by sources.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.6. Is a monitoring plan in place that provides for documentation of all steps involved in the calculations referred to in paragraphs 4 (b) and (f) of appendix B of the JI guidelines?	PDD /CT/ /JI-G/	DR	Yes, the monitoring plan provides the documentation and archiving of all steps and measurements required to calculate emission reductions.	OK	OK
E.7. Are all relevant factors and key characteristics that will be monitored clearly described (incl. also all decisive factors for the control and reporting of project performance)?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	OK All relevant factors and key characteristics that will be monitored are clearly described	OK	OK
E.8. Are the indicators, constants and variables used specified?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR		OK	OK
E.8.1. Are the indicators, constants, variables and/or models used reliable and valid and provide a transparent picture of the emission reductions or enhancements of net removals (to be) monitored?	PDD /CT/ /JI-G/ /H-1/ /H-2/	DR	OK For details please refer to the assessment of the monitoring plan in the section 4.2.4 of the report.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/H-3/				
E.8.2. Are the project-specific indicators used, to the extent possible, indicators that are already used in normal business practice and/or have to be reported e.g. to local authorities?	PDD /CT/ /JI-G/ /H-3/	DR	OK For details please refer to the assessment of the monitoring plan in the section 4.2.4 of the report.	OK	OK
E.8.3. Are leakage indicators used data from suppliers/utilities and/or available public statistics and/or surveys?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	OK For details please refer to the assessment of the monitoring plan in the section 4.2.4 of the report.	OK	OK
E.8.4. Are default values used in the project? Are accuracy and reasonableness carefully balanced in the selection of default values? Are default values chosen from recognized sources, be supported by statistical analyses providing reasonable confidence levels and be presented in a transparent manner?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	OK For details please refer to the assessment of the monitoring plan in the section 4.2.4 of the report.	OK	OK
E.9. Are the standard variables, given in Appendix B of the Guidance on Criteria for Baseline Setting and Monitoring	PDD /CT/	DR	OK The standard variables, given in Appendix B of the Guidance on Criteria for Baseline Setting and Monitoring have been used?	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
used?	/JI-G/ /H-1/ /H-2/ /H-3/				
E.10. Are the methods employed for data monitoring (including its frequency) and recording clearly described?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Methods employed for data monitoring (including its frequency) and recording clearly are described	OK	OK
E.11. Are procedures for quality assurance and control for the monitoring process provided (This includes, as appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept and made available on request)?	PDD /CT/	DR	Ok Procedures for quality assurance and control for the monitoring process are provided and deemed duly elaborated.	OK	OK
E.12. Are the responsibilities and the authority regarding the monitoring activities clearly identified?	PDD /CT/	DR	Yes, the responsibilities and the authority regarding the monitoring activities are clearly identified and stated in the PDD.	OK	OK
E.13. Is a complete compilation of the data that needs to be collected for its application provided (This includes data that is measured or sampled and data that is	PDD /CT/ /JI-G/	DR	Yes, the complete compilation of the data that needs to be collected for its application is provided.	OK	OK

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collected from other sources (e.g. official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature etc.). Data that is calculated with equations should not be included in the compilation. The information in the monitoring plan shall be provided in tabular form)?	/H-1/ /H-2/ /H-3/				
E.14. If a national or international monitoring standard has to be and/or is applied to monitor certain aspects of the project, is this standard identified and a reference as to where a detailed description of the standard can be found provided?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	N/A	OK	OK
E.15. If statistical techniques are used for monitoring, are these documented and used in a conservative manner?	PDD	DR	N/A	OK	OK
E.16. Will the data monitored and required for determination according to paragraph 37 of the JI guidelines be kept for two years after the last transfer of ERUs for the project?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	OK The data monitored and required for determination according to paragraph 37 of the JI guidelines will be kept for two years after the last transfer of ERUs for the project	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
F. Estimations and Calculations used in the baseline and the monitoring plan *7. The emission reductions or enhancements of net removals generated by the project have to be estimated ex ante in the project design document (PDD) of the project and calculated ex post according to the monitoring plan included in the PDD*					
F.1. General issues					
F.1.1. Are the emission reductions or enhancements of net removals generated by the project estimated ex ante in the project design document (PDD) of the project and procedures provided for ex post calculation according to the monitoring plan **on a project specific basis?**	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	OK The emission reductions generated by the project are estimated ex ante in the project design document (PDD) of the project and procedures provided for ex post calculation according to the monitoring plan on a project specific basis.	OK	OK
F.1.2. Are the emission reductions or enhancements of net removals generated by the project estimated ex ante in the project design document (PDD) of the project and procedures provided for ex post calculation according to the monitoring plan **at least from the beginning until the end of the**	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	OK The emission reductions have been estimated from the beginning until the end of the crediting period.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
crediting period?					
F.1.3. Are the emission reductions or enhancements of net removals generated by the project estimated ex ante in the project design document (PDD) of the project and procedures provided for ex post calculation according to the monitoring plan **on a source-by-source/sink-by-sink basis?**	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	OK The emission reductions generated by the project are estimated ex ante in the project design document (PDD) of the project and procedures provided for ex post calculation according to the monitoring plan on a source-by-source/sink-by-sink basis.	OK	OK
F.1.4. Are the emission reductions or enhancements of net removals generated by the project estimated ex ante in the project design document (PDD) of the project and procedures provided for ex post calculation according to the monitoring plan **in tonnes of CO_2 equivalent, using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5 of the Kyoto Protocol?**	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	OK The emission reductions generated by the project are estimated ex ante in the project design document (PDD) of the project and procedures provided for ex post calculation according to the monitoring plan in tonnes of CO_2 equivalent.	OK	OK
F.1.5. Is it ensured that the description of emission reductions or enhancements of net removals is consistent with the monitoring plan?	PDD /CT/ /JI-G/	DR	OK The description of emission reductions is consistent with the monitoring plan	OK	OK
F.2. Algorithms and formulae used					

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F.2.1. Are the underlying rationale for the algorithms / formulae (e.g. marginal vs. average etc.) explained?	PDD /CT/ /JI-G/	DR	OK The underlying rationale for the algorithms / formulae for determination of the calculated values are explained in the PDD	OK	OK
F.2.2. Have consistent variables, equation formats, subscripts etc. been used?	PDD	DR	Ok The variables, equation formats, subscripts have been used consistently throughout the PDD.	OK	OK
F.2.3. Are all equations numbered?	PDD /CT/ /JI-G/	DR	All equations are numbered	OK	OK
F.2.4. Are all variables, with units indicated, defined;	PDD /CT/ /JI-G/	DR	All variables, with units are indicated and defined.	OK	OK
F.2.5. Is the conservativeness of the algorithms / procedures justified (To the extent possible, methods to quantitatively account for uncertainty in key parameters should be included)?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Conservativeness of the algorithms / procedures is justified. In particular please refer to the specific electricity consumption in the baseline scenario.	OK	OK
F.2.6. Are any parts of the algorithms or formulae that are not self-evident clearly explained (It should be	PDD /CT/ /JI-G/	DR	A clear and appropriate explanation is provided for all formulae and algorithm.	OK	OK

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justified that the procedure is consistent with standard technical procedures in the relevant sector. References should be provided as necessary)?	/H-1/ /H-2/ /H-3/				
F.2.7. Are implicit and explicit key assumptions explained in a transparent manner (It should be clearly stated which assumptions and procedures have significant uncertainty associated with them, and how such uncertainty is to be addressed)?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	All assumptions are explained in a transparent manner.	OK	OK
F.3. Parameters, coefficients and variables used					
F.3.1. For those values that are to be provided by the project participants, is it clearly indicated how the values are to be selected and justified, for example, by explaining:	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Values that are to be provided by the project participants the process of data collection including the source of data is clearly indicated and justified. The main monitoring parameter is the electricity consumption and the oxygen generation.	OK	OK
F.3.1.1. What types of sources are suitable (official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature	PDD /CT/ /JI-G/	DR	Appropriate data sources have been applied in the PDD.	OK	OK

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etc.)?	/H-1/ /H-2/ /H-3/				
F.3.1.2. The vintage of data that is suitable (relative to the project's crediting period)?	PDD /CT/ /JI-G/	DR	The vintage of data is consistent with the time frame of the implementation of the project activity.	OK	OK
F.3.1.3. What spatial level of data is suitable (local, regional, national, and international)?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Mainly metallurgical sector of Ukraine has been appropriately identified as a spatial level of data.	OK	OK
F.3.1.4. How conservativeness of the values is to be ensured?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	Conservativeness of the algorithms / procedures is justified. In particular please refer to the specific electricity consumption in the baseline scenario.	OK	OK
F.3.2. For other values:	PDD /CT/	DR	Grid emission factor for the Ukrainian grid (0.896 tCO2/MWh) is based on the standardized emission factors for the Ukrainian electricity grid as determined by the Global Carbon B.V. and	OK	OK

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	/JI-G/ /EF/		verified by TUV SÜD/EF/. The documents have been checked and the value applied in the calculation could be proved.		
F.3.2.1. Are the precise references from which these values are taken clearly indicated (e.g. official statistics, IPCC Guidelines, commercial and scientific literature)?	PDD /CT/	DR	Please refer to the comment above	OK	OK
F.3.2.2. Is the conservativeness of the values provided justified?	PDD	DR	Please refer to the comment above	OK	OK
F.3.3. Are procedures provided for all data sources, to be followed if expected data are unavailable (For instance, it could be pointed to a preferred data source (e.g. national statistics for the past 5 years), and indicated a priority order for use of additional data (e.g. using longer time series) and/or fall back data sources to preferred sources (e.g. private, international statistics etc))?	PDD /CT/ /JI-G/ /H-1/ /H-2/ /H-3/	DR	The main monitoring parameters are based on the internal sources and are to be provided and collected by the project participant. It is expected the study on grid emission factor in Ukrainian power grid will be updated.	OK	OK
F.3.4. Are International System Units (SI units) used?	PDD	DR	OK	OK	OK
F.3.5. Are the standard variables given in Appendix B Guidance on Criteria for baseline setting and monitoring	PDD /CT/	DR	OK, The standard variables given in Appendix B Guidance on	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
used?			Criteria for baseline setting and monitoring are used		

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