FINAL VALIDATION REPORT

GENERATION WITH BLAST FURNACE GAS OF SIDERPITA (JUN 1060), BRAZIL

Report No: 5649/08 – 08/195

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Date: 2009-October-01

2009-08-03	Project No.: 5649/08 – 08/195
Approved by: Mr. Rainer Winter	Organisational unit: TÜV NORD JI/CDM Certification Program
Client: Carbotrader Assessoria e Consultoria em Energia Ltda.	Client ref.: Mr. Arthur Augusto Clessie Moraes

Summary/Opinion:
Carbotrader Assessoria e Consultoria em Energia Ltda. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project "Generation with Blast Furnace Gas of SIDERPITA (JUN 1060), Brazil" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), the simplified modalities and procedures for small scale CDM project activities of annex II to decision 21/CP.8 and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity exports the electrical power from a thermoelectric blast furnace gas (BFG) to the Brazilian National Interconnected System (SIN).

A risk based approach has been followed to perform this validation. In the course of the pre-validation, 11 Corrective Action Requests (CARs) and 7 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 (Brazil) and all relevant UNFCCC requirements for CDM.
- The Brazilian DNA will only issue the Letter of Approval (LoA) on the basis of this positive validation opinion by the validator of the project. Thus the LoA could not be considered at the present validation stage.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 41,745 tCO2e are most likely to be achieved within the fix crediting period (1st January 2010 – 31st June 2017).

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

Report No.: 5649/08 – 08/195	Subject Group: Environment	
Report title: *Generation with Blast Furnace Gas of SIDERPITA (JUN 1060), Brazil*		
Work carried out by: Mr. Maria Carolina C. Coelho Mr. Fernando P. Pacheco		
Work verified by: Mr. Rainer Winter		
Date of this revision: 2009-10-01	Rev. No.: 2	Number of pages: 75

Indexing terms

Climate change
CDM
Validation
Kyoto Protocol

Abbreviations

BAU	Business as usual
BFG	Blast Furnace Gas
BNDES	Banco Nacional de Desenvolvimento Econômico e Social (National Bank to Social and Economic Development)
CAR	Corrective Action Request
CR	Clarification Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CR	Clarification Request
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
kW	Kilowatt
kWh	Kilowatt hour
m	meter
MW	Megawatt
MWh	Megawatt hour
N_2O	Nitrous Oxide
NCV	Net Calorific Value of Fuel
ODA	Official Development Assistance
ONS	Operador Nacional do Sistema (National Electric System Operator)
PDD	Project Design Document
QC/QA	Quality control/Quality assurance
SIN	Sistema Interligado Nacional (Brazilian national Interconnected System)
UNFCCC	United Nations Framework Convention on Climate Change
UTE	Usina Termelétrica (Thermoelectric Plant)

Table of Contents *Page*

1 NTRODUCTION

Companhia Siderúrgica Pitangui has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project:

"Generation with Blast Furnace Gas of SIDERPITA (JUN 1060), Brazil."

with regard to the relevant requirements for CDM project activities.

1.1 Objective

The purpose of this validation is to have an independent third party assessment of the project design. In particular the project baseline, the monitoring plan (MP), and the compliance of the project with

- the requirements of Article 12 of the Kyoto Protocol; the CDM modalities and procedures as agreed in the Marrakech Accords under decision 17/CP.7; the annex to the decision; subsequent decisions made by COP/MOP & CDM Executive Board,
- other relevant rules, including the host country (Brazil) legislation and sustainability criteria

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (based on AMS I.D version 13: Grid connected renewable electricity generation), which are included in the PDD and other relevant supporting documents.

The items covered in the validation are described below:

- **UNFCCC & Host Country Criteria**
  - UNFCCC/Kyoto Protocol requirements, in particular, the requirements of the CDM as set out in decision 17/CP.7 (Marrakech Accords), the present annex, and relevant decisions by COP/MOP & CDM Executive Board
  - Host country requirements / criteria

- **CDM Project Description**
  - Project design
  - Project boundaries
  - Predicted CDM project GHG emissions

- **Project Baseline**
  - Baseline methodology
  - Baseline GHG emissions
  - Additionality

- **Monitoring Plan**
  - Monitoring methodology
  - Indicators/data to be monitored and reported
  - Responsibilities

- **Background investigation and follow up interviews**

- **Stakeholder consultation**
  - Publishing of the PDD on TUV NORD website
  - Review of comments

- **Draft validation reporting with CARs & CRs, if any**

- **Final validation reporting.**

The information included in the PDD and the supporting documents were reviewed against the requirements and criteria mentioned above. The TÜV NORD JI/CDM CP has, based on the recommendations in the Validation and Verification Manual/VVM/, employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs. The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions. TÜV NORD JI/CDM CP can not be held liable by any entities for making its validation opinion based on any false or misleading information supplied to it during the course of validation.

The validation is not meant to provide any consulting to the project participant. 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 CDM 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
1	Energy industries (renewable - / non-renewable sources)

1.3.2 Project Parties

Brazil is the party involved in the project activity.

1.3.3 Project Entities

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

Project Proponent 1	Companhia Siderúrgica Pitangui Fazenda Velho da Taipa s/n Pitangui – 35.650-000 Minas Gerais Brazil
Contact person:	Mr. Newton Cardoso Director Tel: +55-37-32719000 Fax: +55-37-32719030 email: newtonjr@siderpita.com.br
Project Proponent 2	Efficientia S.A. Av. Afonso Pena, no. 1964 – 7º. andar Belo Horizonte – 30.130-005 Minas Gerais Brazil
Contact Person:	Mr. Túlio Marcus Alves Director Tel: +55-31-32733685 Fax: +55-31-32741763 email: tuliomma@efficientia.com.br
Project Proponent 3 and Project Developer	Carbotrader Assessoria e Consultoria em Energia Ltda. 23 de Maio, 790 – room 22 A Jundiaí – 13.207-070 São Paulo Brazil
Contact Person:	Dr. Arthur Augusto Clessie Moraes Director Tel.: +55-11-45227180 Fax: +55-11-45227180 email: moraes.arthur@carbotrader.com

1.3.4 Project location

The project site is located in Southeast region of Brazil, State of Minas Gerais, in the Pitangui city. The details of the project location are given in table 1-2:

Table 1-2: Project Location

No.	Project Scope
Host Country	Brazil
Region:	Southeast
Project location address:	Fazenda Velho da Taipa s/n
Latitude:	19°40'24'' S
Longitude:	44°53'31'' W

1.3.5 Project Technical description

The project consists of the reuse of the generated gas in the pig iron production process for electric power production in a turbo-generator system. To do so, the gas will be used for burning in a boiler, high pressure generation and temperature steam to be directed to a condensation turbine coupled to a generator with gross capacity of 5 MW. These process leads to an installation of a small thermoelectric plant, as suggested by the project activity.

The key parameters of the UTE SIDERPITA are given in table 1-3:

Table 1-3: Key parameters of the UTE SIDERPITA

General	
Installed power	5 MW
Fuel	Blast Furnace Gas - BFG
Boiler	
Type	Aquotubular
Fuel	Blast Furnace Gas
Turbine	
Type	Condensation – TMC 5000
Manufacturer	TGM Turbinas
Power (kW)	5,280
Rotation (rpm)	6,500
Generator	
Type	Three-phase
Frequency (Hz)	60

2 APPOINTMENT OF TEAM MEMBERS AND TECHNICAL REVIEWERS

On the basis of a competence analysis and individual availabilities a verification team, consistent of one team leader and 2 additional team members, were appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 2-1 below.

Table 2-1: Involved Personnel

	Name	Company	Function [1)]	Qualification Status [2)]	Sectoral competence	Technical competence	Host country Competence	Controlling competence
☒ Mr. ☐ Ms.	Rainer Winter	TÜV NORD CERT, Germany	TL	SA	x	x	-	x
☐ Mr. ☒ Ms.	Maria Carolina Crisci Coelho.	TÜV NORD CERT, Brazil	TM	E	x	x	x	-
☒ Mr. ☐ Ms.	Fernando P. Pacheco	TÜV NORD CERT, Brazil	TM	T	-	x	x	-
☒ Mr. ☐ Ms.	Alexander Richter	TÜV NORD CERT, Germany	TM	T	-	x	-	-
☐ Mr. ☒ Ms.	Inga Nagel	TÜV NORD CERT, Germany	TR	A	x	x	-	x
☒ Mr. ☐ Ms.	Eric Krupp	TÜV NORD CERT, Germany	FA	SA	x	x	-	x

[1)] TL : Team Leader; TM : Team Member, TR: Technical review; FA: Final approval

[2)] GHG Auditor Status: A : Assessor; E : Expert; SA: Senior Assessor; T : Trainee; TE Technical Expert

3 METHODOLOGY

The validation of the project was carried out from July ’08 to July ’09. It was divided into two phases: the pre-validation and the validation phase. The pre- validation consisted of the following three phases:

- A desk review of the PDD (incl. annexes) and supporting documents with the use of a customised validation protocol according to the Validation and Verification Manual/VVM/;
- 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 draft validation report includes Corrective action and Clarification Requests (CAR and CR) identified in the course of this validation.

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.

The final validation started after issuance of proposed corrective action (CA) of these CAR and CR by the project proponent. The validator has assessed the proposed CA with a positive result and after the closure of these CAR and CR the project proponent has issued the final version of the PDD. On the basis of this the final validation report and opinion were issued.

3.1 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables: Table 1 (Mandatory Requirements); Table 2 (Requirement Checklist); and Table 3 (Resolution of Corrective Action and Clarification Request) as described in Figure 1.

The completed validation protocol is enclosed in Annex I to this report identifying 11 Corrective Action Requests and 07 Clarification Request.

Validation 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 Validation 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 Validation process.*

Validation 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 seven 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 validation team has identified a need for further clarification.*

Validation 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***	***Validation conclusion***
If the conclusions from the draft Validation 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 validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1: Validation protocol tables

3.2 Review of Documents

The final PDD/PDD3/ submitted by Companhia Siderúrgica Pitangui in July 2009 and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation 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.

The documents that were considered during the validation process are given in chapter 7 of this report. They are listed as follows:

- Documents provided by the project proponent (Table 7-1)
- Background investigation and assessment documents (Table 7-2)
- Websites used (Table 7-3).

In order to ensure the transparency of the decision making process, the reference codes listed in tables 7-1 to 7-3 are used in the validation protocol and – as far applicable – in the report itself.

3.3 Follow-up Interviews

During 31st July 2008, the TÜV NORD JI/CDM CP performed the on-site interviews with the project proponent representatives, the project developer, and plant operating personnel to confirm selected information and to resolve issues identified in the document review.

The key interviewee and main topics of the interviews are summarised in Table 3-1.

Table 3-1 Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project participant representatives	- Technical details of the project - Project feasibility, designing, engineering, - Operational life time - Instrumentation details for GHG monitoring of the project - Legal situation - Approval procedures and status - Quality management system - Monitoring and measurement equipment - Crediting period - Project activity starting date - Baseline study assumptions - Sustainable development issues

Interviewed Persons / Entities	Interview topics
	- EIA Study - Analysis of local stakeholder consultation - Roles & responsibilities of the staff members project management, monitoring, calibration and reporting. - Editorial aspects of PDD - Methodology selection aspects - Baseline study, leakage and additionality

A detailed list including the functions or designations of the interviewed persons is given in chapter 7 (see Table 7-4). This table also includes reference codes to be used in the validation protocol.

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.

In this validation report 11 CARs and 7 CRs were raised.

The CARs / CRs are documented in Table 3 in the Annex to this report and addressed in section 4.

3.5 Public Stakeholder Comments

The PDD was made publicly available through TÜV NORD JI/CDM CP website www.global-warming.de. Comments on the PDD were invited within 30 days, i.e. 28/06/2008 to 28/07/2008.

No comments were received. In case comments would have been received, they would have also been made publicly available on this web site.

3.6 Finalising the report

The draft validation report containing a set of CARs & CRs was submitted to the project participants. The project design document will be revised addressing the CARs & CRs issued by TÜV NORD JI/CDM CP. After reviewing the revised and resubmitted project documentation /PDD2/; resolving the CRs & CARs raised and outstanding concerns, TÜV NORD JI/CDM CP will issue the final validation report and opinion.

4 PRE-VALIDATION FINDINGS

In the following paragraphs the findings from the desk review of the draft PDD/PDD1/ /PDD2/, visits, interviews and supporting documents are summarised. This also includes the corresponding corrective action taken by the client and its final assessment.

The results are shown in table 4-1:

Table 4-1: Summary of CAR and CR issued

Validation topic [1)]	No. of CAR	No. of CR
General description of project activity (A) *(4.1)* - Project boundaries *(4.1.1)* - Participation requirements *(4.1.2)* - Technology to be employed *(4.1.3)* - Contribution to sustainable development *(4.1.4)* - General topics *(4.1.5)*	02	02
Project baseline and monitoring methodology (B) *(4.2)* - Baseline Methodology *(4.2.1)* - Baseline scenario determination *(4.2.2)* - Additionality determination *(4.2.3)* - Calculation of GHG emission reductions *(4.2.4)* Project emissions Baseline emissions Leakage Emission reductions - Monitoring Methodology *(4.2.5)* - Monitoring of *(4.2.6)* Project emissions Baseline emissions Leakage Sustainable development indicators / environmental impacts - Project management planning *(4.2.7)*	08	04
Duration of the Project / Crediting Period (C) *(4.3)*	01	01
Environmental impacts (D) *(4.4)*	0	0
Stakeholder Comments (E) *(4.5)*	0	0
SUM	**11**	**07**

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

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

4.1 Participation Requirements

Brazil, the host country, has ratified the Kyoto Protocol on 23rd August 2002, and as a non Annex I party meets all relevant participation requirements.

The Brazilian DNA assigned for CDM is CIMGC (Interministerial Commission on Global Climate Change). At the time of validation, the Letter of Approval has not yet been issued by the CIMGC. A positive validation opinion is a pre-requisite for host government approval thus the LoA could not be considered at the present validation stage.

Corresponding changes of the project documentation due to the approval process will be addressed in a revision of the final validation report.

4.2 Project design

The objective of electricity generation with Blast Furnace Gas of SIDERPITA (JUN 1060), Brazil is to reduce GHG emissions by replacing electricity of the Brazilian National Interconnected System (SIN) which is a unique system/R8/ defined by Brazilian DNA. The project activity is estimated to reduce GHG emissions equivalent to 5,566 tCO_2e annually.

The proposed CDM project comprises generation of electricity in a turbo-generator (small thermoelectric plant). Before the project activity blast furnace gas (BFG) was used only for pre-heating the air injected in the 3 blast furnaces of the steel plant. The non-used BFG was burned and disposed into the atmosphere without any productive utilization. The project activity comprehends the use of the before burned and disposed BFG (estimates in 40% of total BFG generation) for electricity generation. The part of BFG that was already utilised before project implementation for the purpose of pre-heating the air injected in the three blast furnaces of the steel plant will serve this purpose also during operation of the project equipment. The BFG is a residue of the pig iron production process which uses charcoal derivates from eucalyptus plantations as the raw material for the production of pig iron. No fossil fuels are used. It could be verified by the validation team that the actual existing eucalyptus forest is more than the quantity necessary to maintain the operation of the pig iron production during the entire crediting period/XLSci/. The total charcoal consumption in one year of project activity was predicted applying the internal average consumption related to 100% of BFG produced by the pig iron plant. Evidences could be checked during on-site visit.
The project's system boundaries are the physical limits of UTE SIDERPITA and its main equipment: boiler, turbine and all the other equipment for power generation and direction to the industrial plant and to the national interconnected grid.The project is eligible under the approved small scale CDM methodology AMS I.D – *Grid connected renewable electricity generation* – version 13 and fulfils all applicability criteria of the applied methodology.
No technology transfer is involved in the project activity.

In terms of sustainable development, social, economic and environmental benefits are achieved although the reduction of consume of fossil fuel and associated pollution (particulates and CO), better working conditions and increases employment opportunities in the local to management, operate and maintenance service in new plant (small thermoelectric plan), improvement of the local economy and decentralizes energy generation.

The technology used in the project activity is environmentally safe and sound. The project design does reflect current good practices as the implemented technology is state-of-art.

Based on the financial information furnished by the project participant, no ODA contributes to financing the project./IM01/

However, CAR A1 regarding project's spatial boundaries, CR A1 regarding turbine & generator technical information provided in the PDD/PDD1/ were raised and successfully closed out.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

4.3 Baseline and Additionality

The selected baseline is in line with the approved baseline methodology AMS I.D. – Grid connected renewable electricity generation (Version 13).

As prescribed in small scale type I.D. baseline methodology, the baseline will be the kWh produced/ displaced by the renewable generating unit multiplied by an emission coefficient of the grid (measured in kg CO_2e/kWh).

The power generated by Generation with Blast Furnace Gas of SIDERPITA is delivered to the grid (SIN). The net power generated is approximately 30,222 MWh/year as defined in the PDD./PDD/

In this project, the grid emission coefficient is calculated by "combined margin method" consisting of the combination of "operating margin (OM)" and "build margin (BM)". This EF is calculated by a work group of Brazilian DNA /R8/ (ANEEL, ONS and DNA) and it is according to the procedures prescribed in the approved methodology ACM0002, AMS I.D. and "Tool to calculate the emission factor for an electricity system". Thus, emission reductions for this project activity will be the amount of electricity (kWh) supplied to the grid multiplied with the emission coefficient of National Interconnected System /R8/.

The EF can be applied in calculating ex-ante emissions avoided by the project activity, where the emission reduction will be calculated ex-post.

Brazilian DNA had calculated OM and BM for each interconnected unique system

and published the results /dna/.

The emission reductions (ER_y) of the project activity during the crediting period are the difference between baseline emissions (BE_y) minus project emissions (PE_y) and leakage emissions (L_y).

Baseline emission: BE_y is calculated by multiplying the electricity baseline emission factor or grid emission factor (EF_y) and the net electricity exported to the SIN (EG_y).

The grid emission factor (EF_y) is determined ex-ante and estimated as a combined margin (CM), consisting of the weighted average of operating margin (EF_{OM}) and build margin (EF_{BM}) factors.

The $EF_{OM,y}$ is calculated to be 0.2909 tCO_2e/MWh.

The $EF_{BM,y}$ is calculated to be 0.0775 tCO_2e/MWh.

In accordance with ACM0002, weighted factors of $w_{OM} = w_{BM} = 0.5$ have been used resulting to an combined margin grid emission factor (EF_y) as 0.1842 tCO_2e/MWh.

The calculation of EF_y is published by the Brazilian DNA on its web-site/dna/.

The validation team verified the emission coefficient calculation used in calculating the GHG baseline emissions and emission reductions.

However, CAR B1 regarding to baseline scenario was raised and successfully closed out.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

Additionality

The additionality was demonstrated acc. to Appendix B1 of the simplified modalities and procedures for small-scale CDM project activities (Attachment A)/AB/.

The individual arguments presented in the PDD/PDD3/ to justify the additionality were summarised in table 4-2. This table also includes the assessment of the validation team.

Table 4-2: Additionality assessment

Type of barrier[1)]	Argument	Assessment
(a)	The difficulty in obtaining investment for this kind of project due higher rates of financing, level of guarantees required, the high fees charged due to the risk associated with renewable projects. The Basic Rate of Interest of the	☐ Argument not justified ☐ Argument not convincing ☐ Argument justified but not a decisive barrier ☒ Argument justified / significant barrier See assessment underneath this table.

Type of barrier[1)]	Argument	Assessment
	Brazilian Government (SELIC rate) was considered as comparison index (benchmark) in relation to the project's Internal Rate of Return (IRR). Although the SELIC rate oscillates a lot, it is demonstrate in figure 04 of PDD that it is always more than 15%. The IRR of the project without CER is 13.35% and with CER is 14.38% per year (both less than the SELIC rate).	
(c)	PP further demonstrated the project's additionality on the basis of other barriers, i.e. the barrier due to prevailing practice. The Brazilian electric power generation portfolio consists of 74.5% hydroelectric power plants, 21.3% thermoelectric power plants and remaining sources are micro hydropower, thermonuclear, wind power and photovoltaic plants. Thermoelectric power plants use generally natural gas, diesel oil and fuel oil. It is not common to use BFG as source (less than 0.2% of the electric power generation). Thus, due to lack of information and experiences with this technology a barrier due to prevailing practice exists as well.	☐ Argument not justified ☐ Argument not convincing ☒ Argument justified but not a decisive barrier ☐ Argument justified / significant barrier See assessment underneath this table.
(d)	The calorific value of BFG is lower. The technological know how is not available (and common) for the steel industry sector and capacity to absorb new technologies need additional human management and operation resources.	☐ Argument not justified ☐ Argument not convincing ☐ Argument justified but not a decisive barrier ☒ Argument justified / significant barrier See assessment underneath this table.
Assessment of the validation team		☒ Project is additional ☐ Project is not additional

1) Classification acc. to Attachment A to Appendix B of the simplified modalities and procedures a) investment barrier; b) technological barrier; c) barrier due to prevailing practice; d) other barriers

The PP chooses the investment barrier analysis, barrier due to prevailing practice and other barriers to prove additionality:

Investment barrier

The PP calculated the project IRR of the proposed activity and compared it to a benchmark. The benchmark is the Basic Rate of Interest of the Brazilian Government (SELIC rate). It is the base rate used as reference for monetary policy and it was assessed to be appropriate as source for benchmark. This rate is very reasonable

considering the conditions of the Brazilian Market, where currently the Selic Rate (government bonds- the lowest risk investment) has been historically well over 10%.

The IRR calculation was reproduced by the validation team. The parameters used for the IRR calculation were derived from the Performance Contract between Efficientia S.A, CEMIG Distribuição S.A. and Rio Rancho Agropecuária S.A./PC/ and thus applicable at the time of taking the investment decision. The source of IRR calculation is assessed to be adequate and the assumptions stated in the reports are assessed to be reasonable. For a detailed assessment of parameters considered for IRR calculation please refer to table 4 in the Annex.

The IRR of the project without CER revenues is 13.35% per year and hence lower than the benchmark value (SELIC rate) of 19.56% at the time of taking the decision to proceed with project implementation. The project IRR is still below the benchmark taking into account the average rate of approximately 17% in average during the years 2002 to 2004. The same situation was observed considering the lowest SELIC rate since March 1999 which worked out to 15%.

Barrier due to prevailing practice and other barriers

In Brazilian electric power portfolio, less than 0.2% is generated by Blast Furnace Gas (BFG). It is, hence not a common practice in the south-eastern region or Brazil. Considering the lack of information and experiences with this technology as well as the lower calorific value of BFG the investment is related to risks of proper operation and remedial maintenances of potential plant's breakdowns. Therefore, proper project operation as well as maintenance requires qualified personal and additional financial resources. Thus, it could be observed that a barrier due to prevailing practice and other barriers exist as well.

However, CR B1 regarding parameter used, CR B2 regarding values presented in spreadsheet calculation, CR B3 regarding evidence of documentation and traceability of formulas were raised and successfully closed out.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

Evidence of Management Decision

In July 2005, Performance Contract between Efficientia S.A., CEMIG Distribuição S.A. and Rio Rancho Agropecuária S.A./PC/ was signed. Since all specifications related to the project activity in terms of financial or technological matters are demonstrated in the contract it represents the basic document to proceed with the implementation of the project activity. July 14th 2005 is therefore considered to be the date of investment decision as well as the project starting date. At the time of investment decision, prior to project implementation, the data available were provided in the Performance Contract/PC/ in a detailed and comprehensive manner. Thus all values used in investment analyses spreadsheets/XCLirr//XCLpc/ are representing data available at the time of CDM project investment decision. This is in accordance with the "Guidance on the Assessment of Investment Analysis" (Version 02, EB 41).

Showing accordance with Brazilian laws and regulations in September 2006, ANEEL issued the Dispatch allowing the generation of energy through the 5 MW Siderpita plant/ANEEL/.

In February 2007, the local environmental body of Brazil issues the installation license for the project activity.

In July 2007, provisory operation license /OL/ was issued by Brazilian environmental body. Thus, PP started tests of equipments.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

4.4 Crediting Period

The starting date of the crediting period as mentioned in the PDD/PDD3/ under Section C.2 is 01/01/2010 or the UNFCCC registration date. The intended crediting period of project activity is for a fix period of seven years and six months i.e. starting from the date of registration (in 2010) up to 2017. The operational lifetime of the project activity was identified to be 10 years/DE/, provided normal O&M procedures for the installed equipment are taking place. This was evidenced through /PC/ and several follow up interviews with the PP and the manufacturer. CARs and CRs were raised during validation due to inacceptable definitions of the crediting period and operational lifetime and closed out after proper revision of relevant sections in the PDD. All necessary information is provided in the Annex to the report.

CR C1 regarding to crediting period and CAR C1 regarding to starting date were raised and successfully closed out.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

4.5 Monitoring Plan

The project applies the monitoring methodology AMS I.D.: Renewable electricity generation for a grid (Version 13), for small scale CDM project activities.

The project methodology consists of metering the electricity supplied to the grid and to the Siderpita siderurgical plant (EG_y). They will be measured continuously on the high voltage side after transformation by main and back up meters and recorded monthly. All measuring devises comply with national standards and are sealed for safety after calibration. Data will be kept for at least two years after expiration of the crediting period.

The EF (EF_{grid}) will be calculated ex-post based on OM and BM to be published by Brazilian DNA.

Additionally, the biomass input necessary for the project activity will be monitored during the crediting period. As requested by the applied methodology, paragraphs 14 and 15, the parameters BFG consumption per unit of electricity generated by thermoelectric power plant and the charcoal consumption per unit of BFG are being determined *ex-ante*

The procedure for calibration, accuracy and maintenance of monitoring equipment and the responsibilities are clearly mentioned in section B.7. and Annex 4 of the PDD/PDD3/.

However, CAR B7 regarding to description of parameter, frequency of meter readings, maintenance of equipment, person in charge of monitoring and maintenance , CAR B8 regarding to collection and archiving data, CAR B9 regarding to measurement equipment, CAR B10 regarding to calibration intervals and procedures for day-to-day records were raised and successfully closed out.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

4.6 Calculation of GHG Emissions

Methodologies for calculating emission reductions are documented. The project intends to reduce carbon dioxide (CO_2) emissions by generating electricity from a blast furnace gas originated from the steel production, which would be exported to the SIN.

Project emission: The project emission is considered as zero.

Leakage: The technology introduced is not transferred to or from another project activity. Thus leakage can be ignored.

The emission reduction calculation was reviewed by the validation team. All underlying data/ values are transparent presented and assessed to be adequate.

However, CAR B2, CAR B3 and CAR B5 regarding to inconsistent data between PDD and spreadsheet calculation, CAR B4 regarding to electric power system were raised and successfully closed out.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

4.7 Environmental Impacts

According to Brazilian legislation an Operation License (OL)/OL/ can only be issued if all relevant/necessary environmental issues are duly addressed. Depending on the plant activity different environmental assessments have to be carried out during issuance of Installation License (IL)/IL/. According to Brazilian legislation, if no significant impacts are identified, no environmental impact assessment has to be

carried out. This is the case of Siderpita project, where there are no significant environmental impacts. Despite of that, according to environmental bodies, monitoring of chimney exit, noise and discharge of water is necessary and going to be performed by SIDERPITA.

No significant environmental and social impacts were identified. No adverse environmental impacts as well as transboundary impacts have been envisaged from this project activity.

4.8 Comments by Local Stakeholders

The PP has invited various stakeholders such as governmental officials and local stakeholders to comment about the project, according to DNA's procedure.

Two positive comments from Government of Municipality and Municipal House of Representatives of Pitangui were received and addressed on PDD/PDD3/.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Table 3).

5 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to the modalities for the validation of CDM projects, TÜV NORD JI/CDM CP published the draft PDD on its website www.global-warming.de on 28 June 2008 and invited comments within 30 days, until 28 July 2008 by parties, stakeholders and UNFCCC accredited non-governmental organisations. No comment was received.

6 VALIDATION OPINION

Carbotrader Assessoria e Consultoria em Energia Ltda. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project "Generation with Blast Furnace Gas of SIDERPITA (JUN 1060), Brazil" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), the simplified modalities and procedures for small scale CDM project activities of annex II to decision 21/CP.8 and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity exports the electrical power from a thermoelectric blast furnace gas (BFG) to the Brazilian National Interconnected System (SIN).

In the course of the pre-validation, 11 Corrective Action Requests (CARs) and 7 Clarification Requests (CRs) were raised and successfully closed.

The review of the project design documentation and additional documents; 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 (Brazil) and all relevant UNFCCC requirements for CDM.
- The Brazilian DNA will only issue the Letter of Approval (LoA) on the basis of this positive validation opinion by the validator of the project. Thus the LoA could not be considered at the present validation stage.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 41,745 tCO2e are most likely to be achieved within the fix crediting period (1st January 2010 – 31st June 2017).

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

Essen, 2009-10-01

Rainer Winter
TÜV NORD JI/CDM Certification Program

Essen, 2009-10-01

Eric Krupp
TÜV NORD JI/CDM Certification Program

Validation Team Leader Senior Assessor

7 REFERENCES

Table 7-1: Documents provided by the project proponent

Reference	Document
/**ANNEL**/	ANEEL's Dispatch #2108 of 14/09/2006
/**AR**/	Annotation of receiving from stakeholders
/**CT**/	Certificate of training (NR-13 – SENAI)
/**EP**/	Equipment plate with data of generator (6, 250 kVA)
/**FOC**/	Functional organization chart
/**GP**/	(General) Procedures of: boiler firing / deactivation boiler / turbine departure / cares during turbine operation / control / measurement / register of energy generated / program of calibration / calibration criteria and analysis / list of measurement instrument
/**MM**/	Data of meter (given by manufacturer Actaris)
/**MPM**/	Monitoring Plan (Manual of Operation)
/**OC**/	Organization chart
/**OL**/	Provisory Operation Licence – COPAM #0011/1977/009/2007 (2007/07/06)
/**PC**/	Performance Contract between Efficientia S.A., CEMIG Distribuição S.A. and Rio Rancho Agropecuária S.A. – 2005-07-06
/**PDD1**/	Draft PDD: "Generation with Blast Furnace Gas of Siderpita (JUN 1060), Brazil" (Version 1), 2008-06-02 Draft PDD: "Generation with Blast Furnace Gas of Siderpita (JUN 1060), Brazil" (Version 2), 2008-06-30 (inclusion of emission factor published by Brazilian DNA after the Draft PDD version 01 published
/**PDD2**/	Draft PDD: "Generation with Blast Furnace Gas of Siderpita (JUN 1060), Brazil" (Version 2), 2008-06-30 (inclusion of emission factor published by Brazilian DNA after the Draft PDD version 01 published)

Reference	Document
/**PDD3**/	PDD: "Generation with Blast Furnace Gas of Siderpita (JUN 1060), Brazil" (Version 3), 2009-07-15
/**PO**/	Proof of receipts
/**REC**/	Report of environmental control – February 2006
/**SA**/	Stakeholder's answer: *Câmara Municipal de Pitangui* – letter #016/2007 of 07/05/2007 and *Prefeitura Municipal de Pitangui* – letter of 02/05/2007
/**SC**/	Staff training certificate of the operational contracted personnel.
/**XCLci**/	Excel Spreadsheet excel – calculation of charcoal necessary during the fixed crediting period.
/**XCLirr**/	Excel Spreadsheet – IRR UTE Siderpita
/**XCLpc**/	Excel Spreadsheet – Performance Contract Data

Table 7-2: Background investigation and assessment documents

Reference	Document
/**TA**/	Tool for the demonstration and assessment of additionality (Ver 5).
/**AB**/	Appendix B1 of the simplified modalities and procedures for small-scale CDM project activities (Attachment A)
/**AMS I.D**/	Grid connected renewable electricity generation – version 13
/**CPM**/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/**GCP**/	UNFCCC: Guidelines for completing CDM-PDD and CDM-NM (Version 6.2)
/**IPCC-GP**/	IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories
/**IPPC-RM**/	IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual
/**KP**/	Kyoto Protocol (1997)

Reference	Document
/**MA**/	Decision 17/CP. 7 (Marrakesh – Accords & Annex to decision 17/CP.7)
/**R7**/	Resolution #7 of CIMGC of 05/03/2008
/**R8**/	Resolution #8 of CIMGC of 26/05/2008
/**TEF**/	Tool to calculate the emission factor for an electricity system (Version 1)
/**VVM**/	IETA, PCF Validation and Verification Manual 2006 (Dec.)

Table 7-3: Websites used

Reference	Link	Organisation
/**aneel**/	http://www.aneel.gov.br/aplicacoes/Empreendimento/ResumoUsina.asp?lbxUsina=29473:Siderpita	ANEEL
/**dna**/	www.mct.gov.br	DNA of Brazil
/**dnane**/	http://www.mct.gov.br/upd_blob/0024/24834.pdf	DNA of Brazil (Note of Explanation)
/**plantar**/	http://www.plantar.com.br/portal/page?_pageid=73,91181&_dad=portal&_schema=PORTAL	Plantar Group
/**pigiron**/	http://www.ecen.com/eee21/emiscar2.htm	Ecen
/**ipcc**/	www.ipcc-nggip.iges.or.jp	IPCC publications
/**unfccc**/	http://cdm.unfccc.int	UNFCCC

Table 7-4: List of interviewed persons

Reference	Mol[1]		Name	Organisation / Function
/**IM01**/ /**IM02**/	V E	☐ Mr. ☒ Ms	V. d N. Lima	Carbotrader Assessoria e Consultoria em Energia

Reference	MoI[1]		Name	Organisation / Function
				Ltda. / Project Manager
/**IM01**/	V	☒ Mr. ☐ Ms	J. L. dos Santos	Companhia Siderúrgica Pitangui / Quality Coordinator
/**IM01**/	V	☒ Mr. ☐ Ms	R. Miranda	Companhia Siderúrgica Pitangui / Industrial Manager
/**IM01**/	V	☒ Mr. ☐ Ms.	D. Kux	Efficientia S.A. / Energetic Solutions Engineer
/**IM01**/	V	☒ Mr. ☐ Ms.	G. Salume	Efficientia S.A. / Energetic Solutions Engineer
/**IM01**/ /**IM03**/	V E	☒ Mr. ☐ Ms.	A. Moraes	Carbotrader Assessoria e Consultoria em Energia Ltda. / Director

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

ANNEX

Final Validation Protocol

and

Appointment Certificates of team Members

ANNEX 1: VALIDATION PROTOCOL

Table 1: Mandatory Requirements for (CDM) Project Activities

Requirement	Reference	Conclusion
Parties		
The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	Annex 1 Party will be identified in due time.
The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	(OK)
The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	(OK)
In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	Public funding from Annex I countries is not included in project financing
Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	Yes, the only (host) party involved has designated a

Requirement	Reference	Conclusion
		national authority for the CDM
The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	Yes, Brazil has ratified the Kyoto Protocol
The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	It's a unilateral project. Annex 1 Party will be identified in due time.
The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	It's a unilateral project. Annex 1 Party will be identified in due time.
Additionality		
Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	~~CR B2~~ ~~CR B3~~ ~~CR B4~~

Requirement	Reference	Conclusion
CDM project activity.		
Forecast emission reductions and environmental impacts		
The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	~~CAR B2~~ ~~CAR B3~~ ~~CAR B4~~ ~~CAR B5~~
Environmental impacts		
Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, 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.	CDM Modalities and Procedures §37c	EIA not mandatory by local legislation. No significant impacts were found. All environmental licenses were evidenced.
Stakeholder involvement		
Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK

Requirement	Reference	Conclusion
Other		
The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK, methodology AMS I.D is applied in the project activity.
A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	~~CAR B1~~
The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	The project is not mandatory by law. The CERs are only accounted inside the project boundary.
The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK, the latest version of the SSC PDD was used.
Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	~~CAR B2~~ ~~CAR B3~~

Requirement	Reference	Conclusion
		~~CAR B4~~ ~~CAR B5~~
Requirements for small-scale projects only		
The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	Ok, eligibility criteria met,
The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK, methodology AMS I.D is applied in the project activity.
If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	EIA not mandatory by local legislation. No significant impacts were found. All environmental licenses were evidenced.

Table 2: Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	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 boundaries (geographical) clearly defined?	/PDD/ /Annex 3/	DR	The PDD does not provide information which energy source is used in the project scenario for the purpose of pre-heating the air injected in the 3 blast furnaces. In order to investigate whether or not leakage is associated with the project activity the client is requested to clarify whether fossil fuels are utilised for the above mentioned purpose.	~~CAR A1~~	OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/PDD/	DR	The project's system boundaries are the physical limits of UTE SIDERPITA and its main equipment: boiler, turbine and all the other equipment for power generation and direction to the industrial plant and to the national interconnected grid.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.2. Participation Requirements *Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.*					
A.2.1. Which Parties and project participants are participating in the project?	/PDD/	DR	It is an unilateral project hosted in Brazil with the following project proponents: Companhia Siderúrgica Pitangui, Efficientia S.A. and Carbotrader Assessoria e Consultoria em Energia Ltda.	OK	OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/PDD/	DR	In accordance with the CDM M&P at the time of making the PDD public at the stage of validation a Party involved may or may not have provided its approval. At the time of requesting registration the approval of the Parties involved is required. At the time of completing the Final Validation Report the LoA is still pending. For the Brazilian DNA a positive validation opinion is a prerequisite for the host government approval and thus the LoA could not be considered at the present validation stage. Corresponding changes of the project documentation due to the approval process will be addressed in a revision of the final validation report.	OK	OK
A.2.3. Do all participating Parties fulfil the	/PDD/	DR	Brazil, the host country, has ratified the	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/dna/		Kyoto Protocol on 23rd August 2002. The Brazilian DNA assigned for CDM is the "Comissão Interministerial de Mudança Global do Clima". The voluntary participation will be stated in the LoA which is still pending. See comment A.2.2.		
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/PDD/		Public funding was not used to finance the project activity.	OK	OK
A.3. Technology to be employed *Validation 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.) /IM01/	DR I	Yes, a small thermoelectric plant will be installed. The equipments to be installed were considered adequate, nevertheless, inconsistency was evidenced between turbine potency described in the PDD (5,000 kW) and what was evidenced during the on-site visit (5,260 kW). The project participant is requested to provide clarification.	~~CR A1~~	OK
A.3.2. Does the project use state of the art	/PDD/	DR	Yes, the project activity uses advanced	OK	OK

	CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	(A.4.3.) /IM01/	I	state of the art technology. With the project implementation a reduction of particles emissions due to the BFG laundering will be achieved.		
A.3.3.	Does the project make provisions for meeting training and maintenance needs?	/PDD/ (B.5 and B.7.2) /IM01/ /CT/ /GP/ /MPM/	DR I	Yes, expert engineers and technicians were hired to guarantee the appropriate operation and maintenance of the plant; the operation and maintenance procedures will follow the national regulatory specifications. Training and studies were offered during the project implementation, as follows: Brazilian Regulamentary Standard (NR-13), experience changes in other similar UTE which is a CDM registered project activity, internal trainings and instructions offered by the equipment supplier. Evidences were available to validator during on-site visit/ST/.	OK	OK
A.4. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*						
A.4.1.	Has the host country confirmed that the project assists it in achieving sustainable development?	/dna/	DR	The project is in line with current sustainable development priorities in Brazil. Nevertheless the Brazilian DNA will finally decide whether the project is in line with the sustainable development policies - considering the results of this validation report.	Not yet OK	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.5. General Topics					
A.5.1. Has the PDD been duly filled?	PDD (Annex 1 and 4)	DR	Annex 4 refers to section B.7 in the PDD. Section B.7 and Annex 4 do not describes the monitoring measures in a sufficient manner. Thus, inclusion of all relevant data according to AMS I.D. as well as to /TEF/ has to be done. Moreover, Street name and number are not mentioned in Annex 1. Revision is requested. Page 3 in the PDD states the date of PDD version 1: 06/02/2008. This date is contradictory to the year dates on pages 13, 14, 17 of PDD. The PP is requested to take corresponding action to resolve the issue.	~~CAR A2~~ ~~CR A2~~	OK OK
A.5.2. Has all necessary information been made available to the validator?	PDD	DR	Yes, the PP provided all required information as far as possible at the pre-validation stage.	OK	OK
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/PDD/ (B.1) /AMSID/	DR	Yes, AMS I.D. version 13 is still applicable.	OK	OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/PDD/ (B.2) /AMSID/ /R8/	DR	The applicability criteria were all fulfilled: as stated by AMS I.D.: • the capacity not exceeds the limit of 15 MW, • displace electricity from an electricity distribution system that is supplied by at least one fossil fuel fired generation unit, it is considered the Brazilian National Interconnected System. Moreover, AMS I.D. does not state that waste gas can not be utilized if coming from a renewable biomass, as it is the case. Only in case of waste gas with methane recovery the methodology says it is not applicable; and it is not the case. Moreover the methodology does not state that an implementation of the new facility to burn biomass is a pre-requisite.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2. Baseline Scenario Determination *The choice of the baseline scenario 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/ (B.4)	DR	The baseline scenario is the continuation of the current situation. The waste gas is further burned for the purpose of pre-heating air utilised in the boiler and electricity is further consumed from the grid and the plants physically connected to it. However, mistakes have been identified in the ER calculation. Please refer to section B.5 of the DVR.	~~CAR B1~~	OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/PDD/ (B.4.)	DR	No other alternative scenario is available.	OK	OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/PDD/ (B.4.) /AMSID/	DR	Yes, the project participants determined the most likely baseline scenario as referred to in AMS.I.D.	OK	OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/PDD/ (B.4.)	DR	See comments in B.5.1 and B.5.2.	~~CARs B2-6~~	OK
B.2.5. Does the baseline scenario sufficiently take	/PDD/	DR	Yes, all relevant boundary conditions as	OK	OK

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	(B.4.)		national policies etc. have been taken into account.		
B.2.6.	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/PDD/ (B.4.)	DR	See comments in B.5.1 and B.5.2.	~~CARs B2-6~~	OK
B.2.7.	Have the major risks to the baseline been identified?	/PDD/ (B.4.)	DR	No major risks were identified.	OK	OK
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.	Is the project additionality assessed according to the methodology?	/PDD/ (B.5.), /AB/	DR	To the project additionality assessment was used the Attachment A to Appendix B of the simplified modalities and procedures for CDM small scale project activities.	OK	OK
B.3.2.	Are all assumptions stated in a transparent and conservative manner?	/PDD/ (B.5.) /PC/ /XCLpc/ /IM01/	DR I	The client is kindly requested to state the core financial parameters used for computing the IRR in section B.5 of the PDD. The client shall kindly justify the red highlighted values in xls-sheet, table	~~CR B1~~ ~~CR B2~~	OK OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			"project analysis". Additional, cells are linked to documents not available to the validation team (e.g. Designed Benefit to the process of Siderpita). All formulas shall be traceable and calculations transparent, hence revision of calculation sheet is requested.	~~CR B3~~	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/PDD/ (B.5.) /PC/ /XCLpc/ /IM01/	DR I	Yes, the Benchmark analysis was applied. Furthermore prevailing situation and other barriers were described. The IRR of 13.35 is lower compared to the average of SELIC rate (benchmark) which is 19.7%. The cost-benefit relation of this project activity is 0.57. It was used a conservative capacity factor of 75%.	OK	OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/PDD/ (B.5.) /PC/ /IM01/	DR I	Yes, the starting date of the project activity (management decision and planning) was before the validation process, and sufficient evidence was provided that the incentive from CDM was considered in the decision to proceed with the project activity. It can be evidenced through Performance Contract signed in 2005 between Efficientia S.A and Companhia Siderúrgica Pitangui, which mentions (in page 08) the right to explore CERs, in the national and international market.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Corresponding documentation was provided.		
B.4. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/PDD/ (B.6.)	DR	There is no project emission.	OK	OK
B.4.2. Have conservative assumptions been used when calculating the project emissions	/PDD/ (B.6.)	DR	See comment in B.4.1.	OK	OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/PDD/ (B.6.)	DR	See comment in B.4.1.	OK	OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/PDD/ (B.6.)	DR	The following values in the xls-calculation need further justification or revision, respectively, due to inconsistencies between PDD and xls-sheet: a. Annual Plant Availability		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			b. Auto / Auxiliary Electricity Consumption (in PDD: 400 kW) c. Generator Capacity (in PDD: 5 MW) d. Available Power (in PDD: 4,600 kW) Submission of evidences is requested. Furthermore, simplification of xls-sheet and justification of applied values is suggested by application of values according to the design capacity of the plant's components. In doing so the blue highlighted part in table "summary" can be deleted.	~~CAR B2~~ ~~CAR B3~~	 OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions	/PDD/ (A.4.2, B.6.)	DR	Step 2 under B.6.1.2 requires the selection of the year in which the project activity displaces electricity as well as updating of the emission factor annually during monitoring. The project participant is requested to define the year and to update the emission factor annually according to the grid factor tool. The definition of the relevant electric power system should be carried out under B.6.1.2 in step 1 in a precise manner.	~~CAR B4~~ ~~CAR~~	OK OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			On page 25 in the PDD (table summary) the value EG in MWh/year (30,222) is not matching with the value in the xls-calculation (spreadsheet summary), e.g. 30,112.84 MWh/a. Please refer to CARs A1, B2 and B3. The table under section B.6.4 shall be revised according to the remaining operational lifetime of the project activity. As stated in section C.1.2 the operational lifetime is 10 years and has started in 14. July 2005. In this respect the PP is kindly requested to reconsider the crediting period as per the definition in the glossary of terms. In order to keep consistency table in section A.4.3 should be revised too.	~~B5~~ ~~CAR B6~~ ~~CAR B7~~	OK OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/PDD/ (B.6.)	DR	There are no uncertainties in the baseline emissions.	OK	OK
B.6. Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.6.1. Are the leakage calculations documented according to the approved methodology and	/PDD/ (B.6.)	DR	There is no equipment transferred, so leakage emissions were not considered.	N/A	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
in a complete and transparent manner?					
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/PDD/ (B.6.)	DR	See comments in B.6.1.	N/A	
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/PDD/ (B.6.)	DR	See comments in B.6.1.	N/A	
B.7. Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/PDD/ (B.6.)	DR	Yes, the project activity reduces the GHG emissions avoiding the electricity generation through fossil fuels sources, with consequent CO_2 emissions, which would be produced in the absence of the project activity.	OK	OK
B.8. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/PDD/ (B.7.) /MPM/ /MM/ /Annex 4/	DR	Revision in monitoring plan is necessary according to: a. The description of monitoring of EGy should include also the number, type, accuracy of	~~CAR B8~~	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			meters used. b. The frequency of meter readings is not addressed c. Procedures for maintenance of monitoring equipment should be more precise. d. The person in charge as well as the operational and management structure is not described e. AMS I.D. version 13 requirements to monitor the biomass input as well as to specify the fuel consumption is not described. The PP is requested to follow the Methodology and the necessary corresponding documents precisely.		
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/PDD/ (B.7.1)	DR	Yes.	OK	OK
B.9. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
B.9.1. Does the monitoring plan provide for the	/PDD/	DR	As project emissions are zero, this is not	OK	OK

	CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	(B.7.)		applicable.		
B.9.2.	Are the choices of project GHG indicators reasonable and conservative?	/PDD/ (B.7.)	DR	As project emissions are zero, this is not applicable.	OK	OK
B.9.3.	Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/PDD/ (B.7.)	DR	As project emissions are zero, this is not applicable.	OK	OK
B.9.4.	Is the measurement equipment described and deemed appropriate?	/PDD/ (B.7.)	DR	As project emissions are zero, this is not applicable.	OK	OK
B.9.5.	Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/PDD/ (B.7.) /GP/	DR	As project emissions are zero, this is not applicable.	OK	OK
B.9.6.	Is the measurement interval identified and deemed appropriate?	/PDD/ (B.7.)	DR	As project emissions are zero, this is not applicable.	OK	OK
B.9.7.	Are the registration, monitoring, measurement and reporting procedure defined?	/PDD/ (B.7.) /IM01/ /GP/	DR I	As project emissions are zero, this is not applicable.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.9.8. Are procedures identified for maintenance of monitoring equipment and installations? Are the calibration intervals being observed?	/PDD/ (B.7.) /IM01/ /GP/	DR I	Companhia Siderúrgica Pitangui has procedures for maintenance of equipment and installations. The ENGEMAN software is used to program (annually) the maintenance of the generator, the turbine and the boiler. Calibration intervals are defined on the procedure and in accordance with the calibration requirements. As project emissions are zero, this is not applicable.	OK	OK
B.9.9. 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/ (B.7.) /IM01/ /GP/	DR I	As project emissions are zero, this is not applicable.	OK	OK
B.10. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/PDD/ (B.7.) /Annex 4/	DR	It is necessary to revise PDD considering the measurement equipments adequacy, calibration needs, procedures and frequency. The baseline emissions are calculated as the total energy generation in the year multiplied by a combined margin emission		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			factor. The operational and building emissions factors are calculated in a transparent and conservative manner by Brazilian DNA according "Resolution no. 8, of May 26, 2008, which adopts a single system as definition of a project electric system in the National Interconnected System for purpose of CDM project activity". The combined margin was calculated applying a weighted average between operational and combined margin, using 50% ratio for each margin.	~~CAR B9~~	
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/PDD/ (B.7.) /Annex 4/	DR	Yes, The EF can be assessed as reliable as it is calculated by the local DNA and the energy generation monitoring, procedures and QAQCs measures are properly identified.	OK	OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/PDD/ (B.7.) /Annex 4/	DR	Please refer to B.10.2	OK	OK
B.10.4. Is the measurement equipment described and deemed appropriate?	/PDD/ (B.7.) /Annex 4/	DR	Please refer to CAR B9.	~~CAR B9~~	OK
B.10.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/PDD/ (B.7.) /Annex 4/	DR	Please refer to CAR B9.	~~CAR B9~~	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10.6. Is the measurement interval for baseline data identified and deemed appropriate?	/PDD/ (B.7.) /Annex 4/	DR	Please refer to CAR B9.	~~CAR B9~~	OK
B.10.7. Are the registration, monitoring, measurement and reporting procedure defined?	/PDD/ (B.7.) /Annex 4/	DR	Please refer to CAR B9.	~~CAR B9~~	OK
B.10.8. Are procedures identified for maintenance of monitoring equipment and installations? Are the calibration intervals being observed?	/PDD/ (B.7.) /Annex 4/	DR	Please refer to CAR B9.	~~CAR B9~~	OK
B.10.9. 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/ (B.7.) /Annex 4/	DR	Please refer to CAR B9.	~~CAR B9~~	OK
B.11. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/PDD/ (B.6.1.3)	DR	No equipment will be transferred from or to another activity. The leakage was considered to be zero according to AMS I.D. version 13.	OK	OK
B.11.2. Are the choices of project leakage	/PDD/ (B.6.1.3)	DR	See comment B.11.1.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
indicators reasonable and conservative?					
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/PDD/ (B.6.1.3)	DR	See comment B.11.1.	OK	OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/OL/ /IL/ /IM01/	I	According to environmental body requests, monitoring of chimney exit, noise and discharge water of the boiler is necessary.	OK	OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/OL/ /IL/ /IM01/	I	See comment above.	OK	OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/dna/ /IM01/	I	Previously to the submission of the PDD to EB, the project will have to get the letter of approval from Brazilian DNA and also the confirmation that it contributes to the sustainable development of the country.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.13. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/IM01/	I	Yes, Roberto Miranda Lemos (industrial manager) is responsible.	OK	OK
B.13.2. Are procedures identified for training of monitoring personnel?	/PDD/ (B.7.) /REC/	DR	Yes, training of Brazilian Regulamentary Standard (NR-13), operation training period in other thermoelectric plant (*UTE Barreiro*) and supplier training have happened. Recycling training is foreseen, as it could be evidenced during on-site visit. Although, it should be described in PDD (section B.7)	CR B4	OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/IM01/	DR	Yes, the industry has emergency procedure and the thermoelectric plant will be contemplated in it.	OK	OK
B.13.4. Are procedures identified for review of reported results/data?	/PDD/ (B.7.) /IM01/ /GP/	DR I	Yes, this issue is in charge of the operator and the procedure was evidenced during the on-site visit.	OK	OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/IM01/	I	Yes as per ISO 9001 procedures.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/PDD/ (C.1.)	DR	The starting date of the project activity is 2005-07-14, considering the performance contract signed. The activity project was implanted in June 2006 till July 2007. After this, the equipment is being tested. The length of crediting period is inapplicable, due to the remaining length of the plant's operational lifetime. So, please clarify the plant's operation lifetime.	~~CR C1~~	OK
C.2. Is the start of the crediting period clearly defined and reasonable?	/PDD/ (C.2.)	DR	The starting date of the fixed crediting period is 2008-10-01. The starting date is not possible to occur before the project register date. Correction is necessary.	~~CAR C1~~	OK
D. 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.*					

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.1.	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/PDD/ (D.1.) /IM01/	DR I	No significant impact was identified. The host party does not require an Environmental Impact Assessment for this kind of project activity. With the project activity, some gas washers were installed diminishing the emission of pollutions. Moreover, the environmental body requests the monitoring of thermoelectric chimney and of the discharge water of the boiler, which pass to treatment process in sewer treatment station. No social impacts were evidenced.	OK	OK
D.2.	Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/PDD/ (D.1.) /REC/ /IM01/	DR I	Please see comments above regarding the mandatory of EIA. Although report of environmental control was available. It is in compliance with monitoring requested by environment body.	OK	OK
D.3.	Will the project create any adverse environmental effects?	/PDD/ /IM01/	DR I	No. The project do not creates significant adverse environmental effects.	OK	OK
D.4.	Are transboundary environmental impacts considered in the analysis?	/PDD/ (D.1.)	DR	See comments D.1.	OK	OK
D.5.	Have identified environmental impacts been addressed in the project design?	/PDD/ (D.2.)	DR	See comments D.1.	OK	OK
D.6.	Does the project comply with environmental	/PDD/	DR	Yes. The licenses (installation and	OK	OK

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	legislation in the host country?	(D.1.) /OL/ /REC/ /IM01/	I	operation) were available.		
E. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*						
E.1.	Have relevant stakeholders been consulted?	/PDD/ (E.1.) /dna/ /AR/	DR	Yes, the stakeholders have been addressed, according to request of DNA's Ruling #7.	OK	OK
E.2.	Have appropriate media been used to invite comments by local stakeholders?	/PDD/ (E.1.) /dna/ /PO/ /R7/	DR	Letters have been sent to stakeholders, with proof of receipts[AR/],according to DNA's Rules.	OK	OK
E.3.	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/PDD/ (E.1) /dna/ /R7/	DR	Yes, the consultation process has followed DNA's rule which requests invitation of specific stakeholders by letter.	OK	OK
E.4.	Is a summary of the stakeholder comments received provided?	/PDD/ (E.2.) /SA/	DR	The government of municipality of Pitangui and Municipal House of Representatives of Pitangui has commented positively.	OK	OK
E.5.	Has due account been taken of any	/PDD/ (E.3.)	DR	See comment E.3.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
stakeholder comments received?	/SA/				

Table 3: Resolution of Corrective Action and Clarification Requests

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR A1 The PDD does not provide information which energy source is used in the project scenario for the purpose of pre-heating the air injected in the 3 blast furnaces. In order to investigate whether or not leakage is associated with the project activity the client is requested to clarify whether fossil fuels are utilised for the above mentioned purpose.	Section A	In the project scenario the energy source used for the purpose of pre-heating the air injected in the 3 blast furnaces remains the blast furnace gas. Fossil fuel have never have been used for this purpose. <u>Modified on page 5:</u> "Currently, the volume of produced blast furnace gas is partially used for pre-heating the air injected in the 3 blast furnaces of the steel plant, the non used part is burned and disposed into the atmosphere, without any use. With the implementation of the project, the bast furnace gas used for pre-heating the air injected in the 3 blast furnaces of the steel plant will be kept for this purpose and the non used part shall be used for burning in a boiler, generating high pressure and temperature steam to be directed to a condensation	Amendments in PDD are deemed sufficient and correct in order to close clarify potential energy sources used in the processes of the project activity. The statements were cross checked during on-site visit. Now the PDD gives a comprehensive picture about details of the project activity. Moreover, any leakage source could not be identified in the course of validation. Thus, CAR A1 is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
		turbine coupled to a generator with gross capacity of 5 MW." Was estimated 40% of the total BFG generated to be available for the UTE power plant use. Evidenced in the spreadsheet "*Dados Contrato de Desempenho rev1 (English)* – Summary – Cell C29 "	
CAR A2 Annex 4 refers to section B.7 in the PDD. Section B.7 and Annex 4 does not describe the monitoring measures in a sufficient manner. Thus, inclusion of all relevant data according to AMS I.D. as well as to /TEF/ has to be done. Moreover, Street name and number are not mentioned in Annex 1. Revision is requested.	Section A	<u>Inserted on page 34:</u> Av. Afonso Pena, nº 1964 - 7º andar <u>Inserted on page 39, 40 and 41:</u> More monitoring details	Information included in Annex 4 and Annex 1 are reviewed and deemed sufficient and correct in order close this CAR A2. Monitoring section is now sufficient in detail and enables adequate monitoring of ERs / verification.
CAR B1 The baseline scenario is the continuation of the current situation. The waste gas is further burned for the purpose of pre-heating air utilised in the boiler and electricity is further consumed from the grid and the plants physically connected to it. However, mistakes have been identified in the ER calculation. Please refer	Section B	See also CAR B5 To the ER calculation was considered the effective power of the installed generator that is the same value prior forecasted in the project design (5,000 KW or 5 MW).	The identified baseline is the total energy generated in the year multiplied by the calculated combined margin EF. Necessary corrections were

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
to section B.5 of the DVR.		With the installed Generator specifications data we can calculate the effective power available to the generation process ($P_{effective}$ = $P_{apparent}$ x Power Factor = 6.250kVA x 0.8 = 5,000 kW). Evidence was provided.	made in PDD and ER calculation. All necessary evidence provided were provided to the validation team/DE/ /EP/.
CAR B2 The following values in the xls-calculation need further justification or revision, respectively, due to inconsistencies between PDD and xls-sheet: a. Annual Plant Availability b. Auto / Auxiliary Electricity Consumption (in PDD: 400 kW) c. Generator Capacity (in PDD: 5 MW) d. Available Power (in PDD: 4,600 kW) Submission of evidences is requested.	Section B	According to "Guidance on the Assessment of Investment Analysis" (Version 02, EB 41) "6. Guidance: Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant." Because of this, the values used for the spreadsheet were obtained from the "Performance Contract - Siderpita_06.07.05" without any changes/revision. Furthermore, PDD's data are based on updated project information (specifications of the already installed equipments).	Argument was accepted by the validation team. Supporting documents were reviewed in detail and mismatches / inconsistencies were corrected by the PP upon request for corrective action. The IRR calculation was reproduced by the validation team. The parameters used for the IRR calculation were derived from the Performance Contract between Efficientia S.A,

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
		So the a, b, c and d items presented in the xls-sheet are the same value prior forecasted in the Project Design, so the investment analysis is valid and applicable at the time of the investment decision. Evidence was provided.	CEMIG Distribuição S.A. and Rio Rancho Agropecuária S.A./PC/ and thus applicable at the time of taking the investment decision. The source of IRR calculation is assessed to be adequate and the assumptions stated in the reports are assessed to be reasonable. At the time of submitting the PDD for DOE assessment the values applied in PDD are based on plant's already installed equipments that could be evidenced during on-site visit. The values in the final PDD / IRR spreadsheet are now in line with the "Guidance on the Assessment of

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
			Investment Analysis" (Version 02, EB 41).
CAR B3 Furthermore, simplification of xls-sheet and justification of applied values is requested by application of values according to the design capacity of the plant's components. In doing so the blue highlighted part in table "summary" should be deleted.	Section B	It was created a simplification of xls-sheet: "IRR UTE Siderpita". It is based on the investment analysis valid and applicable at the time of the investment decision.	The validation team accepted the revised IRR spreadsheet /XCLirr/ as it now provides sufficient details to the computation of electricity generation.
CAR B4 Step 2 under B.6.1.2 requires the selection of the year in which the project activity displaces electricity as well as updating of the emission factor annually during monitoring. The project participant is requested to define the year and to update the emission factor annually according to the grid factor tool.	Section B	Inclusions were done.	Emission factor monitoring (ex-post) was clarified in section B.7.1 and the year defined to EF was given in B.6.2.
CAR B5 The definition of the relevant electric power system should be carried out under B.6.1.2 in step 1 in a precise manner.	Section B	<u>Inserted on page 21:</u> "Furthermore the geographic and system boundaries for the relevant electricity grid can be clearly identified and information on characteristics of the grid is available due to the geographic data and the relevant electricity grid system limits are easily identified, as well as all	Amendments in PDD are acceptable and sufficient in detail in order to close this CAR. The electric power system is defined as the Brazilian National interconnected System (SIN).

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
		information about the grid is available in ONS, Operador Nacional do Sistema (National System Operator), (www.ons.org.br), and in ANEEL, Agência Nacional de Energia Elétrica (National Agency of Electric Energy), (www.aneel.gov.br).More details about the Brazilian Interministerial Commission on Global Climate Change – CIMGC single system decision is available in http://www.mct.gov.br/upd_blob/0024/24834.pdf ."	
CAR B6 On page 25 in the PDD (table summary) the value EG in MWh/year (30,222) is not matching with the value in the xls-calculation (spreadsheet summary), e.g. 30,112.84 MWh/a.	Section B	According to "Guidance on the Assessment of Investment Analysis" (Version 02, EB 41) 6. Guidance: Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant. Because of this, the values of the spreadsheet were obtained from the "Performance Contract -	Argument was accepted by the validation team. Supporting documents, i.e. IRR calculation and performance contract were checked applying using specific local and technological competence. CAR B6 could be closed

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
		Siderpita_06.07.05" without any changes/revision. Furthermore, PDD's data are based on updated information of the project (specifications of the already installed equipments). Evidence was provided.	out as the validation team is convinced that the value 30222MWh should be used for calculating the project IRR.
CAR B7 The table under section B.6.4 shall be revised according to the remaining operational lifetime of the project activity. As stated in section C.1.2 the operational lifetime is 10 years and has started in 14. July 2005. In this respect the PP is kindly requested to reconsider the crediting period as per the definition in the glossary of terms. In order to keep consistency table in section A.4.3 should be revised too.	Section B	14 July 2005 is the date when the plant implementation decision was taken (CDM starting date). The UTE installation got read in July 2007 (Evidence was provided). Thus this the crediting period was reconsidered according to the new start date (Table in sections A.4.3 and B.6.4).	The project operational lifetime is 10 years/PC/. The crediting period was revised to the remaining operational lifetime of the project activity in PDD version 3. All necessary corrections were made in the PDD and calculation spreadsheets, enabling closure of CAR B7.
CAR B8 Revision in monitoring plan is necessary according to: a. The description of monitoring of EGy	Section B	A revision in the monitoring plan was provided in the PDD following the requests of the DOE.	The Monitoring Plan is revised in accordance with the

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
should include also the number, type, accuracy of meters used. b. The frequency of meter readings is not addressed c. Procedures for maintenance of monitoring equipment should be more precise. d. The person in charge as well as the operational and management structure is not described e. AMS I.D. version 13 requirements to monitor the biomass input as well as to specify the fuel consumption is not described. The PP is requested to follow the Methodology and the necessary corresponding documents precisely.		a. Described in B.7.1 section (Egy table) also in the Annex 4: b. Described in the PDD Annex 4 c. Described in the PDD Annex 4 d. Described in the PDD Annex 4 e. Done in the PDD B.6.2 and B.7.1 sections Evidence was provided.	validation requirements. All measuring devises (main & back up meters) measuring import, export and auxiliary consumption of electricity are given in section B.7 and Annex 4. Also calibration procedures, analysis of calibration results as well as controlingmeasures are stated in the final version of the PDD comprehensively and do meet requirements on proper monitoring. Evidences were provided to validator during on-site visit and verified for its validity. Also, the biomass input was included as a

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
			monitoring parameter and the parameters BFG consumption per unit of electricity generated by thermoelectric power plant and charcoal consumption per unit of Blast Furnace Gas were specified ex-ante.
CAR B9 It is necessary to revise PDD considering the measurement equipments adequacy, calibration needs, procedures and frequency. The baseline emissions are calculated as the total energy generation in the year multiplied by a combined margin emission factor. The operational and building emissions factors are calculated in a transparent and conservative manner by Brazilian DNA according "Resolution no. 8, of May 26, 2008, which adopts a single system as definition of a project electric system in the National Interconnected System for purpose of CDM project activity". The combined margin was calculated applying a weighted average between operational and combined margin, using 50% ratio for each margin.	Section B	See CAR B8 answer. Also, registration, monitoring, measuremen and reporting procedures are being defined. Evidence was provided.	Amendments are sufficient and correct. Relevant evidences/MPM/ were provided and verified. Thus, CAR B9 is closed.
CAR C1	Section C	Inserted on page 30:	PDD was revised

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
The starting date of the fixed crediting period is 2008-10-01. The starting date is not possible to occur before the project register date. Correction is necessary.		01/01/2010 or in the UNFCCC registration date.	according to the corrective action request. CAR C1 is closed since the remaining operational lifetime of the equipment is reflected in the crediting period applied for.
CR A1 Inconsistency was evidenced between turbine potency described in the PDD (5,000 kW) and the one evidenced during the on-site visit (5,260 kW). Please clarify it. Xls-sheet gives again different data	Section A	The PDD considers the effective power of the installed generator that is the same value forecasted in the project design (5,000 KW). With the installed Generator specifications datas we can calculate the effective power available to the generation process ($P_{effective}$ = $P_{apparent}$ x Power Factor = 6.250kVA x 0.8 = 5,000 kW). According to "Guidance on the Assessment of Investment Analysis" (Version 02, EB 41) 6. Guidance: Input values used in all investment analysis should be valid and applicable at the time of	Clarification was given and assessed sufficient to close the CR. The respective IRR spreadsheet were checked in detail and it can be concluded that the same is correct and established in compliance with the guidance of EB 41, "Guidance on the Assessment of Investment Analysis".

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
		the investment decision taken by the project participant. Because of this, the values of the spreadsheet were obtained from the "Performance Contract - Siderpita_06.07.05" without any changes/revision. Furthermore, PDD's data are based on updated information of the project (specifications of the already installed equipments).	
CR A2 Page 3 in the PDD states the date of PDD version 1: 06/02/2008. This date is contradictory to the year dates on pages 13, 14, 17 in the PDD. The PP is requested to take corresponding action to resolve the issue.	Section A	Inserted on page 3 of PDD version 3: Date: 15 July 2009	PDD version 3 was correctly indicated in page 3 of PDD and reaming reviewed document.
CR B1 The PP is requested to state the core financial parameters used for computing the IRR in section B.5 of the PDD.	Section B	The parameters used are specified in "Performance Contract - Siderpita_06.07.05," sent as Support document. Also, the new simplification xls-sheet with the core financial parameters was provided „IRR UTE Siderpita.xls“	The parameter used in IRR calculation could be properly evidenced by submission of the Performance Contract[/PC/]. Please refer to table 4 for further assessment of the used

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
			parameters. CR B1 is closed as all parameters were backed up by sources and sources are correct and applicable at the time of decision taking.
CR B2 PP shall substantiate O&M cost in IRR spreadsheet incurring over the entire project lifetime.	Section B	In accordance with Item 7 of Annex II of "Performance Contract - Siderpita_06.07.05"the investment of Siderpita refers to the monthly operational cost of ten thousand reais by 119 (months 19 to 137 of financial spreadsheet) plus annual maintenance to 8 estimated at eighty thousand reais and 2 maintenance every five years worth of 400 thousand reais each.	Relevant information was included in the calculation spreadsheet. All input values could be properly identified an assessed uilising the performance contract /PC/ as well as applying specific sectoral and local competence. Thus, CR B2 is closed.
CR B3 Additional, cells are linked to documents not available to the validation team (e.g. Designed Benefit to the process of Siderpita). All formulas shall be traceable and calculations transparent, hence revision of calculation sheet is requested.	Section B	In the spreadsheet english translating process some cells have lost their links. This error has been corrected, according to the original spreedsheet (in Portuguese).	All links and formulas necessary for validation were included in the final revised IRR calculation sheet.

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
CR B4 During on-site visit it could be evidenced that training on Brazilian Regulamentary Standard (NR-13), operation training period in other similar thermoelectric plant (*UTE Barreiro*) and supplier training has happened. Recycling training is foreseen. This information is assessed to be important to project activity, although it was not addressed in PDD. Inclusion of these information is necessary, thus also revision of PDD.	Section B	Insert page 26: Training and studies were provided during the project implementation in order to allow the plant professionals to understand the equipment and process for thermal electric power generation and the metering process, some training examples are listed below: - Brazilian Regulamentary Standard (NR-13), - Live operation training period in other thermoelectric plant (UTE Barreiro- already registered as a CDM project); - Equipment supplier operational instructions/trainning; - Also other and recycling training are forecasted.	Revised PDD now complies with the validation requirements on training measures and CR B4 is closed out.
CR C1 The starting date of the project activity is 2005-07-14, considering the performance contract signed. The project activity was implemented in June 2006 till July 2007. After this, the equipment is being tested. The length of crediting period is inapplicable, due to the	Section C	Inserted on page 30: 01/01/2010 or in the UNFCCC registration date.	The Performance Contract clearly states an operation lifetime of 10 years. The crediting period was revised

Draft report clarification requests and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
remaining length of the plant's operational lifetime. So, please clarify the plant's operation lifetime.			according to the remaining operational lifetime of the project activity.

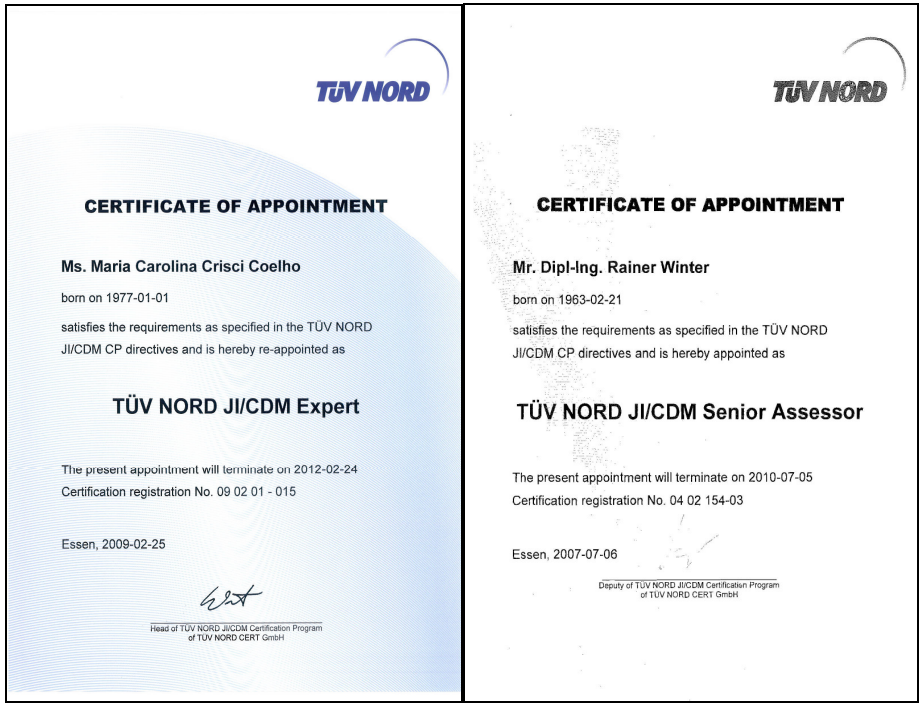
Table 4: Assessment of Financial Parameters

Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT		
					Correctness of value applied	Appropriateness of information source	Comment
Net electricity supplied to Grid	17,503.57	MWh	Performance Contract	/PC/	☒	☒	The net electricity supplied to grid was defined as total generated electricity minus the internal consumption as per /PC/ page 13 considering an estimated plant availability of 80%.
Total generated electricity	30,112.84	MWh	Performance Contract page 13.	/PC/	☒	☒	According to /PC/ page 13, Estimates Results, the total generated electricity was estimate considering an internal electricity consumption of 3,721.8 MW as demonstrated in Performance Contract.
Installed capacity	5	MW	Performance Contract ANEEL's Dispatch	/PF/ /ANEEL/	☒	☒	The installed capacity is verified and deemed correct. Additionally, governmental approval has been issued.
Annual O&M costs	240,000	R$	Performance Contract	/PC/	☒	☒	The O&M consists of labour, water treatment,

			page 13.				pieces and material of replacement, other inputs.
Project Lifetime	10	year	Performance Contract page 19	/PC/	☒	☒	According to /PC/ the lifetime of the equipments are 10 years
Price of energy	0.85	R$/kWh	Performance Contract page 14.	/PC/	☒	☒	The energy tariffs tax that is applied the value that will be applicable apart from July 2005 (according to ANEEL Resolution number 87 of 2005/04/06). Please refer to Performance Contract/PC/ page 11.
Audit and Project	15,560.60	R$	Performance Contract page 15.	/PC/	☒	☒	The estimated value is in accordance with /PC/ and could be properly assessed. Please refer to page 15 of /PC/. All input values and assessments were done considering the Brazilian data available from the year of 2004.
Acquisition	61,040.27	R$	Performance Contract page 15.	/PC/	☒	☒	All input values and assessments were done considering the Brazilian data available from the year of 2004. The forecasted equipments to be applied in the project activity in accordance with Performance Contract are: water filtering equipment, water treatment station for boiler's using, boiler with minimum specification of 21 bar, steam turbine with minimum specification of 5.000kW and generator compatible with the above equipments specification. The forecasted equipments acquisition costs was determined according to /PC/ page 11.
Building	8,452,766.64	R$	Performance Contract page 15.	/PC/	☒	☒	The estimated value applied for the project implementation could be properly assessed and evidenced as page 11 of /PC/. The input values and assessments were done considering the Brazilian data available from the year of 2004.

Installation	12,858.12	R$	Performance Contract page 15.	/PC/	☒	☒	The forecasted equipments to be installed in the project activity are in accordance with Performance Contract page 15. All input values and assessments done to consider the installation price was determined considering the Brazilian data available from the year of 2004 as per /PC/.
O&M	15,171.12	R$	Performance Contract page 15.	/PC/	☒	☒	The O&M consists of labor, water treatment, pieces and material of replacement, other inputs.
Equipments total cost	7,500,000	R$	Performance Contract page 15.	/PC/	☒	☒	All input values and assessments were done considering the Brazilian data available from the year of 2004. The forecasted equipments to be applied in the project activity in accordance with Performance Contract are: water filtering equipment, water treatment station for boiler's using, boiler with minimum specification of 21 bar, steam turbine with minimum specification of 5.000kW and generator compatible with the above equipments specification. The forecasted equipments will be dimensioned to work on a global efficiency of 20.3%. Please refer to Performance Contract/PC/ page 11.
Value total of the project / Investment	8,557,396.75	R$	Preformance Contract page 14.	/PC/	☒	☒	It is considered direct costs.
Total project cost (CT)	11,187,396.75	R$	Performance Contract page 19.	/PC/	☒	☒	They are included equipments cost, indirect cost as administrative activity, O&M, lodging, food, transport, own labor and of third, others.

ANNEX 2: APPOINTMENT CERTIFICATES OF TEAM MEMBERS



TÜV NORD

CERTIFICATE OF APPOINTMENT

Ms. Maria Carolina Crisci Coelho

born on 1977-01-01

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby re-appointed as

TÜV NORD JI/CDM Expert

The present appointment will terminate on 2012-02-24
Certification registration No. 09 02 01 - 015

Essen, 2009-02-25

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

CERTIFICATE OF APPOINTMENT

Mr. Dipl-Ing. Rainer Winter

born on 1963-02-21

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

TÜV NORD JI/CDM Senior Assessor

The present appointment will terminate on 2010-07-05
Certification registration No. 04 02 154-03

Essen, 2007-07-06

Deputy of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH