

Validation Report

Report for:
**Jinniu Tiantie Coking Co., Ltd.,
Climate Change Capital Carbon Fund II s.à r.l., and
Climate Change Capital Carbon Managed Account Limited**

Validation of CDM project for Tiantie Metallurgy Group CDQ Project

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1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Climate Change Capital Limited (CCC), representing the project participants (PP), to undertake validation of the proposed project activity "Tiantie Metallurgy Group CDQ Project". The validation has been performed through a process of document review based on the project design document, Version 1.0 dated 28/04/2008 initially submitted for validation and the subsequent revisions, follow-up interviews with the stakeholders, resolution of outstanding issues and issuance of the validation report.

The project intends to reduce greenhouse gas (GHG) emissions by the introduction of a Coke Dry Quenching (CDQ) process to the newly constructed 1.5 MTPA coke plant associated with a new 2.5 MTPA blast furnace (as the expansion program of Tiantie Metallurgy Group's iron and steel production facility in Gengle Town, She County, Hebei Province, the People's Republic of China), and the implementation of a 25MW waste heat recovery based power project that will partly displace fossil fuel based electricity.

The fulfilment of the requirements as set forth in Article 12 of the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC), the modalities and procedures for a CDM (CDM M&P) and relevant decisions of the Conference of the Parties, serving as meeting of the Parties to the Kyoto Protocol (COP/MOP) and the Executive Board of the CDM (CDM-EB) have been evaluated and conformance to the validation requirements were confirmed based on the given information. A risk based approach was taken to conduct the validation and corrective action requests (CARs) and clarifications (CLs) were raised for relevant actions by the PP.

The validation team has identified through the validation process 7 CARs and 4 CLs. The PP has taken actions and submitted to LRQA the revised project design document and supporting evidence. The validation team is of the opinion that the proposed project activity as described in the project design document Version 4.3 dated 11 October 2009 meets all the relevant UNFCCC requirements for the CDM, as well as the host country's national requirements and if implemented as designed, is likely to achieve the emission reductions and contribute to the sustainable development of the host country. LRQA therefore requests the registration of "Tiantie Metallurgy Group CDQ Project" to the CDM Executive Board as a CDM project activity.

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Abbreviations

BE	Baseline emissions
BF/BFG	Blast furnace/Blast furnace gas
BM	Build margin
CARs	Corrective action requests
CCC	Climate Change Capital Limited
CDM	Clean development mechanism
CDM-EB	Executive board of clean development mechanism
CDM M&P	Modalities and procedures for a clean development mechanism
CDM VVM	CDM Validation and Verification Manual
CDQ	Coke dry quenching
CERs	Certified emission reductions
CLs	Clarification requests
COG	Coke oven gas
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
CWQ	Coke wet quenching
DNA	Designated national authority
DOE	Designated operational entity
EF	Emission factor
EIA	Environmental impacts assessment
ERPA	Emissions reduction purchase agreement
FAR	Forward action requests
FSR	Feasibility study report
GHG	Greenhouse gas
GSP	Global stakeholders' consultation process
IPCC	Intergovernmental panel on climate change
IRR	Internal rate of return
JTC	Jinniu Tiantie Coking Co., Ltd.
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
kW/kWh	Kilowatt / Kilowatt hour
LE	Leakage emissions
LoA	Letter of approval
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
MTPA	Million tonne per annum
MW/MWh	Mega watt / Mega watt hour
NCPG	North China Power Grid
NCV	Net calorific value
NDRC	National Development and Reform Commission (China DNA)
NECG	Northeastern China Power Grid
NGO	Non governmental organization
ODA	Official development aid
OM	Operating margin
PDD	Project design document
PE	Project emissions
PP	Project participant
tCO ₂ e	Tonnes of carbon dioxide equivalent
TISF	Tiantie Iron and Steel Facility
TMG	Tiantie Metallurgy Group
UNFCCC	United Nations Framework Convention on Climate Change

2 Introduction

The project participant (PP) represented by Climate Change Capital Limited (CCC) has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake validation of the proposed project activity "Tiantie Metallurgy Group CDQ Project". This report summarizes the findings of the validation process that has been conducted on the validation requirements of the CDM.

The validation has been undertaken by the team formed of the qualified personnel of LRQA as follows:

Michiaki Chiba	LRQA Ltd.	Team leader CDM lead validator CDM programme expert
Xianxin Yan	LRQA China	Team member CDM validator CDM programme expert
Zeng Ming Chen	LRQA China	Team member CDM validator Host country expert
Ayer V. Shivaramakrishnan	LRQA Ltd. India	Sector expert
Dali Wang	External expert	Sector expert
Prabodha C. Acharya	LRQA Ltd. India	Technical reviewer CDM programme expert Sector expert
Madlen King	LRQA Ltd.	Decision maker

Personnel being engaged in a CDM project validation are qualified based on the established procedures of LRQA to assure the resource requirements satisfy all the requirements of competence criteria in CDM accreditation standard for operational entities. LRQA is designated as an operational entity and holds the full responsibility of decision-making regarding the validation, in accordance with the accreditation requirements of the CDM-EB. The certificate of appointment of the team personnel is attached to this report.

2.1 Objective

Validation is the process of an independent third party evaluation of a project activity on the basis of the PDD, against the requirements of the CDM as set out in Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and other rules applicable to the proposed project activity including the host country's legislation and its specific requirements for sustainable development. The validation follows the requirements of the current version of the CDM validation and verification manual (CDM VVM) to ensure the quality and consistency of the validation work and the report.

2.2 Scope

The scope of validation is an independent and objective review of the project design. Review of the PDD is conducted against the requirements of the Kyoto Protocol, the CDM M&P and relevant decisions of the COP/MOP and the CDM-EB. LRQA follows a risk-based approach in the validation focusing on the identification of significant risks for project implementation and generation of CERs. Validation is not meant to provide any consulting towards the PP, however, the corrective actions requests (CARs) and

clarifications (CLs) might provide input for improvement of the project design. A validation conclusion shall become final subject to the decision maker's review by LRQA Ltd.

2.3 GHG Project Description

Tiantie Metallurgy Group (TMG) started iron and steel production in Hebei Province in 1969. It has recently launched a major modernization and expansion programme to establish a new blast furnace.

The project activity is to introduce a Coke Dry Quenching (CDQ) process to the new 1.5 MTPA coke plant planned to be constructed and associated with the new blast furnace. CDQ is a cooling system of red hot coke produced in the coking plant by circulating gas in an enclosed chamber. This process prevents the release of coke dust and at the same time, the sensible heat contained in the red hot coke can be recovered by the cooling gas and can generate steam usable for electricity generation. The 25MW waste heat recovery based power plant will partly displace the electricity supply of the public electricity grid used by the coke plant and the other iron and steel production facilities of TMG. The estimated GHG emission reductions are 133,008 tCO₂e per annum.

TMG decided to form a joint venture with Hebei Jinniu Energy Resource Co., Ltd. named Jinniu Tiantie Coking Co., Ltd. (JTC) to develop, own and operate the new coke plant with CDQ and the waste heat recovery based power plant. JTC is the host country participant to this project.

Climate Change Capital Carbon Fund II s.à r.l. (C4F2) and Climate Change Capital Carbon Managed Account Limited (C4MA) are the Annex I country participant. C4F2 and C4MA are receiving the emission reduction credits produced by the project activity. Climate Change Capital Limited (CCC) is the investment manager of C4F2 and C4MA and represents the PPs for validation and registration.

3 Methodology

3.1 Review of documents

The validation is performed primarily based on the review of the project design document (PDD) and the other supporting documentation.

The PDD Version 1.0 dated 28/04/2008 was initially reviewed. LRQA requested the PP to present supporting information and documents relating to the project design and such additional information and documents were also reviewed by LRQA.

Through the process of the validation, the PDD and the supporting documents of the same were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by LRQA. The documents reviewed by LRQA are listed in Appendix B.

3.2 Follow-up interviews

Follow-up interviews with the stakeholders and a field survey were conducted as detailed in the schedule as below:

19	May 2008	Caspervandertak Consulting Climate Change Capital
20	May 2008	She County Development and Reform Bureau She County Environmental Protection Bureau Land Resource Department of She County Representatives from the local communities Jinniu Tiantie Coking Co., Ltd. Caspervandertak Consulting Gansu Tonghe Investment Project Consulting Co., Ltd. Climate Change Capital
21	May 2008	Jinniu Tiantie Coking Co., Ltd. Caspervandertak Consulting Gansu Tonghe Investment Project Consulting Co., Ltd. Climate Change Capital
27	August 2009	Jinniu Tiantie Coking Co., Ltd. Gansu Tonghe Investment Project Consulting Co., Ltd. Climate Change Capital

A full list of persons interviewed is shown in Appendix C.

3.3 Resolution of clarification and corrective action requests

LRQA applies the risk based approach aimed at focusing on high risk issues to the validation results whilst not omitting any part of the mandatory processes.

Findings identified in the process are indicated under the titles corrective action requests (CARs) and clarification requests (CLs) and forward action requests (FARs). CARs and CLs require the PP to take relevant actions. Criteria for judging items as CAR or CL are as follows:

Corrective action request (CAR):

- the project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions
- the CDM requirements have not been met, or
- there is a risk that emission reductions cannot be monitored or calculated.

Clarification request (CL):

- information is insufficient or not sufficiently clear to determine whether the applicable CDM requirements have been met.

FARs are to be raised to highlight issues related to project implementation that require review during the first verification of the project activity. FARs do not relate to CDM requirements for registration.

CARs and CLs are to be resolved or closed if the PP modifies the project design, rectifies the PDD or provides adequate additional explanations or evidence that satisfies the concerns. If this is not completed, the project activity cannot be recommended for registration to the CDM Executive Board.

3.4 Internal quality control

A technical review by a qualified person independent from the validation team and a review by an authorized decision maker are conducted prior to the submission of the validation report to the PP and prior to requesting the registration of the project activity.

4 Validation protocol and conclusions

This section provides an overview of the validation activities undertaken by LRQA in order to arrive at the final validation conclusions and opinion. It includes a general discussion of details captured by the validation protocol (which is based on the Clean Development Mechanism Validation and Verification Manual Version 01) and conclusions related to CDM requirements. Further details in relation to specific findings are provided in the Validation Findings Log.

The protocol is structured based on the main validation requirements as follows:

- participation requirements
- general description
- baseline methodology
- emission reductions
- monitoring methodology and monitoring plan
- duration of the project activity / crediting period
- environmental impacts
- stakeholders' comments.

4.1 Participation requirements

A CDM project shall be approved by the Parties involved.

The host Party of the proposed project is the People's Republic of China. China ratified the Kyoto Protocol on 30 August 2002. The Designated National Authority (DNA) is the National Development and Reform Commission (NDRC).

The Annex I Party, the United Kingdom, ratified the Kyoto Protocol on 31 May 2002. The International Climate Change Division, the Department of Energy and Climate Change is the Designated National Authority for the CDM.

The information of the DNAs has been confirmed by the validation team against the relevant information on the UNFCCC CDM website.

(<http://cdm.unfccc.int/DNA/index.html>).

A letter of approval (LoA) from the host Party's DNA dated 18 February 2009 and the LoAs from the Annex-I Party's DNA dated 9 June 2009 were made available by the PP.

The validation team reviewed the LoAs presented by the PP against the requirements in 'Clarification on Elements of a Written Approval' and confirmed that the LoAs contain the elements requested by the CDM-EB, including:

- confirmation of the Party's ratification to the Kyoto Protocol
- voluntary participation
- the project activity's contribution to sustainable development of the country (host Party), and
- the precise title of the CDM project activity of the final PDD referenced.

The LoAs were noted as unconditional with respect of the above elements. The LoAs were also compared with those of other approval cases issued by the DNAs, as well as

information made public by the DNAs on their websites. The team confirmed the authenticity of the letters issued.

Jinniu Tiantie Coking CO., Ltd. (JTC) is a private entity having its registered office in China.

Climate Change Capital Carbon Fund II s.à r.l. is a private entity having its registered office in Luxemburg. Climate Change Capital Carbon Managed Account Limited is a private entity having its registered office in the United Kingdom.

The contact details of the PPs are correctly provided in Annex 1 of the PDD.

Participation in the project activity of the PPs has been authorized, as confirmed in the LoAs issued by the DNAs of the Parties concerned. The team confirmed that no entity other than the authorized entities is indicated as project participants in the PDD.

The Modalities of Communication (MoC) was submitted to LRQA using the form F-CDM-MOC. The validation team confirmed the completeness of the information following the Procedures for modalities of communication between project participants and the executive board. Climate Change Capital Carbon Fund II s.à r.l. becomes the sole focal point for communication. The authorized signatory of the participating entities were confirmed as that of authorized representatives of the respective entities and completeness of information was confirmed by the validation team.

CAR1

CAR 1 was issued because the LoAs from the host country and the Annex-I country were not presented at the initial stage of the validation. This was subsequently addressed as above and CAR 1 was therefore closed accordingly.

4.2 General description

Project design document

The PDD was checked and confirmed as complete against the Guidelines for completing the project design document (CDM-PDD) and proposed new baseline and monitoring methodologies (CDM-NM). Initially the guidelines Version 06.2 were referenced but those were subsequently replaced by Version 07. A valid form of CDM-PDD is used as it is available on the CDM website.

Project description

Tiantie Iron and Steel Facility (TISF) has been operational in Hebei Province since 1969 with steel production capacity of approximately 3.5MTPA and 4 coke ovens of a total 1.1MTPA capacity were constructed in 1973. TMG is implementing the capacity expansion plan with a new 2.5MTPA blast furnace and a 1.5MTPA coke oven. The project intends to reduce greenhouse gas (GHG) emissions by the introduction of a Coke Dry Quenching (CDQ) process to the new 1.5 MTPA coke plant associated with a new 2.5 MTPA blast furnace and the implementation of a 25MW waste heat recovery based power project that will partly displace fossil fuel based electricity. In the absence of the project activity, the coke plant would apply the same coke cooling method as the existing coke plants; coke wet quenching (CWQ), that would release waste heat to the atmosphere without recovery and utilization. Electricity demand would be met by the existing captive power plants of TISF and import from the public electricity grid.

In the existing coke plants, red hot coke that carries high temperature sensible heat is transported to the CWQ tower and cooled by the application of water. The heat is released to the atmosphere as water vapor. CDQ captures 850-950°C of heat in a

cooling gas (mainly composed of nitrogen) and feeds this heat to a waste heat recovery boiler to produce steam. Thus steam is then transferred to a steam turbine generator to produce electricity. CDQ technology was introduced in China in the 1980s to 1990s through a demonstration program including the Green Aid Plan supported by the Japanese Government. Localization of CDQ technology has been promoted since 2005 and a few local technology suppliers have established capacity to supply CDQ plant in China. The project activity employs localized technology and ACRE Coking and Refractory Engineering Consulting Corporation (ACRE) provides the main technology and technical support for implementation of the project activity, including staff training. ACRE is the entity that completed the feasibility study report (FSR) for the proposed project activity.

The validation team has reviewed the PDD, compared with the other documentation and information that was made available during the field visit. The PP was requested to confirm the accuracy of the description of the conditions prior to implementation of the project activity and technical details of the project activity. The information related to the determination of the relevance of the project design for validation requirements described later. Please refer to the related findings in the sections of this report below. The validation team confirmed that the description of the project activity as detailed in the PDD Version 4.3 is accurate and complete and has addressed all the validation findings.

Sustainable development

The host Party's DNA confirmed the contribution of the project activity to the sustainable development of the host Party. CDQ is a proven energy efficiency improvement and pollution prevention technology that if applied to TMG's iron and steel production facility, is expected to contribute to the sustainable development of the host country.

Public funding

The project activity is planned to be funded by the project owner's equity and a loan from a commercial bank. No public funding from Annex I countries is considered to be utilized for the project activity.

4.3 Baseline methodology

Application of baseline and monitoring methodology

The project activity applied the approved consolidated baseline and monitoring methodology: ACM0012 Version 03.1 – Consolidated baseline and monitoring methodology for GHG emission reductions from waste energy recovery projects. The methodology also refers to the latest version of Tool to calculate the emission factor for an electricity system and Tool for the demonstration and assessment of additionality that are Version 01.1 and Version 05.2 respectively in the current version of the PDD.

The project activity originally applied the approved consolidated methodology ACM0012 Version 02. In resolution of CAR6 (see below), the PP decided to apply the revised version of the methodology.

The methodology and the referenced methodological tools are valid as of the date of this report.

Justification to application of the approved methodology for the project activity was presented in the PDD and confirmed by the validation team below.

No	Applicability Conditions ACM0012 Ver. 03.1	Justification in PDD	Comments of Validation Team
1	<p>Type-1: All the waste energy in the identified WECM stream/s, that will be utilized in the project activity, is, or would be flared or released to atmosphere in the absence of the project activity at the existing or new facility. The waste energy is an energy source for:</p> <ul style="list-style-type: none"> - Cogeneration; or - Generation of electricity; or - Direct use as process heat source; or - For generation of heat in element process (e.g. steam, hot water, hot oil, hot air); or - For generation of mechanical energy. 	<p>The proposed CDM project activity will use all waste heat contained in the red hot coke of the new coking facility of TISF for the generation of electricity. In the absence of the project, the heat from the red hot coke would be released to the atmosphere by means of coke wet quenching.</p>	<p>The project is one of the activities defined in Type-1 project. In the absence of the project activity, red hot coke is cooled using a CWQ system (as is currently undertaken in the existing coke plants) and all waste heat is released to atmosphere. The situation was confirmed by the validation team, through on-site review of the existing coke plants, project design of the new coke plant and the business as usual scenario.</p>
2	<p>If the project activity is based on the use of waste pressure to generate electricity, electricity generated using waste pressure should be measurable.</p>	<p>This applicability condition is not relevant, as the project activity does not involve the use of waste pressure.</p>	<p>This condition is not applicable since the project activity uses waste heat to generate electricity.</p>
3	<p>Energy generated in the project activity may be used within the industrial facility or exported from the industrial facility.</p>	<p>Energy generated in the project activity will be exported to the internal grid of the TISF and is therefore in accordance with this condition.</p>	<p>The industrial facility, following the definition in the methodology (where the waste energy is generated), is the coke plant owned by JTC. Consumption in the coking plant is considered as the internal consumption within the industrial facility. As the energy generated is to be exported to the TISF internal grid, the applicability condition is satisfied.</p>

4	The electricity generated in the project activity may be exported to the grid or used for captive purposes.	The project will export electric power to the internal grid of the TISF which draws power generated by both captive power generation units and power imported from the grid. Therefore the project involves the use of electricity for export to an external grid (i.e. the TISF grid) and is therefore in compliance with this condition.	The electricity is exported to the internal grid of the TISF that is supplied by the project waste heat based power, the other captive plants (of TISF) and the regional grid. There is no captive power plant of the project participant within the facility i.e. inside the coking plant of the project owner: JTC. The energy requirement of the facility is to be met from the TISF internal grid.
5	Energy in the project activity can be generated by the owner of the industrial facility producing the waste energy or by a third party (e.g. ESCO) within the industrial facility.	The coke oven and the proposed project activity are owned and operated by a joint venture between the owner of the TISF and a third party investor. Therefore the project is in accordance with this condition.	The industrial facility and the project plant are owned by the same owner, JTC and the applicability condition is met.
6	Regulations do not constrain the industrial facility that generates waste energy from using fossil fuels prior to the implementation of the project activity.	The waste heat (i.e. waste energy) is produced through the combustion of coal in a coke oven. China's regulations do not constrain the use of coal for the production of coke and we conclude that the project is in accordance with this condition.	In China, there are many coke ovens and coal and other fossil fuels are used. There is no regulation constraining the industrial facility that generates waste energy from using fossil fuels prior to the implementation of the project activity. The condition is met.
7	The methodology covers both new and existing facilities. For existing facilities, the methodology applies to existing capacity. If capacity expansion is planned, the added capacity must be treated as a new facility.	The proposed project activity is implemented at a new coking facility and as this situation is covered by this applicability condition we consider the project in compliance.	It was confirmed during the site visit and review of the FSR that the project activity is implemented in the new coking plant.
8	The emission reductions are claimed by the generator of energy using waste energy.	The project entity owns and operates the equipment that is generating energy (i.e. electric power) using waste heat. Therefore the project is in compliance with this condition.	The electricity generation is conducted by the PP (JTC) who claims the emission reductions.

9	In cases where the energy is exported to other facilities, an official agreement exists between the owners of the project energy generation plant (henceforth referred to as generator, unless specified otherwise) with the recipient plant(s) that the emission reductions would not be claimed by the recipient plant(s) for using a zero-emission energy source.	No statement (this relates with 8 above.)	Evidence for consent of TMG to waive any right to claim ERs in a formal agreement has been presented and confirmed by the validation team.
10	For those facilities and recipients included in the project boundary, that prior to implementation of the project activity (current situation) generated energy on-site (sources of energy in the baseline), the credits can be claimed for a minimum of the following time periods: <ul style="list-style-type: none"> - The remaining lifetime of equipments currently being used; and - Credit period. 	The project displaces power supplied by the public electricity grid and therefore this condition is not relevant in the context of the proposed project activity.	The industrial facility is new and does not have on-site energy generation sources. The recipient of the electricity is TISF and a number of on-site energy generation sources existed prior to the implementation of the project activity. The majority of electricity demand of TISF has been met by electricity imported from the public grid and the baseline emission is determined as detailed below i.e. the grid electricity, which is conservative. Therefore, the remaining lifetime of existing on-site energy generation plants of TISF is not considered for limitation of the crediting period.

11	Waste energy that is released under abnormal operation (for example, emergencies, shut down) of the plant shall not be accounted for.	The project uses waste heat contained in red hot coke that requires cooling during normal operating conditions and would under such circumstances release its heat to the atmosphere. The project will utilize this heat and no additional heat will be utilized that is the result of abnormal operations. The emission reductions are calculated on the basis of the electricity generated through the capture of this waste energy (i.e. heat) and therefore does not include any associated with the abnormal release of waste energy. Therefore the project is in compliance with this condition.	The power generating plant is only using the waste energy and the ERs are estimated based on the electricity generated by the proposed project activity. Therefore there are no situations where waste energy released under abnormal operations is accounted for ERs and the case passes the condition.
12	This methodology is not applicable to projects where the waste gas/heat recovery project is implemented in a single-cycle power plant (e.g. gas turbine or diesel generator) to generate power. The projects recovering waste energy from such power plants for the purpose of generation of heat only can apply this methodology.	The project involves the recovery of waste heat directly from the waste energy source (i.e. coking plant) and generates electricity using waste heat boiler and steam turbine generator. The project does not involve the recovery of waste energy from a single cycle power plant and is in accordance with this condition.	The project is not a case of waste heat recovery from combustion turbine or engine as applicable with ACM0007 that is excluded from the applicability condition.

As per the definition of the applied methodology, an industrial facility is the facility where the waste energy is generated. The waste energy to be recovered and utilized in the project activity is waste heat produced from the new coking plant that is owned by JTC. Meanwhile TISF is regarded as the recipient plant that receives electricity from the project activity.

CL1

Based on the PDD Version 1.0 applying ACM0012 Version 02, the validation team raised CL1 asking the PP to clearly demonstrate that all the applicability conditions are met by the project activity.

The validation team reviewed the relevant project documents, supporting evidence, host country regulations, conducted site survey, interviewed the stakeholders and confirmed that the applicability conditions of the applied methodology (Version 03.1) are met by the project activity as above.

CL1 was therefore closed.

Project boundary

Following the requirements of the applied methodology ACM0012, the proposed project activity's geographical boundary is defined as:

- The 1.5 MT coke oven which releases the red hot coke that provides the heat for the proposed project activity (i.e. the waste energy source).
- The Coke Dry Quenching cooling chamber, cooling gas piping infrastructure and auxiliary devices.
- The waste heat utilization equipment, which includes: waste heat recovery boiler, steam turbine/generator unit and auxiliary devices such as the de-aerator, condenser, water pre-heater, and cooling towers.
- Low-pressure steam header providing steam.
- Oxygen separation plant providing nitrogen for the cooling process.
- The internal grid of the TISF.
- All power plants connected physically to the electricity grid that the project will affect.

The project is connected to the internal grid of the TISF which includes a number of captive power generation units and is connected to the local public electricity grid. The local electricity grid is part of the Hebei Provincial Power Grid which in turn is part of the North China Power Grid. The definition of regional electricity grid of the host country DNA is followed.

GHGs included in the project boundary are CO₂ emissions from electricity generation for the baseline scenario, and CO₂ emissions from supplemental fossil fuel and electricity consumption for the project scenario.

The validation team assessed the project documents and supporting evidence including official publication of the host country government, physical site survey and interviews with the PP and other stakeholders and confirmed that the project boundary as described in the PDD Version 4.3 is appropriate and in compliance with the requirements of the applied methodology.

CL2

In the review of PDD Version 1.0 initially presented for validation, it was stated that the internal grid of TISF is currently supplied electricity from 25MW BFG/coal-fired captive power plant. However, during the validation it was found that there are more power supply sources available in the TISF. CL2 was raised to the point.

The PP amended the description in the revised PDD and confirmed that there are 2 x 12MW BFG/coal-fired plants, 4 units of BFG fired plant with total installed capacity of 22.5MW and 5 units of top pressure turbines (TRT) that are newly introduced. The evidence for electricity generation and fuel consumption in years 2005 – 2007 was presented. In resolution of the issue raised by the validation team, the PP clarified that the project electricity generation will not affect the captive power generation of TISF as it is predominantly waste energy, and only electricity import from the regional grid is considered for the baseline. Please refer to the baseline section below.

CL2 was closed.

CL3

The project activity uses a cooling gas mainly composed of N₂. This N₂ gas was confirmed to be produced in the air separation plant located in TISF using electricity. The PP is requested to clarify how the energy consumption and resultant GHG emissions by consumption of the cooling gas are considered. CL3 was issued relating to this point. It was also pointed out that the project CDQ plant requires a supply of low pressure steam and the PP was requested to clarify how the energy consumption and resultant GHG emissions by such steam consumption are accounted for in the project design.

The PP has now taken these into account as the project activity emissions and presented the GHG calculation as well as the monitoring plan in the revised PDD. Please refer to sections 4.4 and 4.5 below for details.

CL3 was closed.

Baseline scenario

The validation team assessed the requirement taking the steps below.

The project does not involve steam/heat generation and mechanical energy. According to ACM0012 Version 03.1, the PP takes into account the following possible options:

- Waste energy use in the absence of the project activity; and
- Power generation in the absence of the project activity.

Step 1. Define the most plausible baseline scenario for the generation of electricity

For the use of waste energy, the PP analysed the plausible baseline scenarios from the options below:

Baseline Options	Description of ACM0012	Justification in PDD	Validation Comments
W1	Waste Energy Carrying Medium (WECM) is directly vented to atmosphere without incineration or waste heat is released to the atmosphere or waste pressure is not utilized.	This option is identical with W2 for the project uses waste heat.	See below W2. W1 is not considered as a plausible baseline scenario itself.
W2	WECM is released to the atmosphere (for example after incineration) or waste heat is released to the atmosphere or waste pressure energy is not utilized.	This option is technically feasible and compliant with laws/regulations.	The option remains for further steps. This option is "Waste heat is released to the atmosphere".

W3	Waste energy is sold as an energy source.	Sensible heat contained in red hot coke cannot be utilized without applying CDQ or more advanced methods and would face similar barriers as the project activity.	Technology survey by PP and validation team confirmed that there is no proven technology commercially available. W3 is not a plausible baseline scenario.
W4	Waste energy is used for meeting energy demand.		Sensible heat contained in red hot coke cannot be utilized without CDQ. This is not considered as a plausible baseline scenario.
W5	A portion of the waste gas produced at the facility is captured and used for captive electricity generation, while the rest of the waste gas produced at the facility is vented/flared.	Although W5 and W6 refer to waste gas, it is interpreted as waste energy in general. Both scenario W5 and W6 face the same barrier as the project scenario as these scenarios would also require the construction of a CDQ unit (similar to W3 and W4).	These are also the same in the project context if waste gas in the methodology description is read as waste energy, and the project activity applying CDQ is the only option to utilize the waste heat. Therefore both W5 and W6 are not considered as plausible baseline scenarios.
W6	All the waste gas produced at the industrial facility is captured and used for export electricity generation.		

Based on the barriers and the legal requirements of each alternative analysed, the PP identified option W2 as technically feasible and compliant with relevant laws/regulations.

For power generation, the PP analysed the plausible baseline scenarios from the options as below:

Baseline Options	Description of ACM0012	Justification in PDD	Validation Comments
P1	Proposed project activity not undertaken as a CDM project activity.	Realistic and credible alternative but faces prohibitive barriers to its implementation.	See Step 3 below.
P2	On-site or off-site existing/new fossil fuel fired cogeneration plant.	Chinese government strongly discourages the construction of small coal-fired thermal power plants. Although natural gas-fired installations are not prohibited, this option is not considered realistic due to the absence of a natural gas pipeline at the project location.	See Step 2 below.

P3	On-site or off-site existing/new renewable energy based cogeneration plant.	The project site does not provide good hydro or wind resources and other waste energy sources have either already been utilized or face similar barriers as the project activity. Also renewable energy based power generation faces prohibitive investment barriers if not developed at a suitable location.	See Step 2 below.
P4	On-site or off-site existing/new fossil fuel based existing captive or identified plant	Continuation of existing captive power generation capacity remains a feasible alternative. These captive power plants can however not meet total energy demand as they have approximately produced on average only 37% of the required on-site power over the past 3 years.	The project electricity generation is unlikely to displace the electricity generated by existing captive plants of TISF as those generating sources are predominantly with waste energy and those have met only 37% of electricity demand of TISF over the past 3 years.
P5	On-site or off-site existing/new renewable energy (or other waste energy) based existing captive or identified plant.	Excluded by the same reasons as P3 above.	See Step 2 below.
P6	Sourced grid-connected power plants.	Continuation of current situation and is in accordance with relevant laws and regulations. Credible and realistic alternative.	Remains for next step.
P7	Captive electricity generation using waste energy (if project activity is captive generation using waste energy, this scenario represents captive generation with lower efficiency than the project activity).	Construction of CDQ cooling chamber would be required also for lower efficiency and faces the same barriers as the proposed project activity.	Proposed project is designed to capture maximum energy using localized technology. Smaller sized or lower efficiency plant is not considered as more feasible option.

P8	Cogeneration using waste energy gas (if project activity is cogeneration using waste energy, this scenario represents cogeneration with lower efficiency than the project activity).	The same barrier also applies. On-site heat demand is already being satisfied and therefore cogeneration using CDQ is not considered as a credible scenario.	Heat supply at the project site and TISF is sufficient while majority of electricity demand is met by import from public grid and cogeneration is not a credible option.
P9	Existing power generating equipment (used previous to implementation of project activity for captive electricity generation from a captured portion of waste gas) is either decommissioned to build new, more efficient and larger capacity plant or modified or expanded (by installing new equipment), and resulting in higher efficiency, to produce and only export electricity generated from waste gas. The electricity generated by existing equipment for captive consumption is now imported from the grid.	Not applicable as no portion of waste energy is currently being utilized.	Not applicable to the project activity.
P10	Existing power generating equipment (used previous to implementation of project activity for captive electricity generation from a captured portion of waste gas) is either decommissioned to build new, more efficient and larger capacity plant or modified or expanded (by installing new equipment), and resulting in higher efficiency, to produce electricity from waste gas (already utilized portion plus the portion flared/vented) for own consumption and for export.		Not applicable to the project activity.
P11	Existing power generating equipment is maintained and additional electricity generated by grid connected power plants.		Not applicable to the project activity.

The PP made analyses on each of the above alternatives and found P1 and P6 remain from the options. The PP made an investment analysis in B.5 of the PDD on P1 and found that the proposed project activity without the benefits of CDM is not economically feasible. Please refer to the below section for Additionality.

Step 2. Identify the fuel for the baseline choice of energy source taking into account the national and/or sectoral policies as applicable

Coal is the predominant fuel source for power generation in Hebei Province. The status was confirmed from the official data of China Energy Statistical Yearbook. The national policy of the host country government however restricts the construction of new coal-based thermal power plants smaller than 135MW generation capacity. This exceeds the electricity demand of TISF, therefore coal is not a reliable fuel source for the baseline.

TISF adjacent to the project site produces blast furnace gas and coke oven gas that have been utilized for steam and power production. Those gases will continue to be utilized to meet part of the energy demand within TISF, however the volume of such gases is not sufficient for the electricity demand of TISF and the majority of electricity will continue to be imported from the public electricity grid.

Other fuels are considered not available options to the PP as having been confirmed below. The situation was also confirmed by the validation team through interviewing local stakeholders. The China Energy Statistical Yearbook 2007 and China Electric Power Yearbook 2007 that provide the latest official information in China as of year 2006 were available for the validation and were referenced.

Natural gas: This is only feasible if a natural gas pipeline is accessible from the project site. Currently the area of the project site is not connected with a gas pipeline. According to the China Energy Statistical Yearbook, natural gas is was used as fuel for power generation in Hebei Province until year 2006.

Hydro: The location of the project site is not available with usable hydro resource. According to the China Electric Power Yearbook, the proportion of installed capacity of hydro power source in Hebei Province in 2006 is only 2.9%.

Wind: The location of the project site is not available with usable wind resource. According to the China Electric Power Yearbook, the proportion of installed capacity of wind power source in Hebei Province in 2006 is only 0.8%.

Biomass: The location of the project site is not available with usable biomass resource. According to the China Electric Power Yearbook, as of 2006 there were no plants operational in Hebei Province that use biomass fuel..

Options P2, P3, and P5 are excluded from further consideration.

Step 3. Identify the most plausible baseline scenarios by eliminating non-feasible options

Step 2 and Step 3 of the Tool for demonstration and assessment of additionality (Additionality tool) Version 05.2 are applied as detailed below. The PDD concluded that the project activity, if not implemented as a CDM project activity (scenario W2 & P1), is not financially viable. While this is further discussed below, scenario W2 and P6 only remain as plausible baseline scenarios.

Step 4. If more than one credible and plausible scenario remains, the alternative with the lowest baseline emissions shall be considered as the most likely scenario.

As per the above Steps 1 and 2, only scenario P6 is considered as a credible and plausible scenario and this step is not applicable to the project case.

The baseline scenarios are defined as scenario P6 (continuation of power consumption from the public electricity grid) and scenario W2 (continuation of releasing waste heat into the atmosphere).

CL2 was raised as described above concerning the project boundary. In the initial version of the PDD, the baseline scenario was described as a combination of existing captive plants and grid power generation and the validation team confirmed the detailed information of the existing captive power sources of TISF. In resolution of the clarification request, the PP clarified that the project power generation is unlikely to displace the generation from the existing captive power sources of TISF and this was confirmed by the validation team in view of the predominant source being waste energy and the capacity of power generation being much lower than the total electricity demand of TISF.

CAR2

The PDD Version 1.0 concluded the identification of the baseline scenario with W2 and P4/P6. W2 is where waste heat is released to the atmosphere. P4 is where the electricity is produced by on-site or off-site existing/new fossil fuel based existing captive or identified plant. P6 is sourced grid-connected power plants. ACM0012, however specifies the applicable baseline option for an electricity generation only project as W2 and P4 or P6, and either P4 or P6 should be selected as with the lowest baseline emissions following Step 4 of the methodology process. CAR2 was issued regarding this point.

In the revised PDD, the baseline scenarios are defined as scenario P6 (continuation of power consumption from the public electricity grid) and scenario W2 (continuation of releasing waste heat into the atmosphere) that meet scenario 1 for a project that generates electricity or heat only as per Table 1 of ACM0012 Version 03.1. CAR2 was closed.

Additionality

The project additionality was demonstrated by the PP using the Tool for the demonstration and assessment of additionality Version 05.2.

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

The proposed alternatives in the absence of the proposed project are identified as:

- Alternative (a): The proposed project activity not undertaken as a CDM project activity.
- Alternative (b): Import of electricity from the grid (exclusive).
- Alternative (c): Existing or new captive power generation on-site, using other energy sources than waste heat and/or gas, such as coal, diesel, natural gas, hydro, wind, etc. (exclusive).
- Alternative (d): A mix of options (b) and (c).
- Alternative (e): Other uses of the waste heat and waste gas.

Alternative (f): The continuation of the current situation, whether this is captive or grid-based power supply (if not already included in the options above).

All the alternatives identified, excluding Alternative (e) are based on option W2.

Alternative (e) is based on options W3 and W4 and is excluded from consideration as no other credible technology is available than CDQ as detailed above.

Alternative (c) meets P2, P3, P4 and P5 and is excluded from consideration as detailed above.

Alternative (a) is analyzed through Step 2 and the PDD concludes Alternative (b) is the baseline scenario as Alternative (a) is not financially viable.

Step 2 - Investment analysis

Investment analysis is used for demonstration of the additionality.

Benchmark analysis is selected out of the options for the analysis method as the project activity will produce economic returns by electricity sales other than the CDM related revenue and the project owner has no other investment option to compare with. The identified benchmark is 13% that is indicated in 'Economic Evaluation Method and Parameters for Project Construction' Version 3 that is relevant for equity IRR after tax. The same benchmark of 13 % is applied for the coking industry. This benchmark is widely used in the investment analysis of project activities in China. The validation team confirmed that the 'Economic Evaluation Method and Parameters for Project Construction' Version 3 was issued in August 2006 and available at the time of the feasibility study and investment decision making of the project activity.

In paragraph 54 of the 38th meeting (Para. 111 of CDM-VVM Version 01), the CDM-EB clarified that in cases where PPs rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed project activities, DOEs are required to ensure that:

- (a) The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed.
- (b) The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the DOE should validate the appropriateness of the values.
- (c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision.

For implementation of the project activity in China, completion of a feasibility study report (FSR) to demonstrate a project's viability and its approval by the Government are a pre-requisite. The main parameters used in the investment analysis in the PDD are derived from the FSR.

The FSR was completed in July 2007 and it was approved by Tianjin Municipal Economic Committee and Tianjin Municipal Development and Reform Committee on 12 October 2007. The investment decision for the project activity followed the FSR and the real action for implementation of the project activity started from 13 February 2008, about a half year after completion of the FSR. The validation team confirmed that there was no significant change that affects implementation of the project activity during the

short time period. Information as available at the time of the investment decision making is considered in the investment analysis.

Parameters	Values	Validation Comments
Installed capacity	25MW	Confirmed with FSR and other project documents.
Total investment cost	200,000,000 Yuan	Confirmed with FSR and official documents (Ref. Category A documents 8), 9), 13) and 32) of Appendix B of this report).
- Equity investment	105,000,000 Yuan	Total investment cost of RMB 200 mil. consists of;
- Working capital	1,050,500 Yuan	- 190,572,900 Yuan for total fixed asset investment,
- Bank loan financing	95,000,000 Yuan	- 5,925,000 Yuan for loan interest during construction, and
- Bank loan for fixed asset investment	92,548,500 Yuan	- 3,502,100 Yuan for working capital.
- Bank loan for working capital	2,451,500 Yuan	Bank loan amount is 95,000,000 Yuan in the FSR and is the same amount as that in the actual loan agreement. Out of RMB 95 mil., 92,548,500 Yuan is for fixed asset investment and 2,451,500 Yuan is for working capital.
Loan interest rate for fixed asset investment	6.84%	Balance 1,050,500 Yuan (30% as per FSR) for working capital is covered by the equity investment of RMB 105 mil. The working capital is fully recovered at the end of the investment analysis period.
Loan interest rate for working capital	6.12%	Confirmed with the FSR and the lending rate at the time of investment decision based on the China Statistical Yearbook 2007 and reference to similar projects (project ref 2506, 2511).
Residual value	9,500,000 Yuan	Confirmed with the FSR. This is estimated as approximately 5% on fixed asset investment cost following local industrial practice. This is a reasonable value at the end of the 20-year operational life time.
Depreciation	9,333,700 Yuan/annum	Confirmed with the FSR. Flat rate is used over the operational life time. It is calculated based on the total fixed asset investment and interest during construction following the local industrial practice (ref Ref. Category A document 22) of Appendix B of this report, project ref 2511, 2516).
Estimated annual power generation	190,128,000 kWh	Confirmed with the FSR. Electricity generation in the first

		year is estimated as 80% of the normal operating year. This estimation is based on the Economic Evaluation Method and Parameters for Project Construction Version 3 and the design institute considered uncertainty due to: the stability of plant operation; possible fluctuation of waste energy supply from the coke ovens; experience of operational staff; and trends from similar projects. Ref. similar projects also apply 70-80% output in the first year (ref projects 2511, 2516, 2703, 1625)
Power price (including VAT)	0.42 Yuan/kWh	Confirmed with the Agreement between TMG and JTC. Detailed justification is provided below in the validation report.
VAT	17%	Confirmed with the FSR, the Agreement between TMG and JTC and local tax regulations. Net VAT amount is calculated as 5,787,802 Yuan/annum by output VAT on raw material and energy purchasing of 4,709,864 Yuan/annum, output VAT on grid connection charge of 1,105,017 Yuan/annum, and input VAT on power sales of 11,602,683 Yuan/annum (11,602,683 - 4,709,864 - 1,105,017 = 5,787,802 Yuan/annum).
Grid connection charges	0.04 Yuan/kWh	Confirmed with official notification and invoices.
O&M cost Consists of; - Raw material costs - Energy costs - Maintenance cost - Salary and welfare costs - Other operational costs	40,018,200 Yuan/annum 13,840,300 Yuan/annum 18,612,000 Yuan/annum 5,128,900 Yuan/annum 1,820,000 Yuan/annum 617,000 Yuan/annum	Confirmed with the FSR and the Agreement between TMG and JTC. It covers energy cost, chemicals, repair and man-power cost. O&M cost of the first year is estimated at 84% following the FSR. This, approximate 5% higher proportion than 80% is owing to fixed cost components that are not reduced in accordance with the operational load of the plant.
Urban maintenance and construction and education tax (% over VAT)	10%	Confirmed with FSR and local tax regulations.
Income tax	25%	Confirmed with local tax regulations. FSR refers to 33% but this is current rate and more conservative for IRR calculation.
Lifetime of project	20 (+1 construction) years	Confirmed with FSR. Residual values as estimated following the local regulations are counted at

		the end of analysis period following Guidance on the assessment of Investment Analysis.
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The total static investment cost was confirmed as consistent in comparison with the FSR and the EPC (engineering, procurement and construction) contract. Comparison with similar projects in China were made both on unit investment cost per power generation capacity and on unit investment cost per coke production capacity using the information available in the CDM website. Unit investment cost per power generation capacity of the project activity is 8,000 Yuan/kW against the average of 11,872 Yuan/kW. Unit investment cost per coke production capacity of the project activity is 133 Yuan per tonne of coke against the average of 150 Yuan per tonne of coke. Through the analysis, the investment cost of the project activity is considered to be in a reasonable range.

The electricity sales tariff was compared with similar projects in Hebei Province as the electricity price is governed by each Province. The result showed a range of tariff at 0.3162 to 0.4 Yuan/kWh and the rate used by the project activity is considered to be in a reasonable range. The electricity tariff was known by the project owner in the supply agreement signed prior to the investment decision making and the actual price agreed is used for the investment analysis.

The project activity is subject to collection of grid connection charge, based on the Notice on charging system back-up fees from enterprises with captive power plant Jijiaguanzi [2006] No. 79 issued by Hebei Provincial Price Bureau on 12 September 2006. The regulation requires all enterprises with captive power plant connected to the grid to pay the system back-up fees to the grid company according to the power supply by the captive power plant for internal consumption. The regulation has been effective since 1 October 2006. The fees have been collected from the existing captive power supply of TISF under the pre-project situation and the validation team confirmed this by checking the invoices that the fees are 0.04 Yuan/kWh of captive power supply. The net increase of captive power supply by the implementation of the project activity that displaces the grid electricity is the subject of this grid connection charge, and the agreement between JTC and TISF and the investment decision of JTC have taken account of the charges. The validation team, using its local and sectoral expertise, confirmed that the accounting of the cost in the investment analysis is correct. The validation team also referred to similar captive power projects recently developed and confirmed that those projects considered 0.035 to 0.09 Yuan/kWh of grid connection charges depending on the regulations of the provincial grid systems that they are connected to.

81% of the O&M costs are material and energy costs. The energy purchase price as a part of the O&M costs was known by the project owner in the supply agreement signed prior to the investment decision making and the actual price agreed is used for the investment analysis. It is considered as more conservative for additionality determination.

The estimated costs for repair and maintenance are 2.5% of the total static investment costs. This is reasonable considering the nature of the main equipment and operational conditions. These amount to approximately 12.5% of the estimated O&M costs. Labour and welfare costs are estimated as approximately 4.5% and the other cost is 1.87% only. There is some saving in O&M costs expected as a consequence of the project activity at the coke plant from operation of CWQ system in the baseline

scenario. The operational cost of the project is estimated based on a comparison of operational costs of the coke plant before implementation of the CDQ project and after implementation of the CDQ project according to the FSR. Therefore, the costs estimated for the investment analysis of the project have taken account of the cost savings due to change of CWQ operation as a result of the project activity. The proportion of O&M costs to the total investment cost was compared with similar projects in China using the information available in the CDM website. The proportion of the project activity is 20.01% and found to be close to an average 19.26%. Thus the O&M costs are also considered to be estimated in a reasonable range.

The fixed input values are used for the investment analysis over the analysis period following the guidance of the 'Economic Evaluation Method and Parameters for Project Construction'. This is also noted as a more conservative approach for projects in China. This is because greater fluctuation is expected with operational expenses whilst the electricity price (that constitutes project's revenue) is regulated by the local government and is not expected to increase greater than the increase of operational expenses. In the case of the project activity, the electricity supply to TISF, together with energy and material purchase from TISF are covered by the same agreement and increase of electricity sale price only is unlikely to happen.

The calculated IRR of the project activity without considering CDM related revenue is 9.35 %, and is below the selected benchmark. The IRR with the revenue of CER is 13.99 % and exceeds the benchmark with the help of CDM incentive. The validation team assessed: the description in the PDD; detailed calculations in the excel spreadsheet; the feasibility study report (FSR); and other supporting evidences.

CAR3

In the initial stage of validation, it was identified that the investment analysis presented was not fully substantiated. The calculations and the result presented in the PDD were identified as not matching those in the FSR that is indicated as the source of most of input data. The benchmark and method of IRR calculation were also inconsistent. CAR3 was issued regarding this point.

The PP prepared a revised PDD, spreadsheet and supporting evidence for the investment analysis. In the revised calculation, the PP removed the double counting of internal power consumption, amended the electricity purchase cost and corrected the electricity sales tariff. These were then verified as accurate and consistent with the evidence assessed by the validation team and the calculation was confirmed as correct. The resultant IRR increased from 8.48% as indicated in the PDD Version 1.0 to 9.35% but still remains below the selected benchmark. CAR3 was closed.

A sensitivity analysis is conducted to check whether the financial attractiveness remains unaltered for reasonable variations in the critical assumptions. The following parameters were used as critical assumptions:

- Total investment.
- Power supply.
- Power price.
- Annual operation and maintenance costs.
- CER price.

The above identified variables cover those investment costs, revenue and operational costs that constitute more than 20% of the project's cost or revenues. The variation

range is +/- 10%, following the recommended variations as stated in engineering guidance documentation in China. The choice of variables and range of variations meet the Guidance on the Assessment of Investment Analysis.

Although the final investment cost had not been available during the validation because the project was still under construction, the total investment cost is unlikely to decrease by more than 10% as the estimate is considered as reasonable and the contract has been signed on a 'turn key' basis at 210,800,000 Yuan. The actual investment cost is more expensive than the estimate in the FSR but the use of the value in FSR was considered more conservative and appropriate.

An increase of annual electricity supply by more than 10% is unlikely to happen. The estimated annual electricity generation is based on a reasonable estimate in the FSR and the plant load factor is as high as 80.33% against the average of similar projects of 67%. Electricity generation in the first year is estimated as 80% of the normal operating year in the FSR. This estimation is based on the Economic Evaluation Method and Parameters for Project Construction Version 3 and the design institute considered uncertainty due to: the stability of plant operation; possible fluctuation of waste energy supply from the coke ovens; experience of operational staff; and trends from similar projects. The validation team referred to similar project activities and confirmed that it is general practice to estimate the output of the first year at 70-80% of the normal operating year and this is considered as reasonable. The operational cost is also reduced in the year by the same proportion to maintain consistency in the investment analysis.

An increase of electricity price by more than 10% is unlikely to happen. The electricity price has been contracted with purchase of material, electricity and other energy (including steam, electricity and fuel supply for operation of coke plant) and the tariff is considered to be in a reasonable range when compared with 0.3162 to 0.4 Yuan/kWh being applied to similar project activities.

Annual O&M costs are also unlikely to decrease by more than 10% over the crediting period. This depends on material, energy and labour costs in China that have increased and are expected to increase further following development of the economy. As per the analysis made by the PP, the project's IRR remains below the selected benchmark.

The validation team confirmed that the sensitivity analysis consistently supports the result of the investment analysis and the project passes Step 2 of the Additionality tool.

Step 3 - Barrier analysis

In the initial versions of the PDD, two kinds of barrier were explained.

The first barrier is that the focus on investment is given to expansion of production capacity that makes it difficult to consider non-core activity investment other than expansion of production capacity. The second barrier is the limited availability of finance due to government restrictions on bank lending to the iron and steel industry due to a potential fear of overcapacity.

CAR4

The validation team assessed the background information and interviewed the PP and considers that these barriers are not prohibitive to the project activity because the second barrier is also applicable to any investment activity. The PP was requested to

further demonstrate the existence of prohibitive barriers or remove the statement. CAR4 was raised.

The PP explained that the barriers indicated in the PDD are general barriers that affect the Iron & Steel Industry to implement energy efficiency projects such as the proposed project activity. The validation team reviewed the documents relating to the investment decision making of the project owner, however, the evidence made available to the validation team did not demonstrate that the project owner seriously considered the barriers as prohibitive to implementation of the project activity investment. After further analysis, the validation team reached the opinion that the kind of barriers explained in the PDDs were not prohibitive barriers that the PP could only overcome with the support of CDM application and the project activity could not be determined as additional based on the barrier analysis.

In the revised PDD Version 4.3, the PP removed the related statement and the project's additionality is demonstrated by Step 2. CAR4 was therefore closed.

Step 4 - Common practice analysis

The project activity uses a specific technology CDQ process that enables recovery of sensible heat from red hot coke. The project site is located in Hebei Province where many iron and steel production industries are located. The circumstances surrounding the project activity largely depend on legislation of local government in China, and the scope of common practice is reasonably determined as CDQ projects in Hebei Province.

The PP identified 2 project activities from the public website of the host country government, both have been approved as CDM projects by the Chinese DNA. The validation team also researched similar activities extending the scope inclusive of coking industries that are separately run from steel plants and found 2 project cases below:

- 1) Installation of waste heat recovery system in a coking plant in Qian'an City, China
– Registered CDM project ref # 0909
- 2) Wu'an Municipality Tongbao Coking Oven and CDQ Waste Heat Recovery Project
– Submitted for CDM validation

The above projects are all proposed for CDM process and excluded from the analysis. The validation team interviewed the officers of local government and confirmed that there is no similar project that has been implemented without the support of CDM. Based on the available information to the validation team, it was confirmed that similar activity is not widely observed and the project activity is not considered as a common practice.

Prior serious consideration of CDM

The project activity start date was before 2 August 2008 and assessment of prior consideration of the CDM is required following the Guidance on the demonstration and assessment of prior consideration of the CDM.

In the PDD Version 1.0, the start date of the project activity was indicated as 18/12/2007 and it was explained as the start date of construction activities. The validation team visited the project site and as of that date only preparatory work had taken place, together with construction work of the new blast furnace and the new coke oven. 18/12/2007 was the start date of the civil construction work for the new coke oven, which is not the project activity. The validation team confirmed that the date originally indicated is not regarded as the start date of the project activity (CDQ project) according to the definition of the Glossary of the CDM terms.

In the revised PDD, the start date of the project was amended to 13/02/2008. This date is of the signature of the equipment purchase contract which indicates the earliest date of any real action towards the implementation of the project activity and it was confirmed by the validation team that the date meets the definition of the Glossary of the CDM terms.

CAR5

In the initial stage of validation, the validation team pointed out that the decision making of the project owner with serious consideration of the CDM incentive at the time was not sufficiently proven. CAR5 was raised to the point.

The relevant part of the PDD was modified and the PP presented evidence to demonstrate its serious consideration of CDM incentive prior to investment decision making for assessment by the validation team. The potential project activity was discussed in August to September 2006 and the FSR was completed in July 2007 that provided main inputs for consideration of the investment by the project owner. From the initial study, application of CDM was taken into consideration and a letter of intent was signed with Climate Change Capital in August 2007. A contract with a CDM consultant for PDD development was signed in October 2007 and the emission reduction purchase agreement (ERPA) was signed in January 2008. The board meeting held on 15 January 2008 decided investment to the project with application for CDM that was before the start date of the project activity of 13 February 2008 when the EPC contract was signed.

The validation team assessed the evidence that includes internal documents of the project owner as well as the documents made with third parties including the government offices, the project investors, consulting companies, technology providers and the other stakeholders and confirmed that the evidence is credible and consistent. Specific interviews with persons concerned also confirmed that the demonstration was credible. The validation team therefore concluded, based on the evidence assessed by the team, that the incentive of CDM was seriously considered prior to the investment decision as a decisive factor to the requirement of clause 5 (a) of Guidance on the demonstration and assessment of prior consideration of the CDM.

Agreement with the CDM consultant was signed on 19 October 2007, the ERPA was signed on 25 January 2008 and agreement with LRQA for validation of the project activity was signed on 9 April 2008. In parallel, agreement for procurement of the main equipment was signed on 13 February 2008 and local stakeholder consultation was conducted during March to May 2008. The validation team assessed the evidence, interviewed the parties concerned, and confirmed that the continuing and real actions were taken to secure CDM status in parallel with the project implementation and the project activity satisfied the requirement of clause 5 (b) of Guidance on the demonstration and assessment of prior consideration of the CDM. CAR5 was closed.

4.4 Emission reductions

Baseline emissions

Baseline emissions are determined by equations given in the applied methodology as below.

$$BE_y = BE_{En,y} + BE_{flst,y}$$

As the project does not use waste gas (that would have been required for flaring) for energy production, BE_{flst} is not applicable.

The baseline is Scenario 1 and the following equation is applied.

$$BE_{En,y} = BE_{Elec,y} + BE_{Ther,y}$$

The project activity generates electricity only and $BE_{Ther,y}$ is not applicable.

The project activity falls in Case-1 of Type-1 activity and equation (1a-1) of ACM0012 is used to determine $BE_{Elec,y}$.

$$BE_{Elec,y} = f_{cap} * f_{wcm} * \sum_j \sum_i (EG_{i,j,y} * EF_{Elec,i,j,y})$$

f_{wcm} is 1 as the electricity generation of the project activity is purely from use of waste energy.

f_{cap} is determined using Method-3 because the PP faced technical limitation in direct monitoring of waste heat carrying medium (WECM).

CAR6

In determining the f_{cap} , CAR6 was raised during the initial stage of validation as ACM0012 Version 02 applied in PDD Version 1.0 required application of Method-2 that is use of (1f) and (1f-1) but the PDD did not fully follow this requirement and how to determine f_{cap} was not substantiated.

The PP revised the PDD after the revised version of methodology ACM0012 Version 03.1 was approved by the CDM-EB.

The PP uses Method 3 as the direct measurement of heat contained in a solid material (coke in the project case). This faces technical challenges and measurement cannot be conducted on-site with commonly available measurement equipment.

The equation (1h) is given as below.

$$f_{cap} = \frac{Q_{OE,BL}}{Q_{OE,y}}$$

The PP has commissioned Harworth Energy to prepare a quantification of the maximum theoretical energy recoverable using the project activity waste heat recovery equipment to the requirement of Case-1 of Method-3. The report of Harworth Energy on assessment of maximum waste heat utilization from the project dated 22 April 2009 was submitted for review by the validation team. The calculation being applied for theoretical maximum waste heat quantity contained in red hot coke of 1,500MJ per tonne of coke resulted in the maximum net power generation of the project activity as 130,960,733kWh.

Using the result of the assessment, the PP calculated f_{cap} ex-ante as below.

$$f_{cap} = \frac{Q_{OE,BL}}{Q_{OE,y}} = \frac{130,961MWh}{175,928MWh} = 0.744$$

Direct monitoring of waste heat contained in solid material is complex and there is no feasible and reliable monitoring practice available to the PP. The proposed method is to determine the cap of baseline emissions by resultant electricity generation that is the sole energy output of the project activity. The method is by direct measurement hiring a reliable monitoring device and practice and the choice of method (Case-1 of the Method-3) is considered as appropriate.

The technical assessment was conducted by an independent chartered engineer as required by the applied methodology. The theoretical maximum waste heat quantity contained in red hot coke used in the calculation is 1,500MJ per tonne of coke based on publicly available literature Dry Coke Quenching Technology issued by China Metallurgy Industry Press. The validation team also conducted background research using sector experts on various data sources and found the mean value at 1,550MJ per tonne of coke. On this basis, the value used by the PP is considered as

appropriate and conservative for calculation of emission reductions. The calculation was based on manufacturer's specifications of the coke oven, CDQ, waste heat recovery boiler and steam turbine generator. The validation team assessed the data sources, assumptions and calculation using sector experts and confirmed their correctness. The efficiency of the boiler, for example, is specified higher than 80% in the manufacturer's specification and the baseline cap will be higher if the actual boiler efficiency is used for the calculation, however the lower end value of 80% is used for conservativeness. The project activity is setting up a new plant and f_{cap} may be assumed as 1, however the validation team agreed that the calculation by the PP is more conservative and meets the requirements of the applied methodology.

The estimated annual power generation in the FSR is based on the assumption of a higher value of waste heat quantity contained in red hot coke from experience of ACRE (the technology supplier of the project activity). The estimated annual power generation of the project activity as per the FSR was used for investment analysis since it is the value actually used for investment decision making by the project owner and it is more conservative for determination of the project's additionality. CAR6 was closed.

$EF_{Elec\ i\ j\ y}$ is CO₂ emission factor of the grid as determined in the baseline and Tool to calculate the emission factor for an electricity system is followed.

Step 1. Identify the relevant electric power system

Regional grids are defined by the Chinese DNA and NCPG (that consists of Beijing, Tianjin, Shanxi, Hebei, Shandong and Inner Mongolia) is connected by the project activity. NCPG also imports electricity from North East China Power Grid (NECG) and the weighted average OM emission rate of NECG is also considered.

Step 2. Select an operating margin (OM) method

EF_{OM} is determined by simple OM method due to a limitation of publicly available data in China. The proportion of low-cost/must-run resources in NCPG constitutes approximately 1% of the total grid generation and less than 50% on average of the 2001 to 2005 generation.

The ex-ante option is chosen using a 3-year generation weighted average of years 2003 to 2005. The PDD Version 1.0 was submitted to LRQA for validation and posted for GSP from 29 April to 28 May 2008 and the chosen data vintage is the most recent data available at the time.

Step 3. Calculate the operating margin emission factor according to the selected method.

Option C is used because available public data in China is limited in following formula.

$$EF_{grid,OM,simple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_y}$$

$EF_{grid,OM,simple,y}$ is calculated for the project activity as 1.12024 tCO₂e/MWh.

Step 4. Identify the cohort of power units to be included in the build margin (BM)

Installed power capacity that belongs to the cohort of BM is determined following the guidance made by EB for alternative methods applicable to China. This is due to a limitation of publicly available data with conservativeness consideration. The capacity

addition in the region during years 2003 to 2005 is used following the EB guidance as detailed in the link below.

http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_QEJWJEF3CFBP1OZ_AK6V5YXPQKK7WYJ

Option 1. (ex-ante) is chosen and data of 2005 is used as the most recent information available at the time of PDD submission for validation.

Step 5. Calculate the build margin emission factor

The following equation as per the methodological tool is used for calculation of

$EF_{grid,BM,y}$.

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

The alternative methods as referenced in the above Step 4 are applied as detailed below:

1) Calculate the share of CO₂ emissions of the solid, liquid and gaseous fuels in the total emissions respectively.

$$\lambda_{Coal} = \frac{\sum_{i \in COAL,j} F_{i,j,y} \times COEF_{i,j}}{\sum_{i,j} F_{i,j,y} \times COEF_{i,j}}$$

$$\lambda_{Oil} = \frac{\sum_{i \in OIL,j} F_{i,j,y} \times COEF_{i,j}}{\sum_{i,j} F_{i,j,y} \times COEF_{i,j}}$$

$$\lambda_{Gas} = \frac{\sum_{i \in GAS,j} F_{i,j,y} \times COEF_{i,j}}{\sum_{i,j} F_{i,j,y} \times COEF_{i,j}}$$

Where:

- $F_{i,j,y}$ the amount of the fuel i consumed in y year of j province (measured in tce);
- $COEF_{i,j,y}$ the emission factor of fuel i (measured in tCO₂/tce) while taking into account the carbon content and oxidation rate of the fuel i consumed in year y , and;
- Coal, Oil and Gas subscripts standing for the solid fuel, liquid fuel and gas fuel.

2) Calculate the emission factor of the thermal power:

$$EF_{Thermal} = \lambda_{Coal} \cdot EF_{Coal,Adv} + \lambda_{Oil} \cdot EF_{Oil,Adv} + \lambda_{Gas} \cdot EF_{Gas,Adv}$$

$EF_{Coal,Adv}$, $EF_{Oil,Adv}$ and $EF_{Gas,Adv}$ represent the emission factors of advanced coal-fired, oil-fired and gas-fired power generation technology.

3) Calculate the BM of the power grid:

$$EF_{grid,BM,y} = \frac{CAP_{Thermal}}{CAP_{Total}} \cdot EF_{Thermal}$$

Where CAP_{Total} represents the total newly-added capacity and $CAP_{Thermal}$ represents newly-added thermal power capacity.

$EF_{grid,BM,simple,y}$ is calculated for the project activity as 0.93688tCO₂e/MWh.

Step 6. Calculate the combined margin emissions factor

$EF_{grid,CM,y}$ is calculated as below.

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$$

W_{OM} and W_{BM} for the first crediting period are 0.5.

$EF_{grid,CM,y}$ for the project activity is;

$$1.12024 \times 0.5 + 0.93688 \times 0.5 = 1.02856 \text{ tCO}_2\text{e/MWh}.$$

The difference in calculation from the published emission factors of Chinese DNA for EF_{OM} was due to the application of the correct carbon emission factors for coke and refinery gas as per the 2006 IPCC Guidelines and the electricity import from NECG in year 2005 as per the respective China Electric Power Yearbook. The difference in calculation from the published emission factors of the Chinese DNA for EF_{BM} was due to the application of the correct carbon emission factors for coke and refinery gas as per the 2006 IPCC Guidelines and the use of weighted average carbon coefficient for solid, gaseous and liquid fuels (while published data of Chinese DNA uses carbon coefficient of coal, natural gas and fuel oil as representative fuels). When comparing with the NCPG emission factors published by the Chinese DNA, the emission factors used in the PDD are more conservative.

	DNA published factor	PP calculated factor
OM	1.1208 tCO ₂ e/MWh	1.12024 tCO ₂ e/MWh
BM	0.9397 tCO ₂ e/MWh	0.93688 tCO ₂ e/MWh
CM	1.03025 tCO ₂ e/MWh	1.02856 tCO ₂ e/MWh

Baseline emissions of the project activity are calculated as below.

$$BE_y = BE_{En,y} = BE_{Elec,y} = f_{cap} * EG_y * EF_{grid}$$

$$BE_y = 0.744 \times 175,928\text{MWh} \times 1.02856 \text{ tCO}_2\text{e/MWh} = 134,628 \text{ tCO}_2\text{e}$$

CAR7

The validation team reviewed the latest calculation worksheet for baseline emission factors submitted by the PP along with the PDD Version 4.1 and identified the following points to be addressed by the PP:

- 1) The weighted average carbon emission coefficient of gaseous fuels is calculated as 13.1 tc/TJ in the worksheet but it is indicated as 13.6 tc/TJ in the PDD Annex 3.
- 2) The capacity addition during 2003 to 2005 for hydro power source is indicated as minus 49.8MW. This is not possible and does not meet the methodological requirements as the negative contribution is assumed as closure of old generation units but power units built more than 10 years ago should be excluded from the group of power units, in accordance with the Tool to calculate the emission factor for an electricity system.
- 3) The resultant combined margin emission factor is indicated as 1.0298 tCO₂e/MWh in the PDD section B.6, however the PDD Annex 3 and the calculation worksheet define it as 1.02977 tCO₂e/MWh.

CAR7 was issued with regard to the above points.

In the revised PDD Version 4.3, the weighted average carbon emission coefficient of gaseous fuels is corrected as 13.1 tc/TJ and is consistent with the figure in the

calculation worksheet. The capacity addition of hydro power source is amended to 20.2MW based on the increase in Hebei Province and confirmed as correct with official data of the China Electric Power Yearbook. The combined margin emission factor is now 1.02856 tCO₂e/MWh having been reflected with the above corrections and was confirmed as consistent with the calculation worksheet. The validation team confirmed that the emission factor is calculated following the Tool to calculate the emission factor of an electricity system and official publication of the host country DNA in a correct and conservative manner. CAR7 was therefore closed.

Project emissions

Project emissions are calculated by the below equation.

$$PE_y = PE_{AF,y} + PE_{EL,y} + PE_{EL,Import,y}$$

The project is a Type-1 activity and $PE_{EL,Import,y}$ is not applicable.

The cooling gas of the project activity is mainly composed of N₂. During the field survey at the project site, it was confirmed that the N₂ gas is produced in the air separation plant located in TISF using electricity. CL3 was raised concerning the project boundary as above section 4.3 and the PP was requested to clarify how the energy consumption by and resultant GHG emissions from consumption of the cooling gas are considered. It was also noted that the project plant requires low pressure steam. The low pressure steam is supplied by TISF through a common steam header that is connected with different heat supply sources, including waste recovery boilers. The PP was requested to confirm the energy and possible GHG emission sources, accounting for GHG emissions and the monitoring plan following the approved methodology along with CO₂ emissions for production of N₂ gas above.

The team reviewed the updated PDD that addressed the 2 sources of project activity emissions.

$PE_{AF,y}$ for steam consumption is calculated in equation of ACM0012 as below.

$$PE_{AF,y} = \sum FF_{i,y} \cdot NCV_i \cdot EF_{CO2,i}$$

It was explained that the project plant is only connected with a low pressure steam header that is mainly supplied with steam from the waste heat recovery boilers and it normally has excess steam. The ex-ante estimate of this emission is therefore assumed to be zero. It may occasionally (especially in winter season) be supplied by BFG firing boilers. In such circumstances, the PP calculates a weighted average emission factor of waste heat recovery based steam and BFG firing based steam in proportion to the total steam supply to the common header. The revised PDD Version 4.3, section B.7.1 is added with relevant monitoring parameters for the possible fuel consumption. The validation team confirmed through the site survey the energy supply sources and steam supply system of TISF, and the designed steam requirement of the project plant. The validation team confirmed that the respective GHG emissions for steam consumption would be captured following the provision of the monitoring plan and request for revision or deviation of the approved methodology is not required for this element. The respective project activity emissions are expected to be of small quantity (less than 1% of estimated annual emission reductions), based on the review of the project documents and comparison with the similar project activities. These emissions will be monitored and calculated ex-post in an appropriate and conservative manner.

$PE_{EL,y}$ for use of N₂ gas is calculated in equation of ACM0012 as below.

$$PE_{EL,y} = EC_{PJ,y} \times EF_{CO_2,EL,y}$$

N₂ gas is to be recycled in the cooling process. It is however expected to require replenishing annually, by a lost volume of approximately 4,112,640 Nm³. A part of the N₂ gas is considered as a by-product of oxygen production, however the PP accounts all the energy consumption as attributable to the project activity, which is conservative. Ex-ante estimation is conducted using the specific electricity requirement for production of N₂ gas obtained from chartered engineering company ACRE at 0.383 kWh/Nm³ and PE_{EL,y} is calculated at 1,620 tCO₂e. The value was confirmed as consistent with the approved FSR. The validation team confirmed that the respective GHG emissions for N₂ gas consumption would be captured following the provision of the monitoring plan and request for revision or deviation of the approved methodology is not required for this element.

Leakage

The main source of potential leakage emissions is the construction work. Construction work related emissions are not considered following the guidance of the applied methodology ACM0012 Version 03.1. The project boundary covers the project site, industrial process and connected electricity grid, and the emissions attributable to the project activity are considered as PE as above. Therefore L_y = 0.

Emission reductions

The emission reductions by the project activity are estimated following the applied methodology. Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y = 134,628 - 1,620 = 133,008 \text{ tCO}_2\text{e}$$

4.5 Monitoring methodology and monitoring plan

The approved consolidated monitoring methodology ACM0012 Version 03.1 is applied to the project.

The monitoring plan is composed of monitoring of eight parameters, f_{cap} , $Q_{OE,y}$, $EG_{ij,y}$, $FF_{i,y}$, NCV_i , $EF_{CO_2,i}$, Steam supply and $EC_{PJ,y}$.

Please refer to the comments of CAR6 on determination of f_{cap} in section 4.4 above. f_{cap} is calculated by $Q_{OE,y}$ and $Q_{OE,y}$ is the same as $EG_{ij,y}$ in this specific project case.

The supervisor assigned from the Vice General Manager or another senior management member of JTC holds the overall responsibility and directs the monitoring officer and operational staff in charge through the monitoring process.

The validation team interviewed Mr. Pei Weihua, Statistics staff and Mr. Zhang Bo, and confirmed that the procedure for data management has been established. The team also interviewed them and confirmed that the project entity collects, on a daily basis, the electricity data and on an hourly basis the steam data via manual logging, and compiles the monthly report. The calibration level is Accuracy class 1 or better which is based on relevant regulations.

Monitoring of steam for PE was checked by interviewing Mr. Zhang Bo. TMG monitors steam flow per hour, the relevant data is manually logged and compiled in a monthly report. The project owner has capacity for calibrating the steam meters, and has been authorized by the local authority.

All electronic and hard copy records of the metering devices, relevant documentation and the results of calibration will be collected in a central location by the project entity. Data records will be archived for a period of 2 years after the crediting period to which the records pertain. The establishment of relevant procedures was confirmed by interview of Mr. Zhang Bo and Mr. Pei Weihua.

The monitoring officer will coordinate with the plant manager to ensure and verify adequate metering and recording of data, including power generation and net power supply to the internal grid by the project activity. The validation team interviewed Mr. Zhang Bo and confirmed that the procedure for corrective action is established for the monitoring activity. The validation team evaluated the relevant monitoring procedures provided in the PDD and confirmed their appropriateness.

The training plan for the project has been established and will be conducted by project technology supplier.

4.6 Duration of the project activity / crediting period

The start date of the project activity is validated as 13/02/2008 and the operational lifetime is expected for 20 years. The PP selected the 10-year fixed crediting period.

In the PDD Version 1.0 initially presented for validation and GSP, the start date of the project was 18/12/2007. 18/12/2007 was the start date of the civil construction work for the new coke oven. The validation team confirmed that the date is not regarded as the start date of the project activity (CDQ project) according to the definition of the Glossary of the CDM terms. The date was corrected in the revised PDD to 13/02/2008 that was the signing date of the EPC contract and it was confirmed by the validation team that the date meets the definition of the Glossary of the CDM terms.

The start date of the crediting period is indicated in the PDD as 01/01/2010 or the date of project's registration as a CDM project activity, whichever is the later.

4.7 Environmental impacts

The EIA report of Tiantie Metallurgy Group CDQ Project was completed in October 2007 and approved by the Handan City Environmental Protection Bureau on 10 October 2007. The validation team interviewed local EPB officer, Ms. Han Shuiye and checked the relevant EIA regulation.

According to the EIA report, air and noise pollution were major focus point of the analysis of the project activity. Relevant project design and management requirements have been requested in the report.

In the approval letter of the EIA, dust, boundary noise, waste water and solid waste were defined as key indicators of the project. The quantitative targets for control of the main pollutants are also identified. The planned actions and the environmental management practice of TMG were reviewed by the team during the field visit.

The validation team checked the personnel competence and equipment availability through the site survey. Three persons have been qualified to monitor the boundary noise and dust emission. All analysis devices will be calibrated by an authorized organization. The team interviewed Mr. Hao Yuehua, Director of the Environmental monitoring department of TMG and confirmed that the procedure for monitoring

process, monitoring quality assurance and data statistics concerning the environmental impacts have been established.

CL4

In the initial stage of validation, CL4 was raised because the noise impact is indicated as 21.7 to 47.3 dB (A) in the initial version of the PDD, however the boundary noise should consider the noise level of the existing activities and it should be assessed whether the combined impact meets the legal requirement. According to the initial version of the PDD, standards for remaining dust concentration are indicated as 40 mg/m³ and the emission rate is 108 kg/h, but the correct value is 10.8kg/h. The PP was requested to further clarify its compliance to the local regulations.

The PP amended the required noise and dust concentration levels in the revised PDD and the description of preventive action concerning compliance to the legal requirements was found as appropriate. CL4 was closed.

4.8 Stakeholders' comments

The comments by local stakeholders are to be invited in an open and transparent manner. A summary of the comments received is to be provided to the DOE together with a report indicating how due account was taken of the comments received.

Chinese regulations do not require a formal stakeholder consultation for the proposed project activity as the environmental impacts of the project activity are considered to be minimal.

The PP took measures for inviting comments from local stakeholders as below.

- 1) Web based consultation during 2 April to 2 May 2008.
- 2) Consultation meeting 7 April 2008 at the project site.

Media used included local newspaper, online announcement by internet and personal invitation. Table E.1. shows the list of stakeholders consulted. The project brief was introduced in the consultation meeting. The validation team reviewed the project outline and the activity, and confirmed that relevant stakeholders were included relating to the extent of the project activity.

Each attendee to the stakeholder consultation meeting expressed their opinion of the proposed project activity. The majority of the participants stated that the project will positively affect the local environment, economy and society. No negative opinion was received. An overview of the main comments & suggestions expressed during the meeting is provided in the PDD section E.2.

5 Comments by parties, stakeholders and NGOs

In accordance with the requirement of the Procedures for Processing and Reporting on Validation of CDM project activities, the PDD is to be made publicly available for 30 days subject to confidentiality provisions agreed with the PP, to enable comments to be received from Parties, stakeholders and UNFCCC accredited NGOs on the validation and registration requirements.

The PDD was made publicly available in accordance with the requirements of the procedure for the period of 30 April to 29 May 2008 and one comment was received during the period. That comment was made publicly available as per;

<http://cdm.unfccc.int/Projects/Validation/DB/CCMF1UITX2C02OEWP07JOOOPZAVGR3/view.html>

Below is the comment.

From: mechmaestro@gmail.com
Sent: 29 May 2008 02:06
To: Climate-change
Subject: CDM Reporting Form

These details were submitted via the CDM Reporting Form:

First Name: Sachin Trivedi
Email Address: mechmaestro@gmail.com
Organisation: CDM Consultancy Firm
Projects: Tiantie Metallurgy Group CDQ Project
Comment: ACM0012 requires the quantity of waste gas to be monitored continuously for the estimation of f_{cap} . But here in the PDD there is no such provision which is a clear deviation from the approved methodology ACM0012. Though the project proponent may argue that here the waste heat (and not waste gas) is being recovered to generate steam. However the DOE must establish the authenticity of the process of calculation of f_{cap} which is clearly a deviation from the approved methodology. Ideally the project proponent should measure the quantity of gas with the help of flow meters as clearly stated in the methodology and multiply it with the net calorific value of the gas in (Nm³/TJ) to get Q_{wg,y} i.e. the quantity of heat recovered which will be utilized to generate steam in the boilers. So clearly here the methodology has been violated and the project proponent has tried to escape via a route (i.e. just by measurement of production of coke) which can never be authentic. Hence it is the responsibility of the DOE now to check the viability of the project or take a deviation of the existing methodology since the project monitoring seems no way viable in accordance with ACM0012.

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The validation team has considered the same point through the validation process as shown under discussion on CAR6.

There were a number of changes from the PDD Version 1.0 posted for GSP and the revised Version 4.3. The major points are:

- Correction of the method of investment analysis and use of the benchmark.
- Correction of the electricity sales tariff.
- Correction of the annual O&M cost.
- Determination of f_{cap} following the requirements of the revised methodology.
- Revision of emission factor for grid electricity.
- Consideration of project activity emissions related with consumption of N₂ gas.

The changes above were to address the issues raised by the validation team in CARs/CLs and resulted in more conservative estimated annual emission reductions of 133,008 tCO₂e and an IRR of 9.35% from 198,021 tCO₂e and 8.48% respectively in the original version of the PDD.

6 Validation Opinion

LRQA has undertaken the validation of the proposed project activity “Tiantie Metallurgy Group CDQ Project” based on the requirements of CDM as set out in Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and the other rules applicable to the proposed project activity including the host country’s legislation and its specific requirements for sustainable development.

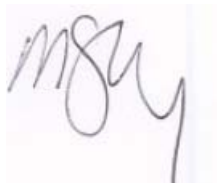
The project intends to reduce greenhouse gas (GHG) emissions by the introduction of a Coke Dry Quenching (CDQ) process to the newly constructed 1.5 MTPA coke plant associated with a new 2.5 MTPA blast furnace (as the expansion program of Tiantie Metallurgy Group’s iron and steel production facility in Gengle Town, She County, Hebei Province, the People’s Republic of China), and the implementation of a 25MW waste heat recovery based power project that will partly displace fossil fuel based electricity.

In order to arrive at the final validation conclusions and opinion, LRQA carried out a documentation review, based on the project design document Version 1.0 dated 28/04/2008, initially submitted for validation, together with a review of subsequent revisions, follow-up interviews with stakeholders, resolution of outstanding issues, independent background research and issuance of the validation report.

Through the validation process, the validation team identified 7 CARs and 4 CLs. The PP has taken action on the raised issues and submitted to LRQA the revised PDD Version 4.3 dated 11/10/2009 and other supporting evidence. All CARs and CLs have been appropriately closed prior to the issuance of the validation report.

The validation team is of the opinion that the proposed project activity conforms with all the relevant UNFCCC requirements for the CDM as well as the host country’s national requirements, and if implemented as designed, is likely to achieve the emission reductions and contribute to the sustainable development of the host country. Therefore LRQA requests the registration of “Tiantie Metallurgy Group CDQ Project” to the CDM Executive Board as a CDM project activity.

Decision Maker



Madlen King
Global Climate Change Manager

7 Appendices

7.1 Appendix A: Letter of approval for the project by the host and investing country DNA

Letter from The National Development and Reform Commission of the People's Republic of China for host country approval to the project activity dated 18 February 2009

Letters of approval from the Secretary of State for Energy and Climate Change acting as the UK's DNA dated 9 June 2009 issued to Climate Change Capital Carbon Fund II s.à r.l., and Climate Change Capital Carbon Managed Account Limited

7.2 Appendix B: List of documents reviewed

Category A documents (documents prepared by the PP)

- 1) The CDM-PDD for Tiantie Metallurgy Group CDQ Project Version 1.0 dated 28/04/2008
- 2) The CDM-PDD for Tiantie Metallurgy Group CDQ Project Version 2.0 dated 28/08/2008
- 3) The CDM-PDD for Tiantie Metallurgy Group CDQ Project Version 3.0 dated 30/10/2008
- 4) The CDM-PDD for Tiantie Metallurgy Group CDQ Project Version 4.0 dated 18/04/2009
- 5) The CDM-PDD for Tiantie Metallurgy Group CDQ Project Version 4.1 dated 10/06/2009
- 6) The CDM-PDD for Tiantie Metallurgy Group CDQ Project Version 4.2 dated 10/09/2009
- 7) The CDM-PDD for Tiantie Metallurgy Group CDQ Project Version 4.3 dated 11/10/2009
- 8) Feasibility Study Report of Tiantie Metallurgy Group CDQ Project prepared by ACE Coking & Refractory Engineering Consultant Corporation, dated July 2007
- 9) EIA report of "Tiantie Metallurgy Group CDQ Project" completed in October 2007
- 10) EIA approval on Tiantie Metallurgy Group CDQ Project, from Handan City Environmental Bureau on 10 Oct. 2007
- 11) Organization chart of Tiantie Metallurgy Group
- 12) Business license of Jinniu Tiantie Coking Co., Ltd, expire dated is 05 Dec 2057
- 13) Administrative Approval letter on Tiantie Metallurgy Group CDQ Project, issued by Tianjin Municipal Economic Commission and Tianjin Municipal Development and Reform Committee dated on 12, Oct 2007 document number JinJinTouZiXuLe [2007] No71.
- 14) Construction Permission on TieQian System reconstruction engineering, from Tianjin Municipal Construction Commission on 27 March 2007, document number JianShe 1210110200803087
- 15) Supply and Corporation Agreement between Tiantie Metallurgy Group and Jinniu Tiantie Coking Co., Ltd signed on 02 Dec 2007
- 16) Industrial production value and major production monthly report of Tiantie Metallurgy Group (2005, 2006 and 2007)
- 17) List of recent major technical improvement projects of Tiantie Group
- 18) Economic objectives list of Tiantie Metallurgy Group for 2008, 2009 and 2010
- 19) Layout drawing of new coke oven and CDQ plant construction
- 20) Technological leapfrogging Technological leapfrogging - a strategic pathway to

- modernisation of the Chinese iron and steel industry, *Yong Chen, Ugo Farinelli, and Thomas B. Johansson, International Institute for Industrial Environmental Economics*
- 21) Energy efficiency policy and CO₂ in China's Industry: Tapping the potential, Wang Yanjia, Tsinghua University, Beijing, China, 20 March 2006
 - 22) Economic Evaluation Method and Parameters for Project Construction (Version 3) published by China NDRC on 03, July 2006
 - 23) China planning press; local guidance for range of sensitivity analysis
 - 24) Announcement of the State Council on Structural Adjustments in Industries with Production Overcapacity [2006] No. 11
 - 25) List of top 110 steel producers in China
 - 26) Report on CDM project application dated on 21 Aug 2006
 - 27) Meeting minutes about the construction plan of new area dated on 23 Sept 2006, the participants including Coking plant of Tiantie Metallurgy Group and the Design party of the construction of new area
 - 28) Current situation of the Chinese steel sector, OECD (2006)
 - 29) Financial statement analysis of Tiantie by CCC – Confidential
 - 30) Data source of nitrogen consumption
 - 31) Start construction order for Tiantie CDQ project dated 12 August 2008
 - 32) Announcement for stakeholder consultation
 - 33) Fuel consumption statistical summary from the Tiantie Metallurgy Group Energy Balance statistical (2005,2006,2007)
 - 34) Power supplied by captive power plants of Tiantie
 - 35) CDM consultancy contract
 - 36) Site visit schedule for CDM consultation services
 - 37) Assessment of maximum waste heat utilization from the Tiantie Metallurgical Group CDQ Project with spreadsheet model for calculation of heat energy balance of the CDQ plant, Harworth Energy, 22 April 2009
 - 38) CER Waiver by Tiantie Steel and Hebei Jinniu
 - 39) Specification of turbine-generator
 - 40) Specification of waste heat recovery boiler
 - 41) Articles of incorporation, Jinniu Tiantie Coking Co., Ltd
 - 42) Board Resolution - Board of Jinniu Tiantie Coking Co., Ltd Dated 15th, Jan., 2008
 - 43) Bank loan contract 20080779 dated 29 May 2008
 - 44) Financial assessment sheet of Tiantie CDQ project
 - 45) Certificate of chartered engineer
 - 46) Professional review report for independent expert
 - 47) Work experience of independent expert
 - 48) Career history of independent expert
 - 49) Calculation of steam turbine isentropic efficiency
 - 50) Clarification on environmental measures taken by Tiantie Metallurgy Group CDQ project, 31 May 2009
 - 51) Technical specification of existing boilers
 - 52) Notice on charging system back-up fees from enterprises with captive power plant issued by Hebei Provincial Price Bureau, Jijiaguanzi [2006] No. 79 dated 12 September 2006
 - 53) Invoice of system back-up fees in 2006 to 2008
 - 54) Financial calculation tool Tiantie CDQ Project_GSP dated 28 April 2008
 - 55) Tiantie CDQ investment analysis dated 16 June 2009 and its updates
 - 56) Baseline emission calculation Tiantie_CDQ_Draft dated 28 April 2008
 - 57) Baseline calculation (updated version)
 - 58) Clarification on Supply and Corporation Agreement between Tiantie Metallurgy Group and Jinniu Tiantie Coking Co., Ltd dated 25 Feb. 2008

59) Modalities of communication dated 2 November 2009

Category B documents (other documents referenced)

- 1) Approved consolidated baseline methodology ACM0012 Version 02 for GHG emission reductions for waste gas or waste heat or waste pressure based energy system
- 2) Approved consolidated baseline methodology ACM0012 Version 03.1 for GHG emission reductions for waste gas or waste heat or waste pressure based energy system
- 3) Tool to calculate the emission factor for an electricity system Version 01
- 4) Tool to calculate the emission factor for an electricity system Version 01.1
- 5) Tool for the Demonstration and Assessment of Additionality Version 04
- 6) Tool for the Demonstration and Assessment of Additionality Version 05.2
- 7) Decision by the CDM-EB on request for clarification on use of approved methodology AM0005 for several projects in China
- 8) Clean development mechanism validation and verification manual Version 01
- 9) Response of CDM Meth Panel to request for clarification on approved methodology AM_CLA_0071 dated 11 April 2008 concerning Q_BL product determination in cases where no 3 years historic data is available
- 10) Response of CDM Meth Panel to request for clarification on approved methodology AM_CLA_0075 dated 11 April 2008 concerning determination of baseline cap (fcap) on waste gas quantity when it is not possible to identify a stream of waste gas used for energy generation
- 11) Response of CDM Meth Panel to request for clarification on approved methodology AM_CLA_0101 dated 12 August 2008 regarding the claim of measuring Qwg,y (Quantity of waste gas used for energy generation during year y) for waste heat projects
- 12) Response of CDM Meth Panel to request for clarification on approved methodology AM_CLA_0156 dated 18 September 2009 concerning that WECM would be released to atmosphere in absence of the project activity in new facility
- 13) Response of CDM Meth Panel to request for clarification on approved methodology AM_CLA_0167 dated 23 October 2009 concerning capping of baseline emission in waste heat recovery projects
- 14) Regulation of CDM in China
- 15) The Operating Margin (OM) Emission Factor and the Build Margin (BM) Emission Factor published by the Chinese DNA on 09 August 2007
- 16) China Energy Statistical Yearbook 2004, 2005 and 2006
- 17) China Electric Power Yearbook 2004, 2005 and 2006
- 18) Cleaner Production Promotion Law of PRC
- 19) The Law on Energy Conservation of the People's Republic of China
- 20) Policies Outline of Energy Conservation Technologies (enacted in 1984 and revised in 1996)
- 21) Act of purchasing electricity generated by renewable resources
- 22) Notice of the State Economic and Trade Commission concerning the stopping and shutting down of small-scale thermal power units [1999] No.44, General Office of the State Council
- 23) Notice of the General Office of the State Council concerning the strict prohibition of the construction of thermal power units with a capacity of 135MW or below [2002] No.6, General Office of the State Council
- 24) The China Medium and Long Term Energy Conservation Plan, LV Wenbin, Department of Environment and Resources Conservation, National Development and Reform Commission, Feb. 2005, Beijing
- 25) Tracking industrial energy efficiency and CO2 emissions, International Energy

- Agency, OECD/IEA 2007
- 26) 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2 Energy
 - 27) Clean Coal Technologies in Japan, Technological Innovation in the Coal Industry, NEDO 2006
 - 28) Factors that affect innovation, deployment and diffusion of energy-efficient technologies - Case studies of Japan and iron/steel industry, Prof. Mitsutsune Yamaguchi, Teikyo University, Japan, May 23, 2005
 - 29) Economic Evaluation of the International Collaboration Project on Global Warming Mitigation - From the Experience of Activities Implemented Jointly (AIJ) of the World and Japan, Asuka-Zhang Shouchuan (Jusen), Tohoku University, the Center for North East Asian studies, July 5, 1999
 - 30) Coke Dry Quenching (CDQ) projects in China - Successful Cases of Technology Transfer in Asian Countries, Teruo Okazaki, Nippon Steel Corporation, 8 March 2006
 - 31) Model programme for coke dry quenching facilities (CDQ) in China, Teruo Okazaki, Nippon Steel Corporation
 - 32) Basic Survey Project for Joint Implementation, Coke Oven Environmental Improvement and Energy Saving Countermeasures at Nanchang Iron & Steel Co., LTD., P.R. China, New Energy and Industrial Technology Development Organization (NEDO) and Kawasaki Steel Corporation, March, 2002
 - 33) The Northeast Asia Natural Gas Pipeline Network - A desirable way of diversifying energy sources of northeast Asia, Kensuke Kanekiyo, Managing Director, IEEJ, March 2004
 - 34) Dry Coke Quenching Technology, China Metallurgical Industry Press
 - 35) Energy Saving at Iron making Division, Kawasaki Steel Corporation Technical Report 1981 Vol. 13 No. 4
 - 36) Energy Saving Techniques of Kawasaki Steel, Kawasaki Steel Technical Report No. 2 March 1981
 - 37) Japanese Technologies for Energy Savings / GHG Emissions Reduction 2008 Revised Edition, New Energy and Industrial Technology Development Organization (NEDO)
 - 38) Thermodynamic analysis of a coke dry quenching unit, Departamento de Energia, Faculdade de Engenharia Macanica, Universidade Estadual de Campinas (UNICAMP) 13081-970 Campinas, SP, Brazil, 22 March 1999, Energy Convention & Management
 - 39) CDM-PDD, The Waste Heat Recovery Based Coke Dry Quenching Power Generation Project of Xingang Company Version 1.7 dated 07/04/2009 (Ref 2511)
 - 40) CDM-PDD, Coke Dry Quenching (CDQ) waste heat recovery for cogeneration project of Henan Shuncheng Group Coal Coke Co., Ltd Version 1.0 dated 15/11/2008
 - 41) Research on similar CDM project activities

7.3 Appendix C: List of persons interviewed

Representatives from Local Communities

Mr. Li Xizhu—Secretary of Jindian Town Yijie Village
 Mr. Zhang Yanping-- Secretary of Gengle Town Nanchi Village
 Mr. Wang Luhuai-- Secretary of Jindian Town Erjie Village
 Mr. Wang Haiping-- Secretary of Jindian Town Sanjie Village
 Mr. Zhang Xuetai-- Secretary of Jindian Town Sijie Village
 Mr. Zhang Gengtang-- Secretary of Gengle Town Dongxiang Village
 Mr. Liu Xirong-- Secretary of Gengle Town Youshang Village
 Mr. Zhao Baoshou-- Secretary of Gengle Town Shangxiang Village

Mr. Shi Baoming-- Secretary of Gengle Town Government

Local Government Authorities

Mr. Jia Zhangxi—vice Director of She Country Development and Reforming Bureau

Ms. Han Shuiye—Vice Director of She Country EPB

Ms. Shen Jinyan—Vice Director of Land Resource Department of She Country

Jinniu Tiantie Coking Co., Ltd.

Mr Ping Jinshan, Directorate Member and Executive Vice General Manager

Mr. Shao Hongchen, Technical Center Division Director

Ms. Dai Guangping, Director of Technical and Quality Department

Mr. Wang Xiujun, Financial Department Director

Mr He Jiangang, Leader of Water and Electricity Plant of Tiantie group (electricity and steam management)

Mr. Zhang Bo, Leader of Power Plant of Tiantie group (air separation plant management)

Mr Yan Yingjie, Engineer

Mr Yan Liqin, Staff

Ms. Jia Qingfen, Technical Center

Mr. Zhang Bo, Thermal Power Plant

Ms. Cao Yufen, Electricity and water Supplying Plant

Mr. Zhang Qinghua, Environmental Protection Department

Mr. Pei Weihua, Statistical staff

Mr. Zhao Kai, Finance Department

Mr. Wang Yongqian, Accountant

Mr. Liu Guangsheng, Planning Department

Climate Change Capital

Ms. Lulu Zhang, Project Manager

Mr. Liu Alvin, Deal Manager

Caspervandertak Consulting

Mr. Joost van Acht, Chief Representative China

Gansu Tonghe Investment Consulting Co., Ltd

Mr. Zhao Yonghong, Project Manager

7.4 Appendix D: How due account has been taken to the public input made to the validation requirements

The PDD was made publicly available in accordance with the requirements of the Procedures for processing and reporting on validation of a CDM project activity for the period of 30 April to 29 May 2008 as per

<http://cdm.unfccc.int/Projects/Validation/DB/CCMF1UITX2C02OEWPO7JOOOPZAVGR3/view.html>

One comment, as detailed in section 5 of this report was received during this period. The validation team has considered the same point through the validation process as detailed under discussions on CAR6.

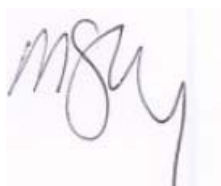
7.5 Appendix E: Certificate of Appointment

Validation of "Tiantie Metallurgy Group CDQ Project"

We hereby certify that the following personnel have engaged in the validation process that has fully satisfied the competence requirements of the validation of the CDM project activity.

Name of Person	Assigned Roles
Michiaki Chiba	Team Leader
Xianxin Yan	Team Member
Zeng Ming Chen	Team Member
Ayer V. Shivaramakrishnan	Host country expert
Dali Wang	Sector Expert
Prabodha C. Acharya	Sector Expert
	Technical Reviewer
	Sector expert
Madlen King	Decision Maker

Signed by



Decision Maker

Madlen King
Global Climate Change Manager

7.6 Appendix F: Validation findings log

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CAR	Closed	The letters of approval from the Parties have not been received by the validation team.	LoA of China DNA and the LoAs from UK DNA to the two PP from annex-1 country were received and the contents were confirmed as satisfactory to the requirements. 24 Jul 09	A.3. Participation requirements	4 June 08	CAR1	CDM M&P Para 37 a, 40 a
CAR	Closed	ACM0012 specifies the applicable baseline option for electricity generation only project as W2 and P4 or P6. However, the baseline scenario identified in the PDD is a combination of P4 and P6 that are not substantially justified in application of the methodology.	In the revised PDD, the baseline scenario are defined as scenario P6 (continuation of power consumption from the public electricity grid) and scenario W2 (continuation of releasing waste heat into the atmosphere) that meet the scenario 1 for the project that generates electricity or heat only as per Table 1 of ACM0012 Version 03.1. 24 Jul 09	B.4, B.5. Identification of baseline	4 June 08	CAR2	CDM M&P Para 44, 45, 46, 47
CAR	Closed	The investment analysis presented was not fully substantiated. The calculation and the result presented in the PDD were found to not match those in the FSR that is indicated as the source of most of the input data. The benchmark and method of IRR calculation were also inconsistent.	The PP prepared the revised PDD, spreadsheet and supporting evidence for the investment analysis. In the revised calculation, the PP removed the double counting of internal power consumption, amended electricity purchase cost and corrected the electricity sales tariff and those were verified as accurate and consistent with the evidence assessed by the validation team. The benchmark was correctly applied in the revised version of the PDD. The resultant IRR increased from 8.48% as indicated in the PDD version 1.0 to 9.35% but it is still below the selected benchmark. 30 Oct 09	B.5. Additionality	4 June 08	CAR3	CDM M&P Para 37 d, 43

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CAR	Closed	The barriers presented are not prohibitive to the project activity because the second barrier is also applicable to any investment activity. The PP is requested to further demonstrate the existence of prohibitive barriers or remove the statement.	The validation team reviewed the documents that consist of the investment decision making of the project owner, however, the evidence made available to the validation team did not demonstrate that the project owner seriously considered the barriers as prohibitive to implementation of the project activity investment. In the revised PDD Version 4.3, the PP removed the statement concerned. 30 Oct 09	B.5. Additionality	4 June 08	CAR4	CDM M&P Para 37 d, 43

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CAR	Closed	The decision making of the project owner with serious consideration of the CDM incentive at the time is not sufficiently proven by the evidence presented.	<p>The relevant part of the PDD was modified and the PP presented evidence to demonstrate its serious consideration of CDM incentive prior to investment decision making for assessment by the validation team. The potential project activity was discussed in August to September 2006 and the FSR was completed in July 2007 that provided main inputs for consideration of the investment by the project owner. The board meeting held on 15 January 2008 decided investment to the project with application for CDM that was before the start date of the project activity of 13 February 2008 when the EPC contract was signed.</p> <p>Agreement with a CDM consultant was signed on 19 October 2007, the ERPA was signed on 25 January 2008 and agreement with LRQA for validation of the project activity was signed on 9 April 2008. In parallel, an agreement for procurement of the main equipment was signed on 13 February 2008 and local stakeholder consultation was conducted during March to May 2008. The validation team concluded, based on the evidence assessed, that the incentive of CDM was seriously considered prior to investment decision as a decisive factor and that continuing and real actions were taken to secure CDM status in parallel with the project implementation and the project satisfies the requirement of clause 5 (a) and (b) of Guidance on the demonstration and assessment of prior consideration of the CDM.</p> <p>30 Oct 09</p>	B.5. Additionality	4 June 08	CAR5	CDM M&P Para 37 d, 43

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CAR	Closed	ACM0012 requires application of Method-2 that is use of (1f) and (1f-1) but the PDD does not fully follow this requirement and how to determine f_{cap} is not substantiated that is also in the monitoring plan.	<p>The PP revised the PDD after the revised version of methodology ACM0012 Version 03.1 was approved by the CDM-EB.</p> <p>The validation team assessed the report of Harworth Energy, the revised PDD Version 4.3 and the other supporting documents presented by the PP. The calculation being applied theoretical maximum waste heat quantity contained in red hot coke of 1,500MJ per tonne of coke results in maximum net power generation of the project activity at 130,960,733kWh and f_{cap} of 0.744.</p> <p>Direct monitoring of waste heat contained in solid material is complex and there is no feasible and reliable monitoring practice available to the PP. The proposed method is to determine the cap of baseline emissions by resultant electricity generation (sole energy output of the project activity) hiring a reliable monitoring device and practice and the choice of method (Case-1 of the Method-3) is considered as appropriate.</p> <p>The technical assessment was conducted by an independent chartered engineer as requested by the applied methodology. The calculation was based on the manufacturer's specifications of the coke oven, CDQ, waste heat recovery boiler and steam turbine generator. The validation team assessed the data sources, assumptions and calculation using sector experts and confirmed their correctness. The project activity is the setting up of a new plant and f_{cap} may be assumed as 1 but the validation team agreed that the calculation by the PP is more conservative and meets the requirements of the applied methodology.</p> <p>30 Oct 09</p>	B.6.1. Application of methodology	4 June 08	CAR6	CDM M&P Para 37 e

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CAR	Closed	<p>The validation team reviewed the latest calculation worksheet for baseline emission factors submitted by the PP along with the PDD Version 4.1 and identified the following points to be addressed by the PP.</p> <ol style="list-style-type: none"> 1) The weighted average carbon emission coefficient of gaseous fuels is calculated as 13.1 tc/TJ in the worksheet but it is indicated as 13.6 tc/TJ in the PDD Annex 3. 2) The capacity addition during 2003 to 2005 for hydro power source is indicated as minus 49.8MW. This is not possible and does not meet the methodological requirements because the negative contribution is assumed as closure of old generation units but power units built more than 10 years ago should be excluded from the group of power units following the Tool to calculate the emission factor for an electricity system. 3) The resultant combined margin emission factor is indicated as 1.0298 tCO₂e/MWh in the PDD section B.6. but PDD Annex 3 and the calculation worksheet show it as 1.02977 tCO₂e/MWh. 	<p>In the revised PDD Version 4.3, the weighted average carbon emission coefficient of gaseous fuels has been corrected as 13.1tc/TJ as consistent with the calculation worksheet. The capacity addition of hydro power source is amended to 20.2MW based on the increase in Hebei Province and confirmed as correct from official data of China Electric Power Yearbook. The combined margin emission factor is now 1.02856 tCO₂e/MWh having been reflected with above corrections and was confirmed as consistent with the calculation worksheet.</p> <p>30 Oct 09</p>	B.6. Emission reduction	24 Jul 09	CAR7	CDM M&P Para 45 b
CL	Closed	The PP is requested to clearly demonstrate that all the applicability conditions are met by the project activity.	<p>The validation team has confirmed that the applicability conditions of the applied methodology are met by the project activity on the basis of PDD Version 4.3.</p> <p>30 Oct 09</p>	B.2. Applicability conditions	4 June 08	CL1	CDM M&P Para 37 e

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CL	Closed	The PDD states that the internal grid of TISF is currently supplied electricity from 25MW BFG/coal-fired captive power plant. However, the information collected by the validation team showed that there are more power supply sources available in the TISF. The PP is requested to transparently present the facilities that produce and consume electricity and thermal energy.	The PP amended the description in the revised PDD and confirmed that there are 2 x 12MW BFG/coal-fired plants, 4 units of BFG fired plant with total installed capacity of 22.5MW and 5 units of top pressure turbines (TRT) that are newly introduced. Evidence for electricity generation and fuel consumption in years 2005 – 2007 was presented. The PP clarified that the project electricity generation will not affect the captive power generation of TISF as it is predominant with waste energy and electricity import from the regional grid only is considered for baseline. 30 Oct 09	B.3. Project boundary, B.4. Baseline	4 June 08	CL2	CDM M&P Para 52

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CL	Closed	<p>The project activity uses cooling gas mainly composed of N₂. This N₂ gas was confirmed to be produced in the air separation plant located in TISF using electricity. The PP is requested to clarify how the energy consumption and resultant GHG emissions by consumption of the cooling gas are considered.</p> <p>It was also pointed out that the project CDQ plant requires a supply of low pressure steam and the PP is requested to clarify how the energy consumption and resultant GHG emissions by such steam consumption are accounted for in the project design.</p>	<p>The team reviewed the updated PDD that addressed the 2 sources of the project activity emissions.</p> <p>PE_{AF,y} for steam consumption is calculated in equation of ACM0012. It is explained that the project plant is only connected with a low pressure steam header that is mainly supplied with steam from the waste heat recovery boilers and it normally has excess steam, therefore ex-ante estimate of this emission is assumed to be zero. It may occasionally (especially in winter season) be supplied by BFG firing boilers. In such circumstances, the PP calculates a weighted average emission factor of waste heat recovery based steam and BFG firing based steam in proportion to the total steam supply to the common header. In the revised PDD Version 4.3, section B.7.1 is added with relevant monitoring parameters for the possible fuel consumption. The validation team confirmed through the site survey the energy supply sources and steam supply system of TISF, and designed steam requirement of the project plant.</p> <p>The respective project activity emissions are expected to be of a small quantity based on the review of the project documents and comparison with similar project activities and it will be monitored and calculated ex-post in an appropriate and conservative manner.</p> <p>PE_{EL,y} for use of N₂ gas is calculated in equation of ACM0012. N₂ gas is to be recycled in the cooling process but it is expected to require replenishing annually for the lost volume of approximately 4,112,640Nm³. A part of the N₂ gas is considered as a by-product of oxygen production but the PP accounts for all of the energy consumption as attributable to the project activity which is conservative.</p> <p>30 Oct 09</p>	<p>B.3. Project boundary</p> <p>B.6. Project emissions</p> <p>B.7. Monitoring plan</p>	4 June 08	CL3	CDM M&P Para 52

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause 8
CL	Closed	<p>The noise impact is indicated as 21.7 to 47.3 dB (A) in the PDD but the boundary noise should consider the noise level of the existing activities, and it should be assessed whether the combined impacts meet the legal requirement.</p> <p>According to the PDD, the remaining dust concentration is indicated as 40 mg/m³ and the emission rate is 108 kg/h, but the correct value is 10.8kg/h. The PP is requested to further clarify its compliance to the local regulations.</p>	<p>The PP amended the required noise and dust concentration levels in the revised PDD and the description of preventive action concerning compliance to the legal requirements is found as appropriate.</p> <p>30 Oct 09</p>	D.1. Environmental impacts	4 June 08	CL4	CDM M&P Para 37 c