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# VALIDATION REPORT

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## IMPROVING KILN EFFICIENCY IN THE BRICK MAKING INDUSTRY IN BANGLADESH (BUNDLE – 2)

REPORT No. 2010-0429

REVISION No. 03

DET NORSKE VERITAS



# VALIDATION REPORT

Date of first issue: 25 March 2010	ConCert Project No.: PRJC-188371-2009-CCS-NOR
Approved by Edwin Aalders	Organisational unit: DNV Climate Change and Environmental Services
Client: The World Bank	Client ref.: Ms. Joelle Chassard

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## Summary:

**Project Name:** Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2)

**Country:** Bangladesh

**Methodology:** AMS-II.D

**Version:** 12

**GHG reducing Measure/Technology:** Efficiency improvements in the brick making process

**ER estimate:** 40 104tCO<sub>2</sub>e per year (average)

## Size

☐ Large Scale

☒ Small Scale

## Validation Phases:

☒ Desk Review

☒ Follow up interviews

☒ Resolution of outstanding issues

## Validation Status

☐ Corrective Actions Requested

☐ Clarifications Requested

☒ Full Approval and submission for registration

☐ Rejected

In summary, it is DNV's opinion that the project activity "Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2)" in Bangladesh, as described in the PDD, version 07 of 12 July 2012, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AMS-II.D, version 12. Hence DNV requests the registration of the project as a CDM project activity.

Report No.: 2010-0429	Subject Group: Environment
Report title: Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2)	
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## Indexing terms

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<i><b>Table of Content</b></i>	<i><b>Page</b></i>
1 EXECUTIVE SUMMARY – VALIDATION OPINION .....	1
2 INTRODUCTION .....	2
2.1 Objective	2
2.2 Scope	2
3 METHODOLOGY .....	3
3.1 Desk review of the project design documentation	3
3.2 Follow-up interviews with project stakeholders	7
3.3 Resolution of outstanding issues	8
3.4 Internal quality control	10
3.5 Validation team	10
4 VALIDATION FINDINGS .....	11
4.1 Participation requirements	11
4.2 Project design	11
4.3 Application of selected baseline and monitoring methodology	13
4.4 Project boundary	14
4.5 Baseline identification	14
4.6 Additionality	16
4.7 Monitoring	21
4.8 Algorithms and/or formulae used to determine emission reductions	24
4.9 Environmental impacts	26
4.10 Comments by local stakeholders	28
4.11 Comments by Parties, stakeholders and NGOs	28
Appendix A Validation Protocol	
Appendix B <a href="#">Initial Validation Protocol</a>	
Appendix C Curriculum vitae of the validation team members	



## ***Abbreviations***

BBOMA	Bangladesh Brick Making and Owners Association
BTK	Bull's Trench Kiln
BUET	Bangladesh University of Engineering and Technology
CAR	Corrective Action Request
CDCF	Community Development Carbon Fund
CDM	Clean Development Mechanism
CEA	Clean Energy Alternatives
CER	Certified Emission Reduction(s)
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
DCF	Danish Carbon Fund
DNA	Designated National Authority
DNV	DNV Climate Change Services AS
DoE	Department of Environment
FAR	Forward Action Request
FCK	Fixed Chimney Kiln
FY	Financial Year
GEF	Global Environment Facility
GHG	Greenhouse gas(es)
GoB	Government of Bangladesh
GWP	Global Warming Potential
HHK	Hybrid Hoffman Kiln
IBRD	International Bank for Reconstruction and Development
IIDFC	Industrial and Infrastructure Development Finance Company Ltd
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of approval
LoI	Letter of Intent
LDC	Least developed country
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PIN	Project Information Note
PP	Project proponent
tCO <sub>2e</sub>	Tonnes of CO <sub>2</sub> equivalents
UNDP	United nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services



## 1 EXECUTIVE SUMMARY – VALIDATION OPINION

*DNV Climate Change Services AS (DNV) has performed a validation of the project activity “Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2)” in Bangladesh. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism as well as criteria given to provide for consistent project operations, monitoring and reporting.*

*The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.*

*The host Party is Bangladesh and the Annex I Party is Denmark. Both Parties fulfil the participation criteria and have approved the project and authorized the project participants Industrial and Infrastructure Development Finance Company Ltd and International Bank for Reconstruction and Development (IBRD) as the Trustee of the Danish Carbon Fund (DCF). The DNA from Bangladesh confirmed that the project assists in achieving sustainable development.*

*The project correctly applies the baseline and monitoring methodology AMS-II.D, version 12 “Energy efficiency and fuel switching measure for industrial facilities”.*

*In the project 8 new energy efficient HHK kilns have been constructed in the place of commonly used FCK brick kiln. As a result, 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. It is demonstrated that the project 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.*

*The total emission reductions from the project are estimated to be on the average 40 104 tCO<sub>2</sub>e per year over the selected 10 year fixed crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.*

*The monitoring plan provides for the monitoring of the project’s emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is DNV’s opinion that the project participants are able to implement the monitoring plan.*

*In summary, it is DNV’s opinion that the project activity “Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2)”, as described in the PDD, version 07 dated 12 July 2012, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AMS-II.D, version 12. Hence, DNV requests the registration of the project as a CDM project activity.*

Bangalore and Oslo, 19 July 2012

Indrajit Rana  
CDM Validator  
DNV Bangalore, India

Edwin Aalders  
Approver,  
DNV Climate Change Services AS



## 2 INTRODUCTION

International Bank for Reconstruction and Development (IBRD) / The World Bank has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2) project in Bangladesh (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, 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 procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

### 2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the 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).

### 2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-II.D (version 12) /58/. The validation was based on the recommendations in the Validation and Verification Manual /57/.

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



### 3 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.

The following sections outline each step in more detail.

#### 3.1 Desk review of the project design documentation

The following tables list the documentation that was reviewed during the validation.

##### 3.1.1 Documentation provided by the project participants

/1/	Mr Shaymal Barman Industrial and Infrastructure development Finance Company Ltd (IIDFC): <i>CDM-PDD for project activity "Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2)" Version 1 dated 24 February 2010 and version 07 dated 12 July 2012</i>
/2/	Md. Matiul Islam, chairman, IIDFC: <i>Letter to Bangladesh Bank for creating of a fund for refinancing loans to HHK brick kiln industry dated 7 February 2010</i>
/3/	Md. Matiul Islam, chairman, IIDFC: <i>Certificate for not using ODA in the project activity dated 3 March 2010</i>
/4/	The World Bank: <i>First LoI dated 18 February 2007 for potential purchase of Emission Reductions from "Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2)"</i>
/5/	The World Bank: <i>Renewal LoI dated 23 September 2008 for potential purchase of Emission Reductions from "Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2)"</i>
/6/	IIDFC: <i>Emission Reductions Transfer Agreement between Bricks 2010 Ltd. and IIDFC dated 17 February 2010</i>
/7/	Barapukuria Coal Mining Company Limited: <i>Calorific value of coal available in the website <a href="http://www.bcmcl.org.bd">www.bcmcl.org.bd</a></i>
/8/	Bangladesh University of Engineering and Technology: <i>Pre-Feasibility Report on a Brick Manufacturing Fuel Substitution CDM Project dated October 2002</i>
/9/	Global Environment Facility: <i>UNDP project report on "Improving Kiln Efficiency in the Brick Making Industry (IKEBMI) in August 2006</i>
/10/	Government of Meghalaya: <i>Calorific value of coal deposited in Meghalaya available in official web site of Government of Meghalaya</i>
/11/	UNOPS, GEF and UNDP: <i>Fact sheet on the Kiln Technology and Brick Industry in Bangladesh</i>
/12/	Bricks 2010 Ltd.: <i>Board approval for installation two HHK brick kiln with capacity 50 000 brick/day/kiln dated 20 January 2010.</i>
/13/	Bricks 2010 Ltd.: <i>MoM of stake holder consulting meeting dated 17 February 2010</i>
/14/	Department of Environment: <i>Receiving letter for environmental clearance for Bricks</i>





## VALIDATION REPORT

	<i>2010 Ltd. (Clearance Number 514) approved on 5 August 2010 and renewed on 6 February 2012</i>
/15/	<i>Bricks 2010 Ltd.: Technology service agreement with Nestor Consulting Limited dated 1 February 2010</i>
/16/	<i>Eeta and Tiles Ltd.: Board approval for installation four HHK brick kilns with capacity 50 000 brick/day/kiln dated 24 December 2009.</i>
/17/	<i>IIDFC: Emission Reductions Transfer Agreement between Eeta and Tiles Ltd. and IIDFC dated 17 February 2010</i>
/18/	<i>Department of Environment: Receiving letter for environmental clearance for Eeta and Tiles Ltd. (Clearance Number 256) approved on 1 April 2010 and renewed on 15 April 2012</i>
/19/	<i>Eeta and Tiles Ltd.: MoM of stake holder consulting meeting dated 12 January 2010</i>
/20/	<i>Eeta and Tiles Ltd.: Technology service agreement with Nestor Consulting Limited dated 10 January 2010</i>
/21/	<i>Sheikh Brothers Enterprise Ltd.: Board approval for installation two HHK brick kilns with capacity 50 000 brick/day/kiln dated 11 January 2010.</i>
/22/	<i>Sheikh Brothers Enterprise Ltd.: MoM of stake holder consulting meeting dated 16 January 2010</i>
/23/	<i>Department of Environment: Acknowledgement letter of Application of environmental clearance for Sheikh Brothers Enterprise Limited dated 29 January 2010</i>
/24/	<i>IIDFC: Emission Reductions Transfer Agreement between Sheikh Brothers Enterprise Limited and IIDFC dated 19 January 2010</i>
/25/	<i>Sheikh Brothers Enterprise Ltd.: Technology service agreement with Nestor Consulting Limited dated 19 January 2010</i>
/26/	<i>IIDFC: Project Idea Note submitted to The World Bank dated 28 November 2008 for renewal</i>
/27/	<i>IIDFC: Prior CDM consideration note to UNFCCC dated 24 February 2010 <a href="http://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html">http://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html</a></i>
/28/	<i>Eeta and Tiles Ltd.: Letter for starting of construction work to the technology supplier Nestor Consulting Limited dated 14 February 2010</i>
/29/	<i>Diamond Auto Bricks Ltd: Letter to IIDFC dated 10 May 2010 regarding increase in project cost and delay in project implementation.</i>
/30/	<i>IIDFC: First financial analysis on HHK during its first HHK project finance to Diamond Auto Bricks in 2007, term loan sanctioned on 3 June 2007</i>
/31/	<i>IIDFC: Prior CDM consideration note to DNA of Bangladesh dated 9 March 2010</i>
/32/	<i>IIDFC: Survey for FCK project cost and assumption for investment analysis in the year 2005 and 2010</i>
/33/	<i>IIDFC: Investment comparison analysis_2010-2011.xls, Investment analysis_HHK_2010-2011.xls, Investment analysis_FCK_2005,2010-2011.xls and Financials of existing FCKs zandcw_2005.xls</i>
/34/	<i>IIDFC: CDM PDD for the project activity "Improving Kiln Efficiency in the Brick Making Industry in Bangladesh" dated 18 April 2011, version 15</i>
/35/	<i>IIDFC: Emission reduction calculation work sheet</i>
/36/	<i>IIDFC: Letter from Diamond Auto Bricks Ltd dated 18 May 2010 to IIDFC regarding increase in project cost</i>
/37/	<i>Sheikh Brothers Enterprise Ltd.: Application to Janata Bank Limited for term loan for</i>





	<i>implementation of HHK dated 10 January 2010</i>
/38/	Danish Energy Agency: <i>Affirmation of no diversion of ODA dated 18 September 2009</i>
/39/	Department of Environment, Bangladesh Government: <i>Current market share of all the brick kiln technology in Bangladesh Memo no: DOE/Enforcement/37, dated 4 May 2010</i>
/40/	IIDFC: <i>Study paper "Weight of Bricks in Bangladesh, 2009"</i>
/41/	Department of Environment (DNA of Bangladesh): <i>Certification letter dated 9 Feb 2011 of grid emission factor for the year 2009 considering the data from the year 2007 to 2009.</i>
/42/	IIDFC: <i>Project Implementation status as on 14 July 2012.</i>
/43/	IIDFC: <i>"Environmental Management Framework for HHK Project" (EMF Report) dated 12 April 2009.</i>
/44/	IIDFC: <i>Stakeholder's Consultations Report for Improving Kiln Efficiency for the Brick Making Industry in Bangladesh from January to February 2010.</i>
/45/	The World Bank: <i>World Bank safeguard policies explained:</i> <a href="http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFE/POL/0,,menuPK:584441~pagePK:64168427~piPK:64168435~theSitePK:584435,00.html">http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFE/POL/0,,menuPK:584441~pagePK:64168427~piPK:64168435~theSitePK:584435,00.html</a>
/46/	Dr. Amir Khan, ST Consultant: <i>Energy and Stack Emissions Monitoring in Hybrid Hoffman Kiln (HHK) Type – Universal Type" dated December 2008</i>
/47/	The Louis Berger Group, Washington DC: <i>Emissions Baseline Report for the IKEBMI Project (PDF-B Phase BGD/04/014) June 2006 Table 2, pg 3</i>
/48/	Global Environment Facility: <i>UNDP project report on "Improving Kiln Efficiency in the Brick Making Industry (IKEBMI) in 20 October 2009 available in</i> <a href="http://www.thegef.org/gef/sites/thegef.org/files/repository/Bangladesh_10-20-2009-ID1901_Improving_Kiln_Efficiency.pdf">http://www.thegef.org/gef/sites/thegef.org/files/repository/Bangladesh_10-20-2009-ID1901_Improving_Kiln_Efficiency.pdf</a>
/49/	The World Bank : <i>Draft Carbon Finance Assessment Memorandum for the project activity dated 31 May 2006</i>
/50/	The World Bank: <i>Financial analysis prepared 5 June 2006 and Review of PIN for HHK brick kilns dated 20 July 2006</i>
/51/	The World Bank: <i>Approved PIN for HHK brick kilns dated 1 November 2006</i>
/52/	IIDFC: <i>Renewed PIN for the project activity dated 28 November 2008.</i>
/53/	Business of Bangladesh: <i>Coal import has been stopped in Bangladesh; Brick fields are majorly used imported coal</i> <a href="http://www.bizbangladesh.com/business-news-2436.php">http://www.bizbangladesh.com/business-news-2436.php</a>
/54/	IIDFC: <i>SSL Ceramic Bricks Ltd and Diamond Auto Bricks Ltd. sent letter to IIDFC informing crack development in HHK foundation in the year 2009</i>

### 3.1.2 Letters of approval

/55/	Department of Environment (DNA of Bangladesh): <i>Letter of approval dated 13 September 2010</i>
/56/	Danish Energy Agency (DNA of Annex I Party-Denmark): <i>Letter of approval dated 9 August 2011</i>



### 3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

/57/	CDM Executive Board: <i>Validation and Verification Manual</i> , version 1.2
/58/	CDM Executive Board: <i>Baseline and monitoring methodology AMS-II.D</i> , version 12
/59/	CDM Executive Board: <i>General Guidelines to SSC CDM methodologies Version 17</i>
/60/	CDM Executive Board: <i>Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities</i>
/61/	CDM Executive Board: <i>GUIDELINES FOR OBJECTIVE DEMONSTRATION AND ASSESSMENT OF BARRIERS; Guideline 7 "For projects in Least Developed Countries"</i>
/62/	CDM Executive Board: <i>Tool to calculate the emission factor for an electricity system version 2</i>
/63/	CDM Executive Board: <i>General Guidelines for Sampling and Surveys for Small Scale CDM Project Activities</i>
/64/	CDM Executive Board: <i>Guidelines on assessment of debundling for SSC project activities version 3</i>
/65/	CDM Executive Board: <i>Guidelines on the demonstration and assessment of prior consideration of the CDM version 4</i>
/66/	CDM Executive Board: <i>Guidelines on the assessment of investment analysis version 5</i>

### 3.1.4 Documentation used by DNV to validate / cross-check the information provided by the project participants

/67/	UNOPS, GEF and UNDP: <i>Terminal Report on Improving Kiln Efficiency for the Brick Making Industry in Bangladesh – PDF B Phase dated May 2007</i>
/68/	UNOPS, GEF and UNDP: <i>Current State of the Brick Industry in Bangladesh dated 29 March 2007</i>
/69/	2006 IPCC Guidelines for National Greenhouse Gas Inventories: <i>Chapter 1: Introduction, Table 1-3; Default values of carbon content, p.21.</i>
/70/	BUET: <i>Small Study on Air Quality of Impacts of the North Dhaka Brick field Cluster by Modeling of Emissions and Suggestions, 2006</i>
/71/	Department of Environment Bangladesh <i>Government-Memo no: DOE/Enforcement/37, May 2010. In this document the data was available up to FY 2009.</i>

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

- Additionality has been revised. Investment barrier has also been used to demonstrate additionality of the project activity.
- Monitoring plan has been revised
- Estimated emission reduction has been revised from web hosted PDD version 1 to the latest version of the PDD due to change in grid emission factor, change in coal emission factor and start date of kiln operation.
- Start date of the crediting period has been revised.



### 3.2 Follow-up interviews with project stakeholders

From 2 March 2010 to 4 March 2010, DNV visited the IIDFC head office in Dhaka, Bangladesh and all HHK brick kilns under this project activity in Bangladesh and performed interviews with project stakeholders.

	Date	Name	Organization	Topic
/72/	2 to 3 March 2010	Mr. Chris Warner	The World Bank	Proposed CDM project activity, Bundling issue for individual HHK brick kiln, Additionality and monitoring, environmental impact, local stakeholder consultation process
/73/	2 to 3 March 2010	Md. Matiul Islam	IIDFC	Proposed CDM project activity, Bundling issue for individual HHK brick kiln, Additionality and monitoring, environmental impact, local stakeholder consultation process
/74/	2 to 4 March 2010	Mr. Shyamal Barman	IIDFC	Proposed CDM project activity, Bundling issue for individual HHK brick kiln, Additionality and monitoring, environmental impact, local stakeholder consultation process
/75/	2 to 3 March 2010	Md. Asaduzzaman Khan	IIDFC	Proposed CDM project activity, Bundling issue for individual HHK brick kiln, Additionality and monitoring, environmental impact, local stakeholder consultation process
/76/	2 March 2010	Nowsher Islam	Eeta and Tiles Ltd.	Proposed CDM project activity, additionality and monitoring, local stakeholder consultation process
/77/	3 March 2010	All-Hajj Sheikh Sujat Miah	Sheikh Brothers Enterprise Ltd.	Proposed CDM project activity, additionality and monitoring, CDM consideration, local stakeholder consultation process
/78/	4 March 2010	Nina Shaheen	Bricks 2010 Ltd.	Proposed CDM project



		Chowdhury		activity, additionality and monitoring, CDM consideration, local stakeholder consultation process
/79/	4 March 2010	Dipro Kaiser Chowdhury	Bricks 2010 Ltd.	Proposed CDM project activity, additionality and monitoring, CDM consideration, local stakeholder consultation process

### 3.3 Resolution of outstanding issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, 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 four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the project activity "Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (Bundle – 2)" in Bangladesh is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

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

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

The validation protocol in Appendix A is based on the project design as documented and described in the PDD, version 5 dated 29 November 2011.

The findings of the validation of the project design as documented and described in earlier version(s) of the PDD are described in the initial validation protocol included in Appendix B to this report.



<b>Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities</b>				
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>		
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided ( <b>OK</b> ) or a <b>corrective action request (CAR)</b> if a requirement is not met.		

  

<b>Validation Protocol Table 2: Requirement Checklist</b>				
<b>Checklist question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Assessment by DNV</b>	<b>Draft and/or Final Conclusion</b>
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the CDM-PDD	Gives reference to documents where the answer to the checklist question or item is found.	Means of verification (MoV) are <b>document review (DR)</b> , <b>interview (I)</b> or any other follow-up actions (e.g., on site visit and telephone or email interviews) and <b>cross-checking (CC)</b> with available information relating to projects or technologies similar to the proposed CDM project activity under validation.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.	OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A <b>corrective action request (CAR)</b> is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A <b>clarification request (CL)</b> is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A <b>forward action request (FAR)</b> during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.

  

<b>Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests</b>			
<b>Corrective action and/or clarification requests</b>	<b>Ref. to checklist question in table 2</b>	<b>Response by project participants</b>	<b>Validation conclusion</b>
The <b>CARs</b> and/ or <b>CLs</b> raised in Table 2 are repeated here.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants to address the <b>CARs</b> and/or <b>CLs</b> .	The validation team's assessment and final conclusions of the <b>CARs</b> and/or <b>CLs</b> .

  

<b>Validation Protocol Table 4: Forward Action Requests</b>		
<b>Forward action request</b>	<b>Ref. to checklist question in table 2</b>	<b>Response by project participants</b>
The <b>FARs</b> raised in Table 2 are repeated here.	Reference to the checklist question number in Table 2 where the FAR is explained.	Response by project participants on how forward action request will be addressed prior to first verification.

Figure 1: Validation protocol tables



### 3.4 Internal quality control

The validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

### 3.5 Validation team

<i><b>Role</b></i>	<i><b>Last Name</b></i>	<i><b>First Name</b></i>	<i><b>Country</b></i>	<i><b>Type of involvement</b></i>					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 4 Other
Team leader (Validator)	Chattopadhyay	Sasim	India	✓	✓	✓	✓		
Validator	Indrajit	Rana	India	✓	✓	✓			
Expert	Faggin	Matteo	Italy	✓		✓			✓
Technical reviewer	Seshan	Ranganathan	India					✓	
Person with sectoral competence assisting technical reviewer	Yang	Xiao shan	China					✓	✓

The qualification of each individual validation team member is detailed in Appendix C to this report.



## 4 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 PDD, version 07 dated 12 July 2012 /1/.

### 4.1 Participation requirements

The project participants are Industrial and Infrastructure Development Finance Company Ltd of host Party of Bangladesh and International Bank for Reconstruction and Development (IBRD) as the Trustee of the Danish Carbon Fund (DCF) authorized by the Annex I Party Denmark. The host Party (Bangladesh) and the Annex I Party Denmark meet all relevant participation requirements.

A letter of approval (LoA) /55/ was issued by DNA of Bangladesh on 13 September 2010, authorizing IIDFC of host Party as project participant and confirming that the project assists in achieving sustainable development. The DNA of Denmark issued the LoA /56/ on 9 August 2011 and authorized International Bank for Reconstruction and Development (IBRD) as the Trustee of the Danish Carbon Fund (DCF) as project participant.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA. Both the Danish Government and IIDFC confirmed that there is no diversion of ODA /3/ /38/

The letters of approval were received from the project participants. DNV does not doubt the authenticity of the letters of approval as DNV verified the letters with the originals. DNV considers the letters are in accordance with paragraphs 45- 48 of the VVM /57/.

### 4.2 Project design

The project activity consists of the installation of 8 new Hybrid Hoffman Kilns for brick manufacturing. The project proponent IIDFC acts as the bundler and nodal point for all 8 individual HHKs. The locations of all of the 8 HHKs in Bangladesh are as per the following:

Name of Entrepreneur	Location of HHK Facility		
	Area	Latitude	Longitude
Eeta and Tiles Ltd. (Kiln1)	Gazipur, Dhaka Division	+24.03935	+90.36975
Eeta and Tiles Ltd.(Kiln 2)	Gazipur, Dhaka Division	+24.03935	+90.36975
Eeta and Tiles Ltd.(Kiln 3)	Gazipur, Dhaka Division	+24.03935	+90.36975
Eeta and Tiles Ltd.(Kiln 4)	Gazipur, Dhaka Division	+24.03935	+90.36975
Sheikh Brothers Enterprises Ltd. (Kiln1)	Hobiganj, Sylhet Division	+24.56740	+91.52068
Sheikh Brothers Enterprises Ltd. (Kiln 2)	Hobiganj, Sylhet Division	+24.56740	+91.52068





Bricks 2010 Ltd. (Kiln1)	Tangail, Dhaka Division	+24.10278	+90.19620
Bricks 2010 Ltd. (Kiln 2)	Tangail, Dhaka Division	+24.10278	+90.19620

The HHK is a hybrid version of the Hoffman Kiln where heat retention in the kilns and capture of waste heat for recirculation in the drying tunnel has been improved. In addition, coal consumption has been reduced by introducing pulverized coal into the wet clay in each brick which then bakes the brick from the inside. It has been evidenced from the board approval note of individual kiln owners and technology service agreement /12/ /15/ /16/ /20/ /21/ /25/ that each HHK capacity is 50 000 bricks per day.

The project activity is a new facility. In this bundle, first two HHKs of Eeta and Tiles Ltd. have been taken for implementation first and construction started on 20 Feb 2010 /42/.

Details of chronology for each HHK brick under this project activity is mentioned in the following table:

Name of the Kiln	Date of board approval /	Start date of each HHK (considering technology service agreement to implement HHK)	Expected commercial operation start date
Eeta and Tiles Ltd. (Kiln1)	24 December 2009 /16/	10 January 2010 /20/	1 August 2012 /42/
Eeta and Tiles Ltd.(Kiln 2)	24 December 2009 /16/	10 January 2010 /20/	1 August 2012 /42/
Eeta and Tiles Ltd.(Kiln 3)	24 December 2009 /16/	10 January 2010 /20/	1 February 2013 /42/
Eeta and Tiles Ltd.(Kiln 4)	24 December 2009 /16/	10 January 2010 /20/	1 February 2013 /42/
Sheikh Brothers Enterprises Ltd. (Kiln1)	11 January 2010 /21/	19 January 2010 /25/	1 June 2013 /42/
Sheikh Brothers Enterprises Ltd. (Kiln 2)	11 January 2010 /21/	19 January 2010 /25/	1 June 2013 /42/
Bricks 2010 Ltd. (Kiln1)	20 January 2010 /12/	1 February 2010 /15/	1 August 2012 /42/
Bricks 2010 Ltd. (Kiln 2)	20 January 2010 /12/	1 February 2010 /15/	1 November 2012 /42/

The lifetime of the project is conservatively estimated to be 10 years. DNV has checked the lifetime of HHK project from the reports mentioned in /8/ /9/. As per the report, the lifetime is at least 10 years after which major replacement is required to run the HHK. Thus the 10 year lifetime for an HHK is deemed appropriate. The project has selected a fixed crediting period of 10 years starting from the date of registration of the activity as a CDM project or 1 September 2012, whichever occurs later.



DNV has verified that the project activity in question and find that it is not to be considered a de-bundled project activity as the individual brick manufacturing units in the project activities are legally independently owned and operated. IIDFC only acts as a bundler and focal point. IIDFC is authorized by individual entrepreneurs to represent them for all matters related to CDM and this fact has been verified by DNV from the emission reductions transfer agreement signed between each brick manufacturing unit owner and IIDFC /6//17//24/.

The project activity is also not a de-bundled component of a larger project as it satisfies the EB54 annex 13 para 2 requirements. The present project activity while has the same project bundler/coordinator, used the same technology /measure and category, and has the bundle 1 registered, the condition 2 (d) is not satisfied as the HHK brick kilns identified to be implemented in bundle 1 (UNFCCC # 5125) are located more than 1 km from the identified HHK brick kilns under bundle 2 (as verified during the site visit).

Thus, the project activity has not been considered as de-bundled component of a larger project.

DNV considers the project description of the project contained in the PDD to be complete and accurate. The PDD complies with the relevant forms and guidance for completing the PDD.

### 4.3 Application of selected baseline and monitoring methodology

The approved small scale methodology AMS-II.D, “Energy efficiency and fuel switching measures for industrial facilities”, version 12 /58/ has been applied for the project activity. DNV found the selected baseline methodology is applicable since:

- The project involves energy efficiency in green field industrial facilities for brick manufacturing by implementing HHK instead of FCK technology.
- The project activity involves 8 installation of energy efficient HHK at three new industrial facilities. Except for Eeta and Tiles Ltd. other two industrial facilities have two HHK s each. Eeta and Tiles Ltd has four HHKs. Thus the project activity consists of a total 8 HHKs. DNV has confirmed this from board approval of individual HHK owners and technology service agreements /12/ /15/ /16/ /20/ /21/ /25/.
- The use of primary fossil fuel (coal) for brick production, electricity and diesel consumption to operate plant equipment of HHK will be directly measured. This has been described in section 4.7 of this report.
- In the project activity, specific consumption of coal is less due to the energy efficiency measures involved in the HHK technology over the baseline FCK technology. The production capacity of brick kiln in baseline FCK technology and in HHK technology has been considered as per the design capacity. Thus DNV confirms that impact of the improvements in energy efficiency can be distinguished from the changes in energy use due to other variables not influenced by the project activity, like increase of production capacity.
- Total equivalent thermal energy saving achieved by the project activity in demand-side is 131 GWh<sub>th</sub> /1/ /35/ per annum, which is less than 180 GWh<sub>th</sub> equivalent thermal energy savings stipulated by the methodology AMS-II.D, version 12. The projected activity level of 50 000 bricks per day per single size HHK is deemed



realistic as per the design capacity of a single size HHK /15//20//25/. Hence it is unlikely that the threshold will be exceeded.

The assessment of the project's compliance with the applicability criteria of AMS-II.D (version 12) are documented in detail in section B.2 of Table 2 in the validation protocol in Appendix A and Appendix B to this report.

#### 4.4 Project boundary

The project boundary is clearly defined in line with the methodology that requires, *"The project boundary is the physical, geographical site of the industrial or mining and mineral production facility, processes or equipment that are affected by the project activity"*.

The project activity covers the eight HHKs in three different industrial facilities each having raw material handling sections, green brick making sections and brick firing sections. The electricity used in the project activity has been sourced from Bangladesh national electricity grid. The project boundary is thus defined as the physical, geographical area of each of the eight brick production facilities where HHK technology has been used and Bangladesh national electricity grid. DNV validate the project boundary during site visit.

The system boundaries may be presented in tabular format:

	GHGs involved	Description
Baseline emissions	CO <sub>2</sub>	Fossil fuel consumption in the baseline activity
Project emissions	CO <sub>2</sub>	On site fossil fuel and electricity consumption due to the project activity.
Leakage	No Leakage	-

DNV validated the project boundary in line with VVM version 01.2 /57/.

The identified boundary and selected sources and gases are justified for the project activity. The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by AMS-II.D (version 12) /58/.

#### 4.5 Baseline identification

In line with the small scale methodology AMS-II.D version 12, for new facility the energy baseline consists of the facility that would otherwise be built. The proposed project is for new and more efficient brick making facilities. Thus energy use and corresponding emissions from the brick making facilities that would otherwise have been built and operated in the absence of the project activity, has been considered to be the baseline scenario technology.

For the project activity the first PIN was reviewed and approved by the World Bank in the year 2006 /50/ /51/. At that time in Bangladesh four types of technologies /9/ namely Fixed Chimney Kilns (FCK), Bull's Trench Kilns (BTK), Zigzag Kilns, and traditional Hoffman Kilns were in used for Brick manufacturing. Thus the four types of baseline technologies for brick kiln have been considered as alternatives.



DNV checked the market share of each brick kiln technology between the period 2006 and 2009 (most recent available market share data is for the year 2009). The following documents have been assessed:

Market share of different technologies in the brick making sector as on FY 2006 (data was available up to FY 2006) published in FY 2006 UNDP document “Bangladesh - Improving Kiln Efficiency in the Brick Making Sector”, August 2006) /9/. The market survey of the brick industry in Bangladesh in the year 2006 revealed that FCK had the highest market share of 75.8% based on percentage of total brick production /9/. The same document was re published in 2009 with revision of the table as on 2009. The revised table in UNDP 2009 describe market share of different technologies in the brick making sector as on FY 2006 (as the data was available up to FY 2006) published in FY 2009 UNDP document “Bangladesh - Improving Kiln Efficiency in the Brick Making Sector” 28 October 2009 /48/. The market share of FCK technology (based on percentage of total brick production) as per the revised document is 76% /48/. In the year 2006 the market share of BTK, Zigzag Kiln and traditional Hoffman kiln was 16.1%, 5.7%, and 2.4% respectively /9/ based on percentage of total brick production.

The latest available market share was published by Department of Environment Bangladesh Government-Memo no: DOE/Enforcement/37, May 2010 /71/. In this document the data was available up to FY 2009. The market share of FCK is 93.65% based on percentage of total brick production. It has also been evidenced from the market survey 2009; all the share of BTK is that converted from FCK technology.

Therefore, FCK became the predominant kiln in Bangladesh for brick manufacturing. Thus in the time of project conceptualization FCK was the predominant type, which is still the case. Zigzag Kilns and traditional Hoffman kilns are not popular in Bangladesh which is evident from the market survey mentioned above of various kiln technology.

Thus, based on the above discussion, DNV considers that kilns of type FCK would have been the most feasible alternative to the project proponents and be built and operated in the absence of the project activity. Hence, the baseline of the project activity is FCK. In absence of the project activity, equivalent amount of bricks would be produced from FCK which require more fossil fuel (coal) than the project activity and increase anthropogenic emissions of greenhouse gases in the baseline.

The baseline emissions have been assessed from the studies carried out in the year 2002 /8/ and 2006 /9/ which is the latest available. In 2006, a UNDP-GEF project /9/ was initiated to transform the brick industry towards cleaner technologies and practices. Under the project, a survey of coal consumption of FCK was carried out. The survey established specific fuel (coal) consumption as 24 tons of coal per 100 000 bricks, which affirmed the coal use of 22-26 ton per 100 000 bricks reported in the previous 2002 BUET Study /8/. In Bangladesh, imported coal (mainly from India) was in use for brick making. However, in recent days, coal importing for brick industries has been stopped /53/. Instead Bangladesh coal from Barapukuria Coal Mining Company Limited has been used in most of the current FCKs. Hence, the calorific value of coal supplied by the Barapukuria Coal Mining Company Limited has been used for baseline specific energy consumption /7/ and the baseline specific energy consumption has been fixed as 2.125 MJ/kg-for 2.9 kg conventional sized brick. In the



baseline FCK only coal is used for energy source. DNV cross checked the baseline specific energy consumption and the input parameters used in the calculation and found the calculations to be correct.

The approved baseline methodology has been correctly applied to identify a complete list of realistic and credible baseline scenarios, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

All the assumption and data used by the project participants are listed in the PDD and/or supporting documents. All documentation relevant for establishing the baseline scenario have been correctly quoted and interpreted in the PDD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD.

## 4.6 Additionality

The project additionality has been assessed as per Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities /60/. In order to demonstrate additionality of the project activity, investment barrier, technology barriers, barriers due to prevailing practise, other barriers at the Project Participant level have been chosen.

### 4.6.1 Evidence for prior CDM consideration and continuous actions to secure CDM status

#### Project start date:

The project activity is a bundle of 8 individual HHKs. As discussed above under section 4.2, the earliest implementation action has been initiated by Eeta and Tiles Ltd. On 10 January 2010 /20/ Eeta and Tiles Ltd. has signed the technology service agreement with the Nestor consulting limited which shows first financial commitment towards the project activity. Thus financial commitment for the HHK of Eeta and Tiles Ltd. has been taken as the starting date of the project activity. Hence start date of the project activity is 10 January 2010.

#### Prior CDM consideration:

The project proponent informed UNFCCC on 24 February 2010 /27/ and informed Bangladesh DNA on 9 March 2010 /31/ on this project activity and consideration of CDM benefits from the project.

Thus DNV considers that the project proponent notified the UNFCCC and the DNA of Bangladesh on CDM consideration of the project activity within six months of the project start date. Hence DNV conclude that CDM was seriously considered in the decision to implement the project activity.

#### Efforts to secure CDM status:

DNV had verified and found that potential benefit from CDM scheme were considered by the individual brick kiln owners on 24 December 2009 /16/, 11 January 2010 /21/ and 20 January 2010 /12/. The start date of the project activity is 10 January 2010 (implementation initiation of the first decision maker /12/). The validation activity of the project activity was started on 26 February 2010, with commencement of global stakeholder consultation process.

VALIDATION REPORT

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[Thus the gap between any two consecutive events is less than 2 years and hence DNV considers that continuing and real actions were taken to secure CDM status for the project activity.

It is DNV's opinion that the proposed CDM project activity complies with the requirements of the latest version of the guidance on prior consideration of CDM /65/.

#### **4.6.2 Identification of alternatives to the project activity**

In the project activity following two alternatives has been considered

1. Installation of HHK without CDM benefit
2. Installation of FCK (it is the most plausible baseline alternative)

DNV considers the listed alternatives to be credible and complete.

#### **4.6.3 Investment analysis**

In order to demonstrate additionality of the project activity, investment barrier has been chosen to establish availability of a financially more viable alternative to the project activity would have led to higher emissions.

##### **Choice of approach**

The CDM project activity and the alternative identified in section 4.6.2 generate financial or economic benefits other than CDM related income through sale of bricks. Therefore, the investment comparison analysis (Option II) or the benchmark analysis (Option III) is applicable to the project activity. Among these two options IIDFC has adopted the investment comparison analysis as the individual brick kiln owners have the choice of alternatives against the project activity for investment. The pre tax project internal rate of return (IRR) has been used as the financial indicator for the investment comparison analysis which is in line with the "*guidelines on the assessment of investment analysis*" /66/. IIDFC has also used Pay Back period of the project activity to demonstrate the investment barrier associated with the project activity. DNV considers the investment comparison analysis with IRR as the financial indicator to be an appropriate choice.

##### **Input parameters**

Completion of the draft Carbon Finance Assessment Memorandum dated 31 May 2006 indicates that significant prior work including consideration of the CDM was undertaken by the IIDFC and the Bank/49/. First financial analysis was done for the baseline FCK on 5 June 2006 /50/ based on the FCK data available on the year 2005. However, at that time IIDFC and as well as the World Bank did not have any financial analysis data of HHK to demonstrate the investment barrier because of lack of organised database in Bangladesh (an LDC), in particular in the brick making sector, which is poorly organised, seasonal in nature and regarded as a part of the informal sector. Being nodal agent of another bundle HHK project, IIDFC in later stage while financing the project of Diamond Auto Bricks in 2007 made first financial analysis on HHK /30/. Since IIDFC had no realistic data on HHK during the first project finance investment decision of Diamond Auto Bricks, available data were used for the assumption made in the IRR analysis of HHK /30/. Hence all the input parameters used for determination of pre-tax project IRR is based on available data at the time of financing to Diamond Auto Bricks. In reality, the project cost exceeded the estimated cost used in the IRR analysis. In the IRR analysis project cost of BDT 145.67 million /33/ is considered. However after successful implementation of HHK in Diamond Auto Bricks, the project cost reached 214.10 million /36/. In this bundle of HHK, construction of none of the HHK is completed.





## VALIDATION REPORT

The input parameters used for the investment analysis of FCK is based on the survey data of 17 FCKs in the year 2005 and 3 FCKs in the year 2010 /32/ /70/. The time period of the investment analysis is from 2005 to 2010 which is relevant as the project implementation is in between the year 2006 to 2012.

Moreover date of approvals of all individual HHK units is within the time period 24 December 2009 to 20 January 2010 (as mentioned in the section 4.2 of this report). In 2009, IIDFC as a CDM bundling agent for its similar project titled “Improving Kiln Efficiency in the Brick Making Industry in Bangladesh (UNFCCC # 5125)” received further financial data from a few additional HHKs recently constructed under that project. The same financial data has been used as input data for IRR analysis. Thus the input values used in the comparison analysis were available at the time of the investment decision of all individual HHK owners in line with the “*Guidelines on the assessment of investment analysis*” EB62 Annex 5 paragraph 6 /66/.

The salvage value has also been taken into account at the end of IRR analysis period /33/. In salvage value 100% of land cost, 50% of the building cost, 10% of machinery cost and 75% of inventory cost are considered which is also same as per the similar registered CDM project activity (UNFCCC # 5125) in Bangladesh.

In line with the “Guidelines for objective demonstration and assessment of barriers” version 1 /61/, “*for projects in Least Developed Countries it is sufficient to transparently describe the relevant barriers, as less stringency is needed with regards to data availability in the actual demonstration of barrier, as compared to the projects in other countries*” DNV considers the input parameters used in the investment comparison analysis to demonstrate the investment barrier to be appropriate.

### Calculation and conclusion

The financial comparison analysis has been done between one single sized HHK of 50 000 daily bricks production capacity and an average capacity FCK (brick production capacity 25 377 per day) /33/. It has been evidenced from the investment comparison analysis that the investment cost of one HHK is equivalent to 15 FCK having capacity of 25 377 daily brick production. Based on investment comparison analysis between one single sized HHK of 50 000 daily bricks production capacity and an average capacity FCK of 25 377 daily brick production the pre-tax project IRR are 14% and 40% for HHK and FCK respectively /33/. The payback period is 6.56 years for HHK with CERs, 7.21 year for HHK without CERs and 2.27 years for FCK. With CDM benefits, pre-tax project IRR for the HHK is 16%.

DNV has verified the calculations and confirm that with the CDM benefits, the pre-tax project IRR will improve, however it is still lower than the pre-tax project IRR of FCK. Hence it can be concluded that CDM benefit will alleviate the investment barrier associated with production of bricks through HHK route.

### Sensitivity analysis

The project’s financial analysis has been done with actual data. However to make the investment comparison analysis robust and realistic, a sensitivity analysis has been done by varying the values of input parameters which have more than or equal to 20% contribution in either total project costs or total project revenues. The following parameters have been considered for the sensitivity analysis /33/.

- Kiln, Dryer & other civil works



VALIDATION REPORT

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- Main machinery & equipment
- Total Investment
- Clay price
- Coal price
- Sales price of brick

Each of the above input parameters have been varied for  $\pm 10\%$  of respective assumptions and in all cases, the pre-tax project IRR of the project with or without CER revenues have been found to be below the IRR of the baseline FCK technology by a substantial margin.

Considering that investment comparison analysis has been adopted which is appropriate for the project activity, it is DNV's opinion that the sensitivity analysis is complete, and in any realistic situation pre-tax project IRR will not be higher than the pre-tax baseline IRR.

#### 4.6.4 Barrier analysis

In barrier analysis the PP has demonstrated the following barriers

- Technology Barriers
- Barriers due to prevailing practise
- Other Barriers at the Project Participant level

DNV validated all of the above mentioned barriers in line with the "Guidelines for objective demonstration and assessment of barriers" version 1 /61/, *"for projects in Least Developed Countries it is sufficient to transparently describe the relevant barriers, as less stringency is needed with regards to data availability in the actual demonstration of barrier, as compared to the projects in other countries"* and find the same acceptable.

##### Technology Barriers

DNV checked the market share of each brick kiln technology between the period 2006 and 2009. The market survey of brick industry in Bangladesh in the year 2006 revealed that FCK had the highest market share of 75.8% of total brick production /9/. The latest available market share was published by Department of Environment Bangladesh Government-Memo no: DOE/Enforcement/37, May 2010 /71/. In this document the data was available up to FY 2009. The market share of FCK is 93.65% based on percentage of total brick production. It has also been evidenced from the market survey 2009; all the share of BTK is converted to FCK technology.

DNV cross checked the existence of a technology barrier for HHK technology from the evidence that the use of the HHK technology in the sector is marginal e.g. below 10% which is possibly due to less technologically advanced alternative to the project activity with high energy consumption and thereby higher emissions having lower performance uncertainty than the new technology.

The market share of the HHK technology was zero when the CDM project Activity was initiated by IIDFC in October 2005. After more than 3 years, despite serious efforts by IIDFC to promote this technology through CDM, less than 10 HHKs have been constructed in Bangladesh. In Bangladesh only IIDFC acts as a bundler for implementing HHK in Bangladesh and no other HHK in Bangladesh has been implemented by IIDFC without CDM benefits. DNV has validated this, from the Department of Environment, Bangladesh Government: Current market share of all the brick kiln technology in Bangladesh Memo no: DOE/Enforcement/37, dated 4 May 2010 /39/.



This technological barrier is not relevant to FCK technology which has also been substantiated by the current market survey /48/.

DNV considers the technological barrier is real and appropriate for the project activity.

### **Barriers due to prevailing practise**

Being bundling agent of another HHK project IIDFC faced the barriers due to the prevailing practice which is till pertinent to this project activity. In this bundle of HHK most of HHK is future project and implementation schedule has been delayed which also proves the barriers due to prevailing practice. Till date only 10 HHK brick kiln was started operation and among which only two HHK achieve smooth operation. The technology is transferred from China. During the site visit DNV validated that local engineers and workers do not have, and have not acquired, the knowledge or experience to implement this technology on their own. Hence for implementation and initial operation of HHK, foreign experts were needed. This creates a significant constraint in diffusing the technology as baseline brick kiln owners are not able to implement the technology without external support including plans & drawings and specialists who understand the technology.

Moreover, the plant design could not be directly transferred from China without modification to local operating conditions. It has been evident from the fact; cracks developed in the foundation (SSL and Diamond kiln) among the two HHK of the first bundle of HHK /54/, which demonstrates different soil condition between China and Bangladesh. During the site visit DNV also verified that in another kiln of the bundle one the drying tunnel flooded as it was not foreseen that the high water table in Bangladesh would cause flooding. IIDFC now gathered this knowledge for successful implementation of HHK, however they are not sure what other barriers may prohibit the successful implementation of all the HHKs in the bundle.

These barriers due to prevailing practise are not relevant to FCK technology which has also been substantiated by the current market survey which shows 93.5% of brick produced is through FCK technology.

DNV considers the barriers due to prevailing practise to be real and appropriate for the project activity.

### **Other Barriers at the Project Participant level**

In the project activity 8 individual HHK owners have been involved and the project proponent IIDFC act as CDM bundler for all these 8 individual HHKs. Being financial institution IIDFC would like to finance all the HHKs. However the CDM benefit for the project activity will be achieved after successful registration and successful issuance of the CERs for the next 10 years. Thus, IIDFC also faced investment barriers for funding all the 8 HHKs on upfront basis. Each HHK owner has depended on different financial institutions (like Sheikh Brothers Enterprise Ltd. applied to Janata Bank Limited /37/) as one single financial institution has not agreed to provide funding of all the 8 HHKs. This created delays in project implementation.

In the first PIN approved by The World Bank some more entrepreneurs expressed interest to implement the HHK. However due to lack of prior experience in HHK, lack of data for demonstrating the project activity as CDM project and difficulty for arrangement of funding, 6 Kiln owners (Chairman Auto Bricks, M.H.C Ltd, S.A. Bricks Ltd., ACTM Brick Industries Ltd, Kazi Group, Karnaphully Group) had opted for dropping out from the project.

The other barriers at the project participant level are not relevant to FCK technology which has also been substantiated by the current market survey.



DNV considers the other barriers at the project participant level are real and appropriate for the project activity.

From the above discussion, it is DNV's opinion that the project activity faces significant investment barriers, technology barriers, barriers due to prevailing practice and other barriers at the project participant level; these are not faced by the selected baseline alternative. Thus the project activity is deemed additional (i.e. its ability to reduce anthropogenic emissions of greenhouse gases by sources below those that would have occurred in the absence of the registered CDM project activity).

## 4.7 Monitoring

The project monitoring plan is in compliance with the monitoring methodology AMS-II.D (version 12) /58/. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

It is DNV's opinion, that the project participants are able to implement the monitoring plan.

### 4.7.1 Parameters determined ex-ante

The monitoring plan /1/ contains all necessary parameters as required by the methodology AMS-II.D, version 12 /58/. In compliance with the methodology, the following parameters have been determined *ex-ante* by the project proponent and will remain fixed for the entire crediting period:

- Carbon emission factor for per energy unit of coal: as the host country Bangladesh does not facilitate availability of local and national level carbon emission factor of coal, IPCC default value has been used and this is justified. The value is 25.80 tC/TJ /69/
- Carbon to CO<sub>2</sub> conversion factor: The value is 3.66 and is the stoichiometric combustion ratio.
- Grid emissions factor per MWh of power produced; DNV confirms that grid emission factor calculation is in line with "*Tool to calculate the emission factor for an electricity system*" version 2 /62/. The grid emission factor provided by the Bangladesh Designated National Authority vide letter dated 9 Feb 2011 has been considered for the project activity /41/. The grid emission factor has been calculated for the time period 2007 to 2009. The value is 0.62tCO<sub>2</sub>e/MWh.
- Specific energy consumption of the existing FCK in Bangladesh: The value has been calculated based on the coal calorific value of Barapukuria Coal Mining Company Limited (BCMCL). In the baseline this coal would have been used. In the absence of published data, calorific value of Barapukuria Coal 6,135 Kcal/Kg (as measured for this project) /7/ and coal use of 24 tonnes per 100,000 bricks were utilized /8/ /9/ to calculate the Specific Fuel Consumption per kg - bricks in the baseline (FCK) technology. The value is  $2.125 \times 10^{-6}$  TJ/kg-brick.
- Specific Fuel (Coal) Consumption per unit FCK brick : The value of coal use of 24 tonnes per 100,000 bricks has been verified from the following documents:  
Clean Development Mechanism Project Opportunities in Bangladesh, Pre-Feasibility Report on a Brick Manufacturing Fuel Substitution CDM Project, Bangladesh University of Engineering, October 2002, Table A, pg 3, /8/.



Emissions Baseline Report for the IKEBMI Project (PDF-B Phase BGD/04/014) by The Louis Berger Group, Washington DC June 2006 Table 2, pg 3 /47/.

The value is 0.24 kg coal/brick

- Calorific Value of the coal used in the baseline: The value has been verified from the *website* of Barapukuria Coal Mining Company Limited. The value is 6,135 Kcal/Kg /7/
- Weight of per unit FCK brick: The value has been verified from the study carried by IIDFC “Weight of Bricks in Bangladesh”, 2009 /40/. The value is 2.9 kg/brick
- Weighted average net calorific value of Diesel (fuel type) in year *y*; as the host country does not facilitate availability of local and national level carbon emission factor, IPCC default value has been used and this is justified. Thus IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories /69/ has been used. The value is 0. 036509 TJ/Kilolitre. The density of diesel considered as 0.8432 kg/liter.
- Weighted average CO<sub>2</sub> emission factor of Diesel (fuel type *I*) in year *y*; as the host country does not facilitate availability of local and national level carbon emission factor, IPCC default value has been used and this is justified. Thus IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories /69/ has been used. The value is 74.8 tCO<sub>2</sub>/TJ.

#### 4.7.2 Parameters monitored ex-post

In compliance with the methodology, the following parameters will be monitored on *ex-post* basis:

- Total consumption of coal for brick making in brick plant *i* in year *y*. The data will be monitored by Weigh Bridge at kiln property. The quantity of coal consumed will be cross checked against supplier invoices and against a coal register in those instances where a coal register is kept. The most conservative quantity of total coal used (procured versus measured) will be considered in the project emission calculation. The project activity has been implemented in individual 3 HHKs owners whose financial capacity is limited for implementation of dedicated weigh bridges for each HHK unit. The 4 EETA and Tiles Kilns will all be on one site and will make use of bulk coal and diesel procurement storage and monitoring as well as bulk electricity purchase. Therefore the 4 kilns will have to be treated as one for purpose of monitoring and calculation of CERs and the consumption monitored together for all the four kilns. The same will apply to the 2 Bricks 2010 kilns. The parameter will be monitored on daily basis and aggregated on monthly basis. Bangladesh Standards and Testing Laboratory (BSTI) is the legally designated body for providing calibration services. The project participant will review whether they can provide a standard and do calibration every two years. If not, it will be seen if the manufacturer standard can be adopted and their service availed for calibration, in case they can provide the same. Sheikh Brother kilns may be monitored separately or together depending on final plant design and construction schedule.
- Net Calorific Value of coal used in *y*<sup>th</sup> year in brick plant *i*. This will be monitored from the data provided by the supplier and independently verified by a credible Bangladesh laboratory. A composite sample of 1 kg coal will be taken from each new



consignment of coal from the individual HHK. At the end of each quarter all of the samples taken in that quarter will be crushed and mingled to produce a representative sample for that quarter and will be laboratory tested to determine the net calorific value of coal used for that particular quarter and the value will be reported in the quarterly report.

- Daily productions of bricks in kiln i. The daily production (units of bricks manufactured) will be counted manually and noted in log sheets. The amount of bricks manufactured at the end of each monitoring period will be cross checked with the invoices for the sale of bricks and the stock in the plant. EETA and Tiles brick production from its 4 kilns will be considered as one kiln as all the four kilns are located within the same plant premises. Same will apply to Bricks 2010. Sheikh Brother kilns may be monitored separately or together depending on final plant design and construction schedule
- Daily mean weight of baked HHK bricks in kiln i. The average weight of bricks will be calculated as per the General Guidelines for Sampling and Surveys for Small Scale CDM Project Activities /63/ using load cell / weighing scale. At each production day, a sample size of 100 bricks will be taken as per the sampling plan (90% confidence level and margin of error for 10% precision) will be weighed separately and mean daily weight will be calculated.
- Specific Energy Consumption in brick kiln i. This will be calculated based on the total coal consumption, coal NCV and brick production.
- Number of operational days of the kiln i in a year. This will be monitored by individual kiln operator and recorded in the plant log book.
- Quantity of diesel (fuel type) combusted in process j during the year y. This will be monitored by flow meters and recorded each day. At the end of the monitoring period the diesel drawn will serve as the diesel consumed. Data will be included in the monthly report. At the end of each year total consumption will be calculated. The most conservative amount of diesel used (procured versus measured) will be considered in the project emission calculation. Bangladesh Standards and Testing (BSTI) Laboratory is the legally designated body for providing calibration standards and services and will be requested every 2 years to calibrate the flow meter. It is understood that BSTI is able to check volumes through using measuring jars. Project Participant may need to make alternative arrangements to demonstrate accuracy of gauges if BSTI cannot provide a service. Diesel will be consumed by one or more generator for all 4 EETA and Tiles kilns and one or more generator for the 2 Bricks 2010 kilns. Hence the 4 EETA and Tiles kilns will be treated as 1 and the 2 Bricks 2010 kilns will be treated as one for monitoring of diesel. Sheikh Brother kilns may be monitored separately or together depending on final plant design and construction schedule.
- Electricity consumption in plant i per year. This will be monitored by electricity meter (from utility or the electricity supplier). Monthly electricity bill for payment to utility by individual kiln owner will be used to calculate the total electricity consumption of the month and will be noted in the monthly report which will in its turn be used for the annual energy consumption compilation. Electricity will be monitored from the energy meter which will measure all the electricity consumption within the industrial premises. This is conservative as not only the electricity consumption for the project activity is considered but also total electricity consumed within the kiln property is considered. The 4 EETA and Tiles kilns will be served by one or more meter and the 2





Tiles 2010 kilns will also be served by one or more meter. Therefore the 4 EETA and Tiles kilns will be treated as one and the 2 Bricks 2010 kilns will be treated as one by adding up the readings from various meters, if any. As the electricity meter belongs to the Utility they are responsible for calibration as per their established standards. Sheikh Brother kilns may be monitored separately or together depending on final plant design and construction schedule.

#### 4.7.3 Management system and quality assurance

IIDFC has framed a good management system and quality assurance system to monitor the emission reductions of all 8 HHKs. The data relevant to the project will be monitored and recorded manually by the plant operators. The individual plant owners (entrepreneurs) will monitor the data for their respective plants based on daily brick production and weight of the bricks. Coal and diesel used in the project activity will be monitored from the invoices of the respective suppliers by individual plant owners. Plant owners will collect the coal sample on consignment basis and will send to the laboratory on a quarterly basis for NCV measurement. All data will be recorded daily in the plant registers and once a month this will be compiled and delivered to IIDFC. Each individual Kiln owner will employ a competent person in his plant as CDM monitoring and compliance officer who will collect all the monitoring data and supply it to IIDFC at the end of each month. IIDFC will prepare the final compiled emission reduction calculation data sheet which could be verified by the DOE during verifications with in the crediting period.

IIDFC will conduct onsite training and quality control programs as and when required to ensure that good management practices are ensured and implemented by all project operating personnel in terms of recordkeeping, equipment calibration, overall maintenance, and procedures for corrective action

#### 4.8 Algorithms and/or formulae used to determine emission reductions

The emission reductions have been calculated using conservative and realistic estimates. The baseline emissions have been calculated as per the following formulae:

$$BE_{FCK\ i, y} = TP_{Bricks, i, y} * SEC_{FCK, Bricks, y} * CEF_{coal} * CF$$

Where,

$BE_{FCK\ i, y}$	Baseline emissions per year for the $i^{th}$ plant
$TP_{Bricks, i, y}$	Total Production of bricks per year in HHK plant i (Kg-bricks/year)
$SEC_{FCK, Bricks, y}$	Specific Energy Consumption in FCK technology (TJ/Kg-brick)
$CEF_{coal}$	IPCC default Carbon Emission Factor for fuel used (tC/TJ)
CF	Carbon to CO <sub>2</sub> Conversion Factor

The project emission has been calculated as per the following formulae:

$$PE_{HHK\ i, y} = (SEC_{i, y} * TP_{Bricks, i, y} * CEF_{coal} * CF) + EC_{i, y} * EF_{CO_2, ELEC} + PE_{FC, j, y}$$

Where,

$PE_{HHK\ i, y}$	Project emissions from operation of $i^{th}$ plant in year y
$SEC_{i, y}$	Specific Energy Consumption in plant i (TJ/kg-brick)
$TP_{Bricks, i, y}$	Total Production of bricks per year in plant i (Kg-bricks/year)
$CEF_{coal}$	IPCC default Carbon Emission Factor for fuel used (tC/TJ)
CF	Carbon to CO <sub>2</sub> Conversion Factor (tCO <sub>2</sub> /tC)
$EC_{i, y}$	Electricity Consumption in plant i per year (MWh)



## VALIDATION REPORT

$EF_{CO_2, ELEC}$  Estimated  $CO_2$  emissions factor for grid electricity in Bangladesh ( $tCO_2/MWh$ )

$PE_{FC,j,y}$   $CO_2$  emissions from fossil fuel combustion in process  $j$  during the year  $y$  ( $tCO_2/yr$ ) in HHK plant  $i$ .

Specific Energy Consumption in plant  $i$  ( $TJ/kg$ -brick) will be calculated by the following formulae:

$$SEC_{i,y} = (TC_{Coal\ i,y} \times NCV_{Coal\ i,y} / TP_{Bricks, i,y})$$

Where,

$TC_{Coal\ i,y}$  Total consumption of coal per year for plant  $i$  (Kg)

$NCV_{Coal\ i,y}$  Weighted average net Calorific Value of coal used in  $y^{th}$  year in plant  $i$  ( $TJ/Kg$ )

$TP_{Bricks, i,y}$  Total Production of bricks per year in plant  $i$  (Kg-bricks/year) will be calculated by the following formulae:

$$TP_{Bricks, i,y} = \sum_{d=1}^n DP_{bricks\ di} \times DMW_{HHK\ brick, i}$$

Where,

$DP_{bricks\ di}$  Daily production of bricks in Kiln  $i$  (bricks/day)

$DMW_{HHK\ bricks\ di}$  Daily Mean Weight of HHK Bricks in kiln  $i$  (Kg/brick)

$n$  Total no. of production days for Kiln  $i$  in a year

$CO_2$  emissions from fossil fuel combustion in process  $j$  during the year  $y$  ( $tCO_2/yr$ ) in HHK plant  $i$ . will be calculated by the following formulae:

$$PE_{FC,j,y} = FC_{Diesel, j, y} \times COEF_{Diesel, y}$$

Where,

$FC_{Diesel, j, y}$  Quantity of diesel (fuel type) combusted in process  $j$  during the year  $y$  (Kilolitre /yr);

$COEF_{Diesel, y}$   $CO_2$  emission coefficient of diesel (fuel type) in year  $y$  ( $tCO_2/ Kilolitre$ )

$CO_2$  emission coefficient of diesel (fuel type) in year  $y$  ( $tCO_2/ Kilolitre$ ) will be calculated by the following formulae:

$$COEF_{Diesel, y} = NCV_{Diesel, y} \times EF_{CO_2, Diesel, y}$$

Where,

$NCV_{Diesel, y}$  Weighted average net calorific value of Diesel (fuel type) in year  $y$  ( $TJ/Kilolitre$ )

$EF_{CO_2, Diesel, y}$  Weighted average  $CO_2$  emission factor of fuel type  $i$  in year  $y$  ( $tCO_2/TJ$ )





Since the HHKs implemented under the project are new HHKs and it is a green field project, there is no leakage emission due to transfer of equipment from another activity.

The emission reduction estimated in the PDD can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration. The data sources mentioned have been verified by DNV. The source of all ex-ante fixed data has been described in section 4.7.1 of the report.

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average *ex-ante* estimation of emission reduction conservatively calculated to be 40 104 tCO<sub>2</sub>e per year for the selected crediting period.

All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

#### 4.9 Environmental impacts

In the project activity three clearances for documenting and mitigating the environmental impacts of the project activity were required:

1. Bangladesh “Environmental Clearance” permits
2. Compliance to the World Bank’s safeguard policies
3. Air quality management

All of the individual Kiln owners have applied for Bangladesh “Environmental Clearance” permits. Government decides to approve or not approve the Environmental Clearance request upon receipt and depending on the status of project planning and implementation. These clearance requests are at varying stages of submission and approval by Government as provided below/14/ /18/ /23/.

Name of Entrepreneur	Clearance Permits Status
Eeta and Tiles Ltd. (Kiln 1)	Approval Clearance Number 256, approved on 01 April 2010 as part of Eeta and Tiles kilns on the same site. Renewed on 15 April 2012 /18/.
Eeta and Tiles Ltd. (Kiln 2)	Approval Clearance Number 256, approved on 01 April 2010 as part of Eeta and Tiles kilns on the same site. Renewed on 15 April 2012 /18/.
Eeta and Tiles Ltd. (Kiln 3)	Approval Clearance Number 256, approved on 01 April 2010 as part of Eeta and Tiles kilns on



	the same site. Renewed on 15 April 2012 /18/.
Eeta and Tiles Ltd. (Kiln 4)	Approval Clearance Number 256, approved on 01 April 2010 as part of Eeta and Tiles kilns on the same site. Renewed on 15 April 2012 /18/.
Shiekh Brother's Enterprises Ltd. (Kiln 1)	Application for clearance requested on 13 January 2010. Government of Bangladesh acknowledge the application on 29 February 2010 /23/. However due to some delays in project finalization, application may be resubmitted once the kiln owner is clearer on his final plans for commissioning. Still expected commissioning date is 1 June 2013 /42/.
Shiekh Brother's Enterprises Ltd. (Kiln 2)	Application for clearance requested on 13 January 2010. Government of Bangladesh acknowledge the application on 29 February 2010 /23/. However due to some delays in project finalization, application may be resubmitted once the kiln owner is clearer on his final plans for commissioning. Still expected commissioning date is 1 June 2013 /42/.
Bricks 2010 Ltd. (Kiln 1)	Approval Clearance Number 514, approved on 05 August 2010 as part of Bricks 2010 Ltd kilns on the same site. Renewed on 06 February 2012 /14/.
Bricks 2010 Ltd. (Kiln 2)	Approval Clearance Number 514, approved on 05 August 2010 as part of Bricks 2010 Ltd kilns on the same site. Renewed on 06 February 2012 /14/.

The LoA received from Government of Bangladesh makes no mention of a need for an environmental impact assessment as this is not required.



The project has triggered World Bank safeguard policy on Environmental Assessment Policy O.P./B.P.4.01 /45/. As the project is rated as category B in terms O.P./B.P.4.01 the project will have some impacts but that they can be mitigated.

In compliance with O.P./B.P.4.01, IIDFC completed a report entitled “Environmental Management Framework for HHK Project” (EMF Report) /43/. The report identifies the project risks to the environment, mitigation actions and responsibilities for the implementation of the mitigation actions/plan. Also the project activity demonstrates excellent air quality management /46/. It appears that air quality management in the project activity is better than the baseline FCK technology.

#### **4.10 Comments by local stakeholders**

The meetings as part of local stake holder consultation process were attended by local residents and other stakeholders including the BBMOA, IIDFC, Social Consultant from World Bank, HHK Technology Provider, Traditional brick field owners, Mayor of the Municipality, representatives of local governments and in on instances, Members of Parliament and Member of the Parliamentary Standing Committee on Environment and Climate change. IIDFC initiated site specific HHK CDM stakeholder consultations in a public meeting and workshop format during the January - February 2010 period /44/. Individual brick kiln owners conducted stake holder consultation meeting individually to invite comments by local stake holders /13/ /19/ /22/. The project did not receive any adverse comments during the stakeholder consultation and hence no mitigating actions were required. DNV considers the local stakeholder consultation carried out adequately.

#### **4.11 Comments by Parties, stakeholders and NGOs**

The PDD, version 01 dated 24 February 2010, was made publicly available on the CDM website

(<http://cdm.unfccc.int/Projects/Validation/DB/E6QHOGX6LMO0YGD7N73EKSWR7W0I3U/view.html>) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 26 February 2010 to 27 March 2010.

No comment was received.

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## **APPENDIX A**

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### **CDM VALIDATION PROTOCOL**

**Table 1 Mandatory requirements for Clean Development Mechanism (CDM) project activities**

Requirement	Reference	Conclusion
<b>About Parties</b>		
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
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. 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
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
<b>About additionality</b>		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK

Requirement	Reference	Conclusion
that would have occurred in the absence of the registered CDM project activity.		
<b>About forecast emission reductions and environmental impacts</b>		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
<b>About small-scale project activities (if applicable)</b>		
12. 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
13. 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
14. 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
<b>About stakeholder involvement</b>		
15. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
<b>Other</b>		
17. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
18. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
19. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
20. Provisions for monitoring, verification and reporting shall be in accordance with	CDM Modalities and Procedures §37f	OK

Requirement	Reference	Conclusion
the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.		



**Table 2 Requirements checklist**

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<b>A General description of project activity</b>					
<b>A.1 Title of the project activity (VVM para 55-57)</b>					
A.1.1 Does section A.1 of the PDD include a clearly identifiable project title, version number of the PDD and date of the PDD?	/1/	DR	<input checked="" type="checkbox"/> Clearly identifiable title of the project activity <input checked="" type="checkbox"/> Version number of the PDD is included <input checked="" type="checkbox"/> Date of the PDD is included.		OK
A.1.2 Is the PDD is in accordance with the applicable requirements for completing PDDs?	/1/	DR	<input checked="" type="checkbox"/> Yes <i>If no, list where the PDD is not in accordance:</i>		OK
<b>A.2 Description of the project activity (VVM para 58-64 and VVM para 135 and 136 (a) &amp; (c) for small-scale project activities, as applicable)</b>					
A.2.1 How was the design of the project assessed?	/1/	DR	<i>What type is the project?</i> <input type="checkbox"/> Project in existing facility or utilizing existing equipment(s) <input type="checkbox"/> Project is either a large scale project or a small scale project with emission reductions exceeding 15 000 tCO <sub>2</sub> e per year. In this case, a site visit must be performed. <input type="checkbox"/> Project is a bundled small scale project, with each project in the bundle with emission reductions not exceeding 15,000 tCO <sub>2</sub> e per year. In such case the number of physical site visits may be based on sampling, if the sampling size is appropriately justified through statistical analysis.		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<input type="checkbox"/> The project is an individual small scale project activity with emission reductions not exceeding 15 000 tCO <sub>2</sub> e per year. In this case, DOE may not conduct a physical site visit as appropriate. <input checked="" type="checkbox"/> Greenfield project  <i>How was the design of the project assessed?</i> <input checked="" type="checkbox"/> Physical site inspection <input type="checkbox"/> Reviewing available designs and feasibility studies <i>If a physical site inspection is not undertaken, justify why no site visit was undertaken:</i>		
A.2.2 If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/	DR	<p>All the eight HHK brick kilns are future project. Among them two are under construction and others will start in future in the year 2012 and 2013.</p> <p>The project proponent has provided the detail progress status of all the individual HHK brick plants.</p>		OK
A.2.3 If physical site visits were performed based on sampling (only applicable for bundled small scale projects, each with emission reductions not exceeding 15 000 tCO <sub>2</sub> e per year), justify the sampling through a statistical analysis:	/1/	DR	<p>The project activity is a bundle of eight individual HHK brick kilns. The physical site visit was done for four HHK brick kilns of Eeta and Tiles Ltd. where land development is under progress. Site visit was not carried out for other HHK brick kilns as construction for those is yet to be started. However DNV validation team has carried out follow up audits with the representatives of M/s Bricks 2010 Ltd and M/s Sheikh Brothers Enterprises Ltd.</p>		OK
A.2.4 Is the description of the proposed CDM project activity as	/1/	DR	Although Eeta and Tiles Ltd. have 4 HHK brick		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity?		/26/		<p>kiln of capacity 50 000 bricks/day each, only two of them are mentioned in the PDD. DNV has confirmed from the Project Idea Note submitted to The World Bank dated 28 November 2008 that all four units of Eeta and Tiles Ltd. are within the scope of the proposed CDM project under consideration.</p> <p>The description of the proposed CDM project activity as contained in the revised PDD sufficiently covers all relevant elements and is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity</p>		
A.2.5	Does the project activity involve alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/	DR	As all the eight HHK brick kilns are green field project the project activity does not involve alteration of existing installations		OK
A.2.6	Does the project design engineering reflect current good practices?	/1/	DR	The HHK brick kiln is the more efficient brick manufacturing technology than FCK, BTK, Zig Zag and Hoffmann Gas. Thus the project design reflects current good practice in brick manufacturing sector of Bangladesh.		OK
A.2.7	Would the technology result in a significantly better performance than any commonly used technologies in the host country? Is any transfer of technology from any Annex-I Party involved?	/1/ /8/ /9/	DR	The HHK brick kiln results significantly better performance than any commonly used brick kiln technology in Bangladesh. The technology has been transferred from China, which is a non Annex -I Party		OK
A.2.8	Does the project qualify as a small scale CDM project activity as defined in paragraph 6(c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	The project being an energy efficiency project by implementation of HHK brick kilns with an estimated equivalent thermal energy saving of 131 GWh <sub>thermal</sub> , which is lower than the stipulated 180 GWh thermal generation capacity.		OK
A.2.9	Is the small scale project activity a debundled component of a	/1/	DR	The project activity is a bundle of eight		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
larger project activity in accordance with the rules defined in appendix C of the simplified modalities and procedures for small-scale CDM project activities?				individual HHK brick kilns. Previously there was no registered project with same methodology, same technology by the same individual HHK brick kiln owners within a distance of 1 km from the individual HHK project boundaries. Thus the project is not a de-bundled component of a larger project activity.		
<b>A.3 Participation requirements (VVM para 51-54, 125-127)</b>						
A.3.1	Do all participating Parties fulfil the participation requirements as follows:	/1/	DR	The Department of Environment is the DNA of Bangladesh. The Ministry of Climate and Energy is the DNA of Denmark. Bangladesh ratified the Kyoto Protocol on 22 October 2001. Denmark ratified the Kyoto Protocol on 31 May 2002. Both Parties have confirmed their voluntary participation.		OK
				Bangladesh (host)      Denmark		
	a) Party has ratified the Kyoto Protocol			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
	b) Party has designated a Designated National Authority			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
A.3.2	Do the letters of approval meet the following requirements?	/1/ /55/ /56/	DR	The project Proponent has provided the letter of approval from all the Parties involved in the project activity.		OK
				Bangladesh (host)      County X		
	a) LoA confirms that Party has ratified the Kyoto Protocol			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
	b) LoA confirms that participation is voluntary			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
	c) The LoA confirms that the project contributes to the			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No      NA		

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
sustainable development of the host country?						
d) The LoA refers to the precise project activity title in the PDD		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
e) The LoA is unconditional with respect to (a) to (d) above		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
f) The LoA is issued by the respective Party's DNA		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
g) The LoA was received directly by the DNA or the PP		<input type="checkbox"/> DNA <input checked="" type="checkbox"/> PP		<input type="checkbox"/> DNA <input checked="" type="checkbox"/> PP		
h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic						
A.3.3	Have all private/public project participants been authorized by an involved Party?	/1/ /55/ /56/	DR	The project proponent has provided the letter of approval from all the Parties involved in the project activity.		OK
<b>A.4 Technical description of the project activity (VVM para 58-64)</b>						
A.4.1	Is the project's location clearly defined?	/1/	DR	Yes project's location has been clearly defined. Seven kilns located in Dhaka division and one kiln is in Sylhet division of Bangladesh		OK
<b>A.5 Public funding of the project activity</b>						
A.5.1	In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided 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?	/1/ /3/ /38/	DR	No public funding/Overseas Development Assistance has been involved in the project activity.		OK
<b>B Application of a baseline and monitoring methodology</b>						
<b>B.1 Methodology applied (VVM para 65-76 and VVM para 136 (b) for small-scale project activities, as applicable)</b>						
B.1.1	Does the project apply an approved methodology and the	/1/	DR	Approved small scale methodology AMS-II.D,		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
correct and valid version thereof?				version 12 has been applied for the project, which was pertinent at the time of web hosting.		
B.1.2	If applicable, has any specific guidance provided by the CDM EB in respect to the applied methodology been considered?	/1/	DR	Not applicable		OK
B.1.3	If the project applies a small-scale methodology, does the project also comply with the general guidelines to SSC CDM methodologies, which provides guidelines on equipment capacity, equipment performance/lifetime, baseline identification for type-II/III Greenfield project activities, sampling and other monitoring-related issues?	/1/	DR	The project has also been complied with the general guidelines to SSC CDM methodologies, which provides guidelines on equipment capacity, equipment performance/lifetime, baseline identification for type-II/III Greenfield project activities, sampling and other monitoring-related issues		OK
<b>B.2</b>	<b>Applicability of methodology (and tools) (VVM para 65-76)</b> <i>Insert a row for each applicability criteria of the applied methodology (and tools)</i>					
B.2.1	How was it validated that project complies with the following applicability criteria: This category comprises any energy efficiency and fuel switching measure implemented at a single industrial or mining and mineral production facility. This category covers project activities aimed primarily at energy efficiency	/1/	DR	The project activity comprises energy efficiency in brick manufacturing process by implementing HHK in the place of FCK.		OK
B.2.2	How was it validated that project complies with the following applicability criteria: The measures may replace, modify or retrofit existing facilities or be installed in a new facility.	/1/	DR	All the HHK brick kilns are new facility and future projects.		OK
B.2.3	How was it validated that project complies with the following applicability criteria: The aggregate energy savings of a single project (inclusive of a single facility or several facilities) may not exceed the equivalent of 60 GWh <sub>e</sub> per year. A total saving of 60 GWh <sub>e</sub> per year is equivalent to a maximal saving of 180 GWh <sub>th</sub> per year in fuel input.	/1/	DR	The project being an energy efficiency project by implementation of HHK brick kilns with an estimated equivalent thermal energy saving of 131 GWh <sub>thermal</sub> , which is lower than the stipulated 180 GWh thermal generation capacity.		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2.4	How was it validated that project complies with the following applicability criteria: This category is applicable to project activities where it is possible to directly measure and record the energy use within the project boundary (e.g. electricity and/or fossil fuel consumption)	/1/	DR	The use of primary fossil fuel (coal) for brick production and electricity and or diesel consumption to operate plant equipments (if any) can be directly measured and recorded in the plant premises as per the standard monitoring procedure.		OK
B.2.5	How was it validated that project complies with the following applicability criteria: This category is applicable to project activities where the impact of the measures implemented (improvements in energy efficiency) by the project activity can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity (signal to noise ratio).	/1/	DR	In the project activity reduction in the coal consumption is achieved only by following energy efficiency measures: - Mixing of pulverized coal into the wet clay in each brick which then bakes the brick from the inside - Improved heat retention in the kilns to capture waste heat for recirculation in the drying tunnel. Moreover production of bricks has been well defined. Thus other variables has not influenced improvements in energy efficiency (signal to noise ratio)		OK
B.2.6	Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/ /9/ /39/	DR	As per the applied methodology AMS-II.D, version 12, In the case of a new facility the energy baseline consists of the facility that would otherwise be built. It has been evidenced from the UNDP project report on “Improving Kiln Efficiency in the Brick Making Industry (IKEBMI)” by M/s Global Environment Facility dated 20 October 2009 that market share of FCK technology in Bangladesh is 76%. Hence selection of FCK technology as the project baseline is justified.  Current Market share of different technologies in 2010 from Department of Environment shows the FCK market share as 92%. Thus during the start		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			date of the project activity the market share of FCK is predominant in Bangladesh. Thus in line with the methodology AMS-II.D, version 12, In the case of a new facility the energy baseline consists of the FCK that would otherwise be built.		
<b>B.3 Project boundary (VVM para 78-80)</b>					
B.3.1 What are the project's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/	DR	The project boundary has been defined as the physical, geographical area of each of the eight brick production facilities where HHK technology will be installed. Thus project boundary is clearly defined and in accordance with the methodology.		OK
B.3.2 Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/	DR	CO <sub>2</sub> has been identified as the only GHG sources for the project. The identify boundary covers all possible GHG sources linked to the project activity. During site visit DNV personnel evidenced the project site and the project boundary and also confirmed identified GHG source is accurate.		OK
B.3.3 Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/	DR I	The project does not involve other emission sources not foreseen by the methodology.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<b>B.4 Baseline scenario determination (VVM para 81-88, 105-107)</b> <i>Ensure that the evaluation of all alternatives provided in the PDD and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. Check that all alternatives required to be considered by the methodology are included in the final PDD. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this.</i>					
B.4.1 Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/	DR	Total four type of baseline technology of brick kiln has been considered. Those are FCK, BTK, Zig Zag and Hoffmann Gas. The list of the baseline scenario has been completed.		OK
B.4.2 How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/ /9/ /39/	DR	<p>The FCK has been selected as the baseline technology since it is most common practice than BTK, Zig Zag and Hoffmann Gas brick manufacturing technology and meets legal requirements. Among these technologies FCK covers 76% of market share. Thus in absence of the project activity same capacity FCK would have been installed.</p> <p>Current Market share of different technologies in 2010 from Department of Environment shows the FCK market share as 92%. Thus during the start date of the project activity the market share of FCK is predominant in Bangladesh. Thus in line with the methodology AMS-II.D, version 12, In the case of a new facility the energy baseline consists of the FCK that would otherwise be built.</p>		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.4.3	What is the baseline scenario?	/1/	DR	The baseline scenario is FCK based brick manufacturing process		OK
B.4.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR	Yes the baseline scenario is in accordance with the guidance in the methodology AMS-II.D version 12		OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /8/ /9/	DR	The base line emission has been assessed by the studies between the years 2002 to 2009. It has been evidenced form the studies coal consumption in FCK has been changed from 22 ~ 26 tonnes of coal per 100 000 bricks to 24 tonnes of coal per 100 000 bricks. The baseline scenario has been determined using conservative assumption to 24 tonnes of coal per 100 000 bricks and the baseline specific energy consumption has been fixed as 2.125 MJ/kg-brick for a 2.9 kg conventional sized brick		OK
B.4.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /8/ /9/	DR	Yes, relevant national and sectoral policies of brick manufacturing in Bangladesh have been taken into account.		OK
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Yes, the baseline scenario determination is compatible with the available data and all literature and sources are referenced.		OK
B.4.8	Is the baseline determination adequately documented in the PDD? <ul style="list-style-type: none"> <li>All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced.</li> <li>All documentation is relevant as well as correctly quoted and interpreted.</li> <li>Assumptions and data can be deemed reasonable</li> </ul>	/1/ /7/ /8/ /9/ /10/ /11/	DR/I	Yes the baseline determination adequately documented in the PDD. <ul style="list-style-type: none"> <li>All assumptions and data used by the project participants has been listed in the PDD</li> <li>All documentations are relevant as well as correctly quoted and interpreted.</li> <li>Assumptions and data could be deemed reasonable</li> </ul>		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<ul style="list-style-type: none"> <li>Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD.</li> <li>The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity</li> </ul>			<ul style="list-style-type: none"> <li>Relevant national and/or Sectoral policies in brick manufacturing industry of Bangladesh has been considered.</li> <li>Finally the methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity</li> </ul>		
<b>B.5 Additionality determination (VVM para 94-121 and VVM para 137 for small-scale project activities, as applicable)</b>					
B.5.1 What approach/tool does the project use to assess additionality? Is this in line with the methodology? In case of small-scale CDM project activities, is Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities applied considering also the “Non-binding best practice examples to demonstrate additionality for SSC project activities”.	/1/	DR	The project additionality has been assessed as per Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities. This is in line with the applied methodology.		OK
B.5.2 Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR	Yes the regulatory requirements have correctly been taken into account to evaluate the project activity and the alternatives. All identified alternatives including the project activity all the alternatives meet regulatory requirements of Bangladesh.		OK
B.5.3 Is sufficient evidence provided to support the relevance of the arguments made?	/1/ /61/	DR	In the latest version of the PDD investment analysis has been done. In line with guidelines for objective demonstration and assessment of barriers; Guideline 7 “for projects in Least Developed Countries” DNV confirms that the relevant barriers (including investment analysis) has been transparently describe, as less stringency is needed with regards to data availability in the		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				actual demonstration of barriers, as compared to the projects in other countries.		
B.5.4	What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/1/	DR	<p>The project additionality has been demonstrated based on a barrier analysis, arguing that the barriers to project implementation are</p> <ul style="list-style-type: none"> <li>➤ Investment barrier</li> <li>➤ Technical barrier</li> <li>➤ Prevailing practice barrier</li> <li>➤ Other barriers</li> </ul> <p>Under the investment barrier the project proponent did the investment comparison analysis between baseline FCK technology and HHK technology.</p>		OK
<b>Prior consideration of CDM (VVM para 98-103)</b>						
B.5.5	What is the evidence for serious consideration of CDM prior to the time of decision to proceed with the project activity?	/1/ /6/ /12/ /16/ /17/ /21/ /24/ /49/ /51/	DR	<p>Prior to decision to precede with the project activity all individual brick kiln owners have considered CDM revenue.</p> <p>All brick kiln owners signed emission reduction trading agreement with IIDFC before implementation of the projects.</p> <p>More over Completion of the draft Carbon Finance Assessment Memorandum indicates that significant prior work including consideration of the CDM was undertaken by the IIDFC and the Bank. This is the first project record available with the Bank. It has been evidenced from the first PIN approval dated 1 November 2006 for the HHK brick kiln project that CDM was considered in the year of 2006 before the start date of the project activity dated</p>		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				10 January 2010 on which first HHK (Eeta and Tiles Ltd. Kiln-1 and kiln-2) signed the agreement signed with the Technology Provider for creating its first financial commitment..		
B.5.6	If the starting date is after 2 August 2008 and before the global stakeholder consultation, has the DNA and UNFCCC confirmed that the project participants have informed in writing of the project's intention to seek CDM status?	/1/ /27/ /31/	DR	The start date of the project activity is after 2 August 2008. The start date of the project activity is 10 January 2010. Within 6 months from the start date of the project activity PP informed UNFCCC on 24 February 2010 and informed Bangladesh DNA on 9 March 2010.		OK
<b>Investment analysis (VVM para 108-114)</b> <i>The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation.</i>						
B.5.7	Does the project activity or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PDD?	/1/	DR	It has been evidenced from the latest version of the PDD the project activity HHK brick kiln and baseline alternative FCK generate revenue apart from CDM.		OK
B.5.8	Do any of the alternatives to the project activity involve investment? Is this reflected in the PDD?	/1/	DR	It has been evidenced from the latest version of the PDD the project activity HHK brick kiln and baseline alternative FCK involve investment		OK
B.5.9	Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/1/	DR	Since the project activity generates financial or economic benefits (revenue from brick sale) other than CDM related income, simple cost analysis is not suitable. Thus investment comparison analysis is chosen to demonstrate investment barrier.		OK
B.5.10	Is the benchmark/discount rate the latest available at the time of decision?	/1/ /33/	DR	Yes the discount rate is the latest available at the time of decision		OK
B.5.11	What is the financial indicator? Is it on equity/project basis?	/1/	DR	The financial indicator chosen is the pre tax project IRR		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	Before/after tax? Is the financial indicator in correspondence with the benchmark?	/33/				
B.5.12	Are the underlying assumptions appropriate, e.g. what is considered as waste in the baseline is considered to have zero value?	/1/	DR	Not applicable		OK
B.5.13	Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/ /33/	DR	In the financial analysis pre tax project IRR has been considered. The depreciation year in accordance with normal accounting practice in the host country		OK
B.5.14	Is the time period of the investment analysis and operating time of the project realistic? Has salvage value been taken into account? Is working capital returned in the last year of operation?	/1/ /33/	DR	The CDM project was initiated in the year 2005 when IIDFC first submitted the PIN to the World Bank. Since 2005 investment analysis was done. However latest investment analysis was done on 2010 which is relevant as the project implementation scheduled on 2010. The salvage value has been taken into account.		OK
B.5.15	When a feasibility study report or similar approved by the government is used as the basis for the investment analysis: Can it be confirmed that the values used in the PDD are fully consistent with the FSR and is the period of time between finalization of the FSR and the investment decision adequate?	/1/ /61/	DR	First time IIDFC did the due diligence of the project activity in the year 2007 based on the survey carried out since 2005. In 2010 based on the actual data from some of the HHK owners IIDFC did the investment analysis. The values used in the PDD are fully consistent with the back up data as per LDC requirement for demonstration of additionality.		OK
B.5.16	How was the amount of output (e.g. sales of electricity) assessed? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /61/	DR	<input type="checkbox"/> The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval <input type="checkbox"/> The plant load factor determined by a third		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>party contracted by the project participants (e.g. an engineering company)</p> <p><input checked="" type="checkbox"/> Other approach.</p> <p><i>Provide details on how the load factor was validated::</i></p> <p>The amount of out put has been assessed as per the actual out puts observed in the operating FCK and HHK technology</p>		
<p>B.5.17 How was the output price (e.g. electricity price) assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.</p>	/1/ /61/	DR	<p><input checked="" type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices)</p> <p><input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants</p> <p><i>Provide details on how the output price was validated:</i></p> <p>The out put price has been assessed as per the actual out puts price observed in the operating FCK and HHK technology</p>		OK
<p>B.5.18 How were the investment costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.</p>	/1/ /61/	DR	<p><input checked="" type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices)</p> <p><input type="checkbox"/> Review of feasibility reports, public announcements, contracts and annual financial reports related to the project and the project participants</p> <p><i>Provide details on how the investment costs were validated:</i></p> <p>The investment cost has been assessed as per the actual investment cost observed for the operating FCK and HHK technology brick kiln.</p>		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.19 How were the O&M costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /61/	DR	<input checked="" type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants <i>Provide details on how the O&amp;M costs were validated:</i> The O & M cost has been assessed as per the actual investment cost observed for the operating FCK and HHK technology brick kiln.		OK
B.5.20 Describe the assessment of the other input parameters. Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /61/	DR	<input checked="" type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants <i>Provide details on how other input parameters were validated:</i> All the other input parameters value is deemed appropriate as all the input parameters has been sourced from actual figures.		OK
B.5.21 Was the financial calculation spreadsheet verified and found to be correct?	/1/ /33/	DR	The financial calculation spreadsheet verified and found to be correct.		OK
B.5.22 Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered?	/1/ /33/	DR	The key parameters contributing to more than 20% of the revenue/costs during operating or implementation have been identified The possible correlation between the parameters has been considered		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.23	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/ /33/	DR	In sensitivity analysis $\pm 10\%$ has been considered which is deemed appropriate.		OK
B.5.24	Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/ /33/	DR	Not applicable as investment comparison analysis has been chosen.		OK
<b>Barrier analysis (VVM para 115-118)</b>						
B.5.25	Are the barriers identified complimentary to a potential investment analysis? Does the barrier have a clear impact on the financial returns so that it can be assessed in an investment analysis? Each barrier is discussed separately.	/1/	DR	Investment analysis has been provided separately. All other identified barriers are not complimentary to a potential investment analysis.		OK
B.5.26	How were the <u>investment barriers</u> assessed to be real? Are the investment barriers substantiated by a source independent of the project participants?	/1/	DR	The investment barrier assessed as real as it is based on the actual investment comparison.		OK
B.5.27	How does CDM alleviate the investment barriers?	/1/	DR	CDM will offset the investment barrier to a certain extent.		OK
B.5.28	Is the project activity prevented by the investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	It is clear from investment comparison analysis the investment to FCK is more lucrative than investment to HHK.		OK
B.5.29	How were the <u>technological barriers</u> assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/ /39/	DR	The technological barrier has been assessed from the third party evidence, Department of Environment, Bangladesh Government-Memo no: DOE/Enforcement/37		OK
B.5.30	How does CDM alleviate the technological barriers?	/1/	DR	CDM benefit will motivate to over come the barrier. More HHK project will come in the future days.		OK
B.5.31	Is the project activity prevented by the technological barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	This technological barrier is not relevant to FCK technology which has been substantiated by the current market survey.		OK
B.5.32	How were the <u>barriers due to prevailing practise</u> assessed to	/1/	DR	The technological barrier has been assessed from		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/39/		the third party evidence, Department of Environment, Bangladesh Government-Memo no: DOE/Enforcement/37. HHK brick kiln is not common in Bangladesh. The first HHK brick kiln is under this bundled project		
B.5.33	How does CDM alleviate the barriers due to prevailing practise?	/1/	DR	CDM benefit will motivate to over come the barrier. More HHK project will come in the future days.		OK
B.5.34	Is the project activity prevented by the barriers due to prevailing practise and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	This prevailing practise barrier is not relevant to FCK technology which has been substantiated by the current market survey.		OK
B.5.35	How were the <u>other barriers</u> assessed to be real? Are the other barriers substantiated by a source independent of the project participants?	/1/	DR	Other Barriers at the Project Participant level has been identified by the PP. This barrier has been substantiated by an independent source		OK
B.5.36	How does CDM alleviate the other barriers?	/1/	DR	CDM benefit will motivate to over come the barrier. More HHK project will come in the future days.		OK
B.5.37	Is the project activity prevented by the other barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	This Other Barriers at the Project Participant level is not relevant to FCK technology which has been substantiated by the current market survey.		OK
<b>Common practice analysis (VVM para 119-121)</b>						
B.5.38	What is the geographical scope of the common practice analysis? Is this justified?	/1/	DR	Being a small scale project activity in LDC Bangladesh common practice is not warranted. However the entire host country Bangladesh has been considered as the geographical scope of the common practice and it is deemed appropriate.		OK
B.5.39	What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has	/1/	DR	As the project activity is based on brick manufacturing process different brick kiln		OK

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this been justified?				technology has been considered for the common practice analysis.		
B.5.40	What is the data source(s) used for the common practice analysis?	/1/ /39/	DR	The data source is a third party document; UNDP project report on “Improving Kiln Efficiency in the Brick Making Industry (IKEBMI)” by M/s Global Environment Facility dated 20 October 2009.  Department of Environment, Bangladesh Government-Memo no: DOE/Enforcement/37 also used as data source		OK
B.5.41	How many similar non-CDM-projects exist in the region within the scope?	/1/ /34/	DR	The first HHK brick kiln in Bangladesh was installed by Universal Bricks Limited, which is under another CDM project activity. Universal Bricks limited have been installed by foreign investment and the technology has been supplied by Tianjin Machinery Import Export Corporation. There after, all the HHK brick kiln has been implemented after considering CDM. While possibility of installation of HHK with out CDM benefit can't be ruled out, DNV considers the present scenario in Bangladesh does not support the same to a great extent. Thus it is DNV's opinion that majority of HHK comes up after CDM consideration in the host country Bangladesh.		OK
B.5.42	How were possible essential distinctions between the project activity and similar activities assessed?	/1/	DR	There was no similar non-CDM HHK brick kilns installed in host country Bangladesh.		OK
B.5.43	What is the conclusion of the common practice analysis?	/1/	DR	As per common practice analysis it has been evidenced HHK brick kiln is not a common practice in host country Bangladesh.		OK
<b>Conclusion</b>						
B.5.44	What is the conclusion with regard to the additionality of the	/1/	DR	The project additionality has been assessed as per		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
project activity?				Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities. This is in line with the applied methodology. Based on this DNV confirmed that the project is additional		
<b>B.6 Calculations of GHG emission reductions</b>						
<b>Data and parameters that are available at validation and that are not monitored (VVM para 199-203)</b>						
B.6.1	How was the Carbon Emission Factor for per energy unit of coal available at validation verified?	/1/	DR	As the host country does not facilitate availability of local and national level carbon emission factor, IPCC default value has been used and this is justified.		OK
B.6.2	How was the Grid emissions factor per MWh of power produced available at validation verified?	/1/ /41/ /62/	DR	DNV confirms that grid emission factor calculation is in line with Tool to calculate the emission factor for an electricity system version 2. The grid emission factor provided by the Bangladesh Designated National Authority in letter dated 9 Feb 2011 has been considered for the project activity.		OK
B.6.3	How was the Carbon to CO <sub>2</sub> conversion factor available at validation verified?	/1/	DR	This value has come from stoichiometric combustion.		OK
B.6.4	How was the specific energy consumption of the existing Fixed Chimney Kilns in Bangladesh available at validation verified?	/1/ /7/	DR	The value has been calculated based on the coal calorific value of Barapukuria Coal Mining Company Limited (BCMCL) In the baseline this coal would have been used.		OK
B.6.5	How was the Specific Fuel (Coal) Consumption per unit FCK brick available at validation verified?	/1/ /8/ /9/	DR	This value has been verified by the following documents Clean Development Mechanism Project Opportunities in Bangladesh, Pre Feasibility Report on a Brick Manufacturing Fuel Substitution CDM Project, Bangladesh University of Engineering, December 2002,		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				Table A, pg 3, Emissions Baseline Report for the IKEBMI Project (PDF-B Phase BGD/04/014) by The Louis Berger Group, Washington DC June 2006 Table 2, pg 3		
B.6.6	How was the <i>Calorific Value of the coal used in the Baseline</i> ( $CV_{\text{Coal, FCK}}$ ) available at validation verified?	/1/ /7/	DR	The value has been verified from the <i>website</i> of Barapukuria Coal Mining Company Limited. <a href="http://www.bcmcl.org.bd">www.bcmcl.org.bd</a>		OK
B.6.7	How was the Weight of per unit FCK brick available at validation verified?	/40/	DR	The value has been verified from the study carried by IIDFC “ <i>Weight of Bricks in Bangladesh</i> ”, 2009		OK
B.6.8	How was the Weighted average net calorific value of Diesel (fuel type) in year <i>y</i> available at validation verified?	/1/	DR	As the host country does not facilitate availability of local and national level carbon emission factor, IPCC default value has been used and this is justified.		OK
B.6.9	How was the Weighted average CO <sub>2</sub> emission factor of fuel type <i>I</i> in year <i>y</i>	/1/		As the host country does not facilitate availability of local and national level carbon emission factor, IPCC default value has been used and this is justified.		OK
<b>Baseline emissions (VVM para 89-93)</b>						
B.6.10	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes the baseline emission calculation has been documented as per the applicable small scale methodology AMS II-D version 12.		OK
B.6.11	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	The conservative assumptions have been used for calculating baseline emission.		OK
B.6.12	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	There are no uncertainties in the estimates of baseline emission.		OK
<b>Project emissions (VVM para 89-93)</b>						
B.6.13	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes the baseline emission calculation has been documented as per the applicable small scale		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			methodology AMS II-D version 12.		
B.6.14 Have conservative assumptions been used when calculating the project emissions?	/1/	DR	The conservative assumptions have been used for calculating baseline emission.		OK
B.6.15 Are uncertainties in the project emission estimates properly addressed?	/1/	DR	There are no uncertainties in the estimates of baseline emission.		OK
<b>Leakage (VVM para 89-93)</b>					
B.6.16 Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	In line with the applicable small scale methodology AMS II-D version 12, the energy efficiency technology equipment has neither been transferred from another activity nor has the existing equipment transferred to another activity. Thus leakage has not been considered		OK
B.6.17 Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	Not applicable		OK
B.6.18 Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	Not applicable		OK
<b>Emission Reductions (VVM para 89-93)</b>					
B.6.19 Algorithms and/or formulae used to determine emission reductions: <ul style="list-style-type: none"> <li>All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced</li> <li>All documentation is correctly quoted and interpreted.</li> <li>All values used can be deemed reasonable in the context of the project activity</li> <li>The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.</li> </ul>	/1/	DR	Formulae used to determine emission reduction are in line with the applicable methodology.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<b>B.7 Monitoring plan (VVM para 122-124)</b>						
<b>Data and parameters monitored</b>						
B.7.1	Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/	DR	Yes the means of monitoring describe in the PDD is in line with the applicable methodology AMS II-D version 12		OK
B.7.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	The monitoring plan contains all necessary parameters with clear description.		OK
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	<p>Measurement equipment has been described adequately.</p> <ul style="list-style-type: none"> <li>▪ Total consumption of coal for brick making in brick field i in year y will be measured by coal invoices</li> <li>▪ Weighted average net Calorific Value of coal used in y<sup>th</sup> year in brick field i will be laboratory tested with each new consignment of coal purchased on quaterly basis.</li> <li>▪ Daily production of bricks in Kiln i will be recorded on a daily basis by the kiln owner.</li> <li>▪ Daily Mean Weight of baked HHK bricks in kiln i will be measured on site by weighing scale by the kiln owner</li> <li>▪ Specific Energy Consumption in brick field i is a calculated parameter</li> <li>▪ Number of operational days of the kiln in a year will be monitored by kiln owner</li> <li>▪ Quantity of diesel (fuel type) combusted in process j during the year y by diesel invoices</li> <li>▪ Electricity Consumption in plant i per year will be monitored by monthly meter</li> </ul>		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				reading reflected in the monthly electricity bill.		
B.7.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR	<p>In the latest version of the PDD monitoring has been simplified in such a way that individual brick kiln owner can monitor the emission reduction from the project activity.</p> <p>Total coal used in the individual project activity will be monitored from the coal invoice.</p> <p>Total diesel used in the individual project activity will be monitored from the diesel invoice.</p> <p>Total electricity used in the individual project activity will be monitored from the electricity bill.</p> <p>NCV of coal will be tested by accredited laboratories.</p> <p>Weight of the brick will be monitored by individual kiln operator on sampling basis.</p> <p>Thus except the weighing machine for weighing of bricks there are no monitoring equipment.</p> <p>Weighing machines calibration frequency and measurement accuracy has been mentioned in the latest version of the PDD.</p>		OK
B.7.5	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR	The weighing machine for weighing of bricks will be calibrated once in a year.		OK
B.7.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	Monitoring and recording frequency of all the monitored parameter has been described in the latest PDD.		OK
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	Monitoring and recording frequency of all the monitored parameter has been described in the latest PDD.		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<b>Ability of project participants to implement monitoring plan</b>						
B.7.8	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/	DR	In the latest version of the PDD monitoring has been simplified in such a way that individual brick kiln owner can monitor the emission reduction from the project activity.		OK
B.7.9	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/1/		Day to day record handling procedure has been identified.		OK
B.7.10	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/	DR	The data management and quality assurance and quality control procedures are sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex-post and verified		OK
B.7.11	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	All monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later.		OK
<b>Monitoring of sustainable development indicators/ environmental impacts</b>						
B.7.12	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	Monitoring of sustainable development indicator is in mandated by the Bangladesh legislations. Contribution of the project towards sustainable development of Bangladesh has been confirmed from the LoA.		OK
B.7.13	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	Refer B.7.12		OK
B.7.14	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR	Refer B.7.12		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<b>C Duration of the project activity / crediting period</b>						
<b>C.1.1 Start date of project activity (VVM para 99-100, 104)</b>						
C.1.2	How has the starting date of the project activity been determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/1/ /20/	DR	Among the three kiln owners Eeta and Tiles Ltd. did first technology service agreement with Nestor Consulting Limited on 10 January 2010. This agreement has been considered as creation of financial commitment and hence 10 January 2010 is now considered as the project start date in the latest PDD version.		OK
C.1.3	Is the stated expected operational lifetime of the project activity reasonable?	/1/	DR	The expected operational lifetime of the project is 10 years which is reasonable.		OK
C.1.4	Is the start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/1/	DR	The fixed crediting period has been chosen for the project activity. The start date of the crediting period is 1 September 2012		OK
<b>D Environmental Impacts (VVM para 131-133 and VVM para 136 (d) for small-scale project activities, as applicable))</b>						
D.1.1	Are there any host country requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? Does the approval contain any conditions that need monitoring? For small-scale project activities, is an assessment of the environmental impacts of the proposed CDM project activity is required by the host Party?	/1/	DR	The individual kiln owners are to obtain environmental clearance from the designated authority of Government of Bangladesh, prior to commencement of kiln operation.		OK
D.1.2	Does the project comply with environmental legislation in the host country?	/1/	DR	All the environmental clearance certificates received or application for clearances to Department of Environment has already been provided.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.1.3	Will the project create any adverse environmental effects?	/1/	DR	The project is unlikely to create adverse environmental impacts.		OK
D.1.4	Have identified environmental impacts been addressed in the project design?	/1/	DR	Two identified environmental impacts are air pollution and occupational health and safety concerns. Those two impacts have been addressed in the project design.		OK
D.1.5	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /43/	DR	IIDFC has done Environmental Management Framework for HHK Project (EMF Report) dated 12 April 2009.		OK
D.1.6	Are transboundary environmental impacts considered in the analysis?	/1/		Please refer to D.1.5		OK
<b>E Stakeholder Comments (VVM para 128-130)</b>						
E.1.1	Have relevant stakeholders been consulted?	/1/	DR	Including local residents who attended the meetings, other stakeholders also included. Those are the BBMOA, BUET, IIDFC, DoE and the Ministry of Power Energy and Mineral Resources (MoPEMR), Members of Parliament and in one instance the media, UNDP and the World Bank attended (Universal kiln).		OK
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/ /13/ /19/ /22/	DR	Individual brick kiln owners conduct stake holder consultation meeting individually to invite comments by local stake holders.		OK
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?	/1/	DR	Stake holder consultation process is not required by regulations/law in the host country		OK
E.1.4	Is a summary of the stakeholder comments received provided?	/1/	DR	A summary of the stakeholder comments received has been provided.		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.1.5 Has due account been taken of any stakeholder comments received?	/1/	DR	No negative feed back has been received in the stake holder consultation process.		OK



**Table 3 Resolution of corrective action requests and clarification requests**

<b>Corrective action and/ or clarification requests</b>	<b>Reference to Table 2</b>	<b>Response by project participants</b>	<b>Validation conclusion</b>
<i>No CAR has been raised on the latest version of PDD</i>			
<i>No CL has been raised on the latest version of PDD</i>			

**Table 4 Forward action requests**

Forward action request	Reference to Table 2	Response by project participants
<i>No FAR has been raised on the latest version of PDD</i>		

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## **APPENDIX B**

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### **INITIAL CDM VALIDATION PROTOCOL**

**Table 2 Requirements checklist**

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<b>A General description of project activity</b>						
<b>A.1 Title of the project activity</b>						
A.1.1	Does section A.1 of the PDD include a clearly identifiable project title, version number of the PDD and date of the PDD?	/1/	DR	<input checked="" type="checkbox"/> Clearly identifiable title of the project activity <input checked="" type="checkbox"/> Version number of the PDD is included <input checked="" type="checkbox"/> Date of the PDD is included.		OK
A.1.2	Is the PDD is in accordance with the applicable requirements for completing PDDs?	/1/	DR	<input checked="" type="checkbox"/> Yes		OK
<b>A.2 Description of the project activity</b>						
A.2.1	How was the design of the project assessed?	/1/	DR I	<input type="checkbox"/> Project in existing facility or utilizing existing equipment(s) <ul style="list-style-type: none"> <li><input type="checkbox"/> Large scale project</li> <li><input type="checkbox"/> bundled small scale projects, each with emission reductions not exceeding 15 000 tCO<sub>2</sub>e per year</li> <li><input type="checkbox"/> individual small scale project activity with emission reductions not exceeding 15 000 tCO<sub>2</sub>e per year</li> </ul> <input checked="" type="checkbox"/> Greenfield project  <i>How was the design of the project assessed?</i> <input checked="" type="checkbox"/> Physical site inspection <input type="checkbox"/> Reviewing available designs and feasibility studies		OK
A.2.2	If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/	DR I	All the eight HHK brick kilns are future project and are under construction.		OK
A.2.3	If physical site visits were performed based on sampling	/1/	DR	The project activity is a bundle of eight		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
(only applicable for bundled small scale projects, each with emission reductions not exceeding 15 000 tCO <sub>2</sub> e per year), justify the sampling through a statistical analysis:				individual HHK brick kilns. The physical site visit was done for four HHK brick kilns of Eeta and Tiles Ltd. where land development is under progress. Site visit was not carried out for other HHK brick kilns as construction for those is yet to be started. However DNV validation team has carried out follow up audits with the representatives of M/s Bricks 2010 Ltd and M/s Sheikh Brothers Enterprises Ltd.		
A.2.4	Is the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity?	/1/ /26/	DR	Although Eeta and Tiles Ltd. have 4 HHK brick kiln of capacity 50 000 bricks/day each, only two of them are mentioned in the PDD. DNV has confirmed from the Project Idea Note submitted to The World Bank dated 28 November 2008 that all four units of Eeta and Tiles Ltd. are within the scope of the proposed CDM project under consideration. Hence the project proponent is requested to revise the PDD to include all four HHK units of Eeta and Tiles Ltd.	CAR-1	OK
A.2.5	Does the project activity involve alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/	DR	As all the eight HHK brick kilns are green field project the project activity does not involve alteration of existing installations		OK
A.2.6	Does the project design engineering reflect current good practices?	/1/	DR	The HHK brick kiln is the more efficient brick manufacturing technology than FCK, BTK, Zig Zag and Hoffmann Gas. Thus the project design reflects current good practice in brick manufacturing sector of Bangladesh.		OK
A.2.7	Would the technology result in a significantly better performance than any commonly used technologies in the host country? Is any transfer of technology from any Annex-I Party involved?	/1/ /8/ /9/	DR	The HHK brick kiln results significantly better performance than any commonly used brick kiln technology in Bangladesh. The technology has been transferred from China, which is a non Annex -I Party		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.2.8	Does the project qualify as a small scale CDM project activity as defined in paragraph 6(c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	The project being an energy efficiency project by implementation of HHK brick kilns with an estimated equivalent thermal energy saving of 103 GWh <sub>thermal</sub> , which is lower than the stipulated 180 GWh thermal generation capacity. However in actual scenario total 8 HHK brick kilns will be implemented under the project activity instead of 6 kilns as mentioned in the PDD. Thus project proponent is requested to re-calculate thermal energy saving and confirm whether the project still comes under small scale project category.	CAR-2	OK
A.2.9	Is the small scale project activity a debundled component of a larger project activity?	/1/	DR I	The project activity is a bundle of eight individual HHK brick kilns. Previously there was no registered project with same methodology, same technology by the same individual HHK brick kiln owners. Thus the project is not a de-bundled component of a larger project activity.		OK
<b>A.3 Participation requirements</b>						
A.3.1	Do all participating Parties fulfil the participation requirements as follows:	/1/	DR I	<p>The Department of Environment is the DNA of Bangladesh. The Ministry of Climate and Energy is the DNA of Denmark.</p> <p>Bangladesh ratified the Kyoto Protocol on 22 October 2001.</p> <p>Denmark ratified the Kyoto Protocol on 31 May 2002.</p> <p>Both Parties have confirmed their voluntary participation.</p>		OK
		Bangladesh (host)		Denmark		
a) Party has ratified the Kyoto Protocol		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
b) Party has designated a Designated National Authority		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
c) The assigned amount has been determined		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
A.3.2	Do the letters of approval meet the following requirements?	/1/ /55/ /56/	DR I	The project Proponent is requested to provide the letter of approval from all the Parties involved in the project activity.	CAR-3	OK
		Bangladesh (host)		Denmark		
	a) LoA confirms that Party has ratified the Kyoto Protocol	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
	b) LoA confirms that participation is voluntary	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
	c) The LoA confirms that the project contributes to the sustainable development of the host country?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	NA		
	d) The LoA refers to the precise project activity title in the PDD	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
	e) The LoA is unconditional with respect to (a) to (d) above	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
	f) The LoA is issued by the respective Party's DNA	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
	g) The LoA was received directly by the DNA or the PP	<input type="checkbox"/> DNA	<input checked="" type="checkbox"/> PP	<input type="checkbox"/> DNA <input checked="" type="checkbox"/> PP		
	h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic					
A.3.3	Have all private/public project participants been authorized by an involved Party?	/1/	DR	The project Proponent is requested to provide the letter of approval from all the Parties involved in the project activity.	CAR-3	OK
<b>A.4 Technical description of the project activity</b>						
A.4.1	Is the project's location clearly defined?	/1/	DR	Yes project's location has been clearly defined. Seven kilns located in Dhaka division and one kiln is in Sylhet division of Bangladesh		OK
<b>A.5 Public funding of the project activity</b>						
A.5.1	In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided 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	/1/ /3/	DR I	No public funding/Overseas Development Assistance has been involved in the project activity. In the PDD it has been stated that the Danish Government, through a letter, confirmed that		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
Parties?				there is no diversion of ODA. The PP is requested to provide the exact date of the letter in the PDD and also submit copy of the same to the validator.	<del>CL-1</del>	
<b>B Application of a baseline and monitoring methodology</b>						
<b>B.1 Methodology applied</b>						
B.1.1	Does the project apply an approved methodology and the correct version thereof?	/1/	DR	Approved small scale methodology AMS-II.D, version 12 has been applied for the project, which was pertinent at the time of web hosting		OK
<b>B.2 Applicability of methodology (and tools)</b>						
B.2.1	How was it validated that project complies with the following applicability criteria: This category comprises any energy efficiency and fuel switching measure implemented at a single industrial or mining and mineral production facility. This category covers project activities aimed primarily at energy efficiency	/1/	DR	The project activity comprises energy efficiency in brick manufacturing process by implementing HHK in the place of FCK.		OK
B.2.2	How was it validated that project complies with the following applicability criteria: The measures may replace, modify or retrofit existing facilities or be installed in a new facility.	/1/	DR/I	All the HHK brick kilns are new facility and future projects.		OK
B.2.3	How was it validated that project complies with the following applicability criteria: The aggregate energy savings of a single project (inclusive of a single facility or several facilities) may not exceed the equivalent of 60 GWh <sub>e</sub> per year. A total saving of 60 GWh <sub>e</sub> per year is equivalent to a maximal saving of 180 GWh <sub>th</sub> per year in fuel input.	/1/	DR/I	The project being an energy efficiency project by implementation of HHK brick kilns with an estimated equivalent thermal energy saving of 103 GWh <sub>thermal</sub> , which is lower than the stipulated 180 GWh thermal generation capacity. However in actual scenario total 8 HHK brick kilns will be implemented under the project activity instead of 6 kilns as mentioned in the PDD. Thus project proponent is requested to re-calculate thermal energy saving and confirm whether the project still comes under small scale	<del>CAR-2</del>	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				project category.		
B.2.4	How was it validated that project complies with the following applicability criteria: This category is applicable to project activities where it is possible to directly measure and record the energy use within the project boundary (e.g. electricity and/or fossil fuel consumption)	/1/	DR	The use of primary fossil fuel (coal) for brick production and electricity and or diesel consumption to operate plant equipments (if any) can be directly measured and recorded in the plant premises as per the standard monitoring procedure.		OK
B.2.5	How was it validated that project complies with the following applicability criteria: This category is applicable to project activities where the impact of the measures implemented (improvements in energy efficiency) by the project activity can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity (signal to noise ratio).	/1/	DR	In the project activity reduction in the coal consumption is achieved only by following energy efficiency measures: - Mixing of pulverized coal into the wet clay in each brick which then bakes the brick from the inside - Improved heat retention in the kilns to capture waste heat for recirculation in the drying tunnel. Moreover production of bricks has been well defined. Thus other variables has not influenced improvements in energy efficiency (signal to noise ratio)		OK
B.2.6	Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/ /9/	DR	As per the applied methodology AMS-II.D, version 12, In the case of a new facility the energy baseline consists of the facility that would otherwise be built. It has been evidenced from the UNDP project report on “Improving Kiln Efficiency in the Brick Making Industry (IKEBMI)” by M/s Global Environment Facility dated 20 October 2009 that market share of FCK technology in Bangladesh is 76%. Hence selection of FCK technology as the project baseline is justified. However as the start date of the project activity would be in the year 2010 and UNDP project		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				report states the market share of different technology of brick kiln in the year 2006 the project proponent is requested to substantiate that the market scenario of the brick manufacturing sector has not been changed abruptly from 2006 scenario by providing the current market share of different brick kiln technology	<del>CL</del> 2	
<b>B.3 Project boundary</b>						
B.3.1	What are the project's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/	DR	The project boundary has been defined as the physical, geographical area of each of the eight brick production facilities where HHK technology will be installed. Thus project boundary is clearly defined and in accordance with the methodology.		OK
B.3.2	Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/	DR	CO <sub>2</sub> has been identified as the only GHG sources for the project. The identify boundary covers all possible GHG sources linked to the project activity. During site visit DNV personnel evidenced the project site and the project boundary and also confirmed identified GHG source is accurate.		OK
B.3.3	Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/	DR I	The project does not involve other emission sources not foreseen by the methodology.		OK
<b>B.4 Baseline scenario determination</b>						
B.4.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/	DR	Total four type of baseline technology of brick kiln has been considered. Those are FCK, BTK, Zig Zag and Hoffmann Gas. The list of the baseline scenario has been completed.		OK
B.4.2	How have the other baseline scenarios been eliminated in	/1/	DR	The FCK has been selected as the baseline		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
order to determine the baseline?		/12/		technology since it is most common practice than BTK, Zig Zag and Hoffmann Gas brick manufacturing technology and meets legal requirements. Among these technologies FCK covers 76% of market share. Thus in absence of the project activity same capacity FCK would have been installed. However the PP is also requested to provide current market scenario of different type of brick kiln technology.	CL2	
B.4.3	What is the baseline scenario?	/1/	DR	The baseline scenario is FCK based brick manufacturing process		OK
B.4.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR	Yes the baseline scenario is in accordance with the guidance in the methodology AMS-II.D version 12		OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /8/ /9/	DR	The base line emission has been assessed by the studies between the years 2002 to 2009. It has been evidenced from the studies coal consumption in FCK has been changed from 22 ~ 26 tonnes of coal per 100 000 bricks to 24 tonnes of coal per 100 000 bricks. The baseline scenario has been determined using conservative assumption to 24 tonnes of coal per 100 000 bricks and the baseline specific energy consumption has been fixed as 2.125 MJ/kg-brick for a 2.9 kg conventional sized brick		OK
B.4.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /8/ /9/	DR	Yes, relevant national and sectoral policies of brick manufacturing in Bangladesh have been taken into account.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Yes, the baseline scenario determination is compatible with the available data and all literature and sources are referenced. However one reference has been quoted wrongly in the PDD. Thus the PP is requested to recheck the references used in the PDD.	<del>CL</del> 3	OK
B.4.8	Is the baseline determination adequately documented in the PDD? <ul style="list-style-type: none"> <li>All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced.</li> <li>All documentation is relevant as well as correctly quoted and interpreted.</li> <li>Assumptions and data can be deemed reasonable</li> <li>Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD.</li> <li>The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity</li> </ul>	/1/ /7/ /8/ /9/ /10/ /11/	DR/I	Yes the baseline determination adequately documented in the PDD. <ul style="list-style-type: none"> <li>All assumptions and data used by the project participants has been listed in the PDD</li> <li>All documentations are relevant as well as correctly quoted and interpreted.</li> <li>Assumptions and data could be deemed reasonable</li> <li>Relevant national and/or Sectoral polices in brick manufacturing industry of Bangladesh has been considered.</li> <li>Finally the methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity</li> </ul>		OK
<b>B.5 Additionality determination.</b>						
B.5.1	What approach/tool does the project use to assess additionality? Is this in line with the methodology?	/1/	DR	The project additionality has been assessed as per Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities. This is in line with the applied methodology.		OK
B.5.2	Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR	Yes the regulatory requirements have correctly been taken into account to evaluate the project activity and the alternatives. All identified alternatives including the project activity meet		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.3	Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	regulatory requirements of Bangladesh. The PP is requested to provide the supportive documents to substantiate related barrier and investment issues which was faced by the project proponent due to prevailing practice	<del>CAR-4</del>	OK
B.5.4	What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/1/	DR	The project additionality has been demonstrated through barrier analysis, arguing that the main barrier to project implementation is that it faces barriers due to prevailing practise. It has been stated in the PDD that investment cost of HHK brick kiln is more than FCK brick kiln. The PP is requested to provide supportive documents for related barrier and investment issue which was faced by the project proponent for barriers due to prevailing practise	<del>CAR-4</del>	OK
<b>Prior consideration of CDM</b>						
B.5.5	What is the evidence for serious consideration of CDM prior to the time of decision to proceed with the project activity?	/1/ /4/ /12/ /16/ /21/	DR	It has been evidenced from the board meeting of individual brick kiln operators that all of them have considered CDM prior to the decision to proceed. However as IIDFC is the project proponent who is the nodal point of the entire brick kilns. Thus the PP is requested to provide first reviewed and approved PIN by The World bank to substantiate serious consideration of CDM prior to the time of decision to proceed with the project activity.	<del>CAR-5</del>	OK
B.5.6	If the starting date is after 2 August 2008 and before the global stakeholder consultation, has the DNA and UNFCCC confirmed that the project participants have informed in writing of the project's intention to seek CDM status?	/1/	DR	The start date of the project activity is after 2 August 2008. The project proponent IIDFC has informed UNFCCC about the project activity for seeking CDM status dated 24 February 2010. The PP is also requested to provide the	<del>CL-4</del>	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				documentary evidences of communication to the DNAs of the involved Parties about the project activity seeking CDM status.		
<b>Investment analysis</b>						
B.5.7	Does the project activity or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PDD?	/1/	DR	The PP has not considered investment analysis to substantiate project additionality		OK
<b>Barrier analysis</b>						
B.5.8	Are the barriers identified complimentary to a potential investment analysis? Does the barrier have a clear impact on the financial returns so that it can be assessed in an investment analysis? Each barrier is discussed separately.	/1/	DR	The PP has demonstrated barrier due to prevailing practice. The barrier has a clear impact on the financial returns so that it can be assessed through investment analysis. Thus the PP is requested to substantiate the financial implication of the project due to prevailing practice barrier.	<del>CL-5</del>	OK
B.5.9	How were the <u>investment barriers</u> assessed to be real? Are the investment barriers substantiated by a source independent of the project participants?	/1/	DR	The PP doesn't consider investment barrier to assess the additionality of the project.		OK
B.5.10	How does CDM alleviate the investment barriers?	/1/	DR	The PP doesn't consider investment barrier to assess the additionality of the project.		OK
B.5.11	Is the project activity prevented by the investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	The PP doesn't consider investment barrier to assess the additionality of the project		OK
B.5.12	How were the <u>technological barriers</u> assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/	DR	The PDD indicates that the project has faced a few barriers which eventually were caused for barrier due to prevailing practice. The PP is requested to demonstrate extent of prohibitive of the following barriers and how CDM would alleviate the same: i) Lack of local knowledge /expertise /competence ii) Delay due to shipment problem	<del>CL-6</del>	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<p>iii) Flood situation – that would any way affect the baseline case in the same way</p> <p>More over maximum of the barrier has been faced by other group of HHK brick kiln owners under project “Improving Kiln Efficiency in the Brick Making Industry in Bangladesh” identified by same project proponent IIDFC. Thus PP is requested to substantiate that how these barriers are also prohibiting the project activity when some technology awareness has been built up by IIDFC, the nodal agent of the project.</p>		
B.5.13	How does CDM alleviate the technological barriers?	/1/	DR	Please refer B.5.16	<del>CL-6</del>	OK
B.5.14	Is the project activity prevented by the technological barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Please refer B.5.16	<del>CL-6</del>	OK
B.5.15	How were the <u>barriers due to prevailing practise</u> assessed to be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/1/	DR	<p>Barriers due to prevailing practice were real as 76% of brick kiln owner operated on FCK. The is has been substantiated by the third party document UNDP project report on “Improving Kiln Efficiency in the Brick Making Industry (IKEBMI)” by M/s Global Environment Facility dated 20 October 2009.</p> <p>However the PP is also requested to provide current market scenario of different type of brick kiln technology.</p>	<del>CL-2</del>	OK
B.5.16	How does CDM alleviate the barriers due to prevailing practise?	/1/	DR	Please refer to B.5.16	<del>CL-6</del>	OK
B.5.17	Is the project activity prevented by the barriers due to prevailing practise and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Among all the alternatives FCK based brick kiln technology does not faces any barrier. It has been evidenced from the market share that FCK covers 76% of market in brick manufacturing industry in		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				Bangladesh.		
B.5.18	How were the <u>other barriers</u> assessed to be real? Are the other barriers substantiated by a source independent of the project participants?	/1/	DR	The PP has not considered other barriers to implement the project activity.		OK
<b>Common practice analysis</b>						
B.5.19	What is the geographical scope of the common practice analysis? Is this justified?	/1/	DR	The entire host country Bangladesh has been considered as the geographical scope of the common practice and it is deemed appropriate.		OK
B.5.20	What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has this been justified?	/1/	DR	As the project activity is based on brick manufacturing process different brick kiln technology has been considered for the common practice analysis.		OK
B.5.21	What is the data source(s) used for the common practice analysis?	/1/	DR	The data source is a third party document; UNDP project report on “Improving Kiln Efficiency in the Brick Making Industry (IKEBMI)” by M/s Global Environment Facility dated 20 October 2009.		OK
B.5.22	How many similar non-CDM-projects exist in the region within the scope?	/1/ /8/ /9/	DR/I	The first HHK brick kiln in Bangladesh was installed by Universal bricks Limited, which is under another CDM project activity “Improving Kiln Efficiency in the Brick Making Industry in Bangladesh” of IIDFC. The project activity is currently under validation stage. Subsequently, all HHK brick kilns have been planned /implemented after considering potential CDM benefits. While possibility of installation of HHK with out CDM benefit can’t be ruled out, DNV considers the present scenario in Bangladesh does not support the same to a great extent. Thus it is DNV’s opinion that majority of HHK comes up after CDM consideration in the host country Bangladesh.		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.23	How were possible essential distinctions between the project activity and similar activities assessed?	/1/	DR	There was no similar non-CDM HHK brick kilns installed in host country Bangladesh.		OK
B.5.24	What is the conclusion of the common practice analysis?	/1/	DR	As per common practice analysis it has been evidenced HHK brick kiln is not a common practice in host country Bangladesh.		OK
<b>Conclusion</b>						
B.5.25	What is the conclusion with regard to the additionality of the project activity?	/1/	DR	Conclusion on additionality of the project activity will be arrived once the CARs and CLs raised in this regard are closed up to DNV's satisfaction.	<del>CL-2</del> <del>CL-4</del> <del>CL-5</del> <del>CL-6</del> <del>CAR-4</del> <del>CAR-5</del>	OK
<b>B.6 Calculations of GHG emission reductions</b>						
<b>Data and parameters that are available at validation and that are not monitored</b>						
B.6.1	How was the Carbon Emission Factor for per energy unit of coal available at validation verified?	/1/	DR	As the host country does not facilitate availability of local and national level carbon emission factor, IPCC default value has been used and this is justified.		OK
B.6.2	How was the Carbon to CO <sub>2</sub> conversion factor available at validation verified?	/1/	DR	This value has come from stoichiometric combustion.		OK
B.6.3	How was the Grid emissions factor per MWh of power produced available at validation verified?	/1/	DR	The grid emission factor has been sourced from published data of Power division 2009, Bangladesh. However the project proponent is requested provide the official database for grid emission factor of Bangladesh national grid. It has also been evidenced from the site visit that all the brick kilns will source electricity from the grid, however in the PDD it is not clear that from where all the brick kilns will take electricity.	<del>CL-7</del>	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				Thus PP is also requested to clearly mention the source of the electricity.		
B.6.4	How was the specific energy consumption of the existing Fixed Chimney Kilns in Bangladesh available at validation verified?	/1/ /7/	DR	The value has been calculated based on the coal calorific value of Barapukuria Coal Mining Company Limited (BCMCL) In the project activity this coal would have been used.		OK
<b>Baseline emissions</b>						
B.6.5	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes the baseline emission calculation has been documented as per the applicable small scale methodology AMS II-D version 12.		OK
B.6.6	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	The conservative assumptions have been used for calculating baseline emission.		OK
B.6.7	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	There are no uncertainties in the estimates of baseline emission.		OK
<b>Project emissions</b>						
B.6.8	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes the project emission calculation has been documented as per the applicable small scale methodology AMS II-D version 12.		OK
B.6.9	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Project emission due to electricity consumption and fossil fuel consumption has been considered as zero. However the project proponent is requested to consider project emission for electricity consumption and fossil fuel consumption.	<del>CAR-6</del>	OK
B.6.10	Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Please refer to B.6.9	<del>CAR-6</del>	OK
<b>Leakage</b>						
B.6.11	Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	In line with the applicable small scale methodology AMS II-D version 12, the energy efficient technology equipment have neither been transferred from another activity nor have the		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			existing equipment transferred to another activity. Thus leakage has not been considered		
<b>Emission Reductions</b>					
B.6.12 Algorithms and/or formulae used to determine emission reductions: <ul style="list-style-type: none"> <li>• All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced</li> <li>• All documentation is correctly quoted and interpreted.</li> <li>• All values used can be deemed reasonable in the context of the project activity</li> <li>• The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.</li> </ul>	/1/	DR	Formulae used to determine emission reduction are in line with the applicable methodology. However there are some issues under project emission. Please refer to B.6.9.	<del>CL-7</del> CAR-6	OK
<b>B.7 Monitoring plan</b>					
<b>Data and parameters monitored</b>					
B.7.1 Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/	DR	Yes the means of monitoring describe in the PDD is in line with the applicable methodology AMS II-D version 12		OK
B.7.2 Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	The monitoring plan contains all necessary parameters with clear description.		OK
B.7.3 In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	Measurement equipment has been described adequately. <ul style="list-style-type: none"> <li>▪ Total consumption of coal for brick making in brick field i in year y will be measured by onsite weighing scale</li> <li>▪ Weighted average net Calorific Value of coal used in y<sup>th</sup> year in brick field i will be laboratory tested with each new consignment of coal purchased.</li> </ul>		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<ul style="list-style-type: none"> <li>Daily production of bricks in Kiln i will be recorded on a daily basis by the kiln owner.</li> <li>Weight of baked bricks from Kiln will be measured on site by weighing scale by the kiln owner</li> <li>Number of operational days of the kiln in a year will be monitored by kiln owner</li> <li>Quantity of diesel (fuel type) combusted in process j during the year y by onsite measurement</li> <li>Electricity Consumption in plant i per year will be monitored by monthly meter reading.</li> </ul> <p>Green brick production or dry brick production or final baked brick production could be considered as daily production of bricks in Kiln i. Thus the project proponent is requested to specify which brick production would be considered as daily brick production.</p>	<del>CL-8</del>	
B.7.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR	The PP is requested to define the measurement accuracy, calibration frequency of all the measuring equipment in the PDD.	<del>CL-9</del>	OK
B.7.5	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR	The PP is requested to define the measurement accuracy, calibration frequency of all the measuring equipment in the PDD.	<del>CL-9</del>	OK
B.7.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	The monitoring frequency and recording frequency is not adequate for all monitoring parameters. The PP is requested to specify the monitoring and recording frequency of all the monitored parameter.	<del>CL-10</del>	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	The monitoring frequency and recording frequency is not adequate for all monitoring parameters. The PP is requested to specify the monitoring and recording frequency of all the monitored parameter.	<del>CL-10</del>	OK
<b>Ability of project participants to implement monitoring plan</b>						
B.7.8	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/	DR/I	The site visit revealed that, in view of the resources available in Bangladesh, the monitoring plan, as defined in the PDD might not be feasible for all the individual kiln owners, e.g., monitoring of coal consumption etc. Hence, the PP is requested to review and revise the measurement procedure to a realistic manner.	<del>CL-11</del>	OK
B.7.9	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/1/	DR/I	Day to day record handling procedure has been identified.		OK
B.7.10	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/	DR/I	The data management and quality assurance and quality control procedures are sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified.		OK
B.7.11	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR/I	All monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later.		OK
<b>Monitoring of sustainable development indicators/ environmental impacts</b>						
B.7.12	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	Monitoring of sustainable development indicator is not mandated by the Bangladesh legislations. However, contribution of the project towards	<del>CAR-3</del>	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				sustainable development of Bangladesh will be confirmed from the LoA.		
B.7.13	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	Refer B.7.12	CAR-3	OK
B.7.14	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR	Refer B.7.12	CAR-3	OK
<b>C Duration of the project activity / crediting period</b>						
<b>C.1.1 Start date of project activity</b>						
C.1.2	How has the starting date of the project activity been determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/1/ /28/	DR	Among the three individual HHK brick kiln owners, only M/s Eeta and Tiles Ltd. has confirmed starting of construction on 20 February 2010 by their technology provider Nestor Consulting Limited. This is the earliest financial commitment towards the project activity as made available by the PP. As per EB 41 guideline the start of the project activity is the earliest financial commitment towards implementation of the project activity. However the project proponent has considered the construction date as the start date of the project activity. Thus PP is requested to define the start date of the project activity in line with the EB guidance and substantiate the same with documentary evidence.	CL-12	OK
C.1.3	Is the stated expected operational lifetime of the project activity reasonable?	/1/	DR	The expected operational lifetime of the project is 20 years which is reasonable.		OK
C.1.4	Is the start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/1/	DR	The project proponent has chosen fixed crediting period and the length of the crediting period is ten years. The start date of the crediting period is 1 June 2010. However in the later stage the		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				crediting period start date has been revised to 1 September 2012.		
<b>D Environmental Impacts</b>						
D.1.1	Are there any host country requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? Does the approval contain any conditions that need monitoring?	/1/	DR	The individual kiln owners are to obtain environmental clearance from the designated authority of Government of Bangladesh, prior to commencement of kiln operation.		OK
D.1.2	Does the project comply with environmental legislation in the host country?	/1/ /14/ /18/ /23/	DR	All the three brick kiln owners under this project activity have environmental clearance from Department of environment.		OK
D.1.3	Will the project create any adverse environmental effects?	/1/	DR	The project is unlikely to create adverse environmental impacts		OK
D.1.4	Have identified environmental impacts been addressed in the project design?	/1/	DR	Two identified environmental impacts are air pollution and worker occupational health and safety concerns. Those two impacts have been addressed in the project design.		OK
<b>E Stakeholder Comments</b>						
E.1.1	Have relevant stakeholders been consulted?	/1/	DR	Local residents, social consultant from World Bank, HHK technology provider, traditional brick field owners, mayor of the municipality, representatives of local governments and in on instances, Members of parliament and member of the ,Parliamentary Standing Committee on environment and climate change has been consulted.		OK
E.1.2	Have appropriate media been used to invite comments by	/1/	DR	Individual brick kiln owners conduct stake holder		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
local stakeholders?		/13/ /19/ /22/		consultation meeting individually to invite comments by local stake holders.		
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?	/1/	DR	Stake holder consultation process is not required by regulations/law in the host country		OK
E.1.4	Is a summary of the stakeholder comments received provided?	/1/	DR	A summary of the stakeholder comments received has been provided.		OK
E.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	No negative feed back has been received in the stake holder consultation process.		OK

**Table 3 Resolution of corrective action requests and clarification requests**

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<b>CAR 1</b> Although Eeta and Tiles Ltd. have 4 HHK brick kiln of capacity 50 000 bricks/day each, only two of them are mentioned in the PDD. DNV has confirmed from the Project Idea Note submitted to The World Bank dated 28 November 2008 that all four units of Eeta and Tiles Ltd. are within the scope of the proposed CDM project under consideration. Mismatch is to be justified..	A.2.4	Updated. All 4 Eeta HHKs included bringing total to 8 for the project	<b>OK.</b> The project proponent has revised the PDD to include all four HHK units of Eeta and Tiles Ltd. Now Total number of HHKs considered in the project activity is 8.  CAR 1 is closed.
<b>CAR 2</b> The project being an energy efficiency project by implementation of HHK brick kilns with an estimated equivalent thermal energy saving of 103 GWh <sub>thermal</sub> , which is lower than the stipulated 180 GWh thermal generation capacity. However in actual scenario total 8 HHK brick kilns will be implemented under the project activity instead of 6 kilns as mentioned in the PDD. In this scenario, the project proponent is required to justify scale of the project in view of CDM-EB guidance.	A.2.8 B.2.3	Updated. Operating at full capacity, the total energy savings are estimated to be about 131 GWh <sub>th</sub> per year.	<b>OK.</b> Total HHK considered in the project activity is 8 having capacity of 50 000 bricks/day each. Thus operating at full capacity, the total energy savings have been estimated to be about 131 GWh <sub>th</sub> per year. Hence the project comes under small scale project activity.  CAR 2 is closed.
<b>CAR 3</b> The project Proponent is to provide the letter of approval from all the Parties involved in the project activity.	A.3.2 A.3.3	Done. Latest versions attached	<b>OK.</b> Letter of approval from host country Bangladesh dated 13 Sep 2010 and letter of approval from Annex –I Party, Denmark dated 9 August 2011 has been provided to DNV. The letters of approval were received from the project participants. DNV does not doubt the authenticity of the letters of approval. DNV considers the letters are in accordance with paragraphs 45- 48 of the

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			VVM.  CAR 3 is closed
CAR 4 The project additionality has been demonstrated through barrier analysis, arguing that the main barrier to project implementation is that it faces barriers due to prevailing practise. It has been stated in the PDD that investment cost of HHK brick kiln is more than FCK brick kiln. The PP is to provide supportive documents for related barrier and investment issue which was faced by the project proponent for barriers due to prevailing practice.	B.5.4 B.5.29	PDD additionality now includes investment analysis and supporting documents, are provided recognizing the difficulties which LDCs face in gathering such evidence.	<b>OK.</b> In the latest version of the PDD, investment analysis has been done. In line with the Guidelines for objective demonstration and assessment of barriers/61/; Guideline 7 “for projects in Least Developed Countries” DNV confirms that the relevant barriers (including investment analysis) has been transparently described, as less stringency is needed with regards to data availability in the actual demonstration of barrier, as compared to the projects in non LDC countries.  CAR 4 is closed
CAR 5 It has been evidenced from the board meeting of different brick kilns that all of them have considered CDM prior to the decision to proceed. However as IIDFC is the project proponent who is the nodal point of the entire brick kilns. Thus the PP is to provide first reviewed and approved PIN by The World bank to substantiate the serious consideration of CDM prior to the time of decision to proceed with the project activity.	B.5.5 B5.7 B.5.10 B.5.29	PDD timeline includes relevant dates and evidence of PIN approval by the Bank is provided.	<b>OK.</b> It has been evidenced from the first PIN approval dated /51/ 1 November 2006 for the HHK brick kiln project that CDM was considered in the year of 2006 before the start date of the project activity dated 10 January 2010 on which first HHK (Eeta and Tiles Ltd. Kiln-1 and kiln-2) signed the agreement signed with the Technology Provider for creating its first financial commitment. As IIDFC is the project proponent and the nodal point of the entire HHK brick kiln owners under the project activity, DNV confirms that prior to the time of decision to proceed with the project

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			activity CDM was considered.  CAR 5 is closed
CAR 6 Project emissions due to electricity consumption and fossil fuel consumption have not been considered.	B.6.9 B.6.10 B.6.12	Project emission for electricity consumption and fossil fuel consumption has been considered in the latest PDD and will be added in the calculation of total project emission.  Grid emission factor provided	<b>OK.</b> In the latest version of the PDD, project emissions for electricity consumption and fossil fuel consumption has been considered.  CAR 6 is closed
CL 1 In the PDD it has been stated that the Danish Government, through a letter, confirmed that there is no diversion of ODA. The PP is requested to explicitly mention the date of the letter, in the PDD and also submit copy of the same to the validator	A.5.1	There is no public funding in this project and no diversion of ODA. The Danish Government has confirmed that there is no diversion of ODA in a letter dated September 18 <sup>th</sup> 2009.	<b>OK.</b> Both Danish Government and IIDFC confirmed that there is no public funding in this project activity and no diversion of ODA /3/ /38//.  CL 1 is closed.
CL 2 As per the applied methodology AMS-II.D, version 12, In the case of a new facility the energy baseline consists of the facility that would otherwise be built. It has been evidenced from the UNDP project report on “Improving Kiln Efficiency in the Brick Making Industry (IKEBMI)” by M/s Global Environment Facility dated 20 October 2009 that market share of FCK technology in Bangladesh is 76%. Hence selection of FCK technology as the project baseline is justified. However as the start date of the project activity is in the year 2010 and UNDP project report states the market share of different technology of brick	B.2.6 B.4.2	Current Market share of different technologies in 2010 from Department of Environment has been provided which shows the FCK market share as 92%. This is the best available evidence given Bangladesh LDC status	<b>OK.</b> Current Market share of different technologies in 2010 from Department of Environment shows the FCK market share as 92% /39/. Thus during the start date of the project activity the market share of FCK is predominant in Bangladesh. Thus in line with the methodology AMS-II.D, version 12, In the case of a new facility the energy baseline consists of the FCK that would otherwise be built.  CL 2 is closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
kiln in the year 2006, appropriateness of the data is required to be justified.			
<b>CL 3</b> Yes, the baseline scenario determination is compatible with the available data and all literature and sources are referenced. However one reference has been quoted wrongly in the PDD. Thus the PP is requested to recheck the references used in the PDD.	B.4.7	References have been checked	<b>OK.</b> The reference mentioned in the latest PDD has been corrected.  CL 3 is closed
<b>CL 4</b> The start date of the project activity is after 2 August 2008. The project proponent IIDFC has informed UNFCCC about the project activity for seeking CDM status dated 24 February 2010. The PP is to provide evidence that the DNA of Bangladesh has also been intimated on CDM status of the project activity..	B.5.6	Letter to UNFCCC is provided. Project advertised for GSC 26 February 2010.  Prior CDM consideration made to DNA 9 March 2010	<b>OK.</b> The start date of the project activity is 10 January 2010. Within 6 months from the start date of the project activity PP informed UNFCCC on 24 February 2010 /27/ and informed Bangladesh DNA on 9 March 2010 /31/.  CL 4 is closed.
<b>CL 5</b> The PP has demonstrated barrier due to prevailing practice. The barrier has a clear impact on the financial returns so that it can be assessed through investment analysis. Thus the PP is requested to substantiate the financial implication of the project due to prevailing practice barrier.	B.5.12	Investment Analysis has been included in the Additionality section of the latest PDD with supporting documentation provided	<b>OK.</b> Investment analysis has been included in the PDD as per the applicable guideline of LDC. As per the investment analysis the project activity is less financially viable than the baseline activity.  CL 5 is closed
<b>CL 6</b> The PDD indicates that the project has faced a few barriers which eventually were caused for barrier due to prevailing practice. The PP is requested to demonstrate extent of prohibitive of	B.5.16 B.5.17 B.5.18 B.5.19	Revised Additionality section has considered these points. Investment analysis is used together with revised additionality argument. The main barriers apart from cost are that the technology is not common practice and the overall skills	<b>OK.</b> In the revised additionality following barriers has been mentioned: Investment barrier Technology barrier Barrier due to prevailing practice Other barriers at the project participant



Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>the following barriers and how CDM would alleviate the same:</p> <ul style="list-style-type: none"> <li>iv) Lack of local knowledge /expertise /competence</li> <li>v) Delay due to shipment problem</li> <li>vi) Flood situation – that would any way affect the baseline case in the same way</li> </ul> <p>More over maximum of the barrier has been faced by other group of HHK brick kiln owners under project “Improving Kiln Efficiency in the Brick Making Industry in Bangladesh” identified by same project proponent IIDFC. Thus PP is requested to substantiate that how these barriers are also prohibiting the project activity when some technology awareness has been built up by IIDFC, the nodal agent of the project.</p>		<p>base or experience does not exist to introduce HHK on a wide scale. Examples are provided of the implementation problems which arise in trying to introduce the HHK technology. Given the newness of the technology further implementation issues may arise – the key point is that the introduction of new technology involves learning by doing process. This technology is still in that process with PDD kilns delayed and not yet operational it is apparent that barriers are not being overcome.</p>	<p>level.</p> <p>Based on the documentary evidences /32/ /33/ DNV confirms that all the barriers mentioned above are prohibitive in nature for implementation of the project activity.</p> <p>CL 6 is closed.</p>
<p>CL 7</p> <p>The grid emission factor has been sourced from published data of Power division 2009, Bangladesh. However the project proponent is requested provide the official database for grid emission factor of Bangladesh national grid.</p> <p>It has also been evidenced from the site visit that all the brick kilns will source electricity from the grid, however in the PDD it is not clear that from where all the brick kilns will take electricity. Thus PP is also requested to clearly mention the source of the electricity.</p>	B.6.3	<p>Latest grid emission factor has been used in the PDD All the kilns will source electricity from the National Grid. This is now clearly mentioned in the latest PDD version</p>	<p><b>OK.</b> DNV confirms that grid emission factor calculation is in line with Tool to calculate the emission factor for an electricity system version 2 /62/.The grid emission factor provided by the Bangladesh Designated National Authority in letter dated 9 Feb 2011 /41/ has been considered for the project activity.</p> <p>CL 7 is closed</p>
<p>CL 8</p> <p>Green brick production or dry brick production or final baked brick production could be considered</p>	B.7.3	<p>It is clearly mentioned in the latest PDD version that finished brick production would be considered as daily brick</p>	<p><b>OK.</b> In the latest version of the PDD it has been clearly mentioned that finished brick production would be considered as daily</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
as daily production of bricks in Kiln i. Thus the project proponent is requested to specify which brick production would be considered as daily brick production		production	brick production. The statistical method has been used to monitor the finished bricks weight.  CL 8 is closed.
CL 9 The PP is requested to define the measurement accuracy, calibration frequency of all the measuring equipment in the PDD.	B.7.4 B.7.5	The monitoring system has simplified and according to the revised monitoring system measuring equipments and their calibration is not required. Except the weighing machine for weighing of finished bricks there is no monitoring equipment. Weighing machines calibration frequency and measurement accuracy has been mentioned in the PDD.	<b>OK.</b> In the latest version of the PDD monitoring has been simplified in such a way that individual brick kiln owner can monitor the emission reduction from the project activity. Total coal used in the individual project activity will be monitored from the coal invoice. Total diesel used in the individual project activity will be monitored from the diesel invoice. Total electricity used in the individual project activity will be monitored from the electricity bill. NCV of coal will be tested by accredited laboratories. Weight of the brick will be monitored by individual kiln operator on sampling basis. Thus except the weighing machine for weighing of bricks there are no monitoring equipment. Weighing machines calibration frequency and measurement accuracy has been mentioned in the latest version of the PDD.  CL 9 is closed
CL 10	B.7.6	Monitoring frequency and recording	<b>OK.</b> Monitoring and recording frequency of all the monitored parameter has been

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
The monitoring frequency and recording frequency is not adequate for all monitoring parameters.	B.7.7	frequency of all the monitored parameter has been adequately defined in the revised monitoring section of the PDD.	described in the latest PDD.  CL 10 is closed.
CL 11 The site visit revealed that, in view of the resources available in Bangladesh, the monitoring plan, as defined in the PDD might not be feasible for all the individual kiln owners, e.g., monitoring of coal consumption etc. Hence, the PP is requested to review and revise the measurement procedure to a realistic manner.	B.7.8	The monitoring section has been reviewed and revised to make the measurement procedure to a realistic manner.	<b>OK.</b> In the latest version of the PDD monitoring has been simplified in such a way that individual brick kiln owner can monitor the emission reduction from the project activity.  CL 11 is closed
CL 12 Among the three individual HHK brick kiln owners, only M/s Eeta and Tiles Ltd. has confirmed starting of construction on 20 February 2010 by their technology provider Nestor Consulting Limited. This is the earliest financial commitment towards the project activity as made available by the PP. As per EB 41 guideline the start of the project activity is the earliest financial commitment towards implementation of the project activity. .However the project proponent has considered the construction date as the start date .of the project activity. Thus PP is requested to define the start date of the project activity in line with the EB guidance and substantiate the same with documentary evidence.	C.1.2	The signing date of the Technology Service Agreement with the Technology provider has been considered as the project start date as the agreement has created the first financial commitment for the entrepreneur. The PDD has been revised accordingly.  Hence the revised project start date is 10 January 2010.	OK. Among all the HHK owners M/s Eeta and Tiles Ltd. has made the first technical service agreement for two HHK (among the four) with the technology provider on 10 January 2010 /20/. Thus this is the first financial commitment towards the project activity and considered as the start date of the project activity.  CL 12 is closed.

## **APPENDIX C**

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### **CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS**

**Sasim Chattopadhyay** holds a Master Degree (M. Sc.) in Physics and a Master Degree (M. Tech.) in "Energy Science and Technology". Having an overall experience of around seventeen years. Prior to joining DNV having five years experience in Energy Auditing in various industries like Engineering, Jute & Textile, Cement, Iron & Steel, Chemical, Automotive etc. covering Analysis of Energy Consumption pattern, Measurement of energy/fuel consumption & environmental emission parameters and Analysis for identifying Energy Conservation Opportunities.

He has experience of around three years in validation and verification of CDM projects and around six years in Management System Certification (QMS/EMS/OHSAS/SA) services.

His qualification, industrial experience and experience in CDM demonstrate him sufficient sectoral competence in "(1) 1.2 - Energy generation from renewable energy sources and (2) 3.1 - Energy Demand."

**Indrajit Rana** holds double Bachelor Degree, in Chemical engineering and in Chemistry and is a certified energy auditor from Bureau of Energy Efficiency (BEE) of Government of India. Having an overall experience of around nine years. Prior to joining DNV having around six years experience in Chemical process industry namely Petrochemical industry covering production, day to day production planning, energy efficiency improvement, safety, and capacity expansion of existing unit. His experience also covers the fields of environmental management and resource conservation including optimisation of steam consumption. Being shift incharge of HDPE unit he has acquired the knowledge of utility services like, nitrogen, hydrogen, plant air and water, steam, power and flare system. He is adequately experienced in handling many types of energy intensive rotating equipment like brine refrigerator (screw compressor), centrifugal and reciprocating compressor, blower, vertical monuted centrifugal pump, extruder, etc. and also experienced in handling DCS and advanced process control systems. He has knowledge in material balance and energy balance of HDPE plant. He has also experience in intrigated offsite plant (IOP) mainly waste water treatment plant, cooling tower operation and flare operation.

He has experience of 3 and half years in validation and verification of numerous CDM projects in DNV, both in India & abroad.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in Energy demand, Renewable energy generation, and Chemical process industries .

**Matteo Faggin** holds a Master Degree in Business Administration and a Master Degree in Mechanical Engineering.

He has an overall experience of around 8 years. Prior to joining DNV having 7 years experience in the cement, construction and aluminum industries covering industrial operations and new project implementation for cement plants, quarries, energy and thermal distribution projects. He has experience of around 1 year in validation and verification of numerous CDM projects.

His qualification, industrial experience and experience in CDM demonstrate him sufficient sectoral competence in Cement Industry, Electricity Distribution, Heat Distribution, Mining and Mineral processes.

Expertise in Project Management for the execution of large projects aimed at reducing the greenhouse gasses emissions and increasing the energy efficiency of manufacturing plants.

**Seshan Ranganathan**, holds a Bachelor's Degree in Chemical Engineering and has done diploma course in Management and completed the graduate ship course in Industrial Engineering and has an overall working experience of around twenty six years. Prior to joining DNV has around twenty four years' experience in Chemical process industry (fertilizer & petrochemical manufacturing) covering production, technical services including energy audits and efficiency studies, waste heat recovery, efficiency studies of boilers ,power plants , safety audits and pollution control activities including waste water treatment, project management, corporate planning, sales, logistics in fertilizer & petrochemical industry . With respect to the thermal power plant the job assignment included the monitoring of flue gas exit temperatures, excess air used efficiency of fuel additives, condition of boiler refractory, insulation of steam lines etc. The experience also includes 5 years in process design & engineering for chemical process industry.

He is qualified validator and verifier for CDM projects. He has completed the EMS lead auditor course. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in areas of (a) 1.1 Thermal energy generation from fossil fuels and Biomass including thermal electricity from solar (b) 1.2 Energy generation from renewable energy sources (c) 2.2 Heat distribution (d) 5.1/11.1/12.1 Chemical Processes Industries and (e) 13.1 Waste handling and disposal.

**Yang Xiao Shan**, Alan holds a Bachelor Degree in Material Science and Engineering. He has an overall experience of around 5 years. Prior to joining DNV, he has around 4 years experience in cement manufacturing industry covering production, process optimization, quality assurance, waste heat recovery and energy efficiency improvement. His experience also covers the fields of environmental management and resource conservation including alternative fuels, cheap coal, and solid waste disposal in clinker kiln. He has also been actively involved in implementation of Quality Management System, ISO 9001 standard in cement manufacturing industry for more than three years. He has experience of around 1 year in validation and verification of CDM and VCS projects. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in "Cement Manufacturing".