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Determination Report

for **ArcelorMittal Flat Carbon S.A.**

DETERMINATION OF THE JI TRACK-1 PROJECT:

"Energy efficiency investment program at OJSC ArcelorMittal Steel Kryviy Rih", Ukraine

REPORT NO. 1155637

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TÜV SÜD Industrie Service GmbH

Carbon Management Service
Westendstr. 199 - 80686 Munich – GERMANY

Report No.	Date of first issue	Revision No.	Date of this revision	Certificate No.
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Subject: Determination of a JI Track-1 Project

Accredited TÜV SÜD Unit:	**TÜV SÜD Contract Partner:**
TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199, 80686 Munich Germany	TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199, 80686 Munich Germany
Client: ArcelorMittal Flat Carbon S. A. 19, avenue de la Liberté, L-2930 Luxembourg	**Project Site**(s)**:** OJSC ArcelorMittal Steel Kryviy Rih 1, Ordzhonikidze Street, Kryviy Rih 50095 Ukraine

Project Title: Energy efficiency investment program at OJSC ArcelorMittal Steel Kryviy Rih

Applied Methodology(s)**:**	**Scope**(s)**:**	**TA**(s):
AMS-II.A (version 09), AMS-II.C (version 09), ACM0009 (version 03), ACM0012 (version 03).	1, 2, 3, 4	1.2, 2.1, 3.1, 4.1

First PDD Version:		**Final PDD version:**	
Date of issuance:	2007-07-23	Date of issuance:	2009-08-04
Version No.:	01	Version No.:	04
Starting Date of GSP	2008-04-11		

Annual average estimated emission reduction: 320,740 ton CO_{2e}

Assessment Team Leader:	**Further Assessment Team Members:**
Mr. Thomas Kleiser	Mr. Konrad Tausche Ms. Anna Peretykina Ms. Olena Maslova Mr. Konstantin Agamirzov

Summary of the Determination Opinion:

☒ The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of all stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the JI as well as all the requirements set by the host country (Ukraine) for approving projects under JI Track 1. Hence, TÜV SÜD will recommend the project for further approval and registration by the responsible DFP.

☐ The review of the project design documentation and the subsequent follow-up interviews have not provided TÜV SÜD with sufficient evidence to determine the fulfilment of all stated criteria. Hence TÜV SÜD will not recommend the project for registration by the JISC and will inform the project participants and the JI Supervisory Committee on this decision.

Abbreviations

ACM	Approved Consolidated Methodology
AIE	Accredited Independent Entity
AMKR	ArcelorMittal Steel Kryviy Rih
ASU	Air Separation Unit
BF	Blast-furnace
BFG	Blast-furnace Gas
CAR	Corrective Action Request
COG	Coke-oven Gas
CR	Clarification Request
DFP	Designated Focal Point
EBRD	European Bank for Reconstruction and Development
EEIP	Energy Efficiency Investment Program
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
EIAUS	Energy Information Administration, Official Energy Statistics from the U.S. Government
ER	Emission Reduction
ERU	Emission Reduction Unit
GDP	Gross Domestic Product
GHG	Greenhouse gas(es)
GSP	Global stakeholder process
HPP	Heat and Power Plant
HV	High Voltage
IRR	Internal Rate of Return
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
KP	Kyoto Protocol
LoA	Letter of Approval
LoE	Letter of Endorsement
MP	Monitoring Plan
MSKR	Mittal Steel Kryviy Rih, OJSC (former plant operator and PP mentioned in the PIN)

N/A	not applicable
NCF	Net Calorific Value
NG	Natural Gas
NPV	Net Present Value
PDD	Project Design Document
PIN	Project Idea Note
PP	Project Participant
SP	Sub-Project (SP1, SP2 ... SP8)
TBD	To be determined
TG	Turbo Generator
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual, IETA/World Bank (PCF)
WACC	Weighted Average Capital Cost

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1. INTRODUCTION

1.1 Objective

The Determination objective is an independent assessment by a Third Party - Accredited Independent Entity (AIE) - of a proposed project activity against all defined criteria set for the registration under the Joint Implementation (JI). Determination is part of the JI project cycle and will finally result in a conclusion by the executing AIE whether a project activity is valid and should be submitted for registration to the Joint Implementation Supervisory Committee (JISC). The ultimate decision on the registration of a proposed project activity rests at the JISC and the Parties involved.

The project activity discussed by this Determination report has been submitted under the project title: “Energy efficiency investment program at OJSC ArcelorMittal Steel Kryviy Rih”.

1.2 Scope

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. In the case of JI project activities the scope is set by:

- The Kyoto Protocol, in particular § 6;
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords);
- Further COP/MOP decisions with reference to the JI (e.g. decisions 4 – 8/CMP.1);
- Specific guidance and decisions by the JISC published under http://ji.unfccc.int;
- Guidelines for users of the JI PDD form;
- Baselines and monitoring methodologies (including GHG inventories);
- Management systems and auditing methods;
- (Host country) Environmental issues relevant to the sectoral scope;
- Applicable environmental and social impacts and aspects of JI project activity;
- Sector specific technologies and their applications:
- Current technical and operational knowledge of the specific sectoral scope and information on best practice.

The determination scope is defined as an independent and objective review of the project design documents (PDD) and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

TÜV SÜD has, based on the recommendations in the Validation and Verification Manual (2003), employed a risk-based approach in the determination, focusing on the identification of significant risks for project implementation and the generation of emission reductions.

Initial version of the PDD document was made publicly available via TÜV SÜD’s own Internet platform www.netinform.de as well as on the UNFCCC JISC webpage for a 30 day global stakeholder consultation process. According to CARs and CRs indicated in the audit process the client decided to revise the PDD. The final PDD formed the basis for the final evaluation as presented by this report.

2. METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual (2003), an initiative of Designated and Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure assessment approach, an analysis of the project was made in accordance with VVM (2003) requirements. The stated criteria (requirements) from this guidance were discussed via risen of so called corrective action and clarification requests. The PPs responses and the assessment team conclusions on the identified criteria are summarized in Table 1 of Annex 1 named “Resolution of Corrective Action and Clarification Requests”, which 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 validator will document how a particular requirement has been validated and the result of the Determination.

The Annex 1 consists of two tables. The different columns in these tables are described in the figure below.

Determination Protocol Table 1: Resolution of Corrective Action and Clarification Requests			
Clarification and corrective action requests	**Ref. to PDD, IRL**	**Summary of project owner response**	**Determination team conclusion**
Conclusions from the PDD reviews are either are CAR, CR and OI; these should be listed in this section.	*Reference to the PDD chapter, to the document or to some specific requirement of the JI mechanism (e.g. additionality) related to the issued CAR, CR or OI.*	*The responses given by the client or other PPs during the communications with the Determination team should be summarised in this section.*	*This section should summarise the determination team’s responses and final conclusions.*

In case of a denial of the project activity more detailed information on this decision will be presented in table 3.

Determination Protocol. Table 2: Unresolved Corrective Action and Clarification Requests		
Clarification and corrective action requests	**Id. of CAR/CR**	**Explanation of the Conclusion for Denial**
If the final conclusions from table 1 results in a denial the referenced	*Identifier of the Request.*	*This section should present a detail explanation, why the project is finally considered not to be in compliance with a criterion.*

request should be listed in this section.		

2.1 Appointment of the Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD Certification Body "climate and energy". The composition of an assessment team has to be approved by the Certification Body ensuring that the required skills are covered by the team. The TÜV SÜD Certification Body operates four qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL);
- Greenhouse Gas Auditor (GHG-A);
- Greenhouse Gas Auditor Trainee (T);
- Experts (E).

It is required that the sectoral scope linked to the methodology has to be covered by the assessment team. The Determination team was consisting of the following experts (the responsible Assessment Team Leader is written in bold letters):

Name	Qualification	Coverage of technical scope	Coverage of TA	Host country experience
Thomas Kleiser	**ATL**	☑ all	☑ all	
Konrad Tausche	ATL	☑ 1, 4	☑ 1.2	
Anna Peretykina	GHG-A			☑
Olena Maslova	GHG-A	☑ 1, 4		☑
Konstantin Agamirzov	T	☑ 2, 4		☑

Thomas Kleiser is the Assessment Team Leader of the project with a background in physics and meteorology. Till 31th of December 2008 he was head of the division CDM and JI at TÜV SÜD Industrie Service GmbH conducting more than 90 validations and verifications of CDM and JI projects. In this position he was responsible for validation, verification and certifications processes for GHG mitigation projects as well as trainings for internal auditors. Since 1st of January he is head of the "Certification Body" of TÜV SÜD.

Konrad Tausche is deputy head of the department "TUV SUD Carbon Management Service" and located in the head quarter in Munich. Because of his long term experience in environmental measurement technique he works as a GHG auditor with a special focus on the scope "Industrial Gases". The former head of department environmental measurement technique at the Frankfurt office of TUV SUD Industrie Service GmbH supports the team since Dec.2006. He has an academic background in physical and chemical engineering. An additional economic study was completed with the academic degree of a Master of Business Administration and Engineering (MBA and Eng.).

Anna Peretykina is an auditor in the "Carbon Management Service" department of TÜV SÜD Industrie Service GmbH in Hamburg, Germany. She is environmental engineer and expert for projects in Russian Federation and Commonwealth of Independent States at the department "TÜV SÜD Carbon Management Service" based in the TÜV SÜD Hamburg office.

Olena Maslova is an auditor in the "Carbon Management Service" department of TÜV SÜD Industrie Service GmbH in Munich, Germany. She is chemical engineer and host country expert for projects in Ukraine and Commonwealth of Independent States. Olena Maslova specializes in the assessment of JI/CDM projects in the sector of chemical industries and waste handling and disposal.

Konstantin Agamirzov is an auditor in training in the "Carbon Management Service" department of TÜV SÜD Industrie Service GmbH in Munich, Germany. He is microwave/radio electronic engineer and host country expert for project in Russian Federation, Ukraine and Commonwealth of Independent States in the department. Konstantin Agamirzov specialized in the assessment of JI/CDM projects in energy distribution and manufacturing industry as well as in project management.

2.2 Review of Documents

A first version of the PDD was submitted to the AIE in April 2008. The first PDD version submitted by the PP and additional background documents related to the project design and baseline were reviewed to verify the correctness, credibility and interpretation of the presented information, furthermore a cross check between information provided and information from other sources (if available) have been done as initial step of the validation process. A complete list of all documents and proofs reviewed is attached as Annex 2 to this report.

2.3 Follow-up interviews

In the period of June 10-12, 2008 TÜV SÜD performed interviews on-site with project stakeholders to confirm selected information and to resolve issues identified in the first document review. The table below provides a list of all persons interviewed in the context of this on-site visit.

Name	Organization
Beatrice Humbert	ArcelorMittal, Energy & Carbon projects, Manager
Alex Churilov	ArcelorMittal, Energy projects, Manager
Evgenio Ferro	MWH SpA, Energy Manager
Marco Baldini	MWH SpA, Energy Department, Project Engineer
Bashta V. A	AMKR, Director of energy department
Volkov V. F.	AMKR, Deputy director responsible for efficient use of fuel energy resources
Kamenev A. I.	AMKR, Chief Engineer of Energy department
Tryapichkina T. G.	AMKR, Manager responsible for fuel & energy resources norms
Yefremov A. V.	AMKR, Manager responsible for distribution & account of fuel & energy resources
Maksimenko L.G.	AMKR, Environmental Department, Head of department

Golovetskaya E.N.	AMKR, Environmental Department, Lead specialist /emission protection
Yerokhin O.O.	AMKR, Energy Department, secretary and interpreter
Elena	Arena Eco: Agency for rational Energy Use and Ecology, Deputy Executive director

2.4 Further cross-check

During the determination process, the team makes reference to available information related to similar projects or technologies as the JI project activity. The documentation has also been reviewed against the approved methodology/ies applied to confirm the appropriateness of formulae and correctness of calculations.

2.5 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the Determination is to resolve the requests for corrective actions and clarifications and any other outstanding issues which needed to be clarified for TÜV SÜD positive conclusion on the project design. The Corrective Action Requests (CARs) and Clarification Requests (CRs) raised by TÜV SÜD were resolved during communication between the PPs and TÜV SÜD. To guarantee the transparency of the determination process, some concerns raised and responses that have been given are summarized below in this Report and documented in more detail in the Annex 1, some issues were solved during direct communication.

2.6 Internal Quality Control

As final step of a Determination the Determination report and all supporting documentation have to undergo and internal quality control procedure by the Certification Body “climate and energy”, i.e. each report has to be approved either by the head of the Certification Body or his deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one.

3. SUMMARY

The assessment work and the main results are described below in accordance with the scope defined (s. chapter 1.2). The reference documents indicated in this section and Annex 1 (Resolution of CAR/CRs) are stated in Annex 2.

From the very beginning PPs were aiming to register the project under JI Track-2 procedure. PDD v.01 was uploaded on UNFCCC JI-SC website for public comments (July 26, 2007 - August 24, 2007). Later on PPs decided to switch the track of the project to the JI Track-1 according to the withdrawal letter submitted by PPs to the TÜV SÜD.

3.1 Approval

The project participants are OJSC ArcelorMittal Steel Kryviy Rih of Ukraine, ArcelorMittal Flat Carbon Europe S.A. and ArcelorMittal Long Carbon Europe S.A. of Luxemburg. The host Party Ukraine and further participating party Luxemburg meet the requirements to participate in the JI.

The investor party in this project is Luxemburg. Luxemburg has indicated officially its DFP – Ministère de l´Environnement; the responsible person for approval of JI projects is Mr. Henri Hain, Conseiller de Direction première classe.

Only Ukraine currently has officially published its national guidelines and procedures for the approval of JI projects, for Luxemburg these documents are currently not available on JI-SC website. Therefore there is a risk in receiving the investor party's approval which is necessary in context of official registration in the Ukrainian national project registry according to the host country requirements. However this issue is out of the direct influence of the project participants.

The DFP of the Luxemburg as well as a Ukrainian DFP didn't issue the required LoAs till now. PP is going to apply for the LoAs after receiving the final determination report from TÜV SÜD.

3.2 Participation

The participation of the private entities AMKR and ArcelorMittal Flat Carbon Europe S.A. in the proposed project activity have been confirmed by each of them.

3.3 Project Description

The project aims to implement the energy efficiency investment program at integrated steel complex of ArcelorMittal Kryviy Rih (AMKR) in Ukraine, as a JI project, under Art.6 of the Kyoto Protocol (KP). The energy efficiency assessment has identified 8 key measures that will be implemented before 2012 to reduce electricity and natural gas consumption and increase the efficiency of power usage hence reducing carbon emissions:

1. Modernization of Air Separating Unit:
2. Modernization of Compressors station
3. Switch fuel from NG to COG+BFG+NG mixtures
4. Refurbishment of Energy Distribution System

5. New Gas Burner Installation
6. Turbo Generators Installation
7. BF top recovery turbine installation
8. Heat recovery in Refractory and Lime Rotary Kilns.

These activities will involve savings of electricity and natural gas. Total energy consumption, and consequent total GHG emission in the project scenario, can be evaluated directly from the future consumption. In order to calculate emission reduction, comparison with the baseline was done by performing ex-post analysis and taking into account any possible fluctuation in the production level.

The information presented in the PDD on the technical design is consistent with the actual planning and implementation of the project activity as confirmed by:

- Review of data and information (see annex 2), cross checked the same with other sources;
- An on-site visit has been performed and relevant stakeholders and personnel with knowledge of the project were interviewed, in case of doubt further cross checks through additional interviews have been done;
- Finally information related to similar projects or technologies as the JI project activity have been used if available to confirm the accuracy and completeness of the project description.

In light of the above, TÜV SÜD confirms that the project description as included to the PDD is sufficiently accurate and complete in order to comply with the requirements of the JI.

3.4 Baseline and Monitoring methodology

3.4.1 Project boundary

As already mentioned in the chapter above, the project is divided in 8 sub-projects and project boundaries are defined for each of them in chapters B.1.1.4, B.1.2.4, B.1.3.4, B.1.4.4, B.1.5.4, B.1.6.4, B.1.7.4 and B.1.8.4 of final PDD accordingly. Complete description in abovementioned chapters contains charts, which show elements enclosed within each SP's boundaries. Presented information is in consistence with real situation, which was assessed during on-site visit. In all direct and indirect sources of GHG emissions related to the project activity are taken into account. Leakages have not been taken into account in the calculations, which can be considered as conservative approach.

3.4.2 Baseline identification

For proposed project activities none of existing approved CDM methodologies can be fully applied. Hence, for each sub-project different approach to define baseline has been applied. All SPs can be divided in 4 groups. SP activities in each group are similar and enable to use similar baseline setting approach.

1st group are SP1 and SP2. Activities proposed in these projects aim at increasing energy efficiency. Hence, AMS-II.C simplified methodology was used for baseline determination.

2nd group is only one SP4. This project activity aims at reduction of power losses in the plant power distribution network. AMS-II.A and AM0067 methodologies were used to determine baseline.

3rd group are SP3 and SP5. Activities proposed in these projects aims to replace NG with waste gases and NG mixture. ACM0009 methodology was used in these projects for baseline determination (fuel switch from coal to NG methodology).

4th group are SP6, SP7 and SP8. Activities proposed in this projects aims to utilize gas and waste heat as energy source for generation of electricity; hence, ACM0012 consolidated methodology was used to determine baseline for these projects.

Determination of the baseline is transparent and described in the PDD for each SP individually.

- Group 1 baseline setting

  The baseline as set for both sub-projects of this group is the electricity that would have been used by the current equipment (ASU, K-1500 compressors and electric motors of the exhaust fans). The baseline emissions defined as multiplication of the energy baseline with the EF (emission factor) of the Ukrainian electricity grid expressed in CO_2/MWh.

- Group 2 baseline setting

  Energy baseline for this SP is the technical losses of electric energy within project boundaries, calculated as measured performance of existing equipment multiplied by the average electric transmission losses of the Ukrainian electricity grid. PP was requested with CR2 to specify the source of EF for Ukrainian electricity grid. In the final PDD version requested referencing on official source of information was made and the relevant excerpts from those documents were provided by PP (for details refer to Annex 2 of this document). The baseline emissions are defined as multiplication of the energy baseline with the EF of the Ukrainian electricity grid expressed in CO_2/MWh.

- Group 3 baseline setting

  Baseline emissions include CO_2 emissions from the combustion of natural gas that would be used in the element process included in the project boundaries in absence of the proposed project activity. Baseline emissions are calculated based on quantity of NG that would be combusted without project activity, respective net calorific value, and CO_2 EF. EF of 1.9 kg/m^3 of NG was used. This value calculated from IPCC value of 0,0561 tCO_2/GJ and considering NCV (net calorific value) for NG provided by the plant (8,106 kcal/Nm^3). Conservative value of 100% efficiency in the combustion was used and for this reason not included in the calculations.

- Group 4 Baseline setting

  Baseline emissions for this group of projects are defined as emissions that would have occurred in absence of the project activity to meet the equivalent power output obtained in the project scenarios from project boundaries. Electricity EF used is the emission coefficient of the Ukrainian electricity grid expressed in CO_2/MWh. The EF as defined by the IPCC guidelines has been used for calculation of the emissions reduction associated to NG combustion.

3.5 Additionality

”Combined tool to indentify the baseline scenario and demonstrate additionality” (version 2.1.) as well as “Tool for the demonstration and assessment of additionality” (version 04) applied to all SP’s. Prove of additionality for each SP is similar. These prove presented in the PDD in complete and transparent manner and despite of their similarity, were discussed for each SP separately.

3.5.1 Prior consideration of the Joint Implementation

The starting date of the project activity is April 2008, what is corresponds to commissioning date of the equipment for SP5. To this date not all sub-projects activities were implemented, respective commissioning days are given in the PDD.

The originals of the documentation presented has been reviewed and cross checked, hence the documents can be considered appropriate to confirm the prior consideration. Additionally in order to confirm that the PPs have taken real actions to perform the activity as JI the following documents were provided to TÜV SÜD assessment team:

- Project agreement between MSKR and EBRD, dated April 2007, where clearly mentioned that project activities has to utilize the carbon dioxide and to generate carbon credits according to JI mechanism;
- Environmental policy of the AM (ArcelorMittal) – reference dated 11 June 2007 - where clearly mentioned that AM aims to control and to reduce CO_2 emissions on all production facilities in case if it is possible from technical and economical point of view.

All above mentioned documents are listed in the Annex 2 of this report.

The implementation start of all SP's is January 2008, however it is reasonable to take as a starting date of the project activity the earliest commissioning date. SP5 have an earliest commissioning date, which is an April 2008. From this date project is able to generate the emission reductions and this date is fixed as a starting date of the project activity.

3.5.2 Identification of alternatives

For all SPs same alternatives are assumed:

- Continuation of the existing situation;
- Implementation of proposed project activities without JI consideration;
- Use of alternative technologies rather than those proposed by the project.

These alternatives are in compliance with all applicable mandatory legal and regulatory requirements in the host country. In further steps project proponent performed barrier analysis and investment analysis, and provided hard proofs of the additionality.

3.5.3 Investment analysis

Despite the fact that "continuation of the existing situation" is only alternative scenario, left after barrier analysis, project proponent performs investment analysis for each SP for transparent and complete demonstration of additionality.

Appropriate analysis method was chosen from "simple cost analysis", "investment comparison analysis" and "benchmark analysis". Since the proposed SPs will produce economical benefits other than JI income (benefit from less power consumption from the Ukrainian grid and less NG consumption), simple cost analysis cannot be applied. Also investment comparison analysis cannot be applied because obtaining of financial indicators for similar projects in Ukraine is not possible. Regarding these "benchmark analysis" was chosen as appropriate one. It based on the calculation of the most common financial indicators of the proposed project as IRR and NPV and the consequent comparison with ArcelorMittal global targets.

The main goal of financial analysis for all SPs is to calculate relevant costs for implementation of each SP and the revenues (excluding carbon credit revenues) coming from energy or NG savings

associated with project implementation and then compare it with the corporate internal benchmark (WACC of the ArcelorMittal). WACC of the company represents minimum permissible gain (in %) of investment return. Usual WACC of ArcelorMittal is 15%. Despite it company never implemented energy efficiency investments in Ukraine prior to this project activity, hence for risk factor coverage corporative WACC was reasonably set around 20% (what is lower than the average discount rates provided by banks, which managing the founds for energy investment in Ukraine – usually discount rates of this banks are higher than 21-23% - that figure confirmed by “Taxes at a Glance 2008” report issued by PriceWaterhouseCoopers). With CR3 PP was requested to provide hard proofs to assess the chosen figure of WACCC. PP presented official letter from ArcelorMittal to TÜV SÜD (with attached ArcelorMittal Investment Procedure document) which confirms 20% as reasonable and approved IRR benchmark for Kryviy Rih plant.

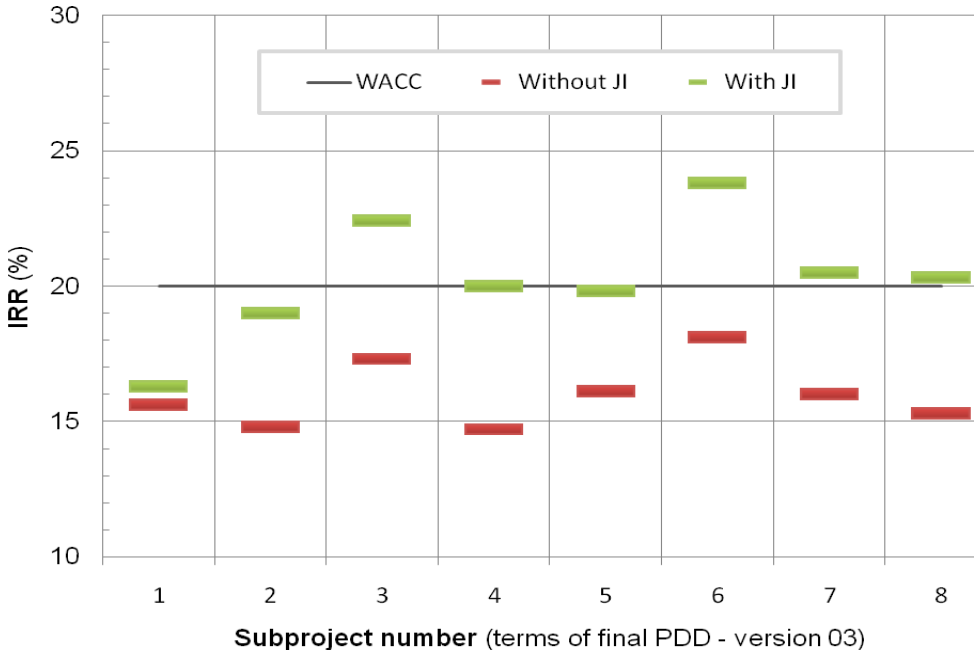
All economic indicators (NVP and IRR) were calculated by project proponent with help of CAPEX program, which was developed by project developer and provided to TÜV SÜD assessment team. All input data for NVP and IRR calculation and calculation method itself considered as appropriate.

In the final PDD all SPs analysed by project proponent individually. “Benchmark analysis” also performed individually, despite that WACC value stays the same for each SP. TÜV SÜD assessment team performed complex analysis of all IRR values for each SP.

Only in case of SP No. 6 (in terms of PDD version 02) IRR significantly larger then WACC and could be consider as “profitable” even without additional revenues from the selling of carbon credits. Therefore, project proponent was requested to specify additional hard proves why this project is in spite of its financial attractiveness is not business as usual or to exclude this SP from whole project (CR4). As a resolution of this clarification request PP decided to exclude SP No 6 (in terms of PDD version 02) from the updated PDD (version 03). Final figure of IRR for each SP represented via figure 1.

Figure 1 clearly shows that IRR of each SP without consideration of ERU revenues lies beyond the WACC and will not be implemented without JI mechanism. On the average the IRR of each SP lays approximately 4% under the assessed WACC benchmark.

Figure 1. *IRR of each sub-project with and without ERU revenues (gained through JI activity) comparing with corporative WACC*



3.5.4 Barrier analysis

The project participants used (also) the barrier analysis in order to demonstrate the additionality of the project. The presented barriers are:

1. Barrier to access to financial resources occurs, because project financing in Ukraine is limited to short-term financing, and the interest rate of Ukranian banks is high. The total investment to implement proposed project is about 102 million USD and it is hard obtaining such amount on the national market. A common practice for commersial bank financing can be a loan for up to maximum 3 years at 18-24% interest rate in national currency. On the other hand, on the international market obtaining financing would also be difficult due to the low credit rating of Ukraine (BB-) and the high perceived risks of the country's market.
2. A technological barrier occurs because of trained labour force absence. In relevant geographical area it's challenging to find personnel, which is able to operate and maintain proposed technologies. Also in the local circumstances the technology failure risk is high.
3. Prevailing practice barrier occurs because no significant energy saving activities has been observed in the Ukrainian steel sector over past 10-15 years. It is demonstrated by comparison of average fuel consumption of steel production in the Ukraine with the average of Europe Union.

Two of three proposed (in step 1) alternatives are prevented by the barriers described above: implementation of proposed project without JI consideration meets financial and prevailing practice barriers, use of alternative technologies scenario meets technological and prevailing practice barriers. Hence, "continuation of the existing situation" is considered as baseline scenario valid for

all SPs, proposed by the project. Investment analysis is performed by the project proponent and compared with this scenario.

3.5.5 Common practice analysis

This JI project is not a common practice. In spite of the fact that several metallurgical companies are considering reduction of energy consumption, in particular after the price hike during 2006, the majority of the other players on the Ukrainian steel market continue to use aged equipment without rehabilitation programs. At the time the AIE's assessment works were completed, no investment project was known that has been implemented.

3.6 Monitoring plan

Monitoring plan (MP) of proposed JI project has been established in accordance with appendix B of the JI guidelines and by taking into account the guidance on criteria for baseline setting and monitoring developed by the JISC. None of the existing approved methodologies can directly be applied to the project. In the preparation of the present MP reference from the following documents has been made, adapting them to each single specific sub-project:

- Guidance on criteria for baseline setting and monitoring;
- ACM0012 – version 03 (sub-project 6,7,8);
- AMS-II.C - version 09 (sub-project 1, 2);
- AMS-II.A – version 09 (sub-project 4);
- ACM0009 – version 03 (sub-project 3, 5).

The project involves eight different activities:

1. Modernization of Air Separating Unit;
2. Modernization of Compressors station;
3. Switch fuel from NG to COG+BFG+NG mixtures;
4. Refurbishment of Energy Distribution System;
5. New Gas Burner Installation;
6. Turbo Generators Installation;
7. BF top recovery turbine installation;
8. Heat recovery in Refractory and Lime Rotary Kilns.

These activities will involve savings of electricity and natural gas. Total energy consumption and consequent total GHG emission in the project scenario can be evaluated directly from the future consumption. In order to calculate emission reduction comparison with the baseline was done by performing ex-post analysis and by taking into account any possible fluctuation in the production level. Emission reductions are calculated and monitored separately for each sub-project; hence the risk to fall into double counting is avoided.

3.6.1 Findings

During review of the monitoring plan, represented in the initial PDD, 18 clarification requests were issued. PP solved all of them in a professional manner and made all requested corrections in the final PDD. Almost all issued CARs and CRs related to the monitoring plan and the answers on these requests are represented in the next chapter; full set of issued CARs and CRs are represented in Table 1 of Annex 1 to this report.

3.6.2 Raised CARs and CRs

With CR SP1-1 was requested to clarify source of $SC_{OP, BS, y}$ (Specific consumption of Compressed Air for Oxygen Production in the baseline scenario) parameter. In the table D.1.1.3 (PDD version 02) was mentioned that it is estimated. Why it is estimated parameter, how it is estimated and why it is not possible to provide measured value of this parameter was not clear. As an answer official document from the plant reporting the value to be used has been included within the documentation provided to the TÜV SÜD. This issue is settled.

With CR SP1-2 was requested to clarify why formula (a.1) and formula (c.3) in PDD (version 02) are different. Presented baseline emission calculation methods represented in chapters B.1.1.6 (Baseline Emissions, SP1) and D.1.1.4 (Description of formulae used to estimate baseline emissions – SP1) was different and explanation was missing. PP mentioned in the answer that basically formulae included in “section B” of the PDD and starting with the letter “a” refer to calculation used to define the preliminary ex-ante emission reductions to be included in the PDD. Formulae, included in the “section D” of PDD and starting with the letter B and C are those using an ex-post approach to be used in the monitoring plan. The above clarification has been included in the PDD (ver. 03). This issue is settled.

With CR SP1-3 it was requested to clarify the applied source of formula (c.3) in D.1.1.4 chapter of PDD (version 02). The PP answered that the source is MWH elaboration of data and that electricity consumption that would have occurred in the baseline without implementation of the project is calculated using an ex-post approach. The starting point is the electricity consumption for oxygen production in year *y* ($EC_{SP1,PS,y}$): this value will be calculated ex-post (see formula b.3). With this scope, the specific compressed air consumption to produce oxygen on year *y* will be monitored as well ($SC_{OP,PS,y}$). The specific baseline compressed air consumption to produce oxygen has been defined ex-ante ($SC_{OP,BS,y}$). By multiplying current consumption in the year *y* times the ratio between current and past specific values permits to define baseline electricity consumption. In other words the baseline will be calculated based on the electric consumption for compressed air availability at the ASU, and taking into account the different specific compressed air consumption between the old and the new configuration to produce oxygen. Finally, to calculate emission reductions, the baseline emission are calculated by multiplying the energy baseline times the emission coefficient for the Ukrainian Electricity Grid included the document “Standardized emission factor for the Ukrainian electricity grid”, version 5 dated 2 February 2007. The complete document is included in Annex 2 of the PDD. This issue is settled.

With CR SP2-1 it was requested to clarify why formula (a.4) and formula (c.5) in PDD (version 02) are different. Presented in baseline emission calculation methods represented in chapters B.1.2.6 (Baseline Emissions, SP2) and D.1.1.4 (Description of formulae used to estimate baseline emissions – SP2) of PDD (version 02) are different and explanation was missing. PP answered that basically formulae included in “section B” of the PDD and starting with the letter “a” refer to calculation used to define the preliminary ex-ante emission reductions to be included in the PDD. Formulae, included in the “section D” of PDD and starting with the letter B and C are those using an ex-post approach to be used in the monitoring plan. The above clarification has been included in the PDD. The issue is solved.

With CR SP2-2 was requested to clarify source of $SEC_{CAP, BS, y}$ (Specific energy consumption of Compressed Air Production in the baseline scenario) parameter. Due to the table D.1.1.3 is estimated. Why it is estimated parameter, how it is estimated and why it is not possible to provide measured value of this parameter? PP answered that the source is the technical datasheet of compressors. Datasheet information has been reported at table 3 paragraph A.4.2.2 of the PDD. Due to absence of adequate equipment for the ex-ante monitoring of this parameter a conservative approach has been used. Technical parameters included in the datasheet have been used to

calculate the specific electric consumption of compressors: 7,400 kWh / (1,370 m^3/min x 60 min/h) = 0.09 kWh/m^3 compressed air. As nominal values are usually much higher than the real consumption, the conservative approach for the ex-ante estimation of this parameter is confirmed. The issue is solved.

With CR SP2-3 was requested to clarify exact source of formula (c.5) in D.1.1.4 chapter of PDD (version 02). Answer: "The source is MWH elaboration of data. Electricity consumption that would have occurred in the baseline without implementation of the project is calculated using an ex-post approach. The starting point is the electricity consumption for compressed air production in year y ($EC_{SP2,PS,y}$): this value will be calculated ex-post (see formula b.4). With this scope the specific electricity consumption to compress air on year y ($SEC_{CAP,PS,y}$) will be monitored as well. The specific baseline electricity consumption to produce compressed air has been defined ex-ante ($SEC_{CAP,BS,y}$). By multiplying current consumption in the year y times the ratio between current and past specific values permits to define baseline electricity consumption. In other words the baseline electricity consumption will be calculated based on the electric consumption for compressed air production in the year $_y$, and by taking into account the different specific electricity consumption between the old and the new configuration to compress the air. Finally, to calculate emission reductions, the baseline emission are calculated by multiplying the energy baseline consumptions times the emission coefficient for the Ukrainian Electricity Grid included the document "Standardized emission factor for the Ukrainian electricity grid", version 5 dated 2 February 2007. The complete document is included in Annex 2 for consultation". The issue is solved.

With CR SP3-1 was requested to provide documents (e.g. log sheets from Central Heating Technical Laboratory of Power Engineering and Power Saving Department or from Division of Automatic Process Control System), which proves used values for NCV_{COG}, NCV_{BFG} and NCV_{NG} to set up baseline for SP3. The requested document was provided and comented like this: "This parameter will be monitored ex-post in order to be used in the monitoring plan. However, evidence of the value used in the PDD have been provided and included in the IRL. 2006 data have been used when preparing the PDD. These data will be changed during monitoring process". The issue is solved.

With CR SP4-1 it was requested to clarify why formula (a.12) and formula (c.9) are different. Answer was: "Basically formulae included in "section B" of the PDD and starting with the letter "a" refer to calculation used to define the preliminary ex ante emission reductions to be included in the PDD. Formulae, included in the "section D" of PDD and starting with the letter B and C are those using an ex-post approach to be used in the monitoring plan. The above clarification has been included in the PDD". This issue is settled.

With the CR SP4-2 was requested to clarify calculation method of $EC_{C, BS, y}$ (Current Consumption for Active power transmission in the baseline scenario) parameter. PP included transparent calculation formula in the final PDD. This issue is settled.

With CR SP4-3 was requested to clarify exact source of formula (c.9) in D.1.1.4 chapter of PDD. PP answered: "The source of the formula is the Joule's law. Such reference has been included as footnote n.1 of the final PDD". The issue is solved.

With CR SP4-4 was requested to provide documents, which proves used values for $\cos\varphi_{i,BS,y}$ and $SEC_{C,PS,y}$. to set up baseline for SP4. Answer was: "As for CR SP4-3 above, $SEC_{C,PS,y}$ actually is replaced by $EC_{C,PS,y.}$ In order to set the baseline for SP4 two parameters are required: rp_i and $\cos\varphi_{i,BS,y}$ (see formula c.9a). Rpi is being already monitored at the plant. $\cos\varphi_{i,BS,y}$ is the power factor measured at the plant during 2007. Documentation on these values has been shown during the visit and included for clarification in the final PDD's version; s. paragraph A.4.2.4". The issue is solved.

There was 4 CRs requested to SP Nr. 6 (CR SP6-1, CR SP6-2, CR SP6-4 and CR SP6-4), but with reference to what reported for CR4, the SP Nr. 6 has been removed from the revised PDD's version 03 and, for this reason, no clarification is required for this requests anymore.

With CR SP7-1 it was requested to provide documents (e.g. historical baseline data), which proves used values for $NG_{SP7,BS,y}$, and $EC_{SP7,BS,y}$ parameters, used to set up baseline for SP7 (SP6 as per revised PDD version 03). Information about historical values was provided and included in the monitoring plan and in the documentation (see IRL). This issue is settled.

With CR SP8-1it was requested to provide documents (e.g. historical baseline data), which proves used values for $EC_{SP8,BS,y}$ parameter, used to set up baseline for SP8 (SP7 as per revised PDD version 03). Answer was: "This is an ex-post value and it is equal to the electricity that will be produced in the project scenario. In absence of the project activity this electricity would have been sourced by the grid in year y". This issue is solved.

With CR SP9-1 was requested to provide documents (e.g. historical baseline data), which proves used values for $NG_{SP9,BS,y}$, and $EC_{SP9,BS,y}$ parameters, used to set up baseline for SP9 (SP8 as per revised PDD version 03). Necessary modification has been made: historical value for $NG_{SP9,BS,y}$, has been included in the monitoring plan and in the documentation (see IRL). $EC_{SP9,BS,y}$ is an ex-post value and it is equal to the electricity that will be produced in the project scenario. In absence of the project activity this electricity would have been sourced by the grid in year $_y$. The issue is solved.

During the assessment of the monitoring plan, there were clarifications requested concerning QA/QM procedures and maintenance structure undertaken by PPs for monitoring. In the final version of PDD, PPs transparently described the QA/QM procedures undertaken for monitoring as well as a maintenance structure. Updated procedures fulfil all requirements stated in applied methodological tools and allow obtaining of the monitoring data with sufficient certainty and frequency.

3.6.3 Conclusion

The monitoring plan was assessed by TÜV SÜD assessment team. Formulae used in final PDD are well referenced and altogether represent an adequate mathematical tool to set up baseline and to estimate future emission reductions of the whole project. QA/QM procedures and maintenance structure, undertaken by PPs in this project activity, ensure future correct and reasonably precise monitoring.

For any further detail about raised CR or CAR please refer to Annex 1 Table 1 (Resolution of Corrective Action and Clarification Requests) and to Annex 2 (Information Reference List).

3.7 Sustainable development

The implementation of this JI Project will offer a number of socio-economic impacts to the region as shortly described here below:

- Implementation of the project will lead to improvement of ecological climate to the region, prevent reduction of working places and improve working conditions;
- The investment will increase economic activity by use of local civil engineering and related contractors for the implementation of the project;

- The project will increase the overall resource efficiency and therefore will strengthen the market position of the company. This will increase the job security of the people directly or indirectly dependent on the plant.

ArcelorMittal investment in the Company is a landmark transaction for Ukraine and its transition to a market economy. It has the potential to demonstrate to other foreign investors the benefits arising from a transparent privatization, successful restructuring and introduction of international business management practices.

The Ministry of Environment of Ukraine has signed the Letter of Endorsement on 12 May 2008. Scan copy of the letter is reported as Annex 4 to the final PDD (version 03).

3.8 Local stakeholder consultation

The procedure undertaken for stakeholder consultation can be summarized as follow:

1. AMKR makes announcement in newspaper;
2. Stakeholders meeting takes place;
3. The official body conducts expertise, and government (Ministry of Ecology) approves/disapproves the project.

Results of such stakeholder processes for SP1 and SP3 are included as Annex 5 to the final PDD (version 03).

EIA for sub-project n.6, n.7, and n.8 will be provided after design stage has been completed and ecological impacts have been identified. After completion, they will follow the Stakeholder consultation as described above.

3.9 Environmental impacts

Resulting from the already undertaken EIA for 2 sub-projects (no. 1, 3) there are no negative impacts are indentified. For these two projects EIA's are issued and submitted to TÜV SÜD assessment team (see the Annex 2).

Sub projects 2, 4 and 5 will not require any EIA according to Ukrainian law №1269 from 31.10.2007 (see Annex 2).

Summary of the environmental impact analysis for the sub-projects n.6, n.7, and n.8 will be provided after completeness of the design stage (according to project implementation schedule) and ecological impacts will be identified. No negative environmental impacts of the proposed project activities are expected.

Industrie Service

4. COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on UNFCCC JI-SC website by installing a link to TÜV SÜD's own website and invited comments by Parties, stakeholders and non-governmental organisations during a period of 30 days.

The following table presents all key information on this process:

webpage: http://ji.unfccc.int/JI_Projects/DB/285ML83S8HRCTFB8Y0LFZJK23Q45TJ/PublicPDD/U781XZRM1P8BC6UFIIA6BGKNLFWIB9/view.html	
Starting date of the global stakeholder consultation process: 2007-07-26	
Comment submitted by: None	**Issues raised:** -
Response by TÜV SÜD: -	

Industrie Service

5. DETERMINATION OPINION

TÜV SÜD has performed a determination of "Energy efficiency investment program at OJSC ArcelorMittal Steel Kryviy Rih", JI Track-1 project located at outskirts of Kryviy Rih city, Ukraine. The determination was performed on the basis of all currently valid and relevant JI criteria.

The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria. In TÜV SÜD opinion, the project meets all relevant requirements for JI Track-1 and like this, would recommend this project for approval by the DNA of investor and of the host country in accordance with the rules for JI Track-1.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 1,603,701 tons CO_2e (to be issued as ERUs) in the crediting period from 2008-04-01 till 2012-12-31 (within the first commitment period of the Kyoto Protocol), resulting in annual average emission reductions of 320,740 tons CO_2e, represents a reasonable estimation using the assumptions given by the currently available project documents and additional background information.

The determination is based on the information made available to us and the engagement conditions detailed in this report. The determination has been performed using a risk-based approach as described above. The only purpose of the report is its use during the registration process as JI Track-1 project. Hence, TÜV SÜD cannot be held liable by any party for decisions made or not made based on the determination opinion, which will go beyond that purpose.

Munich, 2009-09-16

Rachel Zhang
Deputy head of Certification Body
Carbon Management Service
TÜV SÜD Industry Service GmbH

Munich, 2009-09-16

Thomas Kleiser
Assessment Team Leader

Annex 1

Resolution of Corrective Action and Clarification Requests

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
CAR1	It is necessary to updated Tables 1, 12-14 (PDD, ver 02) and reconsider IRR's values for each SP. As a result of the on-site audit: some input data shall be altered and represent the current situation (investment, recalculated IRR for each SPs, ER etc.)		Based on the results of the on-site audit the financial analysis for each project have been revised and changed accordingly.	Requested corrections have been made in updated PDD (version 03). This issue is settled.
CAR2	Updated financial analysis (xls. sheet) shall be provided to the AIE for re-review. Indicate with colour all alterations undertaken.	Investment analysis	Updated financial analysis is provided to TÜV SÜD.	New *.xls calculation sheet has been provided by the PP. The issue is settled.
CR SP1-1	It is necessary to clarify source of $\mathbf{SC_{OP,\,BS,\,y}}$ (Specific consumption of Compressed Air for Oxygen Production in the baseline scenario) parameter. Due to the table D.1.1.3 is estimated. Why it is estimated parameter, how it is estimated and why it is not possible to provide measured value of this parameter?	D.1.1.3 D.1.1.4	Official Document from the Plant reporting the value to be used has been included within the documentation provided to the AIE (see IRL).	Document is provided, requested clarification is sufficient. The issue is solved.
CR SP1-2	It is necessary to clarify why formula (a.1) and formula (c.3) are different. Currently baseline emission calculation methods represented in chapters B.1.1.6 (Baseline Emissions, SP1) and D.1.1.4 (Description of formulae used to estimate baseline emissions – SP1) are different and explanation is missing.	B.1.1.6 D.1.1.4	Basically formulae included in "section B" of the PDD and starting with the letter "a" refer to calculation used to define the preliminary ex-ante emission reductions to be included in the PDD. Formulae, included in the "section D" of PDD and starting with the letter B and C are those using an ex-post approach to be used in the monitoring plan. The above clarification has been	Required clarification has been made; comprehensive explanation provided and added in PDD version 03 by PP. The issue is solved.

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
			included in the PDD.	
CR SP1-3	It is necessary to clarify exact source of formula (c.3) in D.1.1.4 chapter of PDD.	D.1.1.4	The source is MWH elaboration of data. Electricity consumption that would have occurred in the baseline without implementation of the project is calculated using an ex-post approach. The starting point is the electricity consumption for oxygen production in year y ($EC_{SP1,PS,y}$): this value will be calculated ex-post (see formula b.3). With this scope, the specific compressed air consumption to produce oxygen on year y will be monitored as well ($SC_{OP,PS,y}$). The specific baseline compressed air consumption to produce oxygen has been defined ex-ante ($SC_{OP,BS,y}$). By multiplying current consumption in the year y times the ratio between current and past specific values permits to define baseline electricity consumption. In other words, the baseline will be calculated based on the electric	The source of formula (c.3) in D.1.1.4 chapter of PDD version 03 is explained. Explanation is comprehensive. The issue is settled.

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
			consumption for compressed air availability at the ASU, and taking into account the different specific compressed air consumption between the old and the new configuration to produce oxygen. Finally, to calculate emission reductions, the baseline emission are calculated by multiplying the energy baseline times the emission coefficient for the Ukrainian Electricity Grid included the document "Standardized emission factor for the Ukrainian electricity grid", version 5 dated 2 February 2007. The complete document is included in Annex 2 for consultation.	
CR SP2-1	It is necessary to clarify why formula (a.4) and formula (c.5) are different. Currently baseline emission calculation methods represented in chapters B.1.2.6 (Baseline Emissions, SP2) and D.1.1.4 (Description of formulae used to estimate baseline emissions – SP2) are different and explanation is missing.	B.1.2.6 D.1.1.4	Basically formulae included in "section B" of the PDD and starting with the letter "a" refer to calculation used to define the preliminary ex ante emission reductions to be included in the PDD. Formulae, included in the "section D" of PDD and starting with the letter B and C are those using an ex-post approach	Required clarification has been made; comprehensive explanation provided and added in PDD version 03 by PP. The issue is solved.

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
			to be used in the monitoring plan. The above clarification has been included in the PDD.	
CR SP2-2	It is necessary to clarify source of $\mathbf{SEC_{CAP,\,BS,\,y}}$ (Specific energy consumption of Compressed Air Production in the baseline scenario) parameter. Due to the table D.1.1.3 is estimated. Why it is estimated parameter, how it is estimated and why it is not possible to provide measured value of this parameter?	D.1.1.3 D.1.1.4	The source is the technical datasheet of compressors. Datasheet information has been reported at table 3 paragraph A.4.2.2 of the PDD. Due to absence of adequate equipment for the ex-ante monitoring of this parameter a conservative approach has been used. Technical parameters included in the datasheet have been used to calculate the specific electric consumption of compressors: 7,400 kWh / (1,370 m^3/min x 60 min/h) = 0.09 kWh/m^3 compressed air. As nominal values are usually much higher than the real consumption, the conservative approach for the ex-ante estimation of this parameter is confirmed.	Required clarification has been made; comprehensive explanation provided and added, technical datasheet is provided. The issue is solved.
CR	It is necessary to clarify exact source of formula (c.5) in D.1.1.4	D.1.1.4	The source is MWH elaboration of data. Electricity consumption that	The source of formula (c.5) in D.1.1.4 chapter of

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
SP2-3	chapter of PDD.		would have occurred in the baseline without implementation of the project is calculated using an ex-post approach. The starting point is the electricity consumption for compressed air production in year y ($EC_{SP2,PS,y}$): this value will be calculated ex-post (see formula b.4). With this scope the specific electricity consumption to compress air on year y ($SEC_{CAP,PS,y}$) will be monitored as well. The specific baseline electricity consumption to produce compressed air has been defined ex-ante ($SEC_{CAP,BS,y}$). By multiplying current consumption in the year y times the ratio between current and past specific values permits to define baseline electricity consumption. In other words the baseline electricity consumption will be calculated based on the electric consumption for compressed air production in the year y, and taking into account the different specific electricity	PDD version 02 is explained. Explanation is comprehensive. The issue is settled.

CAR – Corrective Action Request, **CR** – Clarification Request

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
			consumption between the old and the new configuration to compress the air. Finally, to calculate emission reductions, the baseline emission are calculated by multiplying the energy baseline consumptions times the emission coefficient for the Ukrainian Electricity Grid included the document "Standardized emission factor for the Ukrainian electricity grid", version 5 dated 2 February 2007. The complete document is included in Annex 2 for consultation.	
CR SP3-1	It is necessary to provide documents (e.g. log sheets from Central Heating Technical Laboratory of Power Engineering and Power Saving Department or from Division of Automatic Process Control System), which proves used values for $\mathbf{NCV_{COG}}$, $\mathbf{NCV_{BFG}}$ and $\mathbf{NCV_{NG}}$ to set up baseline for SP3.	D.1.1.4	This parameter will be monitored ex-post in order to be used in the monitoring plan. However, evidence of the value used in the PDD have been provided and included in the IRL. 2006 data have been used when preparing the PDD. These data will be changed during monitoring process.	Requested documents are provided and contain necessary information. The issue is solved.
CR SP4-1	It is necessary to clarify why formula (a.12) and formula (c.9) are different.	B.1.4.6 D.1.1.4	Basically formulae included in "section B" of the PDD and starting	

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
	Currently baseline emission calculation methods represented in chapters B.1.4.6 (Baseline Emissions, SP4) and D.1.1.4 (Description of formulae used to estimate baseline emissions – SP4) are different and explanation is missing.		with the letter "a" refer to calculation used to define the preliminary ex ante emission reductions to be included in the PDD. Formulae, included in the "section D" of PDD and starting with the letter B and C are those using an ex-post approach to be used in the monitoring plan. The above clarification has been included in the PDD.	
CR SP4-2	It is necessary to clarify calculation method of $\mathbf{EC_{C,BS,v}}$ (Current Consumption for Active power transmission in the baseline scenario) parameter. Due to the table D.1.1.3 it is calculated from $\mathbf{cos\varphi_{i,BS,y}}$ and $\mathbf{SEC_{C,PS,y}}$ parameters, but calculation formula is missing.	D.1.1.3 D.1.1.4	Formulae on calculation of $EC_{C,BS,v}$ have been included in the PDD (c.9a;c.9b). $SEC_{C,PS,v}$ has been replaced by $EC_{C,PS,y}$	Requested corrections has been made, requested explanation was added in final PDD version 03. The issue is settled.
CR SP4-3	It is necessary to clarify exact source of formula (c.9) in D.1.1.4 chapter of PDD.	D.1.1.4	The source of the formula is the Joule's law. Such reference has been included as footnote n.1 of the PDD	The issue is settled.
CR SP4-4	It is necessary to provide documents, which proves used values for $\mathbf{cos\varphi_{i,BS,y}}$ and $\mathbf{SEC_{C,PS,y}}$. to set up baseline for SP4.	D.1.1.4	As for CR SP4-3 above, $SEC_{C,PS,y}$ actually is replaced by $EC_{C,PS,v.}$ In order to set the baseline for SP4 two parameters are required: rp_i and $cos\varphi_{i,BS,y}$ (see formula c9a). Rpi is being already monitored at the plant.	Requested corrections has been made, requested explanation was added in final PDD version 03. The issue is

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
			$\cos\varphi_{i,BS,y}$ is the power factor measured at the plant during 2007. Documentation on these values has been shown during the visit and included for clarification in the version 03 of the PDD at paragraph A.4.2.4.	settled.
CR SP6-1	It is necessary to clarify why formula (a.22) and formula (c.13) are different. Currently baseline emission calculation methods represented in chapters B.1.6.6 (Baseline Emissions, SP6) and D.1.1.4 (Description of formulae used to estimate baseline emissions – SP6) are different and explanation is missing.	B.1.6.6 D.1.1.4	With reference to what reported for next CR4, the measure n.6 has been removed from the revised version 03 of the PDD and, for this reason, no clarification is required for this request anymore.	Due to the resolution of CR4 (presented below) no clarification longer required.
CR SP6-2	It is necessary to clarify source of $\mathbf{SE_{CEM,\,BS,\,y}}$ (Specific energy consumption of electric motors in the baseline scenario) parameter. Due to the table D.1.1.3 is calculated, but no formulas and no source data for calculations are presented.	D.1.1.4	With reference to what reported for next CR4, the measure n.6 has been removed from the revised version 03 of the PDD and, for this reason, no clarification is required for this request anymore.	Due to the resolution of CR4 (presented below) no clarification longer required.
CR SP6-3	It is necessary to clarify exact source of formula (c.5) in D.1.1.4 chapter of PDD.	D.1.1.4	With reference to what reported for next CR4, the measure n.6 has been removed from the revised version 03 of the PDD and, for this reason, no clarification is required for this	Due to the resolution of CR4 (presented below) no clarification longer required.

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
			request anymore.	
CR SP6-4	It is necessary to provide documents, which proves used values for $\mathbf{T_{EM,PS,y}}$ and for historical data, used to calculate $\mathbf{SE_{CEM.BS.y}}$ parameter. It is really important, because these parameters were used to establish baseline for SP6.	D.1.1.4	With reference to what reported for next CR4, the measure n.6 has been removed from the revised version 03 of the PDD and, for this reason, no clarification is required for this request anymore.	Due to the resolution of CR4 (presented below) no clarification longer required.
CR SP7-1	It is necessary to provide documents (e.g. historical baseline data), which proves used values for $\mathbf{NG_{SP7,BS,y}}$, and $\mathbf{EC_{SP7,BS,y}}$ parameters, used to set up baseline for SP7.	D.1.1.4	Information about historical values has been provided and included in the monitoring plan and in the documentation included in the IRL.	Requested document has been provided and contain necessary information. The issue is solved.
CR SP8-1	It is necessary to provide documents (e.g. historical baseline data), which proves used values for $\mathbf{EC_{SP8,BS,y}}$ parameter, used to set up baseline for SP8.	D.1.1.4	This is an ex-post value and it is equal to the electricity that will be produced in the project scenario. In absence of the project activity this electricity would have been sourced by the grid in year y.	The issue is solved.
CR SP9-1	It is necessary to provide documents (e.g. historical baseline data), which proves used values for $\mathbf{NG_{SP9,BS,y}}$, and $\mathbf{EC_{SP9,BS,y}}$ parameters, used to set up baseline for SP9.	D.1.1.4	Historical value for $\mathbf{NG_{SP9,BS,y}}$, has been included in the monitoring plan and in the documentation included in the IRL. $\mathbf{EC_{SP9,BS,y}}$ is an ex-post value and it is equal to the electricity that will be	Requested document has been provided and contains necessary information. The issue is solved.

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
			produced in the project scenario. In absence of the project activity this electricity would have been sourced by the grid in year y.	
CR1	The project title was changed slightly as compared with the PDD (version 01) being publish on UNFCCC website for comments. It's because of the acquisition of Ukrainian steel complex "Kryvorizhstal" by ArcelorMittal and subsequent renaming of the former "Mittal Steel Kryviy Rih" to "ArcelorMittal Steel Kryviy Rih" in June 2006. Brief reference to the issue of renaming of PDD title shall be added in chapter A.1. ***Note:*** This juridical right name of the plant and revised title of the JI Project shall be used in all approval related documents (LoA etc.)	Project **title /** project **history**	Reference to the change of the PDD name was included at chapter A.1 as required.	Requested information has been added in PDD version 03. Issue is solved.
CR2	It is necessary to clarify source of "average electric transmission losses of the Ukrainian electricity grid". In PDD (B.1.4.6) link to the source is provided. Reference document – Ukraine Analysis Brief by Energy Information Administration (Official Energy Statistics from U.S. government) was analysed, but information concerning losses in the Ukrainian grid wasn't found. Please give more detailed link on used value.	B.1.4.6	Used value for electricity transmission losses takes reference from the website: http://www.eia.doe.gov/emeu/cabs/Ukraine/Electricity.html. *.pdf of the website documentation is provided in the documentation included in the IRL for review. In order to facilitate the revision, the mentioned value has been marked in	The issue is solved.

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
			yellow.	
CR3	It is necessary to provide a hard proof for WACC applied for this JI project, e.g. official internal document (from ArcelorMittal) which sets WACC on 20% level for AMKR. It is still not clear enough.	B.1.1.5	Required documentation has been gathered and included in the IRL.	Requested documents have been provided and contain necessary information. The issue is solved.
CR4	Pay the most attention to sub-project 6 (SP6). Results of IRR review are really critical! Thus, provide additional hard proofs, arguments etc., why this project is in spite of its financial attractiveness is not business as usual. (Is SP6 somehow connected with the other SPs or the implementation of SP6 will cause significant losses for the plant etc.) Otherwise, it's necessary to exclude this sub-project from the projected scope of activities. Remaining eight sub-projects seems to be additional.	Additionality	As all information about measure n. 6 have been already included in the PDD and they have been considered not sufficient to proof the additionally of the measure itself, in order to avoid any risk of the whole Project registration failure, the project developer agreed to remove measure number 6 in the revised version number 03 of the PDD.	SP6 (in terms of PDD version 02) was excluded from this JI project. The issue is solved.
CR5	There are specific procedures in the host country specified in the relevant environmental legislative documents with regard to execution of EIA. Thus, an overview or at least references to them are required. Moreover several sub-projects require EIA. Relative hard proof was provided during on-site visit. Short discussion about the results of EIA conducted by authorised entity and its conclusion on (permissible) environmental impact shall be included in PDD.	**Chapter F.** Environmental impacts	Information on EIA has been included at paragraph F1 and F2 of the PDD and as Annex 5.	Requested information has been added in PDD version 03. Issue is solved.

CAR – Corrective Action Request, **CR** – Clarification Request

Annex 1. Resolution of Corrective Action and Clarification Requests

CAR CR No.	CR and CAR	Reference to PDD, IRL or relevance in JI context	Summary of project owner response	Determination conclusion
CR6	An overview or at least references to the host country procedures (s. relevant environmental legislative documents with regard to execution of local stakeholder consultations) is required. Discussion about the appropriateness of its (non-)/applicability shall be included in the PDD (The circle of relevant stakeholders shall be defined reasonably.)	**Chapter G.** Local stakeholder consultation	Information on stakeholder Consultation Process and results has been included at paragraph G1 of the PDD and as Annex 5.	Requested information has been added in PDD version 03. The issue is solved.
CR7	It is necessary to add version numbers to all referenced methodology used in the PDD.	**PDD**	Version numbers to all referenced methodologies used in the PDD have been added	Requested information has been added in PDD version 03. The issue is solved.

Annex 2

Information Reference List

Annex 2. Information Reference List

Ref. No.	Issuance and/or submission date	Title / Type of Document	Editor	Comment (relevance in JI context)
1.	UNFCCC homepage – http://www.unfccc.int including the Joint Implementation section – ji.unfccc.int			Guidelines
2.	Validation and Verification Manual, IETA/World Bank (PCF), http://ieta.org/ieta/www/pages/index.php?IdSitePage=392 (2003) // determination protocol (as background information)			Guidelines
3.	IPCC Good Practice Guidance and Uncertainty Management 2000			
4.	2006 Revised IPCC Guidelines			
5.	On-site visit and interviews were conducted by the TÜV SÜD's assessment team on 10-12 June 2008 at OJSC ArcelorMittal Kryviy Rih (AMKR), Ukraine with representatives of the project developer, i.e. MWH S.p.A., Italy (MWH) as well as with employees of AMKR in Kryviy Rih and representatives of ArcelorMittal (AM), France involved in the JI project activity. Determination team on-site: Tausche Konrad — TÜV SÜD, lead auditor Peretykina Anna — TÜV SÜD, auditor (trainee) Interviewed persons in Kryviy Rih, Ukraine: Beatrice Humbert — ArcelorMittal, Energy & Carbon projects, Project Manager Alex Churilov — ArcelorMittal, Energy projects, Manager Evgenio Ferro — MWH S. p. A., Energy Manager Marco Baldini — MWH S. p. A., Energy Department, Project Engineer Bashta V. A. — AMKR, Director of energy department Volkov V. F. — AMKR, Deputy director responsible for efficient use of fuel energy resources Kamenev A. I. — AMKR, Chief Engineer of Energy department Tryapichkina T. G. — AMKR, Manager responsible for fuel & energy resources norms Yefremov A. V. — AMKR, Manager responsible for distribution & account of fuel & energy resources Maksimenko L.G. — AMKR, Environmental Department, Head of Department Golovetskaya E.N. — AMKR, Environmental Department, Lead specialist / air protection Yerokhin O.O. — Arena Eco: Agency for rational Energy Use and Ecology, Deputy Executive director Elena — AMKR, Energy Department, secretary and interpreter		

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Ref. No.	Issuance and/or submission date	Title / Type of Document	Editor	Comment (relevance in JI context)
6.	AMS-II.A (Version 09, Scope 2): "Supply side energy efficiency improvements – transmission and distribution"			Meth. tool
7.	AMS-II.C (Version 09, Scope 3): "Demand-side energy efficiency activities for specific technologies"			Meth. tool
8.	ACM0009 (Version 03, Scope 1, 4) "Consolidated baseline methodology for fuel switching from coal or petroleum fuel to natural gas"			Meth. tool
9.	ACM0012 (Version 03, Scope 1, 4): "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects"			Meth. tool
10.	Tool for the demonstration and assessment of additionality (Version 5.2)			Meth. tool
11.	Combined tool to identify the baseline scenario and demonstrate additionality (Version 2.1)			Meth. tool
Audit evidences				
12.	2007-07-23	PDD (version 1) of the JI project "Energy efficiency investment program at Mittal Steel Kryviy Rih" as published on the UNFCCC JISC website: http://ji.unfccc.int/JI_Projects/DB/285ML83S8HRCTFB8Y0LFZJK23Q45TJ/PublicPDD/U781XZRM1P8BC6UFIIA6BGKNLFWIB9/view.html (UNFCCC Ref.-No.: 0075) and parallel on www.netinform.net: http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=3504&Ebene1_ID=26&Ebene2_ID=1071&mode=1	AMKR & MWH	PDD in GSP public available: July 26, 2007 to August 24, 2007
13.	2008-05-29	PDD (version 02) of JI project "Energy efficiency investment program at OJSC ArcelorMittal Steel Kryviy Rih" with some revisions and as per new contract with PPs	AMKR & MWH	PDD in re-assessment
14.	2009-08-04	PDD (version 04) – Final of JI project "Energy efficiency investment program at OJSC ArcelorMittal Steel Kryviy Rih"	AMKR & MWH	Final PDD
15.	2007-06-11	ArcelorMittal Ecological Strategy (CO_2 emission reductions + energy efficiency)	AM	Early JI

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Ref. No.	Issuance and/or submission date	Title / Type of Document	Editor	Comment (relevance in JI context)
				consideration
16.	N/A	Official website of the OJSC "ArcelorMittal Steel Kryviy Rih" URL: http://www.arcelormittal.com/kryviyrih/	AMKR	PPs
17.	2006-10	Project Idea Note (version 2.0), with indication of MSKR (former PPs) and preliminary SPs implementation schedule. Earliest starting date is January 2007. *Note: In 2006 PPs were OJSC "Mittal Steel Kryviy Rih" and EBRD (as lender and buyer of ERUs); 9 sub-projects indicated in PIN are not the same as in the revised PDD version 3.0 (2008); Starting date of the project activity is also revised and mentioned in the new PDD version 3.0.*	MSKR & EBRD	PIN Directorate decision, early JI consideration
18.	2006-04-04	Loan agreement (confidential) EBRD appointed as potential ERUs buyer	MITTAL STEEL & EBRD	Early JI consideration
19.	2006-04-21	Project agreement (confidential) Between OJSC MITTAL STEEL KRYVIY RIH (former plant owner) and EBRD.	MITTAL STEEL KRYVIY RIH & EBRD	Early JI consideration
20.	2007-06-11	Ecological Policy of the Arcelor Mittal. Confirmation of intention to control and to reduce the CO_2 emissions (in case of technical and economical practicability) caused by steel production process.	AM	Early JI consideration
21.	2008-05-12	Letter of Endorsement on JI project of the same title issued by Ministry of Environmental protection of the Ukraine (as attached in Annex 4 of PDD, ver. 02)	Former DFP (host)	LoE (host country)
22.	2008-06-11	AM investments Procedure Internal rules of investment projects within AM Group	AM	Investment Analysis - AM internal rules for IRR/WACC level
23.	2008-11	Official letter to Mr. Konrad Tausche (TÜV SÜD Assessment Team) from AM – confirming the WACC figure for investment program in AMKR.	AM	Investment Analysis - WACC level

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Ref. No.	Issuance and/or submission date	Title / Type of Document	Editor	Comment (relevance in JI context)
24.	2008	Flow charts of the facilities and capacities of the plant in 2008 (baseline condition) and in future (after completion of the modernisation within the JI project).	AMKR	
25.	2008	Annual reports (2001 - 2007) on amount of natural gas consumed at AMKR [m3/MT of rolling product].	AMKR	
26.	2008	Annual reports (2001 - 2007) on amount of electricity consumption at AMKR [KWt/MT of rolling product].	AMKR	
27.	2003-07	Specific energy consumption (TJ/t of steel), comparison: Ukraine vs. EU Source: “Solutions for power consumption reduction of metallurgical process at Ukrainian plants”, by Butorina I. V., Charlashin P. S., Suchenko A. V., Stal (scientific and technological international journal – biggest periodical publication in Russia and CIS countries) No. 7, 2003	Scientific paper, published in “Stal” magazine	B.1.1.5 Prevailing practice barrier prove
28.	2007-06-17	Certificated calculations (due to the ACM0002) of emission factor for Ukrainian electricity grid. (approved by TÜV SÜD)	Global Carbon	B.1.1.6 - B.1.9.6 Baseline setting
29.	2006	Emission factor (NG combustion): [EF_{NG}] relevant for SP6, SP7, SP8 / specified by 2006 IPCC Guidelines of National Greenhouse Gas Inventories (s. table 2.2/Volume 2/Energy/Stationary combustion)	2006 IPCC	B.1.7.6 B.1.8.6 B.1.9.6
30.	2003-05	Host country economic uncertainties, investment risks from article: “Project financing” by Alexey V. Didkoviskiy in the Ukrainian Journal of Business Law	Ukrainian Journal of Business Law	B.1.1.5 Financial barrier
31.	2005-11-16	Limited credit sector of Ukraine (12% of GDP for industrial sector) Survey of Economist Intelligence Unit	EBRD	B.1.1.5 Financial barrier
32.	2008-06-06	Coke oven gas and blast furnace gas composition certificate.	AMKR	
33.	2008-05-31	Natural gas composition certificate.	Kharkivtransgaz	
34.	2008	Host country environmental legislation laws: - Federal Law No. 1269, dated October 31, 2007 “*On the order of approval of investment programs and building objects for carrying out the state expertise*”. - Federal Law No. 762-IV, dated on May 15, 2003 “*On high-risk facilities and Environmental Impact*	Cabinet Council of Ukraine	EIA (legal requirements)

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Ref. No.	Issuance and/or submission date	Title / Type of Document	Editor	Comment (relevance in JI context)
		Assessment necessity" *With identification of the applicability criteria for EIA of industrial projects*		
35.	2008-05-19	EIA Positive agreement No. 636 Environmental Impact Assessment (EIA) Results for SP1 done by AM as a summary from the EIA documents issued by Ukrainian Authorities and provided to AIE.	Ministry of Ecology, Ukraine	EIA, Acceptance of JI project by state authority
36.	2007-03-15	EIA Positive agreement No. 466 EIA's results for SP2 done by AM, issued by Ukrainian Authorities and provided to AIE.	Ministry of Ecology, Ukraine	EIA, Acceptance of JI project by state authority
37.	TBD	EIA – Environmental Impact Assessment Results for Sub-Project 6 (SP6) Note: Terms of (initial and/or first periodic) verification	Ministry of Ecology, Ukraine	EIA, Acceptance of JI project by state authority
38.	TBD	EIA – Environmental Impact Assessment Results for SP7 Note: Terms of (initial and/or first periodic) verification	Ministry of Ecology, Ukraine	EIA, Acceptance of JI project by state authority
39.	TBD	EIA – Environmental Impact Assessment Results for SP8 Note: Terms of (initial and/or first periodic) verification	Ministry of Ecology, Ukraine	EIA, Acceptance of JI project by state authority
40.	2008-12-02	AM Flat Carbon Europe SA: Details of Carbon Credit Buyer	AM	CR3's resolution
41.	2008-11-28	AM Discount Rate Target		CR3's resolution; Investment analysis
42.	2008-06-10	Technical specification of AKAR40/35 Purchase order released → to build AKAR40/35	AMKR	
43.	2008-06-12	Volume of produced O_2 (oxygen) in 2007,	AMKR	

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Ref. No.	Issuance and/or submission date	Title / Type of Document	Editor	Comment (relevance in JI context)
		volume of compressed air in 2007 and Energy (kW) to provide either.		
44.	2008-11-28	Calculation of SC_{OP} Details of ex-ante parameter used for the Specific consumption of Compressed air for Oxygen Production	Viktor K. Zheleznyak	Resolution on CR SP1-1
45.	2008-06-10	Technical enquiry on modernization of compressor units K-1500-62-2.	AMKR	
46.	2007-08-23	Contract No. 7296, on modernization of compressor units K-1500-62-2.	AMKR & METALLURG	
47.	2008-06-12	Purchase order compressor Nr. 21 *Shipment of the compressor to Ukraine, which passed retrofitting at LCC* "METALLURGUG" *(Russia)*	METALLURG	
48.	2008-06-11	COG + BF + NG: Composition and calorific values	s. PIN	
49.	2007-08	Country analysis briefs: «Ukraine» URL: http://www.eia.doe.gov/emeu/cabs/Ukraine/Electricity.html	EIA U.S.	B.1.4.6
50.	2008-11-28	Documentation about $SEC_{C,PS,Y}$ Source of information utilised in the PDD	Website	Resolution on CR SP4-4
51.	2007-02-19	Technical passport for gas burner GNP.R-250	LCC "Rubikon"	Compliance with regulations
52.	2008-06-11	Scheme of blast furnace and coke oven gas pipeline on OJSC "AMKR"	AMKR	
53.	2008-06-11	Diagram: Gas fuel consumption by agglomerative area Nr.1, (2 GOK) Note: Diagram provides 21% reductions of NG	AMKR	
54.	2008-06-11	Contract With suppliers for HPP Nr. 2. only	AMKR	

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Ref. No.	Issuance and/or submission date	Title / Type of Document	Editor	Comment (relevance in JI context)
55.	2008-06-12	Consumption before installation of sinter shop and HPP Nr. 3 (Original sources)	AMKR	
56.	2008-06-12	List of instruments used to make the assumptions/calculations	AMKR	
57.	2008-06-12	Sketch of major consumers of BF + COG	AMKR	
58.	2008-06-12	Gas fuel consumption of sinter plant	AMKR	
59.	2008-06	Chart - Power resources distribution in OJSC “AMKR”	AMKR	
60.	2008-06-11	Extract from Feasibility Study on “installation of top gas recovery turbine *in Fos sur Mer Plant”, France*	AM	