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# VALIDATION REPORT

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SeAH Besteel fuel switching project

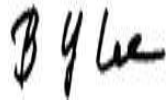
REPORT No. 2008-01

REVISION No. 2

**KOREAN FOUNDATION FOR QUALITY**



## VALIDATION REPORT

Date of first issue: 14 March 2008	Date of this revision 30 June 2009	Project No.: EC-806
Approved by: Byung Yong LEE Director of Sustainable Management Institute		Organisational unit: Korean Foundation for Quality (KFQ)
Client: SeAH Besteel Corporation	Client ref.: Geum Dong Jung	

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### Summary:

**Project Title :** SeAH Besteel fuel switching project

**Investor Country :** Japan

**Host Country :** Republic of Korea

**Project Participants :** SeAH Besteel Corporation

Korea Energy Management Corporation

Mitsubishi UFJ Securities Co., Ltd

**Applied Methodology(ver) :** AMS-III.B(13)

**Technology/Measure to be employed :** Fuel switching

**Crediting Period :** 10 yrs fixed crediting period

**Estimated ER :** 27,728 ton CO<sub>2</sub>/yr

**Project Size :** Small-Scale

**Validation Report Status**

☐ CAR/CL Requested

☐ Before DNA approval

☐ Resolution of Outstanding issues

☒ Full approval and submission for registration

As the result of the validation, it can be confirmed that SeAH Besteel fuel switching project, as described in the revised PDD of 10 June 2009(Ver.3.2), meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baselines and monitoring methodology AMS-III.B\_Ver.13.

KFQ thus requests the registration of the project as a CDM project activity.

Work carried out by :

Jin Pyoung An (Audit team leader, GHG auditor)  
Yu Shim Jeong (Audit team member, GHG auditor)  
Gyung Uk Huh (Audit team member, Observer)

Work verified by :

Jong Mun Park



**Abbreviations**

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide Equivalent
DNA	Designated National Authority
GHG	Greenhouse gas(es)
KEMCO	Korea Energy Management Corporation
KFQ	Korean Foundation for Quality
MoV	Means of verification
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PP	Project Participants
UNFCCC	United Nations Framework Convention for Climate Change
WBF	Walking Beam Furnaces

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## 1 INTRODUCTION

Korean Foundation for Quality(KFQ) has been engaged by SeAH Besteel Corporation, Korea Energy Management Corporation(KEMCO) and Mitsubishi UFJ Securities Co., Ltd to perform a validation of SeAH Besteel fuel switching project. This validation report summarizes the findings of the validation of the project, performed on the basis of UNFCCC and host party's criteria for small-scale CDM project, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the small-scale CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

All the validation team's conclusion and opinion on this project activity are made the PDD of version 3.2, 10 June 2009, as a basis. Final PDD has followed the structure and guidance in the latest relevant PDD template (CDM-SSC-PDD, Ver. 03) and the Simplified project design document (CDM-SSC-PDD) & the form for proposed new small-scale methodology (CDM-SSC-NM) (Ver. 05).

The project is classified with sectoral scope 1- Energy Industries (non-renewable sources) and is located at 1-6, Soryong-Dong, Gunsan City, Jeollabuk-do, Korea.

The project consists two Walking Beam Furnaces (WBF, 150 ton/hr x 2) in the large size rolling mill and one Walking Beam Furnace (WBF, 180 ton/hr x 1) in the small size rolling mill which use natural gas as a fuel source instead of B-C oil. Those furnaces' capacity has been increased. Before fuel switching with capacity increase, one WBF (120 ton/hr x 1) in the large size rolling mill and one WBF (110 ton/hr x 1) was installed in the small size rolling mill, both of which have used B-C oil as a fuel source.

The project is expected to reduce 277,280 tCO<sub>2</sub> over the 10 years crediting period.

### 1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host countries criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide



assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

## 1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD), the project's baseline study, monitoring plan and other relevant documents. The information in these documents is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed on the Marrakech Accords and the relevant decisions by the CDM Executive Board including the approved baseline and monitoring methodology. KFQ has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

## 1.3 Validation Team

The validation team consisted as follows:

Jin Pyoung An (Audit team leader, GHG auditor)  
Yu Shim Jeong (Audit team member, GHG auditor)  
Gyung Uk Huh (Audit team member, Observer)

Validation work is verified by a technical reviewer, Jong Mun Park and the qualification of each individual validation team member is detailed in Appendix B to this report.

## 2 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

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

- It organizes details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1. The completed validation protocol is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective Action Requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification (CL) is issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

The validation team has assessed the proposed CAR with a positive result and after the closure of these CAR and CL the proponent has issued the final version of the PDD. On the basis of this the final validation report and opinion were issued.

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<b>Validation Protocol Table 1: Mandatory Requirements</b>			
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference/Comment</b>
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), or a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

<b>Validation Protocol Table 2: Requirement checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
<i>The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). <b>Clarification Request (CL)</b> is used when the validation team has identified a need for further clarification.</i>

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

**Figure 1 Validation Protocol Tables**





## 2.1 Desk Review of Documents

The Project Design Document (PDD) version 01 was submitted 25 December 2007 and reviewed with additional background documents related to the project design including baseline and additionality of the project. A complete list of all documents and proofs reviewed is in section 6, Reference, to this report.

Furthermore,

Main changes between the version published for the 30 days stakeholders commenting period and the final version submitted for registration:

- Changes related to the CARs and CLs identified in the KFQ's validation report.
- In the process of validation, PP had been submitted a request for clarification on the applicability of methodology to CDM EB. Thus, the methodology has been revised to AMS-III.B\_Version 13 and PDD has been changed accordingly.

## 2.2 Follow-up Interviews

Issues identified by KFQ during the subsequent stages of the validation have been clarified through continuous communication with the project participants. The project participants have also provided underlying documentation for review by KFQ, confirming selected information and resolving issues identified in the validation.

In the period of 14 Feb 2008 to 15 Feb 2008, KFQ performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. On 19 December, 2008, KFQ also performed interviews with project participants to check applicability of revised methodology against the proposed project activity. The main topics of the interviews are summarised in Table 1.

**Table 1 Interview topics**

Interviewed organisation	Interview topics
SeAH Besteel Corporation. - Mr. Geum Dong Jung - Mr. John Soo Na	<ul style="list-style-type: none"> <li>➤ Project design</li> <li>➤ Technical equipment</li> <li>➤ Sustainable development issues</li> <li>➤ Additionality</li> <li>➤ Crediting period</li> <li>➤ Monitoring plan</li> <li>➤ Management system</li> <li>➤ Environmental impacts</li> <li>➤ Stakeholder process</li> </ul>
Korea Energy Management Corporation (KEMCO) - Mr. Chang Goo Kim - Mr. Young Joon Kim - Mr. Jong Uk Seo	<ul style="list-style-type: none"> <li>➤ Baseline</li> <li>➤ Additionality</li> <li>➤ Approval by the host country</li> </ul>
Mitsubishi UFJ Securities Co., Ltd - Mr. Soon Chan Hong	<ul style="list-style-type: none"> <li>➤ Baseline</li> <li>➤ Additionality</li> <li>➤ Approval by the Annex I country</li> </ul>
Gunsan City Province - Mr. Jeong Youl Yeom	<ul style="list-style-type: none"> <li>➤ Environmental issues</li> <li>➤ Stakeholder comments</li> <li>➤ Sustainable development issues</li> </ul>
Local Stakeholder - Mr. Seong Rae Lee	<ul style="list-style-type: none"> <li>➤ Environmental issues</li> <li>➤ Stakeholder comments</li> <li>➤ Sustainable development issues</li> </ul>

## 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve any outstanding issues which need to be clarified prior to KFQ's positive conclusion on the project design. In order to guarantee the transparency of the validation process, the concerns raised by KFQ and responses provided by project participant are documented in Table 3 of the validation protocol in Appendix A.

For this project, nine Corrective Action Requests(CAR) and seven requests for Clarification(CL) were identified. These requests were presented to the project participant in a draft validation report in 14 March 2008. The additional information provided by the project participant to address theses requests and revised PDD of 10 June 2009 resolved the Corrective Action Request and all requests for Clarification to KFQ's entire satisfaction.

## **2.4 Internal Quality Control**

According to KFQ's Procedure for deciding whether to proceed request for registration, the final validation report and validation findings underwent a technical review before being submitted to the project participants for requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with KFQ's qualification scheme for CDM validation and verification.

## **3. Validation Findings**

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

### **3.1 Participation Requirements**

The project participants are 'SeAH Besteel Corporation' and 'Korea Energy Management Corporation(KEMCO)' as them from the host Party, the Republic of Korea, and Mitsubishi UFJ Securities Co.,Ltd is representing the Annex I Party, Japan.

The Letter of Approval (LoA) from Korea was obtained on 29 May 2009. The LoA confirms the project's contribution to sustainable development of Korea.

The Japan confirmed its voluntary participation through a LoA issued on 13 April 2009. This LoA authorizes Mitsubishi UFJ Securities Co., Ltd as project participant.

Validation team has checked the consistency of project participant's information in section A.3 and Annex 1 of the PDD and DNA approval letter.

According to LoA, thus validation team was able to identify that Parties meet the requirements to participate in the CDM.

Nevertheless, CAR1 had to be raised in the course of the validation and were successfully closed (refer to Annex : validation protocol – Table 3).

### 3.2 Project Design

‘SeAH Besteel fuel switching project’ is located at 1-6, Soryong-Dong, Gunsan City, Jeollabuk-do, Korea.

The project has two Walking Beam Furnaces (WBF, 150 ton/hr x 2) in the large size rolling mill and one Walking Beam Furnace (WBF, 180 ton/hr x 1) in the small size rolling mill which use natural gas as a fuel source instead of B-C oil. In the facilities whose capacity has been increased. Before the capacity increase and fuel switching, one WBF (120 ton/hr x 1) in the large size rolling mill and one WBF (110 ton/hr x 1) was installed in the small size rolling mill, both of which have used B-C oil as a fuel source.

The considered project can be classified with Sectoral Scope 1- Energy Industries (non-renewable sources).

The project is expected to reduce 277,280 tCO<sub>2</sub> over the 10 years crediting period (27,728 tCO<sub>2</sub> per year). Therefore this project is small-scale CDM project activity because the estimated emission reduction is less than 60,000 tCO<sub>2</sub> annually.

There is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity in the same project category and technology/measure within 1 km of the project boundary. The validation team confirmed it through physical observation and investigation of UNFCCC website. Therefore, the Project is not deemed to be a debundled component of any other large project.

Starting date of the project activity is 31 March 2005 which is contract date of large size rolling mill WBF #1. According to the definition in the glossary of items, the starting date of the project is the date as the earliest date at which either the implementation or construction or real action of a project activity begins.

Validation team has examined the information related to the implementation or construction or real action of a project activity based on the below documents provided PP.

- contract date for large size rolling mill WBF #1: 31 March 2005
- contract date for small size rolling mill WBF : 23 December 2005
- contract date for large size rolling mill WBF #2: 22 February 2006

Validation team concluded this contract date for construction as the starting date.

The lifetime of WBFs in Korea is estimated as 30 years. The walking beam furnaces displaced by the Project activity had been installed in 1993 and 1995, respectively. Though the WBFs displaced by the project activity had remaining lifetime for more than 15 years, SeAH Besteel decided to displace them for fuel switching and capacity increase.

Validation team has examined the documents such as list of equipment and technical specification provided by Combustech, the WBF manufacturer in Korea([www.combustech.kr](http://www.combustech.kr)) to confirm lifetime of existing and newly installed WBFs,. Also validation team has interviewed with experts involved in steel industry. Finally, validation team got a conclusion that the existing equipment could be used in the absence of the Project activity during the next 10 years of crediting period and lifetime of newly installed facility is 30 years.

A fixed crediting period of 10 years has been chosen for the project, starting from 1 September 2009 or on the date of registration of the CDM project activity whichever is later.

The project contributes to sustainable development in the following ways:

- Mitigation of GHGs
- Improvement of environmental condition
- Promotion of the natural gas use in the local area

Validation team has ascertained the facts that the project contributes to sustainable development through interview with local stakeholders, and approved letter from Korea DNA.

The funding for the project does not lead to a diversion of official development assistance. The validation team has reviewed the project financing information in which ODA is not involved.

Nevertheless, CAR2, CAR9, CL1 and CL2 had to be raised in the course of the validation and were successfully closed (refer to Annex : validation protocol – Table 3).

### **3.3 Baseline Determination and Additionality**

The project applies the approved simplified baseline methodology for small-scale CDM project activities AMS-III.B (Version 13) titled “Switching fossil fuels”.

The category III.B is applicable to this project as below:

- The project activity is a fossil fuel switching project on WBFs in industrial applications. It involves replacement of existing installation with capacity addition;

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- The project activity does not involve switch fossil fuel in baseline to renewable biomass, bio-fuel or renewable energy in the project scenario;
- The project activity primary aims at reducing emissions through fuel switching from B-C oil to natural gas;
- The project activity involves capacity addition compared to the baseline scenario;
- 3 years historical information prior to project implementation on the use of fossil fuels and plant output has been used in the baseline calculations;
- Also annual emission reduction is estimated as 27,728 t CO<sub>2</sub>e, which is less than the 60 k t CO<sub>2</sub>e stipulated as threshold for this project category.

Validation team checked this project activity meet all above requirement for small-scale project by document such as a record of operation hour and capacity of the WBFs and on-site observation. Especially for last requirement in above, KFQ assessed thoroughly to make confirmation. Emission reduction had been estimated as 43,402 t CO<sub>2</sub> per year in GSP PDD considering current natural gas consumption after new facilities is installed. During on-site assessment, validation team had been doubt whether emission reduction is estimated properly considering full capacity of newly installed facility. After clarification for methodology, 3 years historical information and further consideration of future production plan, estimated emission reduction has been to 27,728 t CO<sub>2</sub> per year by PP.

Validation team also calculated emission reduction considering full capacity of WBFs in project scenario and confirmed that emission reduction of this project activity is less than 60 k t CO<sub>2</sub>e even at the full production capacity.

Project participants have considered the incentive from CDM registration in the decision to proceed with the project activity as CDM project.

Starting date of project activity is 31 March 2005 and this date is contract for large size rolling mill WBF #1. The starting date of project activity is before the date of validation, therefore PP provided evidences to support awareness of the CDM consideration before date of contract (31 March 2005) which has been set as s starting date of project activity.

The preliminary meeting for project and CDM plan has been held on 17 January 2005. This meeting was carried out by considering this project as CDM project and the incentive from the CDM was considered.

SeAH Besteel had planned and decided to proceed as CDM project by CEO in stage, on 23 February 2005 for large size rolling WBF #1, on 22 December 2005 for small size rolling WBF and on 23 March 2006 for large size rolling WBF #2.

All of these activities were evidenced by PP and validation team concluded those evidences demonstrate awareness and consideration of the CDM prior to the starting date of the project activity and the table of B.5 of the PDD presents timeline of the project activity and CDM consideration.

According to the paragraph 16 of “General guidance to Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories (version 12)”, project activities involving capacity increase may use a Type III SSC methodology provided that they can demonstrate the most plausible baseline scenario for the additional(incremental) capacity is the baseline provided in the respective type III small-scale methodology. The demonstration should include the assessment of the alternatives of the project activity. For the purpose of the demonstration, project participants may apply the Step 1 to 3 of the latest version of “Combined tool to identify the baseline scenario and demonstrate additionality” to identify the baseline scenario.

Thus, the baseline has been determined by using the latest version of “Combined tool to identify the baseline scenario and demonstrate additionality (Version 02.2, EB 28)”.

For the purpose of the baseline determination, the step 1 to 3 of the methodology tool is applied.

- **Step 1. Identification of alternative scenarios**

- **Sub-step 1a) Define alternative scenarios to the proposed CDM project activity:**

As alternative scenarios to the proposed CDM project activity, following scenarios are considered.

Scenario A: The proposed project activity undertaken without being registered as a CDM project activity (Installation of new WBFs which use natural gas as a fuel source)

Scenario B: Installation of new WBFs which use B-C oil as a fuel source.

It is also technologically possible to use other fossil fuels, such as diesel, gasoline or LPG as fuel sources. However, due to its high price, such fuels are seldom used as fuel source in these types of equipment.

Due to its practice and technological problem, it is not also possible to use non-fossil sources, such as biomass or renewable energy.

Validation team got to know the facts and has confirmed that two alternatives are realistic scenario in Korea.

**- Sub-step 1b) Consistency with mandatory laws and regulations**

Both of the scenarios described above are in compliance all mandatory applicable legal and regulatory requirements. In Gunsan area, B-C oil can be used as an industrial fuel source. There are also no laws or regulations that mandates the use of natural gas.

We confirm the alternatives are consistent with laws and legal through review of legal and regulatory requirements of the Host Party and interview with officeholders of Gunsan city as local stakeholder.

- **Step 2. Barrier Analysis**

There are no barriers that would prevent the implementation of the aforementioned scenarios. Because there are still two alternative scenarios remaining, including the proposed project activity undertaken without being registered as a CDM project activity, step 3 – Investment analysis – is conducted.

- **Step 3. Investment Analysis**

An investment comparison analysis with NPV is conducted for Scenario A(natural gas) and Scenario B(B-C oil). For investment comparison analysis, only costs are considered for each scenario since revenue, which is from the sale of the product, will be identical from both scenarios.

Validation team has checked the input values as follows in order to confirm the consistency and appropriateness with the timing of the investment decision according to EB 41 Report Annex 45 ‘Guidance on the assessment of Investment Analysis(Version 02)’.

KFQ reviewed the input values in:

- GSP PDD, and Excel spreadsheets on financial and emission calculations.
- The ‘Stepwise switching fuel project plan’ that was reported to CEO and investment committee, and investment decision was formally taken based on this



report. Also there is approval by CEO to proceed into fuel switching project activity.

#### ① Equipment Cost

- ▶ Scenario A(Total : 51,630 million KRW);
  - Large size WBF #1 : 14,460 million KRW
  - Large size WBF #2 : 14,720 million KRW
  - Small size WBF : 22,450 million KRW
- ▶ Scenario B(Total : 57,630 million KRW);
  - Large size WBF #1 : 16,460 million KRW
  - Large size WBF #2 : 16,720 million KRW
  - Small size WBF : 24,450 million KRW

Equipment cost for Scenario A has been selected at the time of investment decision, and this figure(51,630 million KRW) is applied for investment analysis for this project. Validation team cross-checked this figure with actual expenditure of equipment cost and concluded that this value is valid and appropriate at the time of investment decision

Equipment cost for Scenario B can be estimated as equipment cost for Scenario A plus 2,000 million KRW. The difference 2,000 million KRW in equipment costs between Scenario A and Scenario B reflects the price difference of burner, additional pre-treatment facilities and after-treatment facilities, etc. According to the technology providers, the additional cost for each WBF in case of Scenario B is around 1,000 ~ 2,000 million KRW. As a conservative approach considering NPV result, additional equipment cost of 2,000 million KRW is selected for each WBF.

For the difference in equipment costs between Scenario A and Scenario B, validation team reviewed information provided by PP and cross-checked the information through interview with independent equipment suppliers.

Thus, validation team confirmed the selected values are valid and appropriate for the project activities at the time of investment decision.

#### ② Fuel price

- ▶ Scenario A;

- Large size WBF #1 : 6,842 million KRW
- Large size WBF #2 : 6,842 million KRW
- Small size WBF : 16,773 million KRW
- ▶ Scenario B;
- Large size WBF #1 : 4,386 million KRW
- Large size WBF #2 : 4,386 million KRW
- Small size WBF : 10,751 million KRW

To determine fuel cost, fuel consumption and fuel price must be considered.

Fuel consumption is estimated based on the information provided by the technology providers (required energy per ton of production) considering the expected production plan in each year and NCV of each fuel. (Natural gas: 40.0 MJ/Nm<sup>3</sup>, B-C oil: 39.1 MJ/l). NCV values is applied using Standard Manual for Calorific Values(the most recent version revised in September, 2006). Since the project specific data is not available, the accurate and reliable national data is used.

Validation team has validated the information provided by the technology providers and national data by Ministry of Commerce, Industry and Energy/Korea Energy Management Corporation.

Fuel prices for LNG and B-C have been confirmed through reference provided by Gunsan gas provider at the decision making of the project activity.

Thus, validation team got a conclusion that this value is valid and applicable.

### ③ Additional O&M Cost compared to use of natural gas

- ▶ Scenario B;
- Large size WBF #1 : 112 million KRW
- Large size WBF #2 : 112 million KRW
- Small size WBF : 561 million KRW

Only additional O&M cost of Scenario B compared to Scenario A, the use of natural gas is considered. Under Scenario B, the additional O&M cost would be incurred due to steam use for spraying, electricity use for pumping B-C oil which has been estimated based on available and historical data(2004) of WBF before implementation of project activity. Validation team has confirmed through check of raw data on-site.

#### ④ Discount rate:

Average bank loan rate for equipment investment in 2004 is used as the discount rate, and 6.6% is selected. The source of the average bank loan rate for equipment investment is “The Bank of Korea(www.ecos.bok.or.kr)”. Validation team has checked 4 years(2005~2008) values of average bank loan rate for equipment investment by Bank of Korea Economic statistics System and found range of it is 6.07%~7.37% and 6.65% for 4 years average value.

Thus, validation team confirmed the selected values are reasonable and appropriate comparing to 6.65%.

KFQ has also confirmed that the calculation is correct and all input values in investment analysis have been applied consistently.

Thus, KFQ is able to confirm that the input values in investment analysis are valid and appropriate representing the economic situation of the project and at the time of investment decision.

As result of the investment comparison analysis, NPV of the total cost is 416,289 million KRW for Scenario A and 299,728 million KRW for Scenario B. Therefore, NPV of Scenario B is lower than that under Scenario A. Scenario B is economically more attractive than Scenario A.

To confirm whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions, sensitivity analysis for equipment cost, fuel cost, O&M costs and discount rate is conducted.

The variation of the natural gas price were assessed by considering the fluctuation of reference which is provided by Gunsan gas provider (2001~2005).

Validation team checked the facts and confirmed the selected values are reasonable and appropriate for the project activities.

As for equipment cost and additional O&M cost, 10% as the EB guidance recommendation has been chosen because of no variation factors.

As for discount rate, 3% is chosen for lower range, which is lower than the risk free rate while 10% is chosen for the upper range which is higher than the historical highest in the past 5 years (9.34% in 2000). Validation team has been confirmed the facts through information of website of “The Bank of Korea”.

KFQ has assessed the applied parameters and variation ranges are suitable for the proposed project and verified the analysis result.

The results are as follows:

- 1) Sensitivity analysis 1: Natural gas price is 20 % lower than expected.
- 2) Sensitivity analysis 2: Equipment cost for Scenario A is 10 % lower than expected.
- 3) Sensitivity analysis 3: Additional O&M cost for Scenario B is 10% higher than expected.
- 4) Sensitivity analysis 4: Discount rate varies 3 ~ 10 %.

As results of sensitivity analysis, NPV of total cost under Scenario B is always lower than that under Scenario A, which means Scenario B is economically more attractive than Scenario A.

Because the Scenario B as considered as baseline scenario is the “proposed project activity undertaken without being registered as a CDM project activity”, step 4 – common practice analysis – is conducted.

Validation team has assessed the applied parameters and variation ranges are suitable for the proposed project and verified the analysis result.

Thus, validation team concluded that result of economic analysis is credible.

- **Common practice Analysis**

In Gunsan area, there are no regulations that mandate to use of natural gas. However, in some area of Korea, such as Seoul Metropolitan area, Incheon Metropolitan area, due to the regulation on the total amount emissions of pollutants enforced in 1 July 2007, including NO<sub>x</sub>, most companies use natural gas as a fuel source.

According to the “Energy consumption statistics” from Ministry of Commerce, Industry and Energy of Korea, more than 80% of the energy source in steel industry is fossil fuels other than natural gas in 2006. Therefore, it is difficult to conclude that the use of natural gas is widely spread and a common practice in steel industry in Korea at the investment decision timing and now.

Validation team has confirmed the facts through Statistics data by Ministry of Commerce, Industry and Energy of Korea.

Above demonstration shows that in the absence of the Project activity, B-C oil would be used as a fuel source for the newly installed WBFs and Scenario B is the baseline scenario to the Project activity.



Hence it can be confirmed that the application, discussion and determination of the chosen baseline for the project activity is transparent and reasonable.

And also the Project activity is economically unattractive comparing to the baseline scenario and is not a common practice in Gunsan City, Korea.

In conclusion, we can state that the project activity is additional.

Nevertheless, CAR3, CAR4, CAR5, CAR6, CL 3, CL4, CL5 and CL6 had to be raised in the course of the validation and were successfully closed (refer to Annex : validation protocol – Table 3).

### 3.4 Monitoring Plan

The monitoring methodology is in line with the approved monitoring methodology “AMS-III.B\_Ver.13 – Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories”.

According to the monitoring methodology, Monitoring shall involve monitoring of the fossil fuel use and output after the project activity has been implemented.

The fossil fuel use ( $\text{Nm}^3$ ) is quantity of natural gas combusted in WBF during the crediting period. Quantity of natural gas used is continuously monitored using meters. The meters will be calibrated every three year by independent entity. The output is quantity of bloom or billet to be heated by WBF during the crediting period. It is same with input entering into WBF. The output entered and heated is measured by measuring system. The quantity of bloom heated for large size WBF is continuously measured by measuring roll which has the EN CORDER. ERP system calculates the quantity of bloom produced using the measured length of bloom. To assure the measurement accuracy, measuring rolls are replaced periodically – usually every one to three months. Besides the periodical replacement, in case more than a tolerance error is detected, measuring roll will be replaced.

The quantity of billet produced for small size WBF is continuously measured using weighing machines.

The weighing machines are calibrated biennially by an independent laboratory/entity. Zero adjustment is conducted every month by the project developer.

Also any further revision of the ‘Standard Manual for Calorific Value’ approved by Ministry of Commerce, Industry and Energy/Korea Energy Management Corporation for  $\text{NCV}_{\text{NG}}$ , will be

taken into account.

SeAH Besteel will organize an Operating and Monitoring Team, which composes of a manager and operators. The manager will be responsible for monitoring and archiving all data associated with items depicted in the monitoring plan. Operators working under the manager will be assigned to the task of monitoring parameters on a timely basis as well as recording and archiving data in an orderly manner. The procedures for the monitoring of the Project activity will follow ISO 9001. All data collected as part of monitoring plan will be archived electronically and be kept at least 2 years after the end of the crediting period. Monitoring reports will be reviewed by the manager on a monthly.

Validation team has validated that the monitoring plan and system were properly established and can be implemented through the documentation provided by PP and interview with worker in on-site.

Nevertheless, CAR7 and CAR8 had to be raised in the course of the validation and were successfully closed (refer to Annex : validation protocol – Table 3).

### 3.5 Calculation of GHG Emissions

The emission reduction achieved by the project activity is calculated as the difference between the baseline emissions and project emissions. As described in AMS III.B, no leakage calculation is required.

Project emissions and baseline emissions are calculated as follows:

$$PE_y = \sum_i FF_{project,i,y} \cdot NCV_{NG} \cdot EF_{NG,CO2}$$

$$BE_y = \sum_i EF_{i,BSL} \times Q_{i,y}$$

Project emissions is calculated with those values such as quantity(Nm<sup>3</sup>), Net calorific value(TJ/Nm<sup>3</sup>) and CO<sub>2</sub> emission factor(tCO<sub>2</sub>/TJ) of natural gas.

Quantity of natural gas(FF<sub>project,i,y</sub>) is quantity to be combusted in WBFs during the year y, Net calorific values(NCV<sub>NG</sub>) is used national data and CO<sub>2</sub> emission factor(EF<sub>NG,CO2</sub>) is used 2006 IPCC default values.



Baseline emissions is calculated with those values such as emission factor( $\text{tCO}_2/\text{ton}$  of bloom or billet) of WBF output( $\text{ton}$  of bloom or billet) of WBF.

For the ex-ante emission factor, 3 years(2003~2006) historical information prior to project implementation is used.

Quantity of bloom and billet are forecasted considering market trend, past trend and full capacity of facilities.

Under the assumptions provided in the PDD, the project is expected to reduce 277,280  $\text{tCO}_2$  over the 10 years crediting period (27,728  $\text{tCO}_2$  per year).

Validation team assessed that the amount of GHG emission reductions were properly estimated and all parameter, datum and assumption applied in this estimation is appropriate with our sectoral expertise.

### **3.6 Environmental Impacts**

Under 'Enforcement Decree of the *Act on Assessment of Impact of Works on Environment, Traffic, and Disasters*' the proposed project activity does not require the completion of an EIA. In fact, the project activity will help to improve local air quality as well as mitigate climate change. Since the natural gas does not contain sulphur B-C oil that would be otherwise used in the absence of the project activity, it is expected that emissions of  $\text{SO}_x$  will be reduced by the project activity. Besides, it is also expected that emissions of  $\text{NO}_x$  and dust will be reduced by project activity.

### **3.7 Comments by Local Stakeholders**

To invite local stakeholders' comments, an announcement is published in the local newspapers on 21 December, 2007. Also internet-based public consultation has been conducted on SeAH Besteel's website from 19 December 2007 to 18 January 2008.

As a result of the invitation of local stakeholders' comments, several comments were provided from various stakeholders including local electric suppliers, gas suppliers, environment purier corporations, students and housekeepers in Gunsan area.

There are no negative comments received that require the project proponent to take any corrective action.



As comments, all of stakeholders have expressed that the project activity will improve the local environment and help sustainable development of the country. Also they expect that unit cost of LNG supplied to residents will decline due to large natural gas demand of SeAH Besteel. They have recommended a safe management and prevention of fire with a result from using LNG equipment.

Validation team has validated that the project contributes to sustainable development and due account was taken of comment received through interview with local stakeholders.

Nevertheless, CL7 had to be raised in the course of the validation and were successfully closed (refer to Annex : validation protocol – Table 3).

#### **4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS**

KFQ published the project documents on <http://cdm.unfccc.int/Projects/Validation> on 1 Feb 2008 and invited comments within 1 Mar 2008 by Parties, stakeholders and non-governmental organisations.

No comment was received.

#### **5. VALIDATION OPINION**

*Korean Foundation for Quality(KFQ) has performed a validation of SeAH Besteel fuel switching project. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and subsequent decision by the CDM Executive Board.*

*The validation is based on the information made available to us and the engagement conditions detailed in this report. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, KFQ can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose. And it has provided KFQ with sufficient evidence to determine the fulfillment of stated criteria. The validation consisted of the following 3 phases : i) a desk review of the project design, the baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the Resolution of outstanding issues and the issuance of the final validation report and opinion.*





*The host country is the Republic of Korea and the Annex I country is the Japan. Both countries fulfil the participation criteria and have approved the project and authorized the project participants. The Korea DNA confirmed that the project assists in achieving sustainable development.*

*The validation did not reveal any information that indicated that the project can be seen as a diversion of official development assistance(ODA) funding towards Korea.*

*By switching bunker fuel oil C with natural gas, the project results in reductions of CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment and the barrier demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.*

*Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 277,280 tonnes CO<sub>2e</sub>, over a fixed crediting period of 10 years, resulting in a calculated annual average of 27,728 tonnes CO<sub>2e</sub>, represents a reasonable estimation using the assumptions given by the project documents.*

*The monitoring responsibilities are clearly defined and a detailed monitoring plan has been developed.*

*In our opinion, SeAH Besteel fuel switching project, as described in the revised PDD of 10 June 2009, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baselines and monitoring methodology AMS-III.B\_Ver.13. Thus the project will hence be recommended by KFQ for registration as a CDM project with the UNFCCC.*

## VALIDATION REPORT

## 6. REFERENCES

Reference No.	Documentation and/or website	Remarks
1	Project Design Document for ‘SeAH Besteel fuel switching project’ - Version 01: 27 December 2007 - Version 3.2: 10 June 2009	
2	Supporting Excel Spreadsheets on financial and emission calculations, KEMCO (Version 00 and Version 1)	
3	CDM-EB, AMS-III.D_Ver.13 – Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories CDM-EB, Guidance on the Assessment of Investment Analysis (Ver. 02) CDM-EB, Combined tool to identify the baseline scenario and demonstrate additionality (Ver 02.2) CDM-EB, Guidance on the demonstration and assessment of prior consideration of the CDM CDM-EB, General guidance if Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories (Ver. 12) Guidelines for completing the simplified project design document (CDM-SSC-PDD) and the form for proposed new small scale methodologies (CDM-SSC-NM) (Version 05) Glossary of CDM terms (Version 04) CDM-EB, Annex 3, Clean Development Mechanism Validation and Verification Manual (Version 01) International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF) : Validation and Verification Manual. <a href="http://www.vvmanual.info">http://www.vvmanual.info</a>	
4	Annex I country DNA Approval: 13 April 2009 Host country DNA Approval : 29 May 2009	
5	SeAH Besteel Corporation, Documents used for decision making by the board of directors (23 February 2005, 22 December 2005 and 23 March 2006)	
6	SeAH Besteel Corporation, Documents related to the implementation or construction or real action of a project activity	
7	Combustech, Documents related to equipment lifetime	

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8	Korea Energy Management Corporation(KEMCO), Government statistics related to equipment lifetime	
9	SeAH Besteel Corporation, Document related to the Investment Cost, fuel consumption and WBF details	
10	Gunsan gas provider, the document related to the fuel cost	
11	Contract for Equipment purchase	
12	CDM consulting agreement with KEMCO	
13	‘Energy consumption statistics’ from Ministry of Commerce, Industry and Energy of Korea	
14	Local stakeholders’ comments/inquired received	
15	Equipment Specification for WBFs	
16	<a href="http://ecos.bok.or.kr/">http://ecos.bok.or.kr/</a> : Bank of Korea Economic Statistics Systems; Corporation bond rate information	
17	<a href="http://likms.assembly.go.kr/law/jsp/main.jsp">http://likms.assembly.go.kr/law/jsp/main.jsp</a> : The National Assembly of the Republic of Korea; National regulation information system	
18	<a href="http://www.kogas.or.kr/">http://www.kogas.or.kr/</a> : The Korea Gas Corporation of Republic of Korea	

## Appendix A

### Validation protocol for Small scale CDM project activities

**Table 1. Mandatory Requirements for Small-Scale Clean Development Mechanism(CDM) Project Activity**

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12. 2	OK	The Parties included in Annex I is Japan. Table 2, B.6
2. The project shall assist non-Annex I Parties in achieving sustainable development and the project has obtained confirmation by the host country that the project assists in achieving sustainable development.	Kyoto Protocol Art. 12. 2	OK	Table 2, A.3.1
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of UNFCCC.	Kyoto Protocol Art. 12. 2	OK	Table 2, B.6
4. The project shall have written approval of voluntary participation from the designated national authorities of each party involved.	Kyoto Protocol Art. 12.5a/ CDM Modalities and Procedures §40a	OK	Table2, A.3.3.  LoA of Korea and Japan have been submitted to DOE.
5. The emission reductions shall be real, measurable and give long-term benefits to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK	Table 2, B.6.
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity.	Kyoto Protocol Art. 12.5c/ CDM Modalities and Procedures §26	OK	Table 2, B.4.
7. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section D
8. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	Table 2, Section A.4.5.  The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Korea.

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9. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, A.4.6.  Project meets eligibility criteria for SSC project of Type III: Below 60Kt CO2e annually. And there is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity in the small project category and technology within 1 km of the project boundary.
10. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, A.4.2 and B. The proposed project belongs to the category of III.B, Other project activity_switching fossil fuels.
11. Parties participating in the CDM shall be designated a national authority for the CDM.	CDM M&P 29	OK	The office for government policy coordination is DNA in Korea for CDM. And the DNA of Japan is Liaison Committee for the Utilization of the Kyoto Mechanism Ministry of Foreign Affairs.
12. The host party and the participating Annex I party shall be a Party to the Kyoto Protocol.	CDM M&P 30/31b	OK	Host party, Republic of Korea has ratified the Kyoto Protocol on 8 November 2002. Annex I party, Japan, ratified the Kyoto Protocol on 04 June 2002.
13. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM M&P 31b	OK	For Japan's assigned amount is 94% of the emission level in 1990.
14. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM M&P 31b	OK	The validation has not in detail assessed Japan compliance with article 5 and 7 of the Kyoto Protocol. The Japan has in place a national system for estimating GHG emissions and annually submits in most recent inventory to the UNFCCC.
15. Comments by local stakeholders are invited, a summary of these provided and how due account was taken of any comments received.	CDM M&P 37b	OK	Table 2, Section E

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16. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts and considered significant by the project participants of the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM M&P 37c	OK	Table 2, Section D.
17. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM M&P 37e	OK	Table 2, Section B.1.1 and B.7.1
18. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM M&P 37f	OK	Table 2, Section B.7
19. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 day, and the project design documents and comments have been made publicly available.	CDM M&P 40	OK	They were invited to provide comments through the CDM website during 30 days from 1 Feb 2008 to 1 March 2008. No Comment was received during the period.
20. A baseline shall be established in a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM M&P 45c,d	OK	Table 2, Section B.5
21. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity of due to force majeure.	CDM M&P 47	OK	Table 2, Section B.5.
22. The project design document is in accordance with the applicable CDM requirements for completing PDDs.	CDM M&P Appendix B, EB Decision	OK	CDM-PDD is in conformance with the UNFCCC CDM-PDD format Version 03 and Guidelines for completing the simplified project design document (CDM-SSC-PDD) and the form for proposed new small scale methodologies (CDM-SSC-NM) (Version 05).

**Table 2. Requirements Checklist**

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

Question	Ref.	MoV	Comments	Draft. Concl.	Final Concl.
<b>A. General Description of Project Activity</b>					
<b>A.1 Project Title</b>					
A.1.1 Does the used project title clearly enables to identify the unique CDM activity?	PDD A.1	DR, I	Yes. The project title is “SeAH Besteel fuel switching project”. The project title can be clearly identified.	OK	OK
A.1.2 Are there any indication concerning the revision number and the date of the revision?	PDD A.1	DR	Yes. The available PDD for document review and on-site assessment is indicated as version 01 and has been completed on 27 December 2007.	OK	OK
<b>A.2 Description of the small-scale project activity</b>					
A.2.1 Does the information provide the reader with a clear understanding of the proposed CDM activity?	PDD A.2,	DR, I	<p>The project consists two Walking Beam Furnaces (WBF, 150 ton/hr x 2) and one Walking Beam Furnace (WBF, 180 ton/hr x 1) which use natural gas as a fuel source instead of B-C oil. Those furnace’s capacity has been increased. Before fuel switching with capacity increase, one WBF (120 ton/hr x 1) and one WBF (110 ton/hr x 1) was installed, both of which have used B-C oil as a fuel source.</p> <p>The project activity fall under the ‘ Type III: Other project activities’ and category B: Version 13: ‘ Switching fossil fuels’ .</p> <p>New facilities (Greenfield projects) and project activities involving capacity additions may be applied this methodology. The project activity had previously been applied New facilities in the PDD(version 01).</p> <p>However it should be clarify whether this project activity can be applied to new facilities.</p>	CL 1	OK



A.2.2 What proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	PDD Sec.A /B	DR, I	<p>During the on-site assessment, numerous proofs for the described project activity were evidenced. They are summarized in the reference list, Annex A to this report.</p> <ul style="list-style-type: none"> <li>- Equipment purchase contract</li> <li>- Site layouts</li> <li>- Data records on historical consumption of Bunker Oil C</li> <li>- Data records on historical output of WBF</li> <li>- Technical specification for burner and WBF, etc</li> </ul> <p>These data have been evidenced during validation work. The required data are delivered in the PDD.</p>	<b>OK</b>	<b>OK</b>
A.2.3 Is all information presented consistent with details provided by further chapters of the PDD?	PDD	DR	The information given in the PDD is all consistent in further chapters.	<b>OK</b>	<b>OK</b>
A.2.4 Does the description of the technology to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance?	PDD A.4.3	DR, I	<p>Yes, the project would avoid GHG emissions by installation of WBF using natural gas which is cleaner than Bunker Oil C to heat bloom and billet.</p> <p>Therefore, natural gas consumption for bloom and billet heating will be used to calculate emission reduction by this project activity.</p>	<b>OK</b>	<b>OK</b>
A.2.5 Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	PDD A.4.3	DR	The explanation of how the project activity will reduce greenhouse gas emissions is suitable.	<b>OK</b>	<b>OK</b>
A.2.6 Will the project create other environmental or social benefits than GHG emission reductions?	PDD A.2	DR, I	The natural gas has no sulphur content compared with bunker oil C, so no NOx is emitted to atmosphere.	<b>OK</b>	<b>OK</b>
<b>A.3 Participation requirements</b>					

<p>A.3.1 Has the DNA of the Host Party involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval which confirms?</p> <ul style="list-style-type: none"> <li>- The country is a Party to the Kyoto Protocol</li> <li>- Participation is Voluntary</li> <li>- The Host Party confirming that the proposed CDM project activity contributes to sustainable development of the country</li> <li>- It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.</li> </ul>	PDD A.2	DR, I	Project participants have not received the host country approval from DNA of Republic of Korea and Japan to ascertain the project activity meets with the host country's sustainable development criteria.	<b>CAR 1</b>	<b>OK</b>
<p>A.3.2 Is the letter of approval from the Host party is unconditional with respect to A.2.6 above?</p>	PDD A.2	DR, I	Refer to A.3.1	<b>CAR 1</b>	<b>OK</b>
<p>A.3.3 Has the DNA of the Annex I country involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval which confirms?</p> <ul style="list-style-type: none"> <li>- The country is a Party to the Kyoto Protocol</li> <li>- Participation is Voluntary</li> <li>- The Annex I country confirming that the proposed CDM project activity contributes to sustainable development of the country and assists it in achieving compliance with part of their emission reduction commitment under Art. 3 of the KP</li> <li>- It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.</li> </ul>	PDD A.2	DR, I	Refer to A.3.1	<b>CAR 1</b>	<b>OK</b>
<p>A.3.4 Is the letter of approval from the Annex I country is unconditional with respect to A.3.3 above?</p>	PDD A.2	DR, I	Refer to A.3.1	<b>CAR 1</b>	<b>OK</b>

A.3.5 Is the table required for the indication of project participants correctly applied?	PDD A.3	DR	<p>The form is correctly applied. The following parties are involved in the project activity:</p> <ul style="list-style-type: none"> <li>- Host Party, Republic of Korea : SeAH Besteel Corporation, Korea Energy Management Corporation(KEMCO)</li> <li>- Annex I Party, Japan : Mitsubishi UFJ Securities Co., Ltd</li> </ul>	<b>OK</b>	<b>OK</b>
A.3.6 Is all information in participants/ Parties provided in consistency with details provided by further chapters of the PDD (in particular Annex I)?	PDD A.3, Annex I	DR, I	Yes, the information provided is in consistency with further chapters of the PDD, the party listed in host party is identical with those listed under A.3.	<b>OK</b>	<b>OK</b>
A.3.7 Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by and involved party?	PDD A.3	DR, I	Refer to A.3.1	<b>CAR 1</b>	<b>OK</b>
<b>A.4. Technological description of the small-scale project activity</b>					
<b>A.4.1 Location of the small-scale the project activity</b>					
A.4.1.1 Does the information (geographical) provided on the location of the project activity allow for a clear identification of the site?	PDD A.4	DR	<p>The geographical location of the project activity has been clearly defined in the PDD.</p> <p>The project is located at 1-6, Soryong-Dong, Gunsan City, Jeollabuk-do, Korea.</p>	<b>OK</b>	<b>OK</b>
A.4.1.2 How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (Ownership, Licenses, Contracts etc.)?	PDD A.4	DR, I	<p>Implementation of this project activity is within SeAH Besteel's site and is demonstrated through Business license.</p> <p>Furthermore, WBFs is under operation since 14 April 2006, 08 November 2006 and 20 November 2007, respectively.</p>	<b>OK</b>	<b>OK</b>
<b>A.4.2 Category(ies) of project activity</b>					

A.4.2.1. To which type(s) does the project activity belong to? Is the type correctly identified and indicated?	PDD A.4.2	DR	The project activity belongs to Type III, Other project activity and the type has been correctly identified and indicated in the PDD.	<b>OK</b>	<b>OK</b>
A.4.2.2. To which category (ies) does the project activity belong to? Is the category correctly identified and indicated?	PDD B.2	DR	The chosen baseline methodology refers to category III. B ‘Switching fossil fuels’ according to Appendix B of Annex II ‘Simplified modalities and procedures for small-scale CDM project activities’.	<b>OK</b>	<b>OK</b>
<b>A.4.3 Technology to be employed by the small-scale project activity</b>					
A.4.3.1 Does the project design engineering reflect current good practices?	PDD A.4.2	DR, I	The project is switching fuel switching project. The project is installed the regenerative burners instead of normal burners. That regenerative burners can achieve high energy efficiency and decrease NO <sub>x</sub> generation.	<b>OK</b>	<b>OK</b>
A.4.3.2. Does the implementation of the project activity require any technology transfer from Annex-I countries to the host country (ies)?	PDD A.4.2	DR, I	No, the project was not described that how is it contributed to the technology transfer and technology used is environmentally safe and sound.	<b>CAR 2</b>	<b>OK</b>
A.4.3.3. Is the technology implemented by the project activity environmentally safe?	PDD A.2	DR, I	The project has environmental benefits such as SO <sub>x</sub> , NO <sub>x</sub> and dust reductions besides GHG emission reduction. But, It has not described the social benefits such as contribution to local community through project activity.	<b>CL 2</b>	<b>OK</b>
A.4.3.4. Is the information provided in compliance with actual situation or planning?	PDD A.4.2	DR, I	Yes. This project activity has been installed and under operation. Please. Refer to A.2.2	<b>OK</b>	<b>OK</b>
A.4.3.5 Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	PDD A.4.2	DR, I	Yes. Refer to A.4.3.1	<b>OK</b>	<b>OK</b>

A.4.3.6. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	PDD A.4.2	DR, I	Yes. Lifetime of this proposed project activity as mentioned in the PDD is 30 years. Project technology would not be substituted during the crediting period.	<b>OK</b>	<b>OK</b>
A.4.3.7. Does the project require extensive training and maintenance efforts in order to work as presumed during project period?	PDD A.2	DR, I	Before start of project activity, the operators have received education from equipment providers.	<b>OK</b>	<b>OK</b>
A.4.3.8 Does the project make provisions for meeting training and maintenance needs?	PDD B.7.2	I	Refer to A.4.3.7	<b>OK</b>	<b>OK</b>
<b>A.4.4 Estimated amount of emission reductions over the chosen crediting period</b>					
A.4.4.1 Is the table required for the indication of projected emission reductions correctly applied?	PDD A.4.3	DR, I	Yes. The project emission reductions are shown in chapter A.4.3 Table 2 according to the guidelines.	<b>OK</b>	<b>OK</b>
A.4.4.2 Are the figures provided consistent with other data presented in the PDD?	PDD	DR	Yes. The yearly emission reduction is estimated to be 27,728 t CO <sub>2</sub> . The same figure is quoted in the entire PDD.	<b>OK</b>	<b>OK</b>
<b>A.4.5 Public funding of the project activity</b>					
A.4.5.1 Does the information on public funding provided conform with the actual situation or planning as presented by the project participants?	PDD A.4.4	DR, I	The PDD mentioned that no ODA was used for the project activity.	<b>OK</b>	<b>OK</b>
<b>A.4.6 Confirmation that the small-scale project activity is not a de-bundled component of a large scale project activity</b>					

A.4.6.1 Is there a registered small-scale CDM project activity or an application to register another small-scale CDM project activity?	PDD A.4.5	DR,I	<p>The following criteria were checked to confirm that the proposed project activity is not a de-bundled component of a large scale project activity.</p> <ul style="list-style-type: none"> <li>- The same project participants? : No</li> <li>- In the same project category and technology/measure? : No</li> <li>- Registered within previous two years? Or in registration process? : No</li> <li>- Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration? : No</li> </ul>	OK	OK
A.4.6.2 If the answer to all the above question is 'Yes' then does the total size of the small scale project activity combined with previously registered small scale CDM project activity exceeds the limits of small scale CDM project activities?	PDD A.4.5	DR,I	No applicable. The proposed project is not a de-bundled component of a larger project activity.	OK	OK
<b>B. Application of a baseline and monitoring methodology</b>					
<b>B.1 Title and reference of the approved baseline and monitoring methodology applied to the project activity</b>					
B.1.1 Are reference number, version number, and title of the baseline and monitoring methodology clearly indicated?	PDD B.1	DR	Yes. As clearly indicated the applied methodology is AMS Type III-Switching fossil fuels (version 13).	OK	OK
B.1.2 Is the applied version the most recent one and/or is this version still applicable?	PDD B.1	DR	The 12 <sup>th</sup> version of AMS-III.B is the latest one where the PDD was prepared and published for the GSP. However, according to revised methodology the 13 <sup>th</sup> version of AMS-III.B is the latest one where the PDD was published for registration.	OK	OK
<b>B.2 Justification of the choice of the project category</b>					

B.2.1 Is the applied methodology considered the most appropriate one?	PDD B.2	DR	<p>Yes. The chosen baseline methodology refers to category III. B ‘Switching fossil fuels’ according to Appendix B of Annex II ‘Simplified modalities and procedures for small-scale CDM project activities’.</p> <p>Proposed project activity meets following applicability criteria:</p> <ul style="list-style-type: none"> <li>- Fossil fuel switching in industrial applications: YES</li> <li>- Primarily aims at reducing emissions through fuel switching: YES</li> <li>- Comply with the requirements in the General Guidance for SSC methodologies including capacity additions: YES</li> <li>- Not switch fossil fuel in the baseline to renewable biomass, biofuel or renewable energy in the project scenario: YES</li> <li>- 3 years data prior to project implementation in the baseline calculations: YES</li> <li>- Not multiple fossil fuel switching: YES</li> <li>- Emission reduction of less than or equal to 60 ktCO<sub>2</sub> equivalent annually: YES</li> </ul> <p>Thus, baseline and monitoring methodology is the most applicable for this project among the existing approved baseline methodologies.</p>	OK	OK
B.2.2 Are the applicability criteria in the baseline methodology all fulfilled and described in the PDD?	PDD B.2	DR	Refer B.2.1.	OK	OK
<b>B.3 Description of the sources and gases included in the project boundary</b>					
B.3.1 Does the project boundary include physical, geographical site of the industrial facility, processes or equipment that are affected by the project activity?	PDD B.3	DR, I	<p>Yes, the spatial and technological boundaries as verified onsite comply with the discussion provided by the PDD.</p> <p>As per the baseline methodology, the project boundary is the physical, geographical site where the fuel combustion affected by the fuel switching measure occurs. Therefore the project boundary encompasses WBF at the SeAH Besteel’s site that the fuel switching occurs.</p>	OK	OK
B.3.2 Do the spatial and technological boundaries as verified on-site comply with the discussion provided by the PDD?	PDD B.3	DR, I	Refer B.3.1	OK	OK

<b>B.4 Description of how the baseline scenario is identified and description of the identified baseline scenario</b>					
B.4.1 What is the baseline scenario? Has the baseline scenario been determined according to the methodology?	PDD B.4	DR, I	<p>According to the decision of EB 41 and the paragraph 16 of “Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories (version 12)”, Capacity increase projects use a type III small-scale methodology provided that they can demonstrate the most plausible baseline scenario for this project activity is the baseline provided in the respective type III small-scale methodology. The baseline has been determined by using the latest version of “Combined tool to identify the baseline scenario and demonstrate additionality (Version 02.2, EB 28)”.</p> <p>The scenario which is installation of new WBFs which use B-C oil as a fuel source, has been determined the baseline scenario to the Project activity.</p>	<b>OK</b>	<b>OK</b>
B.4.2 What other alternatives scenario have been considered and why is the selected scenario the most likely one? Does baseline scenario include all potential realistic and credible baseline scenario in the discussion taking into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	PDD B.4/ B.5	DR, I	<p>Two alternative scenarios have been considered. One(Scenario A) is the proposed project activity undertaken without being registered as a CDM project activity(Installation of new WBFs which use natural gas as a fuel source).</p> <p>The other(Scenario B) is installation of new WBFs which use B-C oil as a fuel source. Scenario B is economically more attractive than Scenario A. Thus Scenario B is the baseline scenario to the Project activity.</p> <p>But, Justification of the choice of two alternative scenarios to the proposed project activity has not been provided a detailed description.</p>	<b>CAR 3</b>	<b>OK</b>
B.4.3 Does PDD provide all the assumptions and data used by the project participants including reference and sources? And is all the documentation used for establishing the baseline scenario and correctly quoted and interpreted in the PDD?	PDD B.4	DR, I	<p>Yes. All the assumptions and data used by the PP including reference and sources are provided in the PDD. And all the documentation is used for establishing the baseline scenario and correctly quoted and interpreted in the PDD.</p>	<b>OK</b>	<b>OK</b>
B.4.4 All the assumptions and data used by the project participants are listed in the PDD? Is it justified appropriately, supported by evidence and can be deemed reasonable?	PDD B.4	DR, I	<p>Yes. The assumptions and data used by the PP are listed in B.4 in the PDD. It is justified appropriately and supported by evidence. And also it deems reasonable.</p>	<b>OK</b>	<b>OK</b>



**B.5 Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):**

B.5.1 If the starting date of the project activity is before the date of validation, is evidence available to prove that incentive from the CDM was seriously considered in the decision to proceed with the project activity?	PDD B.5	DR, I	<p>Starting date of project activity is 31 March 2005 as date of contract for large size rolling mill WBF #1. According to the definition in the glossary of items, the starting date of the project is the date as the earliest date at which either the implementation or construction or real action of a project activity begins. The starting date of project activity is before the date of validation.</p> <p>Validation team confirmed that 31 March 2005 is appropriate for starting date, taking into account that no real action could be done in the project without the contract.</p> <p>Evidence of contract was submitted to DOE and validation team confirmed the fact.</p> <p>And PP provided evidences to support awareness of the CDM consideration before date of contract (31 March 2005) which has been set as s starting date of project activity.</p> <p>The preliminary meeting for project and CDM plan has been held on 17 January 2005. This meeting was carried out by considering this project as CDM project and the incentive from the CDM was considered.</p> <p>SeAH Besteel had planned and decided to proceed as CDM project by CEO step wisely, on 23 February 2005 for large size rolling WBF #1, on 22 December 2005 for small size rolling WBF and on 23 March 2006 for large size rolling WBF #2.</p> <p>All of these activities were evidenced and validation team concluded provided evidence shows that awareness of the CDM prior to the project activity start date and following table presents timeline of the project activity and CDM consideration.</p>	OK	OK
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			<b>Date</b>	<b>Description</b>		
			23/02/2005	A plan for series of fuel switching project activities are prepared with CDM registration and investment decision for large size rolling mill WBF #1 is finalized.		
			31/03/2005	Construction started with the conclusion of agreement with Combustech(for large size rolling mill WBF #1).		
			22/12/2005	Investment decision for small size rolling mill WBF is finalized.		
			23/12/2005	Construction started with the conclusion of agreement with Combustech(for small size rolling mill).		
			22/02/2006	Construction started with the conclusion of agreement with Hanwha machinery(for large size rolling mill WBF #2).		
			23/03/2006	Investment decision for small size rolling mill WBF #2 is finalized.		
			14/04/2006	Test run started from March, 2006 for large size rolling mill WBF #1.		
			08/11/2006	Test run started from September, 2006 for small size rolling mill WBF.		
			27/04/2007	Decided to postpone the fuel switching in the boilers due to high natural gas price.		
			20/11/2007	Test run started from January, 2007 for large size rolling mill WBF #2.		
			09/05/2007	Korea Energy Management Corporation (KEMCO) submitted a CDM consulting proposal to SeAH Besteel.		
			10/09/2007	After the negotiation, a CDM consulting agreement between SeAH Besteel and KEMCO has been finalized.		
			23/10/2007	A CDM consulting agreement between SeAH Besteel and Mitsubishi UFJ Securities (MUS) has been finalized.		
			11/12/2007	A validation agreement between SeAH Besteel and Korean Foundation for Quality (KFQ) has been finalized.		
			01/02/2008 ~ 01/03/2008	PDD is published on the UNFCCC CDM website for global stakeholder consultation.		
			14/02/2008 ~ 15/02/2008	KFQ conducted a site visit.		
			07/05/2008	A request for clarification submitted to SSC WG to clarify the applicability of the methodology (SSC 183).		
			02/07/2008	A response is provided at SSC WG 16 with the recommendation of revision of the methodology.		
			02/08/2008	AMS-III.B is revised at EB 41.		

B.5.2 Is a complete list of barriers developed that prevents the project activity to occur?	PDD B.5	DR, I	Yes. The investment barrier is identified.	OK	OK															
B.5.3 Does this list include at least one of the following barriers?	PDD B.5	DR, I	<table><tr><td>Barrier</td><td>Discussed?</td><td>Verifiable?</td></tr><tr><td>Investment</td><td>Yes</td><td>Yes</td></tr><tr><td>Technical</td><td>No</td><td>N/A</td></tr><tr><td>Due to prevailing practice</td><td>No</td><td>N/A</td></tr><tr><td>Other</td><td>No</td><td>N/A</td></tr></table>	Barrier	Discussed?	Verifiable?	Investment	Yes	Yes	Technical	No	N/A	Due to prevailing practice	No	N/A	Other	No	N/A	OK	OK
Barrier	Discussed?	Verifiable?																		
Investment	Yes	Yes																		
Technical	No	N/A																		
Due to prevailing practice	No	N/A																		
Other	No	N/A																		
B.5.4 Does the discussions sufficiently take into account relevant national and/or sectoral policies?	PDD B.5	DR, I	Yes. In some area of Korea, such as Seoul Metropolitan area and Incheon Metropolitan area, due to the regulation on the total amount emissions of pollutants, including NO <sub>x</sub> , most companies use natural gas as a fuel source. However, in Gunsan area, there are no regulations that mandate use of natural gas.	OK	OK															
B.5.5 Is transparent and documented evidence provided on the existence and significance of these barriers?	PDD B.5	DR, I	<p>Project additionality has been assessed by using the latest version of “Combined tool to identify the baseline scenario and demonstrate additionality (Version 02.2, EB 28)”</p> <p>However NPV calculation is unclear with respect to below:</p> <ul style="list-style-type: none"><li>- Fuel price described in the PDD is not corresponded. (PDD: 460.77, Raw data: 489.22).</li><li>- Discount rate used in the sensibility analysis is not corresponded with Excelsheet(PDD: 5%, 9%, Excelsheet: 6%, 8%)</li><li>- Investment cost is not relevant information available at the time of the investment decision.</li></ul> <p>For investment comparison analysis of alternative scenarios, equipment cost is considered. But, the evidence for one thousands million won as added cost is not provided.</p> <p>Evidence related to SeAH Besteel’s corporate bond rate as 7% should be provided. However it is not indicated clearly.</p> <p>It should be described to details of ‘common practice analysis’ in order to clearly explain additionality(e.g fuel usage rate of relevant site).</p> <p>Justification for range of variation in the sensitivity analysis is not clearly described in the PDD.</p> <p>Source for equipment lifetime should be clearly described in the PDD and for 30 years as lifetime should be considered in the investment analysis.</p>	CAR 4  <																

B.5.6 Is it appropriately explained how the approval of the project activity will help to overcome the identified barriers?	PDD B.5	DR, I	Two alternative scenarios have been considered. One(Scenario A) is the proposed project activity undertaken without being registered as a CDM project activity(Installation of new WBFs which use natural gas as a fuel source). The other(Scenario B) is installation of new WBFs which use B-C oil as a fuel source. Scenario A is economically less attractive than Scenario B.	<b>OK</b>	<b>OK</b>
B.5.7 Is the analysis presented in a transparent manner including publicly available proofs for the utilized data? And all assumptions applied in a conservative manner?	PDD B.5	DR, I	Evidence of every references and input values on investment analysis should be submitted. Refer B.5.5.	<b>OK</b>	<b>OK</b>
<b>B.6 Emission Reductions</b>					
<b>B.6.1. Explanation of methodological choices</b>					
B.6.1.1. Is it explained how the procedures provided in the methodology are applied by the proposed project activity?	PDD. B.6.1	DR	The calculation of the emission reduction is applied according to the steps described in AMS III.B.  Since the accurate and reliable national data is not available, default value from 2006 IPCC Guidelines for National Greenhouse Gas Inventories is used for CO2 emission factor of natural gas(56.1 t CO2/TJ) and bunker fuel oil C (77.4 t CO2/TJ).	<b>OK</b>	<b>OK</b>
B.6.1.2. Is every selection of options offered by the methodology correctly justified and is this justification in line with the situation verified on-site?	PDD. B.6.1	DR	There is no option offered by the methodology.	<b>OK</b>	<b>OK</b>
B.6.1.3. Are the formulae required for the determination of project emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	PDD. B.6.2	DR	Yes, formulae to calculate the baseline emissions are correctly presented.	<b>OK</b>	<b>OK</b>
B.6.1.4. Are the formulae required for the determination of baseline emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	PDD B.6.1	DR	Yes, formulae to calculate the baseline emissions are correctly presented.	<b>OK</b>	<b>OK</b>

B.6.1.5. Is the choice of options to determine the emissions factor justified in a suitable and transparent manner?	PDD B.6.2	DR	Yes, CO2 emission default value of bunker oil C and natural gas is used and it is from 2006 IPCC Guidelines for National Greenhouse Gas Inventories for National Greenhouse Gas Inventories is used.	OK	OK
B.6.1.6 Are the formulae required for the determination of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	PDD B.6.2	DR	No leakage is considered according to the methodology.	OK	OK
<b>B.6.2. Data and parameters that are available at validation</b>					
B.6.2.1. Is the list of parameters presented in chapter B.6.2 considered to be complete with regard to the requirements of the applied Methodology?	PDD B.6.2	DR	Yes. All parameters are listed in chapter B.6.2.	OK	OK
B.6.2.2. Is the choice of ex-ante or ex-post vintage of emission factors clearly specified in the PDD?	PDD B.6.2	DR	Yes. Emission factor of bunker oil C and natural gas are selected as ex-ante and those factors are from 2006 IPCC Guidelines for National Greenhouse Gas Inventories for National Greenhouse Gas Inventories.	OK	OK
B.6.2.3 Are all Parameters included followings properly? - Title in line with methodology? - Data unit correctly expressed? - Appropriate description? - Source clearly referenced? - Correct value provided? - Has this value been verified? - Choice of data correctly justified? - Measurement method correctly described?	PDD B.6.2	DR, I	Yes. All parameters are listed in chapter B.6.2.	OK	OK
<b>B.6.3. Ex-ante calculation of emission reductions</b>					
B.6.3.1. Is the projection based on the same procedures as used for future monitoring?	PDD B.6.3	DR	Yes. The projection is based on the same procedure as for future monitoring.	OK	OK

B.6.3.2. Are the GHG calculations documented in a complete and transparent manner?	DR, I	PDD B.6.3	Emission reductions are estimated based on the production plan. The actual amount of emission reduction can vary depending on the actual production.  It is not clear that justification of assumption for quantity of bloom or billet considering capacity of facilities to demonstrate the eligibility of SSC size, i.e less than or equal to 60,000 tCO <sub>2</sub> equivalent annually.	CAR 6	OK
B.6.3.3. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	DR, I	PDD B.6.3	Yes. The data in the PDD are consistent.	OK	OK
<b>B.6.4. Summary of the ex-ante estimation of emission reductions</b>					
B.6.4.1. Will the project results in fewer GHG emissions than the baseline scenario?	PDD B.6.4	DR, I	Yes. Estimation of emission reduction by this project activity is 27,728 ton CO <sub>2</sub> /yr.	OK	OK
B.6.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?	PDD B.6.4	DR, I	Yes, the table has been correctly applied.	OK	OK
B.6.4.3. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	PDD B.6.4	DR, I	Yes. Validation team found that WBFs is under operation since 14 April 2006, 08 November 2006 and 20 November 2007, respectively. Lifetime of the project is expected to be 30 years and the fixed crediting period of 10 years without renewal is chosen. The emission reductions for each year and total emission reductions are indicated in the Table of B.6.4 of the PDD.	OK	OK
B.6.4.4. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?	PDD	DR	Yes. The data are consistent.	OK	OK
B.6.4.5. Does all estimate of the baseline emission replicate using the data and parameter values provided in the PDD?	PDD B.6.4	DR, I	Yes. All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.	OK	OK
<b>B.7. Application of the monitoring methodology and description of the monitoring plan</b>					
<b>B.7.1. Data and parameters monitored</b>					

B.7.1.1. Is the list of parameters presented by chapter B.7.1 considered to be complete with regard to the requirements of the applied methodology?	PDD B.7.1	DR,1	Yes. It is.	OK	OK
B.7.1.2 Are the parameter included followings properly? - Title in line with methodology? - Data unit correctly expressed? - Appropriate description of parameter? - Source clearly referenced? - Correct value provided for estimation? - Has this value been verified? - Measurement method correctly described? - Correct reference to standards? - Indication of accuracy provided? - QA/QC procedures described? - QA/QC procedures appropriate?	PDD B.7.1	DR,1	Yes. All parameters are listed in chapter. The monitoring plan includes how all the data will be monitored to calculate emissions with QA/QC procedures. Also any further revision of the ‘Standard Manual for Calorific values’ approved by Ministry of Commerce, Industry and Energy/Korea Energy Management Corporation for NCV <sub>NG,y</sub> , will be taken into account.	OK	OK
<b>B.7.2. Description of the monitoring plan</b>					
B.7.2.1. Is the operational and management structure clearly described and in compliance with the envisioned situation?	PDD B.7.2	DR,1	Yes. Operational and management structure of the project activity and responsibilities and institutional arrangements for data collection and archiving well described in section B.7.2 of the PDD. SeAH Besteel had organized an Operating and Monitoring Team, which composes of a manager and operators. The manager will be responsible for monitoring and archiving all data associated with items depicted in the monitoring plan. Operators working under the manager will be assigned to the task of monitoring parameters on a timely basis as well as recording and archiving data in an orderly manner. The procedures for the monitoring of the Project activity will follow ISO 9001. All data collected as part of monitoring plan will be archived electronically and be kept at least 2 years after the end of the crediting period. Monitoring reports will be reviewed by the manager on a monthly basis. Validation team confirmed the facts through on-site assessment.	OK	OK

B.7.2.2. Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	PDD B.7.2	DR,1	<p>According to the monitoring methodology, monitoring of fossil fuel use and output after the project activity has been implemented.</p> <p>The fossil fuel use (Nm3) is quantity of natural gas combusted in WBF during the crediting period. Quantity of natural gas used is continuously monitored using meters. Data is to be aggregated monthly and yearly. The output is quantity of bloom or billet to be heated by WBF during the crediting period. For large size WBF, the quantity of bloom heated is continuously measured by measuring roll which has the EN CORDER. ERP system calculates the quantity of bloom produced using the measured length of bloom from concast process. Data is to be aggregated monthly and yearly. For small size WBF, the quantity of billet produced is continuously measured using weighing machines. Data is to be aggregated monthly and yearly.</p> <p>But, monitoring of the quantity of Bloom to be produced as output is not a realistic approach in terms of accuracy of measuring equipment.</p> <p>Through the section B.7.1 in the PDD gives the description of monitoring. QA/QC procedure for monitoring equipments such as natural gas parameter is confirmed but it was not described fully and correctly in the PDD(e.g control body, calibration retention period, data collection time).</p>	CAR 7  CAR 8	OK
B.7.2.3. Does the monitoring plan provide current good monitoring practice?	PDD B.7.2	DR,1	Yes. Please refer B.7.2.1	OK	OK
B.7.2.4. If applicable: Does annex 4 provide useful information enabling a better understanding of the envisioned monitoring provisions?	PDD B.7.	DR, I	N/A	OK	OK
<b>B.8. Date of completion of the application of the baseline study and monitoring methodology an the name of the responsible person(s)/entity(ies)</b>					
B.8.1. Is there any indication of a date when the baseline was determined?	DR, I	PDD B.8.1	Yes. The baseline of the first version of PDD was determined on 19 December 2007.	OK	OK
B.8.2. Is the information on the person(s) / entity(ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	DR, I	PDD B.8	Yes, The responsible person of the application of the baseline and monitoring methodology is also the ones being interviewed for baseline verification during the on site assessment.	OK	OK



B.8.3. Is information provided whether this person/entity is also considered a project participant?	DR, I	PDD B.8	Yes. Name of the responsible entity, Mitsubishi UFJ Securities Co.,Ltd. and Korea Energy Management Corporation are clearly indicated in the PDD.	OK	OK
<b>C. Duration of the Project/ Crediting Period</b>					
C.1 Are the project's starting date and operational life time clearly defined and evidenced?	PDD C.1	DR, I	According to the definition in the glossary of terms, the project starting date is selected as the date of construction contract. However, evidence of it was not consistent as the date described in the PDD(PDD: August 2008, actual date: May 2008). Please indicate correct date of it.	CAR9	OK
<b>C.2. Choice of the crediting period and related information</b>					
C.2.1. Is the assumed crediting period clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max.10 years)?	PDD C.2.2	DR	Yes. Fixed crediting period, 10 yrs has been selected and it is reasonable as operational life time of this project activity is expected to be 30 years.	OK	OK
C.2.2. Is the start of the crediting period clearly defined and reasonable?	PDD C.2.2.1	DR,I	Yes. Starting date of crediting period will start 01 September 2009 or on the date of registration of the project activity.	OK	OK
<b>D. Environmental Impacts</b>					
<b>D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts</b>					
D.1.1 Has an analysis of the environmental impacts of the project activity been sufficiently described?	PDD D.1	DR,I	Yes, it is expected that SOx, NOx or dust will be reduced by the Project activity.	OK	OK
D.1.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	PDD D.1	DR, I	"Enforcement Decree of the Act on Assessment of Impacts of Works on Environment, Traffic, Disasters, etc." describes projects for which an Environment Impact Assessment (EIA) is required. Under the Act, the proposed Project activity does not require the completion of an EIA.	OK	OK

D.1.3 Will the project create any adverse environmental effects?	PDD D.1	DR, I	No, adverse and transboundary environmental impacts are not likely created as a result of the project activity.	<b>OK</b>	<b>OK</b>
D.1.4 Are transboundary environmental impacts considered in the analysis?	PDD. D.1	DR, I	Yes. Refer to D.1.3	<b>OK</b>	<b>OK</b>
<b>D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Part</b>					
D.2.1 Have identified environmental impacts been addressed in the project design?	PDD D.1	DR, I	Yes. Refer to D.1.1	<b>OK</b>	<b>OK</b>
D.2.2 Does the project comply with environmental legislation in the host country?	PDD D.1	DR, I	Yes. Refer to D.1.2	<b>OK</b>	<b>OK</b>
<b>E. Stakeholder Comments</b>					
<b>E.1. Brief description how comments by local stakeholders have been invited and compiled</b>					
E.1.1 Have relevant stakeholders been consulted?	PDD E.1	DR, I	Yes, to invite local stakeholders comments, an announcement is published in the local newspapers. And internet-based public consultation has been conducted on SeAH Besteel' website.	<b>OK</b>	<b>OK</b>
E.1.2 Have appropriate media been used to invite comments by local stakeholders?	PDD. E.1	DR, I	Yes, Saejeonbuk Newspaper has been used.	<b>OK</b>	<b>OK</b>

E.1.3 If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	PDD E.1	DR, I	Not be required.	OK	OK
E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	PDD. E.1	DR, I	Yes. The PDD transparently defines the stakeholder consultation process adopted.	OK	OK
<b>E.2. Summary of the comments received</b>					
E.2.1 Is a summary of the stakeholder comments received provided and is the stakeholders commented identified?	PDD E.2	DR, I	A summary of the stakeholder comments received is provided in the PDD. But the stakeholder comments received for safety management and prevention of fire was not clearly described.	CL 7	OK
E.2.2 Has due account been taken of any stakeholder comments received?	PDD E.3	DR, I	We have validated that there are no negative comments received by the stakeholders. And through the tele-phone interviews with one of them, we have confirmed.	OK	OK
<b>F. Annexes 1-4</b>					
<b>Annex 1: Contact Information</b>					
F.1.1 Is the information provided consistent with the one given under section A.3?	PDD A.3/ Anne x 1	DR	Yes, the information provided is consistent with one given under section A.3.	OK	OK
F.1.2 Is the information on all private participants and directly involved Parties presented?	PDD A.3/ Anne x 1	DR	Yes.	OK	OK
<b>Annex 2: Information regarding public funding</b>					

F.1.3 Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	PDD A.4.5/ Anne x 2	DR,I	It is stated that the project does not receive ODA of public funding from any Annex I countries.	<b>OK</b>	<b>OK</b>
F.1.4. If necessary: Is an affirmation available that any such funding from Annex – countries does not result in a diversion of ODA?	PDD A.4.5/ Anne x 2	DR	N/A	<b>OK</b>	<b>OK</b>
<b>Annex 3: Baseline information</b>					
F.1.5. If additional background information on baseline data is provided: Is this information consistent with data presented by other section of the PDD?	PDD B.5/A nnex 3	DR,I	N/A	<b>OK</b>	<b>OK</b>
F.1.6.Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	PDD B.5/A nnex 3	DR,I	N/A	<b>OK</b>	<b>OK</b>
F.1.7.Does the additional information substantiate/support statements given in other section of the PDD?	Anne x 3	DR	N/A	<b>OK</b>	<b>OK</b>
<b>Annex 4: Monitoring information</b>					
F.1.8.If additional background information on monitoring is provided: Is this information consistent with data presented in other section of the PDD?	PDD B.7.2/ Anne x 4	DR,I	N/A	<b>OK</b>	<b>OK</b>
F.1.9.Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	PDD B.7.2/ Anne x 4	DR,I	N/A	<b>OK</b>	<b>OK</b>
F.1.10.Do the additional information and/or documented procedures substantiate/support statements given in other section of the PDD?	PDD B.7.2/ Anne x 4	DR,I	N/A	<b>OK</b>	<b>OK</b>

**Table 3. Resolution of Corrective Action and Clarification Requests**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<b>CAR 1 :</b> Project participants have not received the host country approval from DNA of Republic of Korea and Japan to ascertain the project activity meets with the host country's sustainable development criteria.	A.2.7	See the attached approval letters of DNA of Korea and Japan. The DNA of Korea approved and received at 29 May 2009 and the DNA of Japan approved and received at 13 April 2008.	CAR 1 is closed.
<b>CAR 2 :</b> The project was not described that how is it contributed to the technology transfer and technology used is environmentally safe and sound.	A.4.3.2	For this project, technologies such as Low NO <sub>x</sub> regeneration burners which can achieve high energy efficiency by utilizing the waste heat from the combustion process are applied. It has been described in the PDD. Also the natural gas burners are provided by Bloom corporation and Core corporation.	CAR 2 is closed.
<b>CAR 3 :</b> Justification of the choice of two alternative scenarios to the proposed project activity has not been provided a detailed description.	B.4.2	Due to high price of diesel, gasoline or LPG etc, such fuels are seldom used as fuel source in this project. Therefore, such fuel is not considered in the baseline scenario. It has been described in the PDD. Refer to STEP 1 of B.4 of the PDD.	CAR 3 is closed.

## Appendix A. KFQ SSC Validation Protocol

<p><b>CAR 4 :</b> However NPV calculation is unclear with respect to below:</p> <ul style="list-style-type: none"> <li>- Fuel price described in the PDD is not corresponded. (PDD: 460.77, Raw data: 489.22).</li> <li>- Discount rate used in the sensibility analysis is not corresponded with Excelsheet(PDD: 5%, 9%, Excelsheet: 6%, 8%).</li> <li>- Investment cost is not relevant information available at the time of the investment decision.</li> </ul>	B.5.5	<p>Scenario A has is corrected with 489.2 from 460.77 and scenario B is corrected with 306.54 from 304.70.</p> <p>Also NPV have been recalculated with correct data.</p> <p>Discount rate has been corrected 3% and 10% considering the historical data in the past 5 years.</p> <p>Investment cost is applied by relevant information available at the time of the investment decision instead of actual cost.</p> <p>Refer to STEP 3 of B.4 of the PDD.</p>	CAR 4 is closed.
<p><b>CAR 5 :</b> For investment comparison analysis of alternative scenarios, equipment cost is considered. But, the evidence for one thousands million won as added cost is not provided.</p>	B.5.5	<p>As a conservative approach, It has been corrected with two thousands million won from one thousands million won.</p> <p>The evidences are provided to the DOE.</p> <p>Validation team has confirmed.</p>	CAR 5 is closed.
<p><b>CAR 6 :</b> It is not clear that justification of assumption for quantity of bloom or billet considering capacity of facilities to demonstrate the eligibility of SSC size, i.e less than or equal to 60,000 tCO<sub>2</sub> equivalent annually.</p>	B.6.3.2	<p>Even at the full production, the expected emission reductions are less than 60 ktCO<sub>2</sub> equivalent annually.</p> <p>It has been clearly described in the PDD.</p> <p>Refer to the paragraph 8 of B.2 of the PDD.</p>	CAR 6 is closed.
<p><b>CAR 7 :</b> Monitoring of the quantity of Bloom to be produced as output is not a realistic approach in terms of accuracy of measuring equipment.</p>	B.7.2.2	<p>It has been corrected in the PDD.</p> <p>It is the quantity of Bloom to be heated.</p>	CAR 7 is closed.
<p><b>CAR 8 :</b> QA/QC procedure for monitoring equipments such as natural gas parameter is confirmed but it was not described fully and correctly in the PDD(e.g control body, calibration retention period, data collection time).</p>	B.7.2.2	<p>It has been described fully and correctly in the PDD.</p> <p>QA/QC is conducted by project developer instead of natural gas provider.</p>	CAR 8 is closed.

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<b>CAR 9 :</b> However, evidence of it was not consistent as the date described in the PDD(PDD: August 2008, actual date: May 2008). Please indicate correct date of it.	C.1	It has been corrected in the PDD. The project starting date is March 2008.	CAR 9 is closed.
<b>CL 1 :</b> It should be clarify whether this project activity is applied to new facilities.	A.2.1	PP has submitted to EB query which is related to applicability of AMS III.B Version 12. and EB has clarified that it is not the project activity for new facilities but the project activity for capacity expansion. And the methodology has been revised to AMS III.B version 13. Thus, PDD has been revised based on the criteria for capacity expansion instead of new facilities.	CL 1 is closed.
<b>CL 2 :</b> It has not described the social benefits such as contribution to local community through project activity.	A.4.3.3	It has been described the social benefits in the PDD that is the establishment of infrastructure and lower natural gas price. Refer to A.2 of the PDD.	CL 2 is closed.
<b>CL 3 :</b> Evidence related to SeAH Besteel's corporate bond rate as 7% should be provided. However it is not indicated clearly.	B.5.5	It has been applied 6.6% instead of 7%. The source of the average bank loan rate for equipment investment is "The Bank of Korea( <a href="http://www.ecos.bok.or.kr">www.ecos.bok.or.kr</a> )". It has been clearly described in the PDD.  Validation team has checked 4 years(2005~2008) values of average bank loan rate for equipment investment by Bank of Korea Economic statistics System. It is shows from 6.07%~7.37%. Average value of 4 years is 6.65%. Thus, validation team confirmed the selected values are reasonable and appropriate comparing to 6.65%.	CL 3 is closed.

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<p><b>CL 4 :</b> It should be described to details of ‘common practice analysis’ in order to clearly explain additionality(e.g fuel usage rate of relevant site).</p>	<p>B.5.5</p>	<p>It has been described to details of common practice analysis in the PDD that more than 80% of the energy source in steel industry and Korea was fossil fuels other than natural gas in 2006. Refer to B.4 of the PDD.</p>	<p>CL 4 is closed.</p>
<p><b>CL 5 :</b> Justification for range of variation in the sensitivity analysis is not clearly described in the PDD.</p>	<p>B.5.5</p>	<p>The variation of the natural gas price were assessed by considering the fluctuation of reference which is provided by Gunsan gas provider (2001~2005). Validation team checked the facts and confirmed the selected values are reasonable and appropriate for the project activities. As for equipment cost and additional O&amp;M cost, 10% as the EB guidance recommendation has been chosen because of no variation factors. As for discount rate, 3% is chosen for lower range, which is lower than the risk free rate while 10% is chosen for the upper range which is higher than the historical highest in the past 5 years (9.34% in 2000). Validation team has been confirmed the facts through information of website of “The Bank of Korea”. It has been clearly described in the PDD.  KFQ has assessed the applied parameters and variation ranges are suitable for the proposed project and verified the analysis result.</p>	<p>CL 5 is closed.</p>



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<p><b>CL 6 :</b> Source for equipment lifetime should be clearly described in the PDD and for 30 years as lifetime should be considered in the investment analysis.</p>	<p>B.5.5</p>	<p>Source for equipment lifetime has been clearly described in the PDD and it has been applied by 30 years in the investment analysis. Combustech, the WBF manufacturer in Korea (<a href="http://www.combustech.kr">www.combustech.kr</a>) confirms that the lifetime of WBF used in Korea is about 30 years. Validation team has validated and checked the information related to the lifetime of existing WBFs based on the document provided by Combustech. Also, validation team got a conclusion that the existing equipment could have been used in the absence of the Project activity during the next 10 years of crediting period even though the remaining lifetime is considered the date of registration of the CDM project activity.</p>	<p>CL 6 is closed.</p>
<p><b>CL 7 :</b> It the stakeholder comments received for safety management and prevention of fire was not clearly described.</p>	<p>E.2.1</p>	<p>It has been clearly described in the PDD.</p>	<p>CL 7 is closed.</p>

## Appendix B

### Qualification of Validation team



## GHG Validator/Verifier Certificate

**Jin-Pyoung An**

Certificate number: GHG 04007

Sectoral Scope: 04, 05, 10, 11, 12, 13

Expert Scope: 04, 05, 10, 11, 12, 13

Date: 9 MAY 2007

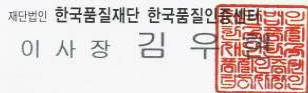
This validator/verifier is qualified by KFQ's Qualification requirements to conduct validation and verification for Carbon offset project and organization's Greenhouse Gas Emissions Report.

Valid until: 8 MAY 2010

Authorized by Korean Foundation for Quality



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## GHG Validator/Verifier Certificate

**Yu-Shim Jeong**

Certificate number: GHG 04006

Sectoral Scope: 01,02,03,04,05,10,11,12

Expert Scope: 04,05,11,12

Date: 9 MAY 2007

This validator/verifier is qualified by KFQ's Qualification requirements to conduct validation and verification for Carbon offset project and organization's Greenhouse Gas Emissions Report.

Valid until: 8 May 2010

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