



VALIDATION REPORT

IMPROVING KILN EFFICIENCY IN THE BRICK MAKING INDUSTRY IN BANGLADESH

REPORT No. 2010-0405

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DET NORSKE VERITAS



VALIDATION REPORT

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Summary:

Project Name: Improving Kiln Efficiency in the Brick Making Industry in Bangladesh

Country: Bangladesh

Methodology: AMS-IL.D

Version: 12

GHG reducing Measure/Technology: Other manufacturing industries

ER estimate: 54 704 tCO₂e 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" in Bangladesh, as described in the PDD, version 15 of 18 April 2011, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AMS-IL.D, version 12. Hence DNV requests the registration of the project as a CDM project activity.

Report No.: 2010-0405	Subject Group: Environment	
Report title: Improving Kiln Efficiency in the Brick Making Industry in Bangladesh		
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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 ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DNV	Det Norske Veritas
DoE	Department of Environment
FAR	Forward Action Request
FCK	Fixed Chimney Kiln
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
IIDFCL	Industrial and Infrastructure Development Finance Company Ltd
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of approval
LoI	Letter of Intent
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PIN	Project Idea Note
tCO ₂ e	Tonnes of CO ₂ 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”. 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 (IIDFC) and International Bank for Reconstruction and Development (IBRD) as 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 CO₂ 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 54 704 tCO₂e 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”, as described in the PDD, version 15 dated 18 April 2011, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria 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, 2011-07-18.

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Director of Services and Technologies
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” project (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 criteria 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. The validation was based on the recommendations in the Validation and Verification Manual /82/.

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 Roland Wong, P.Eng., Clean Energy Alternatives Inc and Mr Shaymal Barman Industrial and Infrastructure development Finance Company Ltd (IIDFCL): *CDM-PDD for project activity "Improving Kiln Efficiency in the Brick Making Industry in Bangladesh" Version 12 dated 30 October 2009, version 14 dated 15 March 2011 and final version 15 dated 18 April 2011-*
- /2/ Md. Matiul Islam, Chairman, IIDFCL: *Certificate for Clean Energy Alternatives Inc as a consultant (not as a project participant) dated 3 March 2010*
- /3/ Md. Matiul Islam, Chairman, IIDFCL: *Letter to Bangladesh Bank for creating of a fund for refinancing loans to HHK brick kiln industry dated 7 February 2010*
- /4/ Md. Matiul Islam, Chairman, IIDFCL: *Certificate for not using ODA in the project activity dated 3 March 2010*
- /5/ IIDFCL: *Contract for consulting services between IIDFCL and CEA dated 14 February 2008*
- /6/ The World Bank: *First LoI dated 18 February 2007 for potential purchase of Emission Reductions from "Improving Kiln Efficiency in the Brick Making Industry in Bangladesh"*
- /7/ The World Bank: *Renewal LoI dated 23 September 2008 for potential purchase of Emission Reductions from "Improving Kiln Efficiency in the Brick Making Industry in Bangladesh"*
- /8/ IIDFCL: *Emission Reductions Transfer Agreement between Kapita Auto Bricks Ltd. and IIDFCL dated 6 September 2009*
- /9/ Barapukuria Coal Mining Company Limited: *Calorific value of coal available in the website www.bcmcl.org.bd*
- /10/ Bangladesh University of Engineering and Technology: *Pre-Feasibility Report on a Brick Manufacturing Fuel Substitution CDM Project dated October 2002*
- /11/ Global Environment Facility: *UNDP project report on "Improving Kiln Efficiency in the Brick Making Industry (IKEBMI) in Bangladesh" in August 2006*
- /12/ Government of Meghalaya: *Calorific value of coal deposited in Meghalaya available in official web site of Government of Meghalaya*



- <http://meghalaya.nic.in/industry/opens.htm>*
- /13/ UNOPS, GEF and UNDP: *Fact sheet on the Kiln Technology and Brick Industry in Bangladesh*
<http://www.undp.org.bd/projects/prodocs/BrickKiln/FINAL%20Brick%20kiln%20factsheet%20Mar%202011.pdf>
<http://www.undp.org.bd/projects/prodocs/IKEBMI/IKEBM%20-%20Project%20Fact%20Sheet.pdf>
- /14/ SSL Ceramic Bricks Ltd: *Technical specification of HHK bricks*
- /15/ SSL Ceramic Bricks Ltd: *Board approval for installation two HHK brick kiln with capacity 50 000 brick/day/kiln dated 14 October 2008*
- /16/ SSL Ceramic Bricks Ltd: *Application for environment clearance dated 14 July 2008*
- /17/ SSL Ceramic Bricks Ltd: *Work order for khoa and solid bricks for construction of HHK dated 1 December 2008*
- /18/ Bank Asia: *Term loan sanction letter to SSL Ceramic Bricks Ltd dated 1 September 2008*
- /19/ Universal Bricks Ltd.: *Board approval by the management of Tianjin Machinery Import Export Corporation for installation one HHK brick kiln with capacity 50 000 brick/day dated 15 July 2006*
- /20/ Tianjin Machinery Import Export Corporation: *Letter for confirmation of construction start dated 20 November 2006 and construction started on 15 December 2006*
- /21/ Department of Environment: *Environment clearance for Universal Bricks limited dated 27 January 2008*
- /22/ Universal Bricks Ltd.: *MoM of stake holder consulting meeting dated 9 February 2009*
- /23/ Universal Bricks Ltd.: *Technology agreement between Tianjin Machinery Import Export Corporation and Universal Bricks Limited dated 30 August 2006*
- /24/ Sunflower Bricks & Construction Materials Ltd: *Board approval for installation one HHK brick kiln with capacity 50 000 brick/day dated 10 September 2007*
- /25/ Sunflower Bricks & Construction Materials Ltd: *Application for environment clearance dated 4 October 2009*
- /26/ Sunflower Bricks & Construction Materials Ltd: *MoM of stake holder consulting meeting dated 10 February 2009*
- /27/ Sunflower Bricks & Construction Materials Ltd: *Work order for rental chain dozer dated 1 October 2009*
- /28/ Sunflower Bricks & Construction Materials Ltd: *Term loan sanction letter from IIDFCL dated 11 September 2009*
- /29/ Kapita Auto Bricks Ltd: *Board approval for installation one HHK brick kiln with capacity 100 000 brick/day dated 18 May 2008*
- /30/ Kapita Auto Bricks Ltd.: *Term loan sanction letter from United Commercial bank Limited dated 5 May 2009*
- /31/ Kapita Auto Bricks Ltd.: *MoM of stake holder consulting meeting dated 8 September 2009*
- /32/ Department of Environment: *Receiving letter for environmental clearance for Kapita Auto bricks Limited dated 8 September 2009*
- /33/ Kapita Auto Bricks Ltd.: *Work order for procurement of 1st class bricks for*



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- construction of kiln dated 12 April 2009*
- /34/ Haair Bricks Ltd.: *Board approval for installation one HHK brick kiln with capacity 50 000 brick/day dated 15 January 2007*
 - /35/ Haair Bricks Ltd.: *MoM of stake holder consulting meeting dated 9 February 2009*
 - /36/ Haair Bricks Ltd.: *Term loan sanction letter from IIDFCL dated 28 December 2006*
 - /37/ Tianjin Machinery Import Export Corporation: *Letter for confirmation of construction start dated 15 April 2007 and construction started on 20 May 2007*
 - /38/ Banolata Refractory Ltd: *Board approval for installation one HHK brick kiln with capacity 50 000 brick/day dated 6 March 2009*
 - /39/ Banalata Refractory Ltd: *MoM of stake holder consulting meeting dated 5 September 2009*
 - /40/ Banalata Refractory Ltd: *Loan disbursement report from Sonali Bank Limited dated 16 September 2009*
 - /41/ Banalata Refractory Ltd: *Technology agreement between Tianjin Machinery Import Export Corporation and Universal Bricks Limited dated June 2009*
 - /42/ Banalata Refractory Ltd: *Work order for construction of HHK dated 11 October 2009*
 - /43/ Department of Environment: *Receiving letter for environmental clearance for Banolata Refractory Limited dated 5 August 2009*
 - /44/ Diamond Auto Bricks Ltd: *Board approval for installation one HHK brick kiln with capacity 100 000 brick/day dated 3 June 2007*
 - /45/ Diamond Auto Bricks Ltd: *Letter dated 18 May 2010 to IIDFC regarding project cost and commissioning date*
 - /46/ Diamond Auto Bricks Ltd: *Letter to IIDFC dated 10 May 2010 regarding increase in project cost and delay in project implementation.*
 - /47/ IIDFCL: *First financial analysis on HHK during its first HHK project finance to Diamond Auto Bricks in 2007, term loan sanctioned on 3 June 2007*
 - /48/ IIDFCL: *First PIN submitted to The World Bank dated) October 2005*
 - /49/ The World Bank: *Review of PIN for HHK brick kilns dated 20 July 2006*
 - /50/ The World Bank: *Approved PIN for HHK brick kilns dated 1 November 2006*
 - /51/ IIDFCL: *Renewed PIN for the project activity dated 28 November 2008.*
 - /52/ IIDFCL: *Emission reduction calculation work sheet*
 - /53/ IIDFCL: *Survey of 17 FCK in the year 2005*
 - /54/ IIDFCL: *Survey of 3 FCK in the year 2010*
 - /55/ Danish Energy Agency: *Affirmation of no diversion of ODA dated 18 September 2009*
 - /56/ 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*
 - /57/ IIDFCL: *Study paper "Weight of Bricks in Bangladesh, 2009"*
 - /58/ Department of Environment (DNA of Bangladesh): *Certification letter dated 9 Feb 2011 of grid emission factor for the year 2009*
 - /59/ IIDFCL: *Project Implementation status as on 28 November 2010.*
 - /60/ Kapita Auto Bricks limited: *Letter dated 25 February 2010 to IIDFCL regarding project cost and commissioning date*



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- /61/ SSL Ceramic Bricks Ltd: *Letter dated 9 March 2010 to IIDFCL regarding project cost and commissioning date*
- /62/ SSL Ceramic Bricks Ltd and Diamond Auto Bricks Ltd: *Letter to IIDFCL informing crack development in HHK foundation in the year 2009*
- /63/ Banolata Refractory Ltd: *Letter dated 21 April 2010 to IIDFCL regarding project cost and commissioning date*
- /64/ Sunflower Bricks & Construction Materials Ltd: *Letter dated 18 May 2010 to IIDFCL regarding project cost and commissioning date*
- /65/ Universal Bricks Ltd.: *Equipment list and rated connected load in HHK brick kiln*
- /66/ IIDFCL: *Survey for FCK project cost and assumption for investment analysis in the year 2005 and 2010*
- /67/ IIDFCL: *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*
- /68/ The Louis Berger Group, Washington DC: *Emissions Baseline Report for the IKEBMI Project (PDF-B Phase BGD/04/014) June 2006 Table 2, pg 3*
- /69/ Global Environment Facility: *UNDP project report on "Improving Kiln Efficiency in the Brick Making Industry (IKEBMI) in 20 October 2009 available in http://www.thegef.org/gef/sites/thegef.org/files/repository/Bangladesh_10-20-2009-ID1901_Improving_Kiln_Efficiency.pdf*
- /70/ Business of Bangladesh: *Coal import has been stopped in Bangladesh; Brick fields are majorly used imported coal*
<http://www.bizbangladesh.com/business-news-2436.php>
- /71/ IIDFCL: *ERPA Negotiation dated 15 June 2009*
- /72/ IIDFCL: *ERPA signed with the World Bank and Danish Ministry of Climate and Energy on 25 Aug 2009*
- /73/ IIDFCL Board Memoto Sunflower Bricks and Construction material Ltd.-*Revival of the suspended loan facility for completion of the project in the year 2009, Page 1&2.*
- /74/ The World Bank: *World Bank safeguard policies explained: <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFE/POL/0,,menuPK:584441~pagePK:64168427~piPK:64168435~theSitePK:584435,00.html>*
- /75/ IIDFCL: *"Environmental Management Framework for HHK Project" (EMF Report) dated 12 April 2009.*
- /76/ Dr. Amir Khan, ST Consultant: *Energy and Stack Emissions Monitoring in Hybrid Hoffman Kiln (HHK) Type – Universal Type" dated December 2008*
- /77/ IIDFCL: *Stakeholder's Consultations Report for Improving Kiln Efficiency for the Brick Making Industry in Bangladesh dated January 2009 to September 2009.*
- /78/ Haair Bricks Ltd.: *MoM of stake holder consulting meeting dated 9 February 2009*
- /79/ SSL Ceramic Bricks Ltd: *MoM of stake holder consulting meeting dated 4 February 2009*



3.1.2 Letters of approval

- /80/ Department of Environment (DNA of Bangladesh): *Letter of approval dated 13 Sep 2010*
- /81/ Danish Energy Agency (DNA of Denmark): *Letter of approval dated 14 July 2011*

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

- /82/ CDM Executive Board: *Validation and Verification Manual*. Version 01.2
- /83/ CDM Executive Board: *Baseline and monitoring methodology AMS-II.D, version 12*
- /84/ CDM Executive Board: *General Guidelines to SSC CDM methodologies Version 15*
- /85/ CDM Executive Board: *Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities*
- /86/ CDM Executive Board: *GUIDELINES FOR OBJECTIVE DEMONSTRATION AND ASSESSMENT OF BARRIERS; Guideline 7 "For projects in Least Developed Countries"*
- /87/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system version 2*
- /88/ CDM Executive Board: *General Guidelines for Sampling and Surveys for Small Scale CDM Project Activities*

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

- /89/ UNOPS, GEF and UNDP: *Terminal Report on Improving Kiln Efficiency for the Brick Making Industry in Bangladesh – PDF B Phase dated May 2007*
- /90/ UNOPS, GEF and UNDP: *Current State of the Brick Industry in Bangladesh dated 29 March 2007*
- /91/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories: *Chapter 1: Introduction, Table 1-3; Default values of carbon content, p.21.*

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

- During web hosting of the PDD AMS-II.D version 11 has been applied. However at the time of request for registration AMS-II.D version 11 is no more valid. Hence the PDD has been revised to AMS-II.D version 12
- Additionality has been revised. Investment barrier has also been used to demonstrate the additionality
- Monitoring plan has been revised
- Estimated emission reduction has been revised from web hosted PDD version 12 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 to 1 September 2011.



3.2 Follow-up interviews with project stakeholders

From 2 March 2010 to 4 March 2010 DNV visited the IIDFCL 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
/92/	2 to 3 March 2010	Mr. Chris Warner	The World Bank	
/93/	2 to 3 March 2010	Md. Matiul Islam	IIDFCL	
/94/	2 to 4 March 2010	Mr. Shyamal Barman	IIDFCL	
/95/	2 to 3 March 2010	Md. Asaduzzaman Khan	IIDFCL	
/96/	2 March 2010	Md. Ziaul Karim Khan	SSL Ceramic Bricks Ltd.	
/97/	2 March 2010	Md. Sharif Hossain	SSL Ceramic Bricks Ltd.	Proposed CDM project activity, baseline determination, environmental impact, bundling issue for individual HHK brick kiln, additionality and monitoring, local stakeholder consultation process
/98/	2 March 2010	Md. Shahidul Islam	SSL Ceramic Bricks Ltd.	
/99/	3 March 2010	Mr. Imtiaz Ahmed Shirajee, MD	Sunflower Bricks & Construction Materials Ltd	
/100/	3 March 2010	M. Zaydul Abedin, MD	Diamond Auto Bricks Ltd	
/101/	3 March 2010	Qazi Nezam-Ul-Haque, Manager	Diamond Auto Bricks Ltd	
/102/	4 March 2010	C. M. Alam	Kapita Auto Bricks Ltd.	
/103/	4 March 2010	C. Manzur Alam	Kapita Auto Bricks Ltd.	
/104/	4 March 2010	Liu Fusheng, GM Ding Jianxin	Universal Bricks Limited	

3.3 Resolution of outstanding issues

The objective of this phase of the validation is to resolve any outstanding issues which needed 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” 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 15 dated 18 April 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.



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

Validation Protocol Table 2: Requirement Checklist				
Checklist question	Reference	Means of verification (MoV)	Assessment by DNV	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in 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 document review (DR) , interview (I) or any other follow-up actions (e.g., on site visit and telephone or email interviews) and cross-checking (CC) 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 corrective action request (CAR) 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 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) during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Corrective action and/or clarification requests	Ref. to checklist question in table 2	Response by project participants	Validation conclusion
The CARs and/ or CLs 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 CARs and/or CLs .	The validation team's assessment and final conclusions of the CARs and/or CLs .

Validation Protocol Table 4: Forward Action Requests		
Forward action request	Ref. to checklist question in table 2	Response by project participants
The FARs 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>Role</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 4. Other competence
Technical team leader (CDM validator)	Chattopadhyay	Sasim	India	✓	✓	✓	✓		
CDM validator	Rana	Indrajit	India	✓	✓	✓			
Expert	Faggin	Matteo	Italy	✓		✓			✓
Assessor under training	Folkestad	Tonje	Norway			✓			
Technical reviewer	Namboodiri	Krishnan	India					✓	
Person with sectoral competence assisting technical reviewer	Yang	Xiao Shan Alan						✓	✓

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 15 dated 18 April 2011.

4.1 Participation requirements

The project participants are Industrial and Infrastructure Development Finance Company Ltd (IIDFC) of host Party 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) /80/ was issued by the DNA of Bangladesh on 13 Sep 2010, authorizing IIDFCL as project participant and confirming that the project assists in achieving sustainable development. The DNA of Denmark of Annex I Party issued the LoA /81/ on 14 July 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 IIDFCL confirmed that there is no diversion of ODA /4/ /55/.

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 VVM /82/.

4.2 Project design

The project activity consists of the installation of 8 new Hybrid Hoffman Kilns for brick manufacturing. Each individual kiln by itself would qualify as a Clean Development Mechanism (CDM) project. However, the project proposes bundling 8 HHK which are implemented by seven individual commercial enterprises. The project proponent IIDFCL 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
Universal Bricks Ltd.	Dhamrai, Dhaka Division	+23.5852	+90.1128
Haair Bricks Ltd.(Dhamrai)	Dhamrai, Dhaka Division	+23.5852	+90.1128
Diamond Auto Bricks Ltd.	Narayangonj, Dhaka Division	+23.4800	+90.3437
SSL Ceramic Bricks	Gazipur,	+24.1051	+90.2319



(Kiln 1)	Dhaka Division		
SSL Ceramic Bricks (Kiln 2)	Gazipur Dhaka Division	+24.1051	+90.2319
Kapita Auto Bricks	Dhamrai, Dhaka Division	+23.5248	+90.0138
Banalata Refractory Ltd.	Natore, Rajshai Division	+23.5611	+90.1450
Sunflower Bricks & Construction Materials Ltd.	Narayanganj Dhaka Division	+23.4800	+90.3470

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 during the site visit that each HHK capacity is 50 000 bricks per day or a multiple of 50 000 bricks per day (100 000 bricks per day). In the project activity amongst the 8 HHKs, 6 HHKs have the capacity of 50 000 bricks per day and the other 2 HHKs have the capacity of 100 000 /14/ /8/ /19/ /24/ /29/ /34/ /38/ /41/ /42/ /45/ /47/. The kiln capacity of the individual HHKs has been listed below:

Name of the Kiln	Brick production capacity Number of bricks per day
Universal Bricks Ltd.	50 000
Haair Bricks Ltd - Dhamrai	50 000
Diamond Auto Bricks Ltd.	100 000
SSL Ceramic Bricks Ltd. (Kiln 1)	50 000
SSL Ceramic Bricks Ltd. (Kiln 2)	50 000
Kapita Auto Bricks Ltd.	100 000
Banalata Refractory Ltd.	50 000
Sunflower Bricks and Construction Materials Ltd.	50 000



The project activity is a new facility. In this bundle, HHK of Universal Bricks Ltd has been implemented first and construction started on 15 Dec 2006 /20/. Technology has been transferred from Tianjin Machinery Import Export Corporation of China. The starting date of the project activity is 20 Nov 2006, i.e. the date on which the letter of confirmation for construction of HHK in Universal Bricks Ltd issued by technology supplier Tianjin Machinery Import Export Corporation of China /20/.

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	Commissioning date/ current status
Universal Bricks Ltd.	15 July 2006 /19/	20 November 2006 /20/	9 January 2008, now under operation /59/
Haair Bricks Ltd	15 January 2007 /34/	28 December 2006 /36/	Expected commissioning date 15 March 2012/59/
Diamond Auto Bricks Ltd.	3 June 2007 /44/	3 June 2007 /47/	17 December 2008, now under operation /59/
SSL Ceramic Bricks Ltd. (Kiln 1)	14 October 2008 /15/	01 September 2008 /18/	16 May 2010, now under operation /59/
SSL Ceramic Bricks Ltd. (Kiln 2)	14 October 2008 /15/	Financial commitment has not yet been made.	Expected commissioning date 15 March 2012 /59/
Kapita Auto Bricks Ltd.	18 May 2008 /29/	05 May 2009 /30/	1 March 2010, now under operation /59/
Banalata Refractory Ltd.	6 March 2009 /38/	14 September 2009 /40/	15 May 2010, now under operation /59/
Sunflower Bricks and Construction Materials Ltd.	10 September 2007 /24/	11 September 2009 /28/	1 September 2010, now under operation /59/



As indicated above in the chronologies of the individual HHKs, in two cases the project entity board approval date is after the loan sanction letter date which has been considered as the project start date of those two HHK operations. This is because the companies are family owned (shareholders are relatives) and board meetings are occasionally held to serve emergency financial / legal purposes. CDM consideration was made earlier before even applying for finance. The fact that the Board minutes indicate that the decisions to undertake those 2 projects were taken after financial closure was reached is understandable given that these are small businesses. In such cases a Board can only decide to approve a project if financial closure is reached. Further, there have been several meetings between IIDFC and the entrepreneurs regarding CDM consideration since review and approval of PIN for HHK brick kiln by The World Bank in the year 2006 /49/ /50/. All of the above HHK owners have been considered in the PIN.

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 /10/ /11/. 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 2011, whichever ever occurs later. Among all eight HHK brick kilns, the operation of six HHK brick kilns has been started. The other two will start operation in the year 2012 /59/.

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 has been applied for the project activity. 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.
- The project activity involves installation of energy efficient HHK at seven new industrial facilities. Except for SSL Ceramic Bricks Ltd, all of the industrial facilities have one HHK. SSL Ceramic Bricks Ltd has two HHKs. Thus the project activity consists of a total 8 HHKs. DNV has confirmed this during onsite validation.
- The use of primary fossil fuel (coal) for brick production, electricity and diesel consumption to operate plant equipments of HHK could be directly measured. This has been described in section 4.7 of this report.
- In the project activity, consumption of coal is low 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 other variables, like increase of production capacity, do not influence the changes in energy use.
- Total equivalent thermal energy saving achieved by the project activity in demand-side is 164 GWh_{th} /1/ /52/ per annum which is less than 180 GWh_{th} equivalent thermal energy savings as 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 and 100 000 bricks per day per double size HHK is deemed realistic as per the design capacity of a double size HHK. 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 to this report.

4.4 Project boundary

The project boundary is clearly defined in line with the methodology "*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 seven different industrial facilities which have 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 installed 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 ₂	Fossil fuel consumption in the baseline activity
Project emissions	CO ₂	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 /82/

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 to more than 1% of the overall expected average annual emission reduction and which are not addressed by AMS-II.D (version 12).

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.

In Bangladesh four types of technologies /11/ Fixed Chimney Kilns (FCK), Bull's Trench Kilns (BTK), Zigzag Kilns, and traditional Hoffman Kilns has been used for Brick



manufacturing in the year 2006 during the time of decision making for implementation of the project activity /49/ /50/. Thus the four types of baseline technologies of brick kiln have been considered.

In the project activity, construction of the first HHK (i.e. Universal Bricks Limited) was started in the year 2006. Six other HHKs started construction between 2007 and 2009. The remaining one HHK (i.e. SSL Ceramic Bricks (kiln 2)) will be implemented in the year 2011. DNV checked the market share of each brick kiln technology between the period 2006 and 2009. The market survey of the brick industry in Bangladesh in the year 2006 revealed that FCK had the highest market share of 75.4% /10/. The market survey in the year 2009 also revealed almost the same market share of FCK technology which is 76% /69/.

In the year 2006 the market share of BTK, Zigzag Kiln and traditional Hoffman kiln is 19.2%, 4.8%, and 0.6% respectively /11/. Moreover in the year 2009 this market share has not been changed /69/. BTK had the highest market share until the Burning Control Act 1989, Brick Burning (Control) Rules 2004. Thereafter, 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 has also been reflected in market share of each kiln technology.

Thus based on the above points DNV has validated that kilns of type FCK would have been 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 prepared 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 by studies between the years 2002 to 2006 /10/ /11/. In 2006, a UNDP-GEF project /11/ 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 /10/. In Bangladesh, imported coal was used for brick making which is mainly from India. However, in recent days, import of coal for brick making industries has been stopped /70/. Thus coal of Barapukuria Coal Mining Company Limited has been used in most of the current FCKs. Hence, the calorific value of coal of Barapukuria Coal Mining Company Limited has been used for baseline specific energy consumption /9/ and the baseline specific energy consumption has been fixed as 2.125 MJ/kg-for 2.9 kg conventional sized brick. 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 of the assumptions and data used by the project participants are listed in the PDD and/or supporting documents. All documentation relevant for establishing the baseline scenario are 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 /85/.

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

The project activity is a bundle of 8 individual HHKs. In this bundle, the first HHK has been implemented by Universal Bricks Limited. Thus financial commitment for the HHK of Universal Bricks Limited has been taken as the starting date of the project activity. On 20 November 2006 /20/ Tianjin Machinery Import Export Corporation, the technology supplier of HHK confirmed that construction would be started on 15 December 2006. Hence start date of the project activity is 20 November 2006.

Before the starting date of the project activity the World Bank reviewed the PIN of the bundle HHK project on 20 July 2006 /49/ and approved the PIN on 1 November 2006 /50/. In the PIN all the HHK considered in the project activity has been considered. Moreover Tianjin Machinery Import Export Corporation has approved for installation of one HHK brick kiln with capacity of 50 000 brick/day in Universal Bricks Limited on 15 July 2006 /19/ where CDM revenue has been considered. Hence DNV confirmed that prior consideration of CDM in the project activity is adequate.

The continuous actions to secure CDM status has been demonstrated as per the following:

- The World Bank issued LoI on 18 February 2007 /6/ for potential purchase of Emission Reductions from “Improving Kiln Efficiency in the Brick Making Industry in Bangladesh and subsequently renewed the LOI on 23 September 2008 /7/.
- PDD web hosted for the first time on 27 October 2007
- ERPA negotiation on 15 June 2009 /71/ and ERPA signed with the World Bank and Danish Ministry of Climate and Energy 25 August 2009 /72/
- In the board approval of all HHK owners CDM has been considered before implementation of the HHK by each individual owners /15/ /19/ /24/ /29/ /34/ /38/ /44/
- Second time web hosting of the PDD version 12 for Global Stakeholder Consultation on 10 November 2009

Hence DNV confirmed that continuous action to secure CDM status in the project activity is adequate.

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.

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

DNV considers the listed alternatives to be credible and complete.



4.6.3 Investment barrier

The investment barrier has been chosen to demonstrate 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. Therefore, the investment comparison analysis (Option II) or the benchmark analysis (Option III) is applicable to the project activity. Among these two options IIDFCL has adopted the investment comparison analysis. The pre tax project internal rate of return (IRR) has been used as the financial indicator for the investment comparison analysis. IIDFCL 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

The project activity was initiated in the year 2005 /48/ when the first PIN of the project activity was submitted to the World Bank. However, at that time IIDFCL did not have any financial analysis data to demonstrate the investment barrier because LDC's data is not readily available, in particular in the brick making sector, which is poorly organised, seasonal in nature and regarded as a part of the informal sector. This is also evidenced from the first version of the web hosted PDD which had been web hosted on 27 October 2007. In later stage during the project financing to Diamond Auto Bricks in 2007, IIDFCL made first financial analysis on HHK. Since IIDFCL had no realistic data on HHK during the first project finance investment decision making to Diamond Auto Bricks, available data were used for the assumption made in the IRR analysis of HHK /47/. 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 actuality, the project cost exceeded the estimated cost used in the IRR analysis /45/.

The input parameters used for the investment analysis of FCK is based on the survey data of 17 FCKs in the year 2005 /53/ and 3 FCKs in the year 2010 /54/. 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 2011. The salvage value has also been taken into account at the end of IRR analysis period /67/.

In line with the "Guidelines for objective demonstration and assessment of barriers" version 1 /86/, *"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) /67/. It has been evidenced from the investment comparison analysis that the 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 the pre tax project IRR are 14% and 40% for HHK and FCK respectively /67/. The payback period is 6.48 years for HHK with CERs, 7.21 year for HHK without CERs and 2.26 years for FCK. With CDM benefits, pre-tax project IRR for the HHK is 16%.

Thus with the CDM benefits, the pre-tax project IRR will improve, however it is less than the pre-tax project IRR of FCK. Hence CDM benefit will alleviate the investment barrier associated with HHK.

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 /67/.

- Kiln, Dryer & other civil works
- Main machinery & equipments
- Total Investment
- Clay Price
- Sales price of brick

In all cases, the pre-tax project IRR of the project with or without CER revenues would be below the IRR of the baseline FCK technology by a substantial margin even in the case of significant ($\pm 10\%$) variations of the input parameters.

Thus it is DNV's opinion the sensitivity analysis is complete, and in any realistic situation project IRR will not be higher than the baseline IRR.

4.6.4 Barrier analysis

In barrier analysis the PP demonstrate on 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 /86/, "*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*".

Technology Barriers

In the project activity, construction of the first HHK (i.e. Universal Bricks Limited) was started in the year 2006. Six other HHKs started construction between 2007 and 2009. The remaining HHK (i.e. SSL Ceramic Bricks (kiln 2)) will be implemented in the year 2011. DNV checked the market share of each brick kiln technology between the period 2006 and

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2009. The market survey of brick industry in Bangladesh in the year 2006 revealed that FCK had the highest market share of 75.4% /11/. The market survey in the year 2009 also revealed almost the same market share of FCK technology which is 76% /69/.

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%. The market share of the HHK technology was zero when the CDM project activity was undertaken and after more than 3 years, despite serious effort of IIDFCL to promote this technology through CDM, the market share of the HHK technology is still very marginal (0.2%) /56/. In Bangladesh only IIDFCL acts as a bundler for implementing HHK in Bangladesh and no other HHK in Bangladesh has been implemented by IIDFCL without CDM benefits. DNV has validated 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 /56/.

This technological barrier is not relevant to FCK technology which has also been substantiated by the current market survey /69/.

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

Barriers due to prevailing practise

Among these 8 HHKs, the HHK implemented by Universal Bricks Limited is the first HHK implemented in Bangladesh /19/. The technology has been transferred from China by Tianjin Machinery Import Export Corporation /20/. 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 at SSL and Diamond kiln /62/, which demonstrates different soil condition between China and Bangladesh. In another kiln the drying tunnel flooded as it was not foreseen that the high water table in Bangladesh would cause flooding. The actual cost of implementation of HHK is higher than the estimated value during the start of the project activity. DNV validated this from the loan sanction letter for individual kiln and declaration of increased cost from several kiln owners/28/ /30/ /36/ /40/ /46/ /60/ /61/ /64/. The increased cost has made the Sunflower kiln owner limit his investment plan to a single sized kiln spending the same amount of money with which the kiln owner originally planned to construct a double sized kiln /73/.

These barriers due to prevailing practise are not relevant to FCK technology which has also been substantiated by the current market survey.

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 IIDFCL act as CDM bundler for all these 8 individual HHKs. Being a financial institution



IIDFCL, also provided funding for a few of the HHKs, like Haair Bricks Limited /36/. 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, IIDFCL also faced investment barriers for funding all the 8 HHKs on upfront basis. Each HHK owner has depended on different financial institutions /3/ /18/ /28/ /30/ /40/ as one single financial institution has not agreed to provide funding of all the 8 HHKs. This created delays in project implementation.

The first version of this PDD was web hosted for global stakeholder consultations on 27 October 2007. However due to lack of prior experience in HHK, lack of data for demonstrating the project activity as CDM project, difficulty for arrangement of funding, 5 Kiln owners (BK Ceramic Bricks, Sun and Rahman, Modern Rotor, Uttara and Comfort Bricks) had dropped out from the project. Moreover, 4 years after the implementation of the first kiln it was expected that all kilns would be operational. However, construction of the second SSL kiln has not begun due to prevailing barriers, including access to finance which demonstrates the prohibitive nature of all the barriers.

These 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). 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 contains all necessary parameters as required by the methodology AMS-II.D, version 12. 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 /91/
- Carbon to CO₂ conversion factor; this value has come from stoichiometric combustion ratio. The value is 3.66.



- 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 /87/. The grid emission factor provided by the Bangladesh Designated National Authority in letter dated 9 Feb 2011 has been considered for the project activity /58/. The grid emission factor has been calculated for the time period 2007 to 2009. The value is 0.62 tCO₂e/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) /9/ and coal use of 24 tonnes per 100,000 bricks were utilized /10/ /11/ to calculate the Specific Fuel Consumption per kg - bricks in the baseline (FCK) technology. The value is 2.125 10⁻⁶ TJ/kg-brick.
- Specific Fuel (Coal) Consumption per unit FCK brick; 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, October 2002, Table A, pg 3, /10/.

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 /68/.

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 /9/
- Weight of per unit FCK brick; The value has been verified from the study carried by IIDFCL "Weight of Bricks in Bangladesh", 2009 /57/. 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 /91/ has been used. The density of diesel considered as 0.8432 kg/liter. The value is 0.036509 TJ/Kilolitre.
- Weighted average CO₂ 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 /91/ has been used. The value is 74.8 tCO₂/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 invoices from the coal suppliers. The project activity has been



implemented in individual 8 HHKs owners whose financial capacity is limited for implementation of weigh bridges on the plant premises. During the site visit DNV also cross checked that not one of the HHKs have weigh bridges in the plant premises. Hence, in house monitoring of coal consumption is not possible in the plant itself. Thus coal invoices from the coal suppliers has been used for monitoring of coal consumption in the project activity. The parameter will be monitored on monthly basis.

- Net Calorific Value of coal used in y^{th} 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 for 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 production 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.
- 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 /88/ 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 from the invoices from the diesel supplier. The data will be recorded on monthly basis.
- Electricity consumption in plant i per year. Monthly electricity bill for paid to Rural Electricity Board (REB) by individual kiln owner will be used to calculate the total electricity consumption of the month and will be noted in the monthly report.

4.7.3 Management system and quality assurance

IIDFCL 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. This data will be recorded daily in the plant registers and once a month this will be compiled and delivered to IIDFCL. 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



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supply it to IIDFCL at the end of each month. IIDFCL will prepare the final compiled emission reduction calculation data sheet which could verify by the DOE during verifications with in the crediting period.

IIDFCL 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 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 ₂ 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 ₂ Conversion Factor (tCO ₂ /tC)
$EC_{i, y}$	Electricity Consumption in plant i per year (MWh)
$EF_{CO_2, ELEC}$ (tCO ₂ /MWh)	Estimated CO ₂ emissions factor for grid electricity in Bangladesh
$PE_{FC, j, y}$	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:

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

Where,

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



 VALIDATION REPORT

Total Production of bricks per year in plant i (Kg-bricks/year) will be calculated by the following formulae:

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

Where,

$DP_{bricks, d, i}$ 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

CO₂ emissions from fossil fuel combustion in process j during the year y (tCO₂/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);
 $COEF_{Diesel, y}$ CO₂ emission coefficient of diesel (fuel type) in year y (tCO₂/ Kilolitre)

CO₂ emission coefficient of diesel (fuel type) in year y (tCO₂/ 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 CO₂ emission factor of fuel type i in year y (tCO₂/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 54 704 tCO₂e 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. Some of them have already received the clearance /16/ /21/ /25/ /32/ /43/.

The project has triggered World Bank safeguard policy on Environmental Assessment Policy O.P./B.P.4.01. /74/. 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, IIDFCL completed a report entitled “Environmental Management Framework for HHK Project” (EMF Report) /75/. The report identifies the project risks to the environment, mitigation actions and responsibilities for the implementation of the mitigation actions/plan.

The project activity also demonstrates air quality management /76/. It seems 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, BUET, IIDFCL, 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). Individual brick kiln owners conducted stake holder consultation meeting individually to invite comments by local stake holders /22/ /26/ /31/ /35/ /39/ /78/ /79/. IIDFCL also conducted site specific HHK CDM stakeholder consultations in a public meeting and workshop format during the January-September 2009 period /77/. 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 12 dated 30 October 2009, was made publicly available on the CDM website

(<http://cdm.unfccc.int/Projects/Validation/DB/OPFHLOO2MKUEWXS2OO2MR4Q1M0JI5C/view.html>) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 10 November 2009 to 9 December 2009.

No comment was received.

APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion
About Parties		
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
About additionality		
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

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

Requirement	Reference	Conclusion
that would have occurred in the absence of the registered CDM project activity.		
About forecast emission reductions and environmental impacts		
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
About small-scale project activities (if applicable)		
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	NA
About stakeholder involvement		
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
Other		
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

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

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.
A General description of project activity					
A.1 Title of the project activity (VVM para 55-57)					
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
A.2 Description of the project activity (VVM para 58-64) and VVM para 135 and 136 (a) & (c) for small-scale project activities, as applicable)					
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 ₂ 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 ₂ 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		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>analysis.</p> <p><input type="checkbox"/> The project is an individual small scale project activity with emission reductions not exceeding 15 000 tCO₂e per year. In this case, DOE may not conduct a physical site visit as appropriate.</p> <p><input checked="" type="checkbox"/> Greenfield project</p> <p><i>How was the design of the project assessed?</i></p> <p><input checked="" type="checkbox"/> Physical site inspection</p> <p><input type="checkbox"/> Reviewing available designs and feasibility studies</p> <p><i>If a physical site inspection is not undertaken, justify why no site visit was undertaken:</i></p>		
A.2.2 If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/ /52/	DR	<p>The project proponent has provided the detail progress status of all the individual HHK brick plants.</p> <p>Among all eight HHK brick kiln the operation of six HHK brick kiln has been started. Other two will start operation in the year 2012.</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 ₂ e per year), justify the sampling through a statistical analysis:	/1/	DR	Physical site visit has been conducted in all the eight brick kiln site		OK
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/	DR	One single size brick kiln capacity is 50 000 bricks/day. In this bundle of HHK brick kilns two brick kilns (M/s Diamond Auto Bricks Limited and M/s Kapita Auto Bricks) has the capacity of 100 000 brick/day which has been considered as double size brick kiln. In the latest version of the		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			PDD it has been described clearly. Other brick kilns have the capacity of 50 000 bricks/day.		
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 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/	DR	The HHK brick kiln results in significantly better performance than any commonly used brick kiln technology in Bangladesh. The technology has been transferred from China, which is a non Annex - 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 a energy efficiency project by implementation of HHK brick kilns with an estimated collective thermal energy saving of 164 GWh thermal generation which is lower than the stipulated 180 GWh thermal generation capacity, the project qualifies under small scale CDM project category.		OK
A.2.9 Is the small scale project activity a debundled component of a larger project activity?	/1/	DR	The project activity is a cluster of eight HHK brick kilns. Previously there was no registered project with same methodology, same technology in the host country itself. Thus the project is not a debundled component of a larger project activity		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.															
A.3 Participation requirements (VVM para 51-54, 125-127)																				
A.3.1 Do all participating Parties fulfil the participation requirements as follows:	/1/	DR	Department of Environment is the DNA of Bangladesh. 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															
			<table><tr><td></td><td>Bangladesh (host)</td><td>Denmark</td></tr><tr><td>a) Party has ratified the Kyoto Protocol</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td></tr><tr><td>b) Party has designated a Designated National Authority</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td></tr><tr><td>c) The assigned amount has been determined</td><td><input type="checkbox"/> Yes <input type="checkbox"/> No</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td></tr></table>		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	c) The assigned amount has been determined	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
	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																		
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/ /80/ /81/	DR	Letter of approval from host country Bangladesh dated 13 Sep 2010 and letter of approval from Annex –I Party, Denmark dated 14 July 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 VVM.		OK															
			<table><tr><td></td><td>Bangladesh (host)</td><td>Denmark</td></tr><tr><td>a) LoA confirms that Party has ratified the Kyoto Protocol</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td></tr><tr><td>b) LoA confirms that participation is voluntary</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td></tr><tr><td>c) The LoA confirms that the project contributes to the sustainable development of the host country?</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td>NA</td></tr><tr><td>d) The LoA refers to the precise project activity title in the PDD</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td></tr></table>		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		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																		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
e) The LoA is unconditional with respect to (a) to (d) above f) The LoA is issued by the respective Party's DNA g) The LoA was received directly by the DNA or the 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			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DNA <input checked="" type="checkbox"/> PP <input type="checkbox"/> DNA <input checked="" type="checkbox"/> PP		
A.3.3 Have all private/public project participants been authorized by an involved Party?	/1/	DR	Letter of approval from host country Bangladesh dated 13 Sep 2010 and letter of approval from Annex –I Party, Denmark dated 14 July 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 VVM.		OK
A.4 Technical description of the project activity (VVM para 58-64)					
A.4.1 Is the project's location clearly defined?	/1/	DR/I	Yes project's location has been clearly defined. Among the eight units, seven are located in Dhaka division and the other in Rajshai division of Bangladesh.		OK
A.5 Public funding of the project activity					
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/ /4/ /55/	DR	Both Danish Government and IIDFCL confirmed that there is no diversion of ODA.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B Application of a baseline and monitoring methodology					
B.1 Methodology applied (VVM para 65-76) and VVM para 136 (b) for small-scale project activities, as applicable)					
B.1.1 Does the project apply an approved methodology and the correct and valid version thereof?	/1/	DR	Approved small scale methodology AMS-II.D, version 11 has been applied for the project, which was pertinent at the time of web hosting. However AMS-II.D version 11 has been expired at the time of final version of the PDD. Thus AMS-II.D version 12 has been adopted in the project activity.		OK
B.1.2 If applicable, has any specific guidance provided by the CDM EB in respect to the applied methodology been considered?	/1/ /83/	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/		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.2 Applicability of methodology (and tools) (VVM para 65-76) <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	/1/	DR	The project activity comprises energy efficiency improvement in brick manufacturing process by implementing HHK in the place of FCK.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
primarily at energy efficiency?					
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. The aggregate energy savings of a single project may not exceed the equivalent of 60 GWh _e per year. A total saving of 60 GWh _e per year is equivalent to a maximal saving of 180 GWh _{th} per year in fuel input?	/1/	DR	All the HHK brick kilns are new facility. The project being a energy efficiency project by implementation of eight HHK brick kilns with an equivalent thermal energy saving of 164 GWh thermal generation which is lower than the stipulated 180 GWh thermal generation capacity, the project qualifies applicability criteria of scale of energy saving.		OK
B.2.3 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	In the latest version of the PDD, version 13 dated 1 December 2010 it has been stated that in the project activity it is possible to directly measure and record the energy use within the project boundary. DNV confirms that the energy use within the project boundary can be directly measured and recorded.		OK
B.2.4 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 of coal consumption is low 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 other variables, like increase of production capacity do not influence the changes in energy use.		OK
B.2.5 Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/	DR	As per the applied methodology AMS-II.D, version 11, 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		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			(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.		
B.3 Project boundary (VVM para 78-80)					
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 including the grid facility. 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 ₂ has been identified as the only GHG for the project. The identified boundary covers all possible GHG sources linked to the project activity. The GHG sources are coal, diesel and grid electricity. 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	The project does not involve other emission sources not foreseen by the applied methodology.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.4 Baseline scenario determination (VVM para 81-88, 105-107) <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/ /10/ /11/	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/ /11/	DR	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.		OK
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/ /10/ /11/	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 ~		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			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		
B.4.6 Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /10/ /11/	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
<p>B.4.8 Is the baseline determination adequately documented in the PDD?</p> <ul style="list-style-type: none"> 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. All documentation is relevant as well as correctly quoted and interpreted. Assumptions and data can be deemed reasonable Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity 	/1/ /9/ /12/ /13/ /10/ /11/	DR	<p>Yes the baseline determination adequately documented in the PDD.</p> <ul style="list-style-type: none"> All assumptions and data used by the project participants has been listed in the PDD All documentations are relevant as well as correctly quoted and interpreted. Assumptions and data could be deemed reasonable Relevant national and/or Sectoral polices in brick manufacturing industry of Bangladesh has been considered. Finally the methodology has been correctly applied to identify what would have occurred in the absence of the proposed CDM project activity 		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5 Additionality determination (VVM para 94-121) and VVM para 137 for small-scale project activities, as applicable)					
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/ /86/	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 actual demonstration of barriers, as compared to the projects in other countries.		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 based on a barrier analysis, arguing that the barriers to project implementation are <ul style="list-style-type: none"> • Investment barrier • Technical barrier 		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<ul style="list-style-type: none"> • Prevailing practice barrier • Other barriers <p>Under the investment barrier the project proponent did the investment comparison analysis between baseline FCK technology and HHK technology.</p>		
Prior consideration of CDM (VVM para 98-103)					
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/ /15/ /19/ /20/ /29/ /34/ /38/ /50/ /44/	DR	<p>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 the individual brick kilns have been planned for implementation at different point of time and accordingly included in the project bundle. Board resolution of different brick kiln management except Universal brick kiln happened to be after 20 November 2006, which is the start date of the project activity. IIDFCL is the project proponent and the nodal point of the entire brick kilns and the world bank is also a project participant.</p> <p>It has been evidenced from the first PIN approval dated 1 November 2006 for the HHK brick kiln project that CDM was considered before the 20 November 2006. As IIDFCL 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 activity CDM was considered.</p>		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	/1/	DR	The start date of the project activity is before 2 August 2008.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
informed in writing of the project's intention to seek CDM status?					
Continuous efforts to secure CDM status (only to be completed if starting date is before 2 August 2008)					
B.5.7 What initiatives were taken by the project participants from the starting date of the project activity to the start of validation in parallel with the physical implementation of the project activity?	/1/ /49/	DR	In the latest version of the PDD version 13, the chronology of the events has been described clearly from the review of PIN for the project activity dated 20 June 2006 up to the second time validation site visit dated 3 March 2010.		OK
B.5.8 When did the construction of the project activity start?	/1/ /20/	DR	The project is a bundle of individual HHK brick kiln. In this bundle total eight brick kilns exist. Among these first brick kiln construction started on 15 December 2006		OK
B.5.9 When was the project commissioned?	/1/ /52/	DR	The project proponent has provided the detail progress status of all the individual HHK brick plants. Among all eight HHK brick kiln the operation of six HHK brick kiln has been started. Other two will start operation in the year 2012.		OK
B.5.10 Does the timeline of the project confirm that continuous actions in parallel with the implementation were taken to secure CDM status?	/1/	DR	It has been evidenced from the chronology of events the time gap between any two initiatives to secure CDM status is less than 2 years. Thus DNV confirms that the project proponent did continuous efforts to secure CDM status.		OK
Investment analysis (VVM para 108-114) <i>The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation.</i>					
B.5.11 Does the project activity or any of the remaining alternatives generate revenues apart from CDM? Is this	/1/	DR	It has been evidenced from the latest version of the PDD the project activity HHK brick kiln and		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
reflected in the PDD?			baseline alternative FCK generate revenue apart from CDM.		
B.5.12 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.5.13 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.5.14 What is the financial indicator? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/1/ /67/	DR	The financial indicator chosen is the pre tax project IRR		OK
B.5.15 Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/ /67/	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.5.16 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/ /67/	DR	The time period of the investment analysis is 2005 to 2010 which is relevant as the project implementation is in between the year 2006 to 2011. The salvage value has been taken into account.		OK
B.5.17 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/ /67/	DR	For all the input assumptions used in the report survey report of the year 2005 and 2010 has been used for FCK operation. As per 2005 survey data an average capacity FCK technology brick field has an Internal Rate of Return of 57%. The financial analysis of Diamond Auto Bricks was done in 2007 during the investment proposal appraisal. The analysis was based on 5 years		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>lending period. From the analysis, considering 10 years equivalent project cash flow, the project IRR could be derived as approximately 30%.</p> <p>Due to lack of data availability for both baseline technology (FCK) and as well as HHK technology (reliable and actual HHK data), investment comparison at the same point of reference was not possible. However since at present a few HHK kilns have been stabilized, after facing substantial teething problems for almost two years and adopted the technology locally, actual HHK and FCK data is available. The actual cost of the project and other assumptions on HHK substantially varied from the initial assumptions. Meanwhile the raw material prices along with other costs have substantially increased. Hence the financial analysis is revised based on the actual data.</p>		
B.5.18 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/ /67/	DR	<p><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</p> <p><input type="checkbox"/> The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company)</p> <p><input checked="" type="checkbox"/> Other approach.</p> <p>The amount of output has been assessed as per the actual outputs observed in the operating FCK and HHK technology</p>		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.19 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.	/1/ /67/	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 output price was validated:</i> The output price has been assessed as per the actual output price observed in the operating FCK and HHK technology		OK
B.5.20 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.	/1/ /67/	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, contracts and annual financial reports related to the project and the project participants <i>Provide details on how the investment costs were validated:</i> The investment cost has been assessed as per the actual investment cost observed for the operating FCK and HHK technology brick kiln.		OK
B.5.21 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/ /67/	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&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

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.22 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/ /67/	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.5.23 Was the financial calculation spreadsheet verified and found to be correct?	/1/ /67/	DR	The financial calculation spreadsheet verified and found to be correct.		OK
B.5.24 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/ /67/	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
B.5.25 Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/ /67/	DR	In sensitivity analysis $\pm 10\%$ has been considered which is deemed appropriate.		OK
B.5.26 Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/ /67/	DR	Not applicable as investment comparison analysis has been chosen.		OK
Barrier analysis (VVM para 115-118)					
B.5.27 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.5.28 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

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.29How does CDM alleviate the investment barriers?	/1/	DR	CDM will offset the investment barrier to a certain extent.		OK
B.5.30Is 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.5.31How were the <u>technological barriers</u> assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/ /56/	DR	The technological barrier has been assessed from the third party evidence, Department of Environment, Bangladesh Government-Memo no: DOE/Enforcement/37		OK
B.5.32How 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.5.33Is 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/ /56/	DR	This technological barrier is not relevant to FCK technology which has been substantiated by the current market survey.		OK
B.5.34How 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/ /56/	DR	The technological barrier has been assessed from 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		OK
B.5.35How 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.5.36Is 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/ /56/	DR	This prevailing practise barrier is not relevant to FCK technology which has been substantiated by the current market survey.		OK
B.5.37How were the <u>other barriers</u> assessed to be real? Are the other barriers substantiated by a source independent of	/1/	DR	Other Barriers at the Project Participant level has been identified by the PP. This barrier has been		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
the project participants?			substantiated by an independent source		
B.5.38How 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.5.39Is 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
Common practice analysis (VVM para 119-121)					
B.5.40What 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.5.41What 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.5.42What is the data source(s) used for the common practice analysis?	/1/ /56/	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.5.43How many similar non-CDM-projects exist in the region within the scope?	/1/	DR	The first HHK brick kiln in Bangladesh was installed by Universal Bricks Limited, which is under this project activity. Universal Bricks limited have been installed by foreign investment and the technology has been supplied by Tianjin		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			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.		
B.5.44 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.5.45 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
Conclusion					
B.5.46 What is the conclusion with regard to the additionality of the project activity?	/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. Based on this DNV confirmed that the project is additional		OK
B.6 Calculations of GHG emission reductions					
Data and parameters that are available at validation and that are not monitored (VVM para 199-203)					
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/ /87/	DR	DNV confirms that grid emission factor calculation is in line with Tool to calculate the		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	/58/		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.		
B.6.3 How was the Carbon to CO ₂ 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/ /9/	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/ /10/ /11/ /68/	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, 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		OK
B.6.6 How was the <i>Calorific Value of the coal used in the Baseline (CV_{Coal}, FCK)</i> available at validation verified?	/1/ /9/	DR	The value has been verified from the <i>website</i> of Barapukuria Coal Mining Company Limited. www.bcmcl.org.bd		OK
B.6.7 How was the Weight of per unit FCK brick available at validation verified?	/57/	DR	The value has been verified from the study carried by IIDFCL “ <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		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			justified.		
B.6.9 How was the Weighted average CO ₂ 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
Baseline emissions (VVM para 89-93)					
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. In the web hosted PDD AMS II-D version 11 was used. However as this version is no more valid, version 12 has been used		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
Project emissions (VVM para 89-93)					
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 methodology AMS II-D version 12. In the web hosted PDD AMS II-D version 11 was used. However as this version is no more valid, version 12 has been used		OK
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
Leakage (VVM para 89-93)					
B.6.16 Are the leakage calculations documented according to the approved methodology and in a complete and transparent	/1/	DR	In line with the applicable small scale methodology AMS II-D version 12, the energy		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
manner?			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		
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
Emission Reductions (VVM para 89-93)					
B.6.19 Algorithms and/or formulae used to determine emission reductions: <ul style="list-style-type: none"> • 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 • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • 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. 	/1/	DR	Formulae used to determine emission reduction are in line with the applicable methodology.		OK
B.7 Monitoring plan (VVM para 122-124)					
Data and parameters monitored					
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.		
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.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<ul style="list-style-type: none"> Total consumption of coal for brick making in brick field i in year y will be measured by coal invoices Weighted average net Calorific Value of coal used in yth year in brick field i will be laboratory tested with each new consignment of coal purchased on quaterly basis. Daily production of bricks in Kiln i will be recorded on a daily basis by the kiln owner. Daily Mean Weight of baked HHK bricks in kiln i will be measured on site by weighing scale by the kiln owner Specific Energy Consumption in brick field i is a calculated parameter Number of operational days of the kiln in a year will be monitored by kiln owner Quantity of diesel (fuel type) combusted in process j during the year y by diesel invoices Electricity Consumption in plant i per year will be monitored by monthly meter 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>		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<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. Weighing machines calibration frequency and measurement accuracy has been mentioned in the latest version of the PDD.</p>		
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
Ability of project participants to implement monitoring plan					
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)?			Day to day record handling procedure has been identified.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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
Monitoring of sustainable development indicators/ environmental impacts					
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
C Duration of the project activity / crediting period					
C.1.1 Start date of project activity (VVM para 99-100, 104)					
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	A letter from the Technology provider to Universal bricks dated 20 November 2006 specifies that project construction would start at 15 December 2006. This letter has been considered as creation of		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			financial commitment and hence 20 November 2006 is now considered as the project start date in the latest PDD version.		
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 August 2011		OK
D Environmental Impacts (VVM para 131-133) and VVM para 136 (d) for small-scale project activities, as applicable)					
D.1.1 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
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
E Stakeholder Comments (VVM para 128-130)					
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, IIDFCL, DoE and the		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				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).		
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/ /22/ /26/ /31/ /35/ /39/	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
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
<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

INITIAL CDM VALIDATION PROTOCOL

Table 2 Requirements Checklist

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A General description of project activity					
A.1 Title of the project activity					
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
A.2 Description of the project activity					
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) <input type="checkbox"/> Large scale project <input type="checkbox"/> bundled small scale projects, each with emission reductions not exceeding 15 000 tCO ₂ e per year <input type="checkbox"/> individual small scale project activity with emission reductions not exceeding 15 000 tCO ₂ e per year <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	Among the eight HHK brick kilns, Universal Bricks Limited, Diamond Auto Bricks Limited and SSL Ceramic Bricks (1 unit) have started	CL-1	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			commercial production. Others have been found to be at various stages of installation. The PP is requested to provide current status of the brick kilns in the PDD and provide commissioning certificates / project progress status of the individual HHK brick kilns as applicable.		
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 ₂ e per year), justify the sampling through a statistical analysis:	/1/	DR	The project activity consists of 8 individual HHK brick kilns. The physical site visit was done for 7 HHK brick kilns. Site visit was not carried out in Banalata Refractory Ltd. as it is under early stage of construction. The PP is requested to substantiate current status of installation of this kiln.	CL1	OK
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/	DR	Site visit revealed that M/s Diamond Auto Bricks Limited and M/s Kapita Auto Bricks have one kiln each with production capacity of 100 000 bricks/day. However in the PDD these two brick kilns have been considered as two unit of 50 000 bricks/day. The project proponent is requested to revise the total number of units involved with actual production capacity	CL2	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/ /10/ /11/	DR	The HHK brick kiln is 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-	/1/	DR	The HHK brick kiln results significantly better performance than any commonly used brick kiln technology in Bangladesh. The technology has		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.																
I Party involved?			been transferred from China, which is a non Annex - Party																		
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 a energy efficiency project by implementation of HHK brick kilns with an estimated collective thermal energy saving of 171 GWh thermal generation which is lower than the stipulated 180 GWh thermal generation capacity, the project qualifies under small scale CDM project category.		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 cluster of eight HHK brick kilns. Previously there was no registered project with same methodology, same technology in the host country itself. Thus the project is not a debundled component of a larger project activity		OK																
A.3 Participation requirements																					
A.3.1 Do all participating Parties fulfil the participation requirements as follows:	/1/	DR I	Department of Environment is the DNA of Bangladesh. 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																
			<table><tr><td colspan="2">Bangladesh (host)</td><td colspan="2">Denmark</td></tr><tr><td>a) Party has ratified the Kyoto Protocol</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td></td></tr><tr><td>b) Party has designated a Designated National Authority</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td></td></tr><tr><td>c) The assigned amount has been determined</td><td><input type="checkbox"/> Yes <input type="checkbox"/> No</td><td><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</td><td></td></tr></table>	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		c) The assigned amount has been determined	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
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																			
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/ /80/	DR I	The project Proponent is requested to provide the letter of approval from Bangladesh and Denmark.	CAR-1	OK																

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	/81/ /2/ /5/		In the earlier web hosted PDD Clean Energy Alternatives (CEA) was involved as one project participant. However it has been evidenced from contract for consulting services between IIDFCL and CEA dated 14 February 2008 CEA was a consultant for the CDM project but was not a project proponent. Thus Clean Energy Alternatives (CEA) has not been included in the participant list in the current PDD version 12 dated 30 October 2009		
a) LoA confirms that Party has ratified the Kyoto Protocol b) LoA confirms that participation is voluntary c) The LoA confirms that the project contributes to the sustainable development of the host country? d) The LoA refers to the precise project activity title in the PDD e) The LoA is unconditional with respect to (a) to (d) above f) The LoA is issued by the respective Party's DNA g) The LoA was received directly by the DNA or the 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		Bangladesh (host) Denmark <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No NA <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DNA <input checked="" type="checkbox"/> PP <input type="checkbox"/> DNA <input checked="" type="checkbox"/> PP			OK
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-1	OK
A.4 Technical description of the project activity					
A.4.1 Is the project's location clearly defined?	/1/	DR	Yes project's location has been clearly defined. Among the eight units, seven are located in Dhaka division and the other in Rajshai division of Bangladesh.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.5 Public funding of the project activity					
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/	DR I	No public funding/Overseas Development Assistance has been involved in the project activity. In the PDD it has been stated that Danish Government confirmed that there is no diversion of ODA by issuing a letter. However the date of the letter is not clear in the PDD. The PP is requested to provide the exact date of the later in the PDD with supporting documentary evidence	CL 3	OK
B Application of a baseline and monitoring methodology					
B.1 Methodology applied					
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 11 has been applied for the project, which was pertinent at the time of web hosting		OK
B.2 Applicability of methodology (and tools)					
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 improvement 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. The aggregate energy savings of a single project may not exceed the equivalent of 60 GWh _e per year. A total saving of 60 GWh _e per year is equivalent to a maximal saving of 180 GWh _{th} per year in fuel input	/1/	DR	All the HHK brick kilns are new facility. The project being a energy efficiency project by implementation of eight HHK brick kilns with an equivalent thermal energy saving of 171 GWh thermal generation which is lower than the stipulated 180 GWh thermal generation capacity, the project qualifies applicability criteria of scale		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			of energy saving.		
B.2.3 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/ /83/	DR	The project proponent is requested to explicitly clarify in the PDD that the energy use within the project boundary can be directly measured and recorded.	CAR-2	OK
B.2.4 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/ /83/	DR	The project proponent is requested to explicitly clarify in the PDD that 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).	CAR-3	OK
B.2.5 Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/	DR	As per the applied methodology AMS-II.D, version 11, 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.		OK
B.3 Project boundary					
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 and the electricity grid. Thus project boundary is clearly defined and in accordance with the methodology.		OK
B.3.2 Which GHG sources are identified for the project?	/1/	DR	CO ₂ has been identified as the only GHG for the		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.			project. The identify boundary covers all possible GHG sources linked to the project activity. The GHG sources are coal, diesel and grid electricity. During site visit DNV personnel evidenced the project site and the project boundary and also confirmed identified GHG source is accurate.		
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 applied methodology.		OK
B.4 Baseline scenario determination					
B.4.1 Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/ /10/ /11/	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/ /11/	DR	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.		OK
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 11		OK
B.4.5 Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /10/	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		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	/11/		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		
B.4.6 Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /10/ /11/	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. However one reference has been quoted wrongly in the PDD. Thus the PP is requested to recheck the references used in the PDD.	CL 4	OK
B.4.8 Is the baseline determination adequately documented in the PDD? <ul style="list-style-type: none"> 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. All documentation is relevant as well as correctly quoted and interpreted. Assumptions and data can be deemed reasonable Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. The methodology has been correctly applied to identify what would occurred in the absence of the proposed 	/1/ /9/ /12/ /13/ /10/ /11/	DR/I	Yes the baseline determination adequately documented in the PDD. <ul style="list-style-type: none"> All assumptions and data used by the project participants has been listed in the PDD All documentations are relevant as well as correctly quoted and interpreted. Assumptions and data could be deemed reasonable Relevant national and/or Sectoral polices in brick manufacturing industry of Bangladesh has been considered. Finally the methodology has been correctly applied to identify what would 		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
CDM project activity			occurred in the absence of the proposed CDM project activity		
B.5 Additionality determination.					
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 all the alternatives meets regulatory requirements of Bangladesh.		OK
B.5.3 Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	The PP is requested to provide the supportive documents for related barrier and investment issue which was faced by the project proponent due to the fact “First of its Kind” nature of the project activity.	CAR-4	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 based on a barrier analysis, arguing that the main barrier to project implementation is that it is first of its kind. It has been stated in the PDD that investment cost have become doubled than the projected one. This may happen to any project due to various reasons e.g., price escalation, delay in project implementation, and changes in national policy etc. The PP is requested to demonstrate reasons behind the increase in investment along with documentary evidences as relevant The PP is also requested to provide the supportive documents to substantiate related	CAR-4	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			barriers and investment issue which was faced by the project proponent due to the fact “First of its Kind” nature of the project activity.		
Prior consideration of CDM					
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/ /15/ /19/ /24/ /29/ /34/ /38/	DR	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 the individual brick kilns have been planned for implementation at different point of time and accordingly included in the project bundle. Board resolution of different brick kiln management except Universal brick kiln happened to be after 20 November 2006, which is the start date of the project activity. IIDFCL is the project proponent and the nodal point of the entire brick kilns and the world bank is also a project participant. Thus the PP is requested to provide the first reviewed and approved PIN by The World Bank in order to substantiate serious consideration of CDM prior to the time of decision to proceed with the project activity.	CAR-5	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 before 2 August 2008.		OK
Continuous efforts to secure CDM status (only to be completed if starting date is before 2 August 2008)					
B.5.7 What initiatives were taken by the project participants from the starting date of the project activity to the start of validation in parallel with the physical implementation of the project activity?	/1/	DR	The chronology of events described in the PDD lists the activities up to June 2007. The PDD was initially web hosted for global stakeholder consultation for the period 27 October 2007 to 25	CAR-6	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			November 2007. The PDD version 12 dated 30 October 2009 has been re-hosted in the UNFCCC site for the period 10 November 2009 to 9 December 2009. Thus the PP is requested to provide the entire chronology of events up to web hosting of current PDD towards CDM activity with proper supportive evidences.		
B.5.8 When did the construction of the project activity start?	/1/ /15/	DR	The construction of all the brick kilns has been started between December 2006 and October 2009. However, SSL brick kiln has two units. The PP is requested to provide the construction date of the two units separately. The PP is also requested to provide the supporting documents for commencement of construction activity of Diamond auto bricks Limited.	CL-5	OK
B.5.9 When was the project commissioned?	/1/	DR	The PP is requested to provide the commissioning certificates of all the projects which have already started production, for others please provide the current status of the project.	CL-4	OK
B.5.10 Does the timeline of the project confirm that continuous actions in parallel with the implementation were taken to secure CDM status?	/1/	DR	Please refer B.5.7	CAR-6	OK
Investment analysis					
B.5.11 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
Barrier analysis					
B.5.12 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 first of its kind. The barrier has a clear impact on the financial returns so that it can be assessed in an investment analysis. Thus the PP is requested to	CL-6	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			substantiate the financial implication of the project due to its first of its kind nature.		
B.5.13How 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.5.14How does CDM alleviate the investment barriers?	/1/	DR	The PP doesn't consider investment barrier to assess the additionality of the project.		OK
B.5.15Is 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.5.16How 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 due to the project's "first-of-its-kind" nature. 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 iii) Flood situation – that would any way affect the baseline case in the same way	CL 7	OK
B.5.17How does CDM alleviate the technological barriers?	/1/	DR	Please refer B.5.16	CL 7	OK
B.5.18Is 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	CL 7	OK
B.5.19How 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/ /10/ /11/	DR	The PP has argued on first of its kind which in the other way states barriers due to prevailing practice. 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	CL 7	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>Kiln Efficiency in the Brick Making Industry (IKEBMI)” by M/s Global Environment Facility dated 20 October 2009.</p> <p>However, the PDD indicates that the project has faced a few barriers which eventually were caused due to the project’s “first-of-its –kind” nature. The PP is requested to demonstrate extent of prohibitive of the following barriers and how CDM would alleviate the same:</p> <p>i) Lack of local knowledge / expertise /competence</p> <p>ii) Delay due to shipment problem</p>		
B.5.20How does CDM alleviate the barriers due to prevailing practise?	/1/	DR	Please refer to B.5.16	CL-7	OK
B.5.21Is 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 Bangladesh.		OK
B.5.22How 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
Common practice analysis					
B.5.23What 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.5.24What 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

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.25 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.5.26 How many similar non-CDM-projects exist in the region within the scope?	/1/	DR	The first HHK brick kiln in Bangladesh was installed by Universal bricks Limited, which is under this 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.5.27 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.5.28 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
Conclusion					
B.5.29 What is the conclusion with regard to the additionality of the project activity?	/1/	DR	The project proponent has argued only on first of its kind barrier to assess the additionality of the project activity. However under this barrier technological barrier and financial barrier has been discussed. Thus the project proponent is requested to provide the documentary evidences	CL-6 CL-7 CAR-5 CAR-6	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			of first of its kind barrier.		
B.6 Calculations of GHG emission reductions					
Data and parameters that are available at validation and that are not monitored					
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 ₂ 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 PDD for Landfill Gas Extraction at Matuail (registered CDM project). The PP is requested to provide project reference number of Landfill Gas Extraction project at Matuail. However grid emission factor could be changed from one year to another year based on build margin and operating margin. Thus the project proponent is requested use current grid emission factor. It has been evidenced from the site visit that all the brick kiln 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.	CL-8	OK
B.6.4 How was the specific energy consumption of the existing Fixed Chimney Kilns in Bangladesh available at validation verified?	/1/ /9/	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
Baseline emissions					
B.6.5 Are the calculations documented according to the approved methodology and in a complete and transparent	/1/	DR	Yes the baseline emission calculation has been documented as per the applicable small scale		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
manner?			methodology AMS II-D version 11.		
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
Project emissions					
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 11.		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.	CAR-7	OK
B.6.10 Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Please refer to B.6.9	CAR-7	OK
Leakage					
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 11, 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
Emission Reductions					
B.6.12 Algorithms and/or formulae used to determine emission reductions: <ul style="list-style-type: none"> 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 	/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.	CL-8 CAR-7	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<ul style="list-style-type: none"> All documentation is correctly quoted and interpreted. All values used can be deemed reasonable in the context of the project activity 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. 					
B.7 Monitoring plan					
Data and parameters monitored					
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 11		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"> Total consumption of coal for brick making in brick field i in year y will be measured by onsite weighing scale Weighted average net Calorific Value of coal used in yth year in brick field i will be laboratory tested with each new consignment of coal purchased. Daily production of bricks in Kiln i will be recorded on a daily basis by the kiln owner. Weight of baked bricks from Kiln will be measured on site by weighing scale by the kiln owner Number of operational days of the kiln in a year will be monitored by kiln owner 		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<ul style="list-style-type: none"> Quantity of diesel (fuel type) combusted in process j during the year y by onsite measurement Electricity Consumption in plant i per year will be monitored by monthly meter reading. <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>	CL9	
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 substantiate the measurement accuracy, calibration frequency of all the measuring equipment in the PDD.	CL10	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 substantiate the measurement accuracy, calibration frequency of all the measuring equipment in the PDD.	CL10	OK
B.7.6 Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	The monitoring frequency and recording frequency have not been adequately defined for all monitoring parameters. The PP is requested to specify the monitoring and recording frequency of all the monitored parameter.	CL11	OK
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.	CL11	OK
Ability of project participants to implement monitoring plan					
B.7.8 How has it been assessed that the monitoring	/1/	DR/I	The site visit revealed that, in view of the		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
arrangements described in the monitoring plan are feasible within the project design?			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.	CL-12	
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
Monitoring of sustainable development indicators/ environmental impacts					
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 mandated by the Bangladesh legislations. However, contribution of the project towards sustainable development of Bangladesh will be confirmed from the LoA.	CAR-1	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	CAR-1	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-1	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
C Duration of the project activity / crediting period					
C.1.1 Start date of project activity					
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/	DR	Among the 8 HHK brick kiln under this project activity construction of Universal brick kiln had been started earliest. As per EB guideline the start of the project activity is the earliest financial commitment towards implementation project activity. However the project proponent has considered the construction date as the start date of the project activity. Thus PP is requested to substantiate the start date of the project activity in line with the EB guidance.	CL-13	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 PP has opted for a fixed crediting period of ten years with start date "1/1/2010 or not before project registration". The project proponent is requested to revise the start date of crediting period to a realistic one.	CL-14	OK
D Environmental Impacts					
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/	DR	It has been noted that while some of the brick kiln owners already have obtained environment clearance certificates, others have applied and awaiting for the same. The project proponent is	CL-15	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			requested to provide copies of the environment clearance certificate or application thereto for the individual brick kilns.		
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
E Stakeholder Comments					
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, IIDFCL, 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/ /22/ /26/ /31/ /35/ /39/	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

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 and Clarification Requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 1 The project Proponent is requested to provide the letter of approval from all the Parties involved in the project activity.	A.3.2 A.3.3	Letter of Host Country Approval has been provided	OK. Letter of approval from host country Bangladesh dated 13 Sep 2010 and letter of approval from Annex –I Party, Denmark dated 14 July 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 VVM. CAR 1 is closed
CAR 2 The project proponent is requested to explicitly clarify in the PDD that the energy use within the project boundary can be directly measured and recorded.	B.2.3	In the case of the project, 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. As HHKs mainly consume thermal energy for brick making, the project will measure this energy use through monitoring the quantity and type of fuel used (coal) along with their calorific values. The annual coal, electricity and diesel consumption will be directly measured by Invoices from supplier and electricity bills. All the coal and diesel supply bought in a	OK. In the latest version of the PDD, it has been stated that in the project activity it is possible to directly measure and record the energy use within the project boundary which includes daily coal consumption, quarterly coal NCV analysis based on daily consignment of coal, daily brick production, daily mean weight of baked bricks, specific energy consumption in each brick kiln, number of operational days, electricity consumption, diesel consumption. Thus DNV confirms that the energy use within the project boundary can be directly measured and recorded. CAR 2 is closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		particular year will be assumed to be consumed in that year. The detail of metering and monitoring the energy consumption are provided in section B.7.1	
CAR 3 The project proponent is requested to explicitly clarify in the PDD that 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).	B.2.4	In the case of the project activity reduction in the coal consumption is significant (almost 50% of the baseline) and the reduction 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.	OK. In the project activity coal consumption is low 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 other variables, like increase of production capacity do not influence the changes in energy use. CAR 3 is closed
CAR 4 The project additionality has been demonstrated based on a barrier analysis, arguing that the main barrier to project implementation is that it is first of its kind. It has been stated in the PDD that investment cost have become doubled than the projected one. This may happen to any project due to various reasons e.g., price escalation, delay in project implementation, and changes in national policy etc. The PP is requested to demonstrate reasons behind the increase in investment along with documentary evidences as relevant The PP is also requested to provide the supportive documents to substantiate related barriers and investment issue which was faced by the project	B.5.4	Refer to section B5 which now includes investment analysis and related supporting documents. LDCs are not required to provide same level of supporting documents / evidence to substantiate all aspects of the argument. Nevertheless it is believed that the evidence provided is sufficient.	OK. In the latest version of the PDD investment analysis has been done. In line with the Guidelines for objective demonstration and assessment of barriers/86/; 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 other countries. CAR 4 is closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
proponent due to the fact “First of its Kind” nature of the project activity.			
<p>CAR 5</p> <p>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 the individual brick kilns have been planned for implementation at different point of time and accordingly included in the project bundle. Board resolution of different brick kiln management except Universal brick kiln happened to be after 20 November 2006, which is the start date of the project activity. IIDFCL is the project proponent and the nodal point of the entire brick kilns and the world bank is also a project participant. Thus the PP is requested to provide the first reviewed and approved PIN by The World Bank in order to substantiate serious consideration of CDM prior to the time of decision to proceed with the project activity.</p>	B.5.5	<p>Please see the following evidence:</p> <ul style="list-style-type: none"> - QAT review begins 20/10/ 2005 - PIN summary 26 /7/ 2006 - PIN approval 1 /11/2006 	<p>OK. It has been evidenced from the first PIN approval dated /50/ 1 November 2006 for the HHK brick kiln project that CDM was considered before the 15 December 2006. The PIN has mentioned Universal bricks Ltd. as a project owner. As IIDFCL 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 activity CDM was considered.</p> <p>CAR 5 is closed.</p>
<p>CAR 6</p> <p>The chronology of events described in the PDD lists the activities up to June 2007. The PDD was initially web hosted for global stakeholder consultation for the period 27 October 2007 to 25 November 2007. The PDD version 12 dated 30 October 2009 has been re-hosted in the UNFCCC site for the period 10 November 2009 to 9 December 2009. Thus the PP is requested to provide the entire chronology of events up to web hosting of current PDD towards CDM activity with proper supportive evidences.</p>	B.5.7	The latest PDD provides more detailed timeline and supporting evidence	<p>OK. In the latest version of the PDD, the chronology of the events has been described clearly from the review of PIN for the project activity /49/ dated 20 June 2006 up to the second time validation site visit dated 3 March 2010.</p> <p>CAR 6 is closed</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 7 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.	B.6.9 B.6.10 B.6.12	Project emission for electricity consumption and fossil fuel consumption has been considered in the PDD version 13 (latest version) and has been added in the calculation of total project emission.	OK. In the latest version of the PDD, project emissions for electricity consumption and fossil fuel consumption has been considered. CAR 7 is closed
CL 1 Among the eight HHK brick kilns, Universal Bricks Limited, Diamond Auto Bricks Limited and SSL Ceramic Bricks (1 unit) have started commercial production. Others have been found to be are at various stages of installation. The PP is requested to provide current status of the brick kilns in the PDD and provide commissioning certificates / project progress status of the individual HHK brick kilns as applicable.	A.2.2	A detail progress status of all the individual HHK brick plants has been provided including expected commissioning and commercial operation date.	OK. The project proponent has provided the detail progress status of all the individual HHK brick plants /59/. Among all eight HHK brick kiln the operation of six HHK brick kiln has been started. Other two will start operation in the year 2011. CL 1 is closed.
CL 2 Site visit revealed that M/s Diamond Auto Bricks Limited and M/s Kapita Auto Bricks have one kiln each with production capacity of 100 000 bricks/day. However in the PDD these two brick kilns have been considered as two unit of 50 000 bricks/day. The project proponent is requested to revise the total number of units involved with actual production capacity.	A.2.4	To avoid any further confusion, the number of kilns will not be based on its capacity. A kiln whether its daily capacity is 50,000 or 100,000 it will be considered as one kiln. The kiln number has been revised as 8 kilns in PDD 1 having six single size kiln (50,000 bricks/ day) and two double size kiln (100,00 bricks/day)	OK. One single size brick kiln capacity is 50 000 bricks/day. In this bundle of HHK brick kilns two brick kiln having capacity of 100 000 brick/day which has been considered as double size brick kiln. In the latest version of the PDD it has been described clearly. CL 2 is closed.
CL 3 In the PDD it has been stated that Danish Government confirmed that there is no diversion	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	OK. Both Danish Government and IIDFCL confirmed that there is no public funding in this project activity and no diversion of

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
of ODA by issuing a letter. However the date of the letter is not clear in the PDD. The PP is requested to provide the exact date of the later in the PDD with supporting documentary evidence		diversion of ODA in a letter dated September 18 th . IIDFCL has also confirmed this in a letter dated March 03, 2010.	ODA /4/ /55/. CL 3 is closed.
CL 4 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	OK. The reference mentioned in the latest PDD has been corrected. CL 4 is closed
CL 5 The construction of all the brick kilns has been started between December 2006 and October 2009. However, SSL brick kiln has two units. The PP is requested to provide the construction date of the two units separately. The PP is also requested to provide the supporting documents for commencement of construction activity of Diamond auto bricks Limited.	B.5.8	SSL brick kiln has already constructed one kiln of capacity 50,000 bricks/ day. The construction started on 23/12/2008. Supporting documents has been provided along with the Validation documents. SSL bricks kilns has been provided an expected construction start date of the second kiln which is 1/7/2011 Diamond Auto Bricks has already constructed one kiln of capacity (100,000 bricks/day). Supporting documents for commencement of construction activity of Diamond auto bricks Limited has been provided along with the Validation documents. Please refer	OK. Supporting documents of commencement of construction activity of SSL second unit and Diamond auto bricks Limited. SSL bricks kilns provided an expected construction start date of the second kiln which is 1 July 2011 CL 5 is closed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		to work order issued by Diamond in favor of M/S S. K international to start sand filling on the project site on 23.03.2008	
<p>CL 6</p> <p>The PP has demonstrated barrier due to first of its kind. The barrier has a clear impact on the financial returns so that it can be assessed in an investment analysis. Thus the PP is requested to substantiate the financial implication of the project due to its first of its kind nature.</p>	B.5.12	Investment Analysis has been included in the Additionality section of the PDD version 13 dated June 06, 2010	<p>OK. The financial analysis has been done for the project activity. It has been evidenced from the financial analysis that the baseline FCK technology has higher IRR than the HHK technology.</p> <p>CL 6 is closed.</p>
<p>CL 7</p> <p>The PDD indicates that the project has faced a few barriers which eventually were caused due to the project's "first-of-its-kind" nature. The PP is requested to demonstrate extent of prohibitive of the following barriers and how CDM would alleviate the same:</p> <ul style="list-style-type: none"> i) Lack of local knowledge /expertise /competence ii) Delay due to shipment problem iii) Flood situation – that would any way affect the baseline case in the same way 	<p>B.5.16</p> <p>B.5.17</p> <p>B.5.18</p> <p>B.5.19</p>	Revised Additionality section has considered these points.	<p>OK. In the revised additionality following barriers has been mentioned:</p> <p>Investment barrier</p> <p>Technology barrier</p> <p>Barrier due to prevailing practice</p> <p>Other barriers at the project participant level.</p> <p>Based on the documentary evidences /66/ /67//62/ DNV confirms that all the barriers mentioned above are prohibitive in nature for implementation of the project activity.</p> <p>CL 7 is closed.</p>
<p>CL 8</p> <p>The grid emission factor has been sourced PDD for Landfill Gas Extraction at Matuail (registered CDM project). The PP is requested to provide project reference number of Landfill Gas Extraction project at Matuail. However grid emission factor could be changed from one year to another year based on build margin and operating</p>	B.6.3	<p>Emission factor in year y calculated in accordance with the provisions in AMS I.D, version 15 (tCO₂e/MWh). The value is provided by the Bangladesh Designated National Authority in letter dated 09/02/2011.</p> <p>All the kilns will source electricity from the</p>	<p>OK. DNV confirms that grid emission factor calculation is in line with Tool to calculate the emission factor for an electricity system version 2 /87/.The grid emission factor provided by the Bangladesh Designated National Authority in letter dated 9 Feb 2011/58/ has been considered for the project activity.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>margin. Thus the project proponent is requested to use current grid emission factor.</p> <p>It has been evidenced from the site visit that all the brick kiln 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>		National Grid. This is now clearly mentioned in the latest PDD version	<p>In the latest version of the PDD it has been clearly mentioned that all the brick kiln will source electricity from the Bangladesh national electricity grid.</p> <p>CL 8 is closed</p>
<p>CL 9</p> <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>	B.7.3	It is clearly mentioned in the latest PDD version that finished brick production would be considered as daily brick production	<p>OK. In the latest version of the PDD it has been clearly mentioned that finished brick production would be considered as daily brick production.</p> <p>The statistical method has been used to monitor the finished bricks weight.</p> <p>CL 9 is closed.</p>
<p>CL 10</p> <p>The PP is requested to substantiate the measurement accuracy, calibration frequency of all the measuring equipment in the PDD.</p>	B.7.4 B.7.5	<p>The monitoring system has simplified and according to the revised monitoring system measuring equipment and their calibration is not required.</p> <p>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.</p>	<p>OK. 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</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			<p>laboratories.</p> <p>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.</p> <p>CL 10 is closed.</p>
<p>CL 11</p> <p>The monitoring frequency and recording frequency have not been adequately defined for all monitoring parameters. The PP is requested to specify the monitoring and recording frequency of all the monitored parameter.</p>	<p>B.7.6</p> <p>B.7.7</p>	<p>Monitoring frequency and recording frequency of all the monitored parameter has been adequately defined in the revised monitoring section of the PDD version 13 December 01, 2010.</p>	<p>OK. Monitoring and recording frequency of all the monitored parameter has been described in the latest PDD.</p> <p>CL 11 is closed.</p>
<p>CL 12</p> <p>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.</p>	<p>B.7.8</p>	<p>The monitoring section has been reviewed and revised to make the measurement procedure to a realistic manner. Refer to the PDD version 13 December 01, 2010.</p>	<p>OK. 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>CL 12 is closed</p>
<p>CL 13</p> <p>Among the 8 HHK brick kiln under this project activity construction of Universal brick kiln had been started earliest. As per EB guideline the start of the project activity is the earliest financial commitment towards implementation project</p>	<p>C.1.2</p>	<p>A letter from the Technology provider to Universal bricks dated 20th November 2006, specifies that project construct would start at 15th December 2006. The letter has already been provided.</p>	<p>OK. A letter from the Technology provider to Universal bricks dated 20 November 2006 /20/, specifies that project construct would start at 15 December 2006.</p> <p>This letter has been considered as creation of financial commitment and hence 20</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
activity. However the project proponent has considered the construction date as the start date of the project activity. Thus PP is requested to substantiate the start date of the project activity in line with the EB guidance.		This letter can be considered as creation of financial commitment and hence 20 th November 2006 is now considered as the project start date in the latest PDD version.	November 2006 is now considered as the project start date in the latest PDD version. CL 13 is closed.
CL 14 The PP has opted for a fixed crediting period of ten years with start date “1/1/2010 or not before project registration”. The project proponent is requested to revise the start date of crediting period to a realistic one.	C.1.4	The start date of crediting period has been revised to August 01, 2011	OK. The start date of the crediting period has been taken as 1 August 2011. CL 14 is closed
CL 15 It has been noted that while some of the brick kiln owners already have obtained environment clearance certificates, others have applied and awaiting for the same. The project proponent is requested to provide copies of the environment clearance certificate or application thereto for the individual brick kilns.	D.1.2	All the environmental clearance certificates received or application for clearances to Department of Environment has already been provided. However they were in Bengali and the Dept of Environment does not have English version of the certificate. The translated copies of the environment clearance certificates or applications translated by Government certified translators have been provided in the Documentary Evidence package.	OK. All the environmental clearance certificates received or application for clearances to Department of Environment has already been provided. CL 15 is closed.

APPENDIX C

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Indrajit Rana

Mr. 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 optimization of steam consumption. Being shift in charge 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 mounted 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 around 3 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

Sasim Chattopadhyay

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."

Matteo Faggin

Matteo 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.

Tonje Folkestad

Tonje holds a Master of Science in Management of Natural Resources, specialising in water management in developing countries.

Prior to joining DNV, Tonje had seven years of experience working for non-governmental organisations, focusing on energy, climate and environment issues. For four years she directed a Norwegian NGO focusing on the environmental and social impacts of large dams and other hydropower projects in developing countries, including hydropower's role in the emerging CDM scheme. For the next three years she was part of WWF's international arctic programme, connecting the organisation's work on climate change impacts across the Arctic with the climate policy work on the international level.

As a member of DNV's climate change team since January 2007, Tonje has been a validation team member of about 15 projects and a project manager for many more. She was heavily involved in the development of DNV's portfolio of climate change training courses for internal and external use, and is a co-trainer in two of these courses.

Krishnan Namboodiri

Krishnan Namboodiri, DNV Kochi, India. Holds graduate degree in chemical engineering and has done a short term diploma course in Management. Prior to joining DNV in 2008, has had 24 years of direct work experience in the fertilizer and chemicals industry. Work experience covers 5 years in process design & engineering for chemical industry ; 7 years in technical services including environment management activities, 7 years in project management and 5 years in training & corporate planning in fertilizer & petrochemical manufacturing units. Has been actively involved in Management System Audits as per ISO 14001 for more than 8 years.

The above work experience includes-(a) experience in steam system optimization & trouble shooting , development of improvement schemes in large fertilizer & caprolactam complex (b) Design and engineering, efficiency studies and development of efficiency improvement schemes for fossil fuel fired steam & power generation plants (c) Implementation of energy

saving measures in Ammonia plants , sulfuric acid plant etc (d)Monitoring, trouble shooting and development & implementation of of improvement schemes for of pollution control facilities (chemical, aerobic & anaerobic treatment systems) in Fertilizer and petrochemical complex. Development & implementation of landfill facilities for solid and hazardous wastes from fertilizer & caprolactam manufacturing complex.

He has received extensive training in the CDM validation and verification process. He is an appointed GHG auditor for the CDM validation and verification program of DNV and has performed validation & verification of several CDM projects.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in (1) Thermal energy generation from fossil fuels as well as thermal electricity from solar, (2) waste handling and disposal and (3) Energy demand.

Mr. Yang Xiao Shan, Alan

Mr. Yang Xiao Shan, Alan holds a Bachelor Degree in Material Science and Engineering. He has an overall experience of around four years. Prior to joining DNV, he has around four 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”.