Trading Emissions PLC
Third Floor, Exchange House, 54/62 Athol Street,
Douglas, Isle of Man, IM1 1JD, British Isles
t: +44 (0) 1624 681200
f: +44 (0) 1624 681392
w: www.tradingemissionsplc.com

Ref: Response to request for review "Power generation from coking waste heat utilization project at Taiyuan City Wanguang Coal and Coking Co., Ltd in Shanxi, China" with the Reference Number 1725

01 August 2008

UNFCCC Secretariat
Martin-Luther-King-Strasse 8
D-53153 Bonn
Germany

Attention: CDM Executive Board

Dear Sir or Madam,

We were informed that our project "*Power generation from coking waste heat utilization project at Taiyuan City Wanguang Coal and Coking Co., Ltd in Shanxi, China*" (reference number 1725) was requested for review by CDM Executive Board. As required by the Executive Board and on behalf of the project participants, we would like to answer the questions and clarify the issues raised in the requests for review as follows:

Question 1:
"Considering that the investment being made is in the power sector, further substantiation that the benchmark reflects the risk profile of this project activity is required."

The benchmark internal rate of return (IRR) used for this project is taken from page 204 of the *Economic Assessment Methods and Parameters for Project Construction* (3rd Edition, 2006), hereafter referred to as "Economic Assessment Methods". This reference is widely used by Chinese authorities for assessing the financial viability of potential new projects. According to regulation No.6 in Chapter 4 of Annex II of the "Economic Assessment Methods", only when the IRR of a project exceeds the sectoral benchmark IRR, will the proposed project be considered financially feasible.

The "Economic Assessment Methods" states that when a project owner invests in a project with key characteristics of another sector rather than its own core business, and has little experience of these characteristics and the project risk, the sectoral benchmark IRR of its own core business will be applied.[1] Although this project is a power generation project, given that the core investment focus of the project owner is the coking industry, the sectoral benchmark of the coking industry is adopted (12% IRR). This is a conservative assumption, since the project owner has little experience in power generation adding significant risk to the investment decision. The project owner would therefore expect at least the same returns as they would normally expect from an investment in their core business.

In addition, because the project relies on the coking facility's production output to be maintained to generate electricity the project suffers from the following risks: a) market risk; b) technology/operational risk; and c) input-supply risk.

a) Market risk: China's coking industry is highly fragmented consisting of a large number of small-scale suppliers.[2] Although coke prices are currently increasing, the industry suffers from over-capacity which in the past has led to volatile market shares and plummeting coke prices.[3] By contrast, the Chinese power industry is highly regulated and market segments are carved up by the authorities to ensure that market shares are relatively stable. Chinese power industry operators are dominated by large scale enterprises which enjoy relatively easy access to capital.[4]

b) Technology/operational risk: As explained in the PDD, the project activity is based at a coking facility which uses a clean type *non-chemical-recovery* coking system that produces only waste heat. This is a new environmentally friendly coking technique but not as financially attractive as compared to the traditional *by-product* coke ovens. Furthermore, as the project will generate power by utilizing waste heat from coke production, which is currently vented into the atmosphere, power production is dependent upon the core business of the project owner. This brings with it its own risks not normally associated with the power industry. The power generation facility will only produce power when there is sufficient waste heat being produced by the coking ovens and there is demand from the grid. Supply will be interrupted should either the ovens or the power generation facility suffer periods of operational downtime. These operational risks are increased by the project owner's unfamiliarity with the technology involved and the additional need to provide new training to staff to operate and perform maintenance on the power generating facility.

---

[1] Methods and Parameters for Economic Assessment of Construction Projects (version 3), published by China's National Development and Reform Commission and Construction Ministry, December 2006, paragraph 2, point 2, page 197.

[2] See http://russian.china.org.cn/english/BAT/158034.htm

[3] *Ibid* fn. 2

[4] In China the power industry is considered a so-called "Basic Industry". This means that operators in this industry enjoy policy support such as preferential access to finance by China's policy banks. See for example: http://www.cdb.com.cn/English/NewsInfo.asp?NewsId=1926

Input-supply risk: There are uncertainties in particular about the reliability of the coal supply used for coking.[5] The project will generate electricity not based solely on power demand but based on the ability to maintain levels of production of the underlying coking facility. Such uncertainties are less of a concern for operators within the mainstream power sector who enjoy higher buyer power and base their investment assumptions on a more stable supply of inputs.[6]

In addition to the above risks the project owner has to consider the opportunity cost of making an investment decision in favour of the power generating facility. Another attractive investment opportunity for coking plant owners is to engage in vertical backward integration by investing in coal production facilities. Apart from the financial attractiveness of the coal industry due to rising fuel prices, this would also help to ensure a reliable source of coal supply for the coking process which is becoming an increasingly important concern for coking industry operators due to the persistent coal shortages described above. The project's activity's IRR of 17.95% only exceeds the IRR of the coal industry (15%[7]) due to the revenue derived from participation in the CDM.

The above assumptions are in line with guidance issued by the Shanxi Coke Association which recommends that the benchmark IRR should be 12% for the waste heat recovery power generation projects in the coking industry.[8]

Question 2:
*The DOE is requested to clarify the discrepancy in the benchmark of 12,0% proposed for this project, while for another project connected to the coke production sector (project 1726) another benchmark of 11% is validated as being correct, being the financial IRR for the iron industry (*The Economic Assessment Method and Parameters for Project Construction, 2ndversion, 1993, valid to August 2006*)*

Apart from the response by the DOE, we would like to clarify as follows:

Based on the information provided in the PDD and validation report, Project 1726 applies the iron industry benchmark according to the same rationale described above (outlined in **Q1**). The PDD for Project 1726 states that the project is a waste heat utilization project aimed at reducing GHG emissions through the installation of two sets of coke dry quenching systems at the new plant of Maanshan Iron & Steel Co., Ltd. (Ma Steel).[9] The validation report confirmed that the core business of the project

[5] Beyond the operational reliability constraints of the coking facility, the most likely reason for interruptions to the coking process is shortages in thermal coal supply. See also http://www.chinamining.org/News/2008-06-03/1212473878d14395.html

[6] The Chinese government has called on mines and those in charge of transport to ensure that thermal coal is supplied to power plants over coking plants. Recently China prioritised thermal coal supplies to power plants while weather impeded coal shipments from abroad: http://uk.reuters.com/article/oilRpt/idUKSHA23542120080226

[7] Methods and Parameters for Economic Assessment of Construction Project (version 3), published by China's National Development and Reform Commission and Construction Ministry, December 2006, page 204

[8] The notice on benchmark selection for waste heat power generation projects in coking industry

[9] https://cdm.unfccc.int/UserManagement/FileStorage/6CJZ4VWVHGOLKDSSCWXLN8DHUK2B33

owner is the iron and steel industry and that "[the] project is constructed at a large scale iron & steel enterprise" (p11).[10]

The historical difference between the investment benchmark of the coking industry and iron & steel industry lies in a number of reasons. The most important reason is that whereas the coking industry consists largely of small-scale players, the iron & steel industry is increasingly dominated by large-scale players such as Ma Steel who enjoy cheaper access to capital and stronger buyer power. While in some areas the steel industry remains fragmented, increasing mergers & acquisitions since 2005 have meant that Chinese steel industry is now relatively consolidated.[11] Although the coking industry's input (thermal coal) is more commoditized than that of the steel industry (which uses coke in traditional blast furnaces) prices of coal have been rising faster than that of coke and the government keeps domestic coke prices artificially low.[12] These factors contribute to the investment risk profile of the iron & steel industry being lower than that of the coke industry.

The project owner for this project is a small-scale private company representative of the kind of producers typically found in the coke industry. In contrast Ma Steel is a large-scale state-owned enterprise more representative of the iron & steel industry.[13] Therefore, although both projects are connected to the coke production sector the project owners operate in different areas of the supply chain where different industry dynamics prevail. This approach is therefore consistent with the guidelines set out by *The Economic Assessment Method and Parameters for Project Construction* also outlined in **Q 1**.

The benchmark selection was confirmed in May 2004 by the Shanxi Coke Association which recommends that the benchmark IRR should be 12% for the waste heat recovery power generation projects in the coking industry.[14]

Question 3

The DOE shall describe how the reliability of the input values used in the investment analysis has been validated in accordance with the requirements of EB38 paragraph 54(c).

Besides the response from the DOE, we would like to clarify as follows:

The requirement of EB 38 para 54 (a) states that the period of time between the finalization of the FSR and the investment decision should be sufficiently short for the

[10] https://cdm.unfccc.int/UserManagement/FileStorage/I9QX53LT9KZJZ40QN72JQ1L1BIZO4E

[11] Research and Markets (2006) *China Steel Industry Analysis* (purchase required). Summary of report available at: http://www.allbusiness.com/manufacturing/primary-metal-mfg-iron-steel/5439704-1.html; There are 871 global steel producers in China while in Shanxi province alone there are 717 coke production factories.

[12] Wiley Rein & Fielding LLP (2006) *The China Syndrome: How Subsidies and Government Intervention Created the World's Largest Steel Industry* available at http://www.wileyrein.com/docs/docs/80.pdf

[13] Ma Steel is the largest industrial enterprise in Anhui Province with 70,000 employees. See also http://211.141.223.9:82/gate/big5/zs.magang.com.cn/english/project/

[14] The Notice on Benchmark Selection for Waste Heat Power Generation Projects in Coking Industry (May 2004)

DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed.

The DOE has validated that the FSR of the project activity was completed in May 2005 and the validated project start date is 8 September 2005 when the construction agreement was signed. As the time gap between FSR and the project start date is less than four months the input values used in the FSR would not have materially changed by the time of finalizing the investment decision leading to the start of the project.

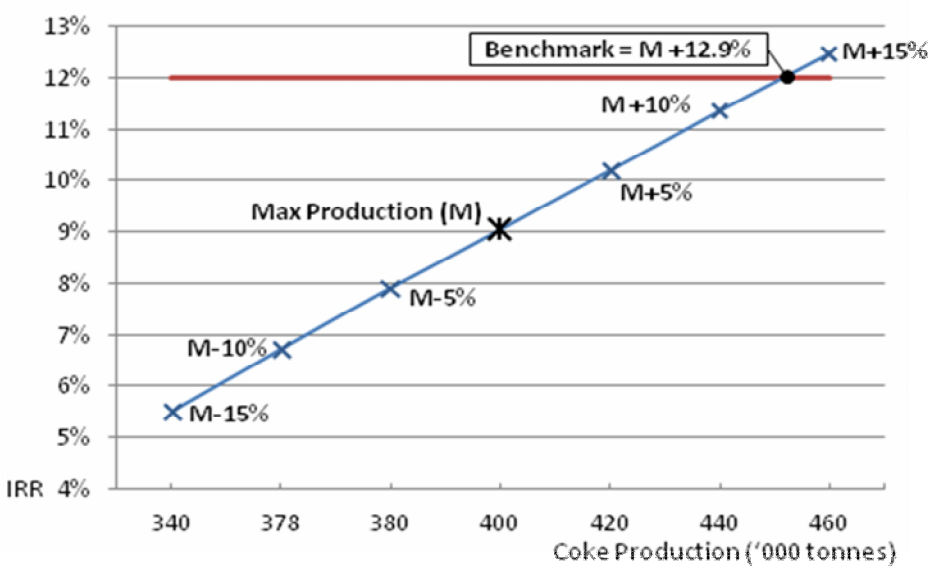
Question 4:

The PP/DOE shall provide information on the maximum and minimum production capacity design rate of the coke production and apply these values to the sensitivity analysis

The maximum capacity design rate of the coke production facility is set at 40,000 tonnes per year. The minimum production capacity design rate for the coke oven in this project is zero.[15] This is specified by the project activity's FSR and bound by the local authority's official approval for the project (both documents validated by the DOE). The power plant capacity is designed on the basis of the maximum coke production and determined by the power plant design institute of the FSR, the "Shanxi Diwei Electric Power Design Institute", which has substantial experience with these types of project.

A sensitivity analysis on the maximum coke production has been included in the updated spreadsheet previously submitted to the DOE. **Figure 1** shows the results of the sensitivity analysis.

Figure 1: Sensitivity analysis production capacity design rate



The IRR of the project exceeds the benchmark in the scenario that coking production reaches 12.9% over its estimated maximum production capacity. This result meets the general point of departure as outlined in the EB's *Guidance on the assessment of investment analysis* which suggests that variations in the sensitivity analysis should at

[15] The minimum production capacity is not further considered as any value below the maximum production capacity can be considered relatively more conservative.

least cover a range of +10% and –10%.[16]

In conclusion it is therefore unfeasible that realized coke production would exceed the maximum capacity design rate by 12.9%. Apart from that this would contradict the FSR and relevant approvals, such a large variation for a facility of this type and size would be unlikely. The amount of power generated is also restricted by the design of the power generation facility.

Question 5:
Further clarification is required on why the common practice analysis includes only those project activities that started construction after 2005.

According to the EB's *"Tool for the demonstration and assessment of additionality",* only those projects which are similar to the proposed activity need to be analyzed for common practice analysis which is defined as follows: *"*Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc."[17]

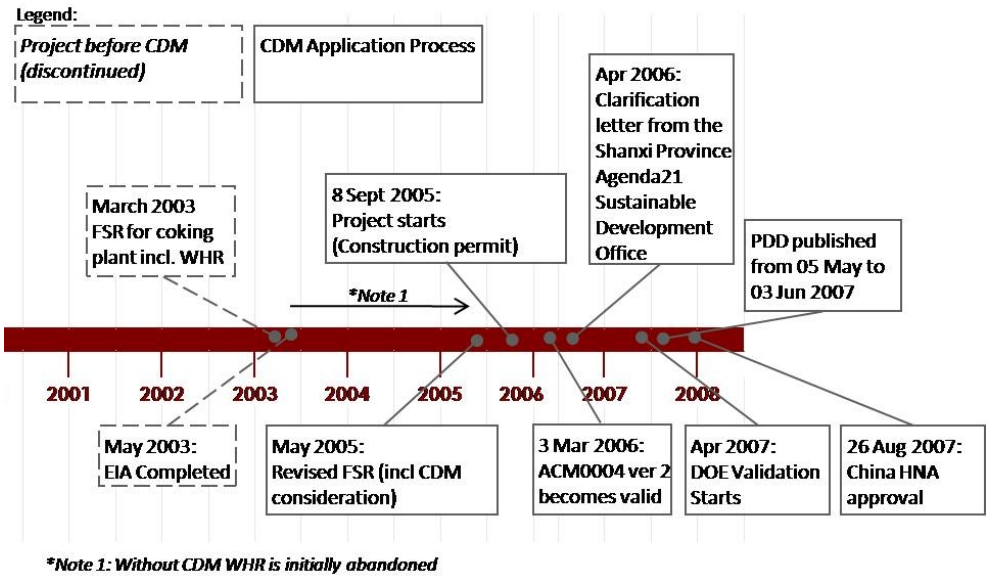
After extensive research the project participants did not identify any similar project activities according to the definition above which started before 2005. This has been confirmed by a clarification letter from the Shanxi Province Agenda21 Sustainable Development Office (under the Provincial Development and Reform Committee) which was validated by the DOE.

Question 6:
The DOE is requested to provide an explanation for the delay in submitting the project for validation to show that CDM revenues were considered essential in the decision to invest in the project activity. The response should provide a detailed timeline of project implementation with relevant, preferably third-party, evidences of the serious prior consideration of CDM.

A detailed timeline of the project implementation is provided in **Figure 2**. This timeline has been validated by the DOE.

Figure 2: Detailed Project Implementation Timeline

[16] *Guidance on the assessment of investment analysis* available at: http://cdm.unfccc.int/EB/039/eb39_repan35.pdf
[17] http://cdm.unfccc.int/Reference/tools/ls/meth_tool01_v05.pdf



During initial development of the coking facility a feasibility study was undertaken in March 2003 to determine the feasibility of a waste heat recovery plant at the coking facility. Ultimately it was decided by the project owner not to proceed with the waste heat recovery plant at this time as it was not considered a financially attractive investment. In 2005 the project owner learned of CDM and reconsidered its decision, commissioning a new feasibility study in 2005 which considered the potential benefit of CDM.

The project owner seriously considered CDM revenues for its investment decision in May 2005, basing the decision on the revised FSR. A clarification letter from the Shanxi Province Agenda21 Sustainable Development Office (under the Provincial Development and Reform Committee) dated April 2006 confirmed that the project had started the CDM application process. This letter has been validated by the DOE and is referred to in the project's validation report.[18]

The time period between the project start-date to the validation date is 19 months and is reasonable considering the lengthy development process of CDM projects in China for the following reasons:

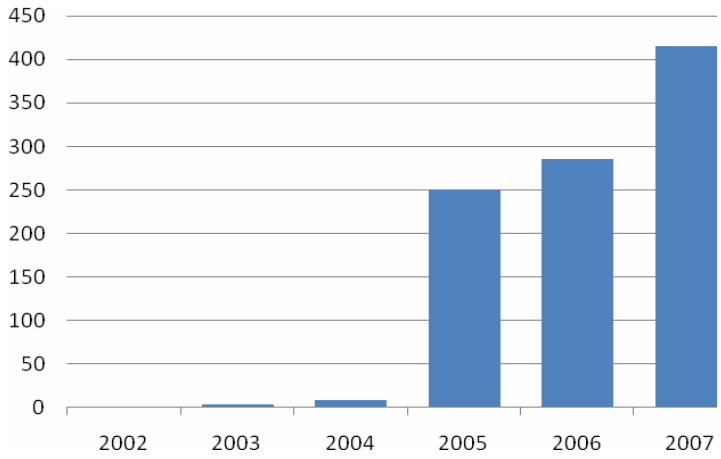
1. Although the project owner had made the decision to apply for CDM revenues in May 2005 the regulatory framework for the CDM in China was still immature.[19] At that time the wider institutional framework to implement the CDM in China was still being established. The first major capacity building projects only began implementation in 2005 and were at that time mostly engaged in preliminary

[18] Page 7 (item 8) of the Validation Report available at: https://cdm.unfccc.int/UserManagement/FileStorage/EW5WQ28V90JH4Z9UYIEJ0LL5TM4VUP

[19] At the time of the investment decision the "Interim Measures for Operation and Management of Clean Development Mechanism Projects" (promulgated on 31 May 2004) was still in force. This was not repealed until 12 October 2005 by the "Measures for Operation and Management of Clean Development Mechanism Projects"

research and needs assessment.[20] There was therefore at the time a shortage of competent consultants active in China and resources really only developed in late-2005 to 2006 (see **Figure 3**). In addition it is important to note that in 2005 when the CDM was in the early stages of development consultants focused on large scale emission reduction projects such as HFC destruction (58% of technology share) while energy efficiency projects only accounted for 2% of CDM projects.[21] Therefore a period of time passed before the project owner was able to nominate a consultant to write the PDD for this project.

Figure 3: Primary CDM annual volumes transacted in China (MtCO2e)



Source: World Bank (2008), State and Trends of the Carbon Market 2008, p.27

2. It is common market practice in China for projects to wait to secure an Annex 1 participant (typically a buyer) before proceeding with seeking to obtain host nation approval. This is because the Chinese DNA issues Letter of Approval (LOAs) that specify the name of the Annex 1 participant to which the Chinese government approves transfer of CERs. It is therefore important for the Chinese project participant to ensure that before it applies for an LOA it has selected the right partner. Negotiation of terms for emission reduction purchase agreements can take some time, and it was not until the relevant contract was executed in May 2007 that the project participant submitted its PDD for host nation approval. It is common practice in China for projects not to proceed for validation until after receiving host nation approval. This is largely a language issue as project proponents do not want to continuously translate a document from Chinese (necessary for host nation approval) to English (necessary for validation) and prefer instead to complete the Chinese language PDD before proceeding with

[20] See for example Japan's Ministry of Environment ICS-CDM/JI programme http://www.meti.go.jp/english/information/downloadfiles/JCIF/moe.pdf. A comprehensive overview of international capacity building projects in China can be found at http://www.euchina-cdm.org/media/docs/Matrix%20of%20projects%20in%20implelentation%2020071005.pdf and http://cdm.ccchina.gov.cn/english/main.asp?ColumnId=29. The most comprehensive capacity building to date, the EU-China CDM Facilitation Project, only started its initial needs assessment phase in 2007. See also http://www.euchina-cdm.org/media/docs/CDM%20work%20plan%20schedule.pdf

[21] World Bank (2008), State and Trends of the Carbon Market 2006, p.29 http://www.ieta.org/ieta/www/pages/getfile.php?docID=1667

validation.

The project owner and consultants are not aware of any rules or regulations under the CDM which set a time limit between project start date and publication for GSP. The project owner worked continuously and steadily towards registration of the project. Progress has been sometimes slower than anticipated but at the time the investment decision was made the owner did not foresee the length of time it takes to register a project under the CDM. Despite the difficulties described above, the project participants remained determined in their intention to register the project activity for the CDM as this had remained an essential precondition making the project activity financially attractive.

Question 7:

Further clarification is required on how the DOE has validated the baseline determination, in particular that the continuation of grid electricity imports is a more economically attractive alternative than the project activity undertaken without CDM

Besides the response from the DOE, we would like to clarify as follows:

The proposed project activity without CDM has an IRR of 9.08% which does not reach the relevant coking industry benchmark and the proposed project is therefore not economically attractive. As illustrated in **Q 1**, the project owner will only make an investment over the coke industry benchmark of 12% as only then does it consider profit-potential of the investment sufficient. The baseline scenario is therefore that the project owner will continue to buy electricity from the grid and will endeavor to find projects to invest its limited capital other than the project activity undertaken without CDM.

In further confirming the additionality of the project, the approach taken in the submitted PDD is in line with the "Tool for the demonstration and assessment of additionality"[22] (EB39 Report). As the proposed project generates financial and economic benefits through the sale of electricity other than CDM-related income, the simple cost analysis (Option I) cannot be used. The investment comparison analysis (Option II) is applicable to projects where alternatives are similar investment projects. However, as the proposed project activity without CDM is not economically attractive Option II was also excluded. As the alternative scenarios do not require similar amounts of investment the investment benchmark analysis (Option III) was chosen to confirm the project's additionality.

EB 39 Report Annex 35 provides further relevant guidance stating that in a situation such as this project activity, an investment comparison analysis is not appropriate as the alternative to the project activity is to make no investment and take the supply of electricity from the grid:

[22]"Tool for the demonstration and assessment of additionality" (version 5) EB39 Report

"If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate."

As the alternative to the project activity is continued import of electricity from the grid, the project developer's decision is simply to invest in the project activity or not invest (i.e. the project developer does not require the project activity to provide its limited electricity demand as it can be sourced from the grid) the following elaboration in the aforementioned EB 39 Report Annex 35 is relevant: *"The benchmark approach is therefore suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest."*[23]

In order to further illustrate succinctly that continuation of grid electricity imports is more economically attractive than the project activity undertaken without CDM, a comparative NPV calculation can be conducted. The comparative calculation adopted here is based on a conservative calculation of the NPV between a) "*The project activity undertaken without CDM*" and b) "*Continuation of grid electricity imports*".

a) *"The project activity undertaken without CDM*": In the NPV calculation for this alternative scenario all of the coking facility's electricity production is exported to the grid. The electricity requirement for the coking facility is then purchased back from the grid. This is a requirement in Shanxi Province if the project owner wishes to be grid connected and sell electricity to the grid.[24] The NPV calculation result for "*The project activity undertaken without CDM*" is minus 44.77 million RMB.

b) "*Continuation of grid electricity imports*": The calculation of the NPV is simplified based on a number of assumptions which make the result of the calculation conservative:

1. It is assumed that the project owner cannot find an alternative invest project which is more economically attractive than the project activity undertaken without CDM.
2. The project owner has no shareholders or third parties who can put to productive use the capital used as the project cost. This means in effect that the project owner's capital lays dormant.

The NPV calculation result for the "*continuation of grid electricity imports*" based on these conservative assumptions is minus 31.65 million RMB.

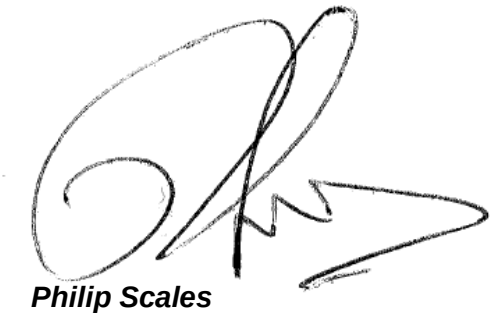
The result of the comparative NPV calculation indicates that b) "*continuation of grid electricity imports*" is more economically attractive than a) *"the project activity*

[23] EB 39 Report Annex 35 "Guidance on the Assessment of Investment Analysis" page 3
[24] "Coke Ovens CDM Due Diligence in Shanxi, China" report by Mott MacDonald.

undertaken without CDM". The NPV results can be found in the spreadsheet attached to this document and are based on the economic analysis previously submitted to DOE.

The baseline scenario as outlined in the PDD has therefore been confirmed as alternative b) "Continuation of equivalent import of electricity from North China Power Grid" without the use of waste heat for electricity production. As the benchmark analysis in the PDD had already shown, the potential revenue derived from the project is insufficient without the revenues resulting from participation in the CDM. Due to the project owner's relative unfamiliarity with the risks involved in power generation the coking industry investment benchmark chosen for this project is conservative (IRR of 12%). This project will therefore not have occurred without the additional revenue derived from of CERs (at an IRR of 9.08%). Under these conditions, the continued use of grid electricity carries with it no additional risks and provides several attractive investment alternatives for the project owner's limited capital, for example in expanding its current coking capacity or by investing in coal mining activities (see also response to **Q 1**).

Yours faithfully,



Philip Scales
Director
Trading Emissions PLC
Third Floor, Exchange House, 54/62 Athol Street
Douglas, Isle of Man, IM1 1JD
British Isles
Tel: +44 (0) 1624 681200
Fax: +44 (0) 1624 681392
E-mail: eb@tradingemissionsplc.com

Note:
In case you have any further question or request during the review process, please do not hesitate to contact us by phone or e-mail to the person listed below:
Mr Haoxiang Jiang
Tel: +86 10 85911462 ext 816
Mob: + 86 138 0105 0580
E-mail: Haoxiang.Jiang@eeafm.com