



VALIDATION REPORT

EFFICIENT FUEL WOOD COOKING STOVES PROJECT IN FOOTHILLS AND PLAINS OF CENTRAL REGION OF NEPAL

REPORT No. 2009-0390

REVISION No. 01

DET NORSKE VERITAS

**VALIDATION REPORT**

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Approved by: Michael Lehmann	Organisational unit: Climate Change & Environmental Services	
Client: Egluro	Client ref.: Mr. Kieron Hugh Robinson	
Summary: Project Name: Efficient Fuel Wood Cooking Stoves Project in Foothills and Plains of Central Region of Nepal Country: Nepal Methodology: AMS-II.G Version: 2 GHG reducing Measure/Technology: Energy efficiency measures in thermal applications of non-renewable biomass. ER estimate: 19 899 tCO ₂ e per year (average) over a crediting period of 10 years Size <input type="checkbox"/> Large Scale <input checked="" type="checkbox"/> Small Scale Validation Phases: <input checked="" type="checkbox"/> Desk Review <input checked="" type="checkbox"/> Follow up interviews <input checked="" type="checkbox"/> Resolution of outstanding issues Validation Status <input type="checkbox"/> Corrective Actions Requested <input type="checkbox"/> Clarifications Requested <input checked="" type="checkbox"/> Full Approval and submission for registration <input type="checkbox"/> Rejected <p>In summary, it is Det Norske Veritas Certification AS (DNV)'s opinion that the project activity "Efficient Fuel Wood Cooking Stoves Project in Foothills and Plains of Central Region of Nepal" as described in the PDD version 3, dated 19 January 2011, meets all relevant UNFCCC requirements for the CDM and all host country criteria and correctly applies the baseline and monitoring methodology AMS-II.G, version 2. DNV thus requests the registration of the project as a CDM project activity.</p>		
Report No.: 2009-0390	Subject Group: Environment	Indexing terms Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism <input checked="" type="checkbox"/> No distribution without permission from the client or responsible organisational unit <input type="checkbox"/> free distribution within DNV after 3 years <input type="checkbox"/> Strictly confidential <input type="checkbox"/> Unrestricted distribution
Report title: Efficient Fuel Wood Cooking Stoves Project in Foothills and Plains of Central Region of Nepal Project in Nepal.		
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***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse gas(es)
ICS	Improved Cooking Stove
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of approval
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
tCO ₂ e	Tonnes of CO ₂ equivalents
UNFCCC	United Nations Framework Convention on Climate Change
GWP	Global Warming Potential



1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the project activity “Efficient Fuel Wood Cooking Stoves Project in Foothills and Plains of Central Region of Nepal”. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria 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 project participant are Centre for Rural Technology, Nepal (CRT/N) of the host Party Nepal and Egluro from the Annex I Party United Kingdom. The host Party Nepal meets all participation requirements. The DNA of Nepal has confirmed that the project assists in achieving sustainable development and has approved the project and authorized the project participant on 15 June 2010. Letter of approval from DNA of UK has been received on 22 September 2010 /20/ authorizing the participation of Egluro.

The validation has confirmed that the project is eligible as category II.G small-scale CDM project activity and correctly applies the simplified baseline and monitoring methodology AMS-II.G, version 2. The determination of the baseline is well elaborated, transparent and sufficiently supported with facts. The selected baseline scenario is reasonable for the selected 10 years fixed crediting period. Moreover, an analysis of the barriers facing the project demonstrates that the project is not a likely baseline scenario.

The project results in the reduction of GHG emissions that are real, measurable and give long-term benefits and that are additional to what would have occurred in the absence of the project. The emission reductions from the project are estimated to be on average 19 899 tCO_{2e} per year over the selected 10 year fixed crediting period. The emission reduction forecast has been checked and is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring plan makes sufficient provision for monitoring relevant project and baseline emission indicators. Responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been addressed.

A local stakeholder consultation process has been carried out by the project participant. DNV published the PDD on the UNFCCC web site and comments by Parties, stakeholders and UNFCCC accredited NGOs were invited through the CDM web site. No comments were received during the period.



In summary, it is DNV's opinion that the project, as described in the project design document version 3, dated 19 January 2011, meets all relevant UNFCCC requirements for the CDM, and correctly applies the approved simplified baseline and monitoring methodology AMS-II.G version 2. Hence, DNV requests the registration of the "Efficient Fuel Wood Cooking Stoves Project in Foothills and Plains of Central Region of Nepal" as a CDM project activity.

Bangalore and Oslo, 2011-02-17



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2 INTRODUCTION

Egluro has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Efficient Fuel Wood Cooking Stoves Project in Foothills and Plains of Central Region of Nepal” 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 and host Party 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.G, version 2. The validation was based on the recommendations in the Validation and Verification Manual /21/.

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/ Egluro and Centre for Rural Technology, Nepal: CDM-SSC-PDD for project activity “Efficient Fuel Wood Cooking Stoves Project in Foothills and Plains of Central Region of Nepal” in Nepal, version 1 dated November 2009, version 2 dated March 2010 and version 3 dated 19 January 2011.
- /2/ APTEC Consultancy (P) Ltd: “Survey to Gather Baseline Information Required for Development of CDM Project on Improved Cooking Stoves in the Mid Terai”, October 2009.
- /3/ Kathmandu University, School of Engineering, Department of Mechanical Engineering: Result of water boiling test for fuel efficient stoves (two pothole Improved Cooking Stoves), dated 17 September 2009.
- /4/ Kathmandu University, School of Engineering, Department of Mechanical Engineering: Result of water boiling test for fuel efficient stoves (Rocket stoves or Prefabricated Improved Cooking Stoves), dated 20 September 2009.
- /5/ Water and Energy Commission Secretariat, Government of Nepal: Energy Synopsis Report: Nepal, June 2006
- /6/ National Planning Commission Secretariat, Central Bureau of Statistics: Population census 2001, National Report.
- /7/ Baseline determination: Biogas Support Programme, year book 2008. 2009.
- /8/ The Nepal Living Standard Survey 2003/04 by Central Bureau of statistic, National commission, December 2004
- /9/ Financial input parameters: Promotion and dissemination of ICS in Chitwan district as sustainable carbon reduction project proposed budget for June 2007 to May 2009.
- /10/ Financial input parameters: Quotation for the rocket stoves from the suppliers :Gramin Urja Tatha Prabidhi Sewa Kendra Pvt. Ltd, dated 04 January 2010 and D.L. Energy Concern Pvt Ltd, dated 14 may 2010.
- /11/ Financial input parameters: Purchase bills from the supplier of iron rod, pottery liner and chimney pipe for the ICS project in Chitwan district, dated June 2009.
- /12/ Centre for Rural Technology, Nepal (CRT/N), Annual report, 2009. http://crtnepal.org/annual_reports/annual_report_159309312010-04-0115930931.pdf



- /13/ Forest Cover Change Analysis of the Terai District (1990/91 - 2000/01), Department of Forest, May 2005
- /14/ Forest Resources of Nepal (1987-1998) and Master Plan for the Forestry Sector Nepal
- /15/ Egluro and Centre for Rural Technology, Nepal: Excel sheet for emission reduction calculation and simple cost analysis.
- /16/ Minutes of meeting: Local Level Stakeholders' Consultation Meeting on CDM Project on Efficient Fuel wood Cooking Stoves in Foothills and Plains of Central Development Regions of Nepal, dated 2 August 2009.
- /17/ List of participants for local stakeholder consultation with signature.
- /18/ Minutes of meeting: Central Level Stakeholders' Consultation Meeting on CDM Project on Efficient Fuel wood Cooking Stoves in Foothills and Plains of Central Development Regions of Nepal , dated 8 September 2009 at Kathmandu.

3.1.2 Letters of approval

- /19/ LoA from DNA of Nepal, dated 15 June 2010
- /20/ LoA from DNA of United Kingdom, dated 22 September 2010

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

- /21/ CDM Executive Board: *Validation and Verification Manual*. Version 1.2
- /22/ CDM Executive Board: AMS-II.G, version 2 "Energy efficiency measures in thermal applications of non-renewable biomass"
- /23/ CDM Executive Board 49: "Guidelines on the demonstration and assessment of prior consideration of the CDM", version 3
- /24/ CDM Executive Board 50: "General guidelines1 for sampling and surveys for small-scale CDM project activities" version 01
- /25/ CDM Executive Board 39: "Tool for the demonstration and assessment of additionality" version 5.2



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

- /26/ CustomInsight: Survey Random Sample Calculator
<http://www.custominsight.com/articles/random-sample-calculator.asp>
- /27/ Alternate Energy Promotion Centre: Program budget:
http://www.aepc.gov.np/index.php?option=com_content&view=article&id=96&Itemid=125
- /28/ DNA of United Kingdom website of the list of project which has been issued Letter of approval:
http://www.decc.gov.uk/assets/decc/what%20we%20do/global%20climate%20change%20and%20energy/tackling%20climate%20change/intl_strategy/mechanisms/clean_de_v/1_20100527094605_e_@@_cdmukapprovedprojects.pdf
- /29/ Confirmation letter from DNA of Nepal, Ministry of Environment, Government of Nepal, for the issuance of LoA, dated 19 September 2010.
- /30/ UNFCCC Project number: 0136- Biogas Support Program - Nepal (BSP-Nepal)
 Activity 1: <http://cdm.unfccc.int/Projects/DB/DNV-CUK1132666829.52/view>
- /31/ UNFCCC Project number: 0139- Biogas Support Program - Nepal (BSP-Nepal)
 Activity 2: <http://cdm.unfccc.int/Projects/DB/DNV-CUK1132671435.09/view>

3.2 Follow-up interviews with project stakeholders

On 9 – 11 March 2010 DNV visited the CRT/N office in Kathmandu, Nepal and performed interviews with project stakeholders, Egluro and CRT/N. DNV has performed the on site visit in one of the Village Development Committees, Parsauni in Bara district, where the pilot demonstration has been conducted by the project participants. In addition to the below list, DNV has also interacted with the DNA of Nepal, local NGOs, DEEU, forest user, local project staffs and stove users.

	Date	Name	Organization	Topic
/1/	9 – 11 March 2010	Mr. Lee Baker Mr. Rajan Thapa	Egluro.	Clarifications on technology of the project activity. Implementation status of the project.
		Mr. Ganesh Ram Shrestha Mr. Hari Gopal Gokhali Mr. Sandeep Joshi Mr. Nanda Ram Baidya Mr. Subarna Kapali Ms. Pratikshya Pradhan Ms. Lachana Sthapit Mr. Bhupendra Shakya	CRT/N	Confirmation that the project is not a de-bundled component of a larger project activity. Existing and common practice and source of cooking fuel in the project region. Confirmation on non involvement of ODA.
		Mr. Purushottam Ghimire	DNA of Nepal, Joint Secretary,	Clarifications on establishment of baseline, monitoring plan, sampling procedure, sample



			Ministry of Environment	size and emission reduction calculations. Clarifications on input financial parameters and prevailing practice barriers. Resources, training needs and procedures for operation and maintenance. CDM consideration and benefits from CDM registration.
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3.3 Resolution of outstanding issues

The objective of this phase of the validation is to resolve any outstanding issues which need to 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 "Efficient Fuel Wood Cooking Stoves Project in Foothills and Plains of Central Region of Nepal" in Nepal 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.

**Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities**

Requirement	Reference	Conclusion
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK) or a corrective action request (CAR) if a requirement is not met.</i>

Validation Protocol Table 2: Requirement Checklist

Checklist question	Reference	Means of verification (MoV)	Assessment by DNV	Draft and/or Final Conclusion
<i>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</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>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.</i>	<i>The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.</i>	<i>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.</i>

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
<i>The CARs and/or CLs raised in Table 2 are repeated here.</i>	<i>Reference to the checklist question number in Table 2 where the CAR or CL is explained.</i>	<i>The responses given by the project participants to address the CARs and/or CLs.</i>	<i>The validation team's assessment and final conclusions of the CARs and/or CLs.</i>

Validation Protocol Table 4: Forward Action Requests

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

Figure 1 Validation protocol tables



3.4 Internal quality control

The validation report will undergo 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>						
				Administrative	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Sectoral competence
Project manager/GHG Auditor	Shome	Sharmistha	India	✓	✓	✓	✓			
Technical team leader (CDM validator)	Chandrashekar	Kumaraswamy	India		✓		✓	✓		
GHG auditor	Vidyacharan	Astakala	India		✓	✓	✓			
Sector expert	Rana	Indrajit	India		✓		✓			✓
Technical reviewer	Lehmann	Michael	Norway						✓	
Person with sectoral competence assisting technical reviewer	Chatteropadhyay	Sasim	India						✓	✓

The qualification of each individual validation team member is detailed in Appendix B 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 validation findings relate to the project design as documented and described in the PDD, version 03 dated 19 January 2011.

4.1 Participation requirements

The project participants are Centre for Rural Technology, Nepal from host Party Nepal and Egluro from the Annex I Party the United Kingdom. The host Party Nepal fulfils the participation requirements, having ratified the Kyoto Protocol on the 16 September 2005 and having established the Ministry of Environment, Science and Technology (MoEST) as its Designated National Authority (DNA). The United Kingdom has also ratified the Kyoto Protocol on 31 May 2002 and has established its DNA, Department of Energy and Climate Change.

Letter of Approval (LoA) from the DNA of Nepal dated 15 June 2010 /19/ has been provided authorizing Centre for Rural Technology, Nepal, as a project participant and confirming that the project assists in achieving sustainable development. Letter of approval was received from the project participant. The issuance of the LoA by DNA of Nepal for the proposed project activity has been further verified from the letter from DNA of Nepal, Ministry of Environment, Government of Nepal, dated 19 September 2010 /29/, confirming the issuance of LoA for the project activity. The DNA of United Kingdom has also approved the project on 22 September 2010 /20/ confirming the voluntary participation of Egluro. Letter of approval was received from the project participant. The issuance of Letter of Approval by DNA of United Kingdom of Great Britain for the proposed project activity to Egluro has been further verified by DNV from DNA of United Kingdom's website of the list of project which has been issued letter of approval /28/. 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

The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Nepal. The declaration by Egluro for the non involvement of ODA has been provided /1/.

4.2 Project design

The proposed project activity involves the installation of improved cooking stoves by replacing the existing conventional cooking stoves in the households. The project activity is located in the six districts of Central Development Region of Nepal, namely Bara, Parsa, Rautahat, Sarlahi, Mahottari and Dhanusa, which lying within 84°22'00" to 86°14'00" east longitude and 26°38'00" to 27°30'00" north latitude. The geo coordinates of each of the districts has been provided in PDD /1/.

The project activity includes 20 Village Development Committees (VDC) in each of the six districts and is envisage to install 191 improved cooking stoves in each of the Village Development committees. The project activity is envisaged to install a total of up to 22 920



improved cooking stoves within the project activity boundary. Two types of improved cooking stoves (ICS) would be used in the project activity, namely built-on-site and prefabricated model, also called as rocket stove.

It has been verified from the result of water boiling test for fuel efficient stoves for built on site (two pot hole) Improved Cooking Stoves, dated 17 September 2009 /3/ and result of water boiling test for fuel efficient stoves for prefabricated (also called as rocket stove) model Improved Cooking Stoves, dated 20 September 2009 /4/ by Kathmandu University, School of Engineering, Department of Mechanical Engineering that efficiency from using improved stoves would be up to 30.65 – 33.43 % for built on site stoves and 28.72 – 30.43% for prefabricated model stoves. The project activity shall include only two-pot hole built on site cooking stove and prefabricated model stove. To maximize the benefit, 1 and 3 pot hole built on site cooking stove shall also be constructed as and where required, however, the same (1 and 3 pot hole stoves) shall not be included in the project boundary, thus, no emission reduction shall be claimed for the same.

It has been demonstrated that the project activity shall restrict itself with the small scale limit during the actual implementation stage (c.f section 4.3) and will result in an estimated reduction of 198 994 tCO₂e over its entire fixed crediting period of 10 years by reducing the consumption of non renewable biomass. The technology applied is deemed current good practice and is not expected to be replaced within the crediting period. The lifetime of each improved cooking stove is expected to 3 years. After three years of operation, the same improved cooking stove shall be replaced by the similar cooking stoves, under the project activity.

The project start date has been selected as 1 October 2010. The expected operational lifetime of the project activity shall be maintained for 10 years and a fixed crediting period of 10 years has been chosen with the starting date of the crediting period as 1 May 2011 or date of registration, which ever is later.

In line with paragraph 64 of CDM VVM, version 1.2, DNV considers that the project description is complete and accurate.

4.3 Application of selected baseline and monitoring methodology

The project activity correctly applies the baseline methodology stipulated for category II.G of the “simplified modalities and procedure for small scale CDM project activity” The simplified baseline methodology AMS-II.G, version 2 is applicable for energy efficiency measures in thermal applications of non-renewable biomass /22/.

It has been verified from the “Survey to Gather Baseline Information Required for Development of CDM Project on Improved Cooking Stoves in the Mid Terai”, October 2009 /2/ (Baseline survey), a survey conducted by APTEC Consultancy (P) Ltd for the project activity, that about 96.44 % of the surveyed households used firewood for cooking foods in varying degree and the average firewood consumption of per household is 2.674 tonnes per annum. The efficiency for the installed stoves has been calculated based on the weighted average of maximum efficiency of 33.43% for built on site /3/, which is considered to be 80% of the total installed stoves, and maximum efficiency of 30.43% for prefabricated stoves /4/, which envisaged contributing for 20% of the total installation. Based on this, the weighted average efficiency of the stove has been calculated to be 32.85%. Considering the efficiency of 32.85% per improved cooking stoves, NCV of 4167 kWh/t, as per IPCC 2006 default value and 10% as the efficiency of the replaced cooking stoves, it has been demonstrated that the



thermal energy saving of efficient stoves is 0.0078264 GWh per stove. Thus considering the SSC limit of 180 GWh thermal energy saving, the maximum number of cooking stoves that will be operated at a certain time will not exceed 22 999. The project activity shall install a total number of 22 920 stoves. Therefore, it is concluded that the project activity abides by the SSC guidance.

As aforementioned, 96.44% of the population in the project activity region uses firewood for cooking at varying degree. The usage of non-renewable biomass has been demonstrated as per paragraph 7 of the applied methodology, AMS-IIG, version 2, as follows:

- The time required for the collection of firewood increased from 1.46 hour in 1989 to 4.12 hour in 2009, as verified from the Baseline survey conducted by APTEC Consultancy (P) Ltd. October 2009 /2/. It has been verified from the Baseline survey that the data for 1989 has been derived from the field interview and feedback from the sample family/population;
- The distance travelled to collect firewood increased from 2.37 km in 1989 to 5.83 km in 2009 as verified from the Baseline survey /2/. It has been verified from the Baseline survey that the data for 1989 has been derived from the field interview and feedback from the sample family/population;
- Price of firewood increased from NPR 31.98 per bundle in 1989 to NPR 143.48 per bundle in 2009, as verified from the Baseline survey /2/. It has been verified from the Baseline survey that the data for 1989 has been derived from the field interview and feedback from the sample family/population.

Thus, in line with para 7 of AMS-IIG, version 2, it can be concluded that the non renewable biomass is used for thermal application in the baseline.

It has also been verified from the Baseline survey conducted by APTEC Consultancy (P) Ltd. /2/ in all the six districts of the project activity that 50.7 % of the users collected firewood from community forests and while some 68.8 % of users collected firewood from government forests and 13 % and 24.9 % percent of users used private forests/lands and other sources respectively. Firewood collection contributes for an average of 53.9% of the forest degradation. The fraction of non-renewable biomass (woody biomass) has been described in section 4.7.

The project activity is applicable to the applied methodology, AMS-IIG, version 2, as justified:

- The project activity involves the replacement of the existing conventional cooking stoves with the improved cooking stove with the envisaged efficiency of 30.65 – 33.43 % for built on site stoves and 28.72 – 30.43% for prefabricated model stoves as verified from the efficiency test reports /3//4/. It has been verified from the Baseline survey conducted by APTEC Consultancy (P) Ltd. /2/ in all the six districts of the project activity that non renewable biomass has been used for cooking purpose (as discussed above).
- It has been verified from the Baseline survey conducted by APTEC Consultancy (P) Ltd. /2/ that no similar cooking stove CDM project activity exists in the region where the proposed project activity is implemented. The project activity stoves are installed in the households where there is no other support program, such as the Biogas Sector



Partnership and Biogas Support Program projects in Nepal, has taken place. Thus, the project activity shall not claim for the non renewable biomass saved under biogas projects. This has also been clarified from the interaction with the local stakeholders during the site visit by DNV. There are two CDM registered biogas support programs in the project activity region (six districts) and amount of non renewable biomass saved by both the project has been taken in to account while calculating the fraction of non renewable woody biomass. It has been demonstrated that the fraction of non renewable woody biomass saved by the project activity, including the non renewable biomass saved by the biogas projects, is 0.807 and the fraction of non renewable woody biomass saved by the project activity, without considering the saving by biogas projects, is 0.81. As applicable, to eliminate any kind of double counting, 0.807 has been considered for the calculation of emission reduction.

- It has been verified from the Baseline survey conducted by APTEC Consultancy (P) Ltd. /2/ in all the six districts of the project activity that non renewable biomass has been used for cooking purpose since 1989. It has been verified from the Baseline survey that the data for 1989 has been derived from the field interview and feedback from the sample family/population.

Thus, inline with CDM VVM, version 1.2, paragraph 76, DNV confirms that the project activity is applicable to the applied methodology, AMS-IIG, version 2.

4.4 Baseline determination

As per the methodology, AMS-IIG, the baseline of the project activity is that in absence of the project activity, fossil fuels would have been used for meeting similar thermal energy needs. Kerosene has been considered as the baseline fossil fuel that would have been used in absence of the project activity by the users where the improved cooking stoves shall be installed. This has been demonstrated and confirmed from verifying the following:

- The Nepal Living Standard Survey 2003/04 by Central Bureau of statistics, National commission, December 2004 /8/, confirming that kerosene is the second alternative for fuel for cooking purpose, after wood and leaves, straw and thatches, by the low capita income group of society.
- National Report on Population Census 2001; by Central Bureau of Statistics /6/, that kerosene is the second alternative after wood that is used for cooking purpose.
- It has been verified from the news article in Nepal Business News website that the cost of kerosene is lower in comparison to LPG.
- Furthermore, it has been verified from Biogas Support Programme report 2008 and 2009 /7/ that the household with biogas plant, in the six districts where the project activity is located, varies from 5.4% to 0.79% of the total household with animals and with potential biogas household. Thus, biogas cannot be considered as the baseline fuel.

In view of the above mentioned facts, it can be concluded that kerosene is the fossil fuel that would have used to substitute the non renewable biomass in absence of the project activity.

The project activity being a small scale CDM project, assessments of alternative baseline scenarios are not required as per the methodology. However, to be more systematic and since



the project activity has applied for Gold standard registration, as per the Gold Standard tool kit the project proponent has used Additionality tool, version 5.2. Furthermore, as there is no restriction in the usage of Additionality tool for small scale projects, DNV has accepted the same. The alternatives considered for determining the baseline are:

- The proposed project activity undertaken without using carbon finance: It has been addressed and verified from budget of ICS project of Chitwan that the cost of improved stoves has an indirect cost, which includes the cost incurred in marketing, awareness, training of local labour, of NPR 1086 /9/. This expenditure shall be contributed by the project proponent. The intended users of the stoves belong to the low per capita income group and are thus not expected to be able to afford the improved stove with the complete cost. The project proponent's contribution in each fixed model stove is NPR 96 and NPR 579.28 for prefab metal stoves. The input parameters have been verified by DNV, as addressed in section 4.5.3. Thus, this is not deemed as the baseline scenario.
- Energy delivered at household level through liquid fossil fuels such as LPG, kerosene: It has been verified from the National Report on Population Census 2001; by Central Bureau of Statistics and the Nepal Living Standard Survey 2003/04, December 2004 /8/, that kerosene is the second alternative after wood that is used for cooking purpose. It has been verified from the Nepal Living Standard Survey 2003/04 /8/ that 74 - 77.5% of the low income group uses wood, 18.1 - 25.8% population uses leaves, straw and thatches and 0.1 - 2.7% of the population uses kerosene. It has also been verified that the cost of LPG is higher than kerosene. In view of this fact, the usage of wood would have been continued in the baseline scenario. Thus, this is not a plausible baseline scenario.
- Energy delivered at household level through electricity and other renewable energy technologies: It has been verified from the baseline survey conducted by APTEC Consultancy (P) Ltd. /2/ in all the six districts of the project activity that non renewable biomass has been used for cooking purpose since 1989 and there is no trend to shift from wood to electricity for cooking. The other renewable alternatives like solar and bio fuel stove technology are not deemed to be viable due to the high upfront cost and unavailability of the bio fuel. It has also been verified during the site visit that the energy efficient cooking stoves are installed only for the replacement of the conventional stoves.
- Energy delivered at household level through biogas: It has been verified from the Biogas Support Programme report 2008 /7/ that the household with biogas plant, in the six districts where the project activity is located, varies from 5.4% to 0.79% of the total household with animals and with potential biogas house hold. Further, the energy efficient cooking stoves are installed only for the replacement of the conventional stoves.
- Continuation of the current situation: business as usual: Since this scenario is in compliance with the national regulation and does not encounter any barriers, this scenario has been selected as the baseline scenario.

The project boundary includes households where the fuel efficient cooking devices shall be installed in maximum of 120 Village Development Committees in 6 districts, namely, Bara, Parsa, Rautahat, Sarlahi, Mahottari and Dhanusa, where non-renewable biomass is used for cooking.



Emission sources and gases included in the project boundary are:

	GHGs involved	Description
Baseline emissions	CO ₂	Emission from the usage of kerosene (fossil fuel) that would have used to meet the equivalent thermal energy, which is generated by the non renewable biomass saved by the project activity, in the baseline scenario. Baseline emission considers the emission from non-renewable biomass used in the absence of the project activity, fossil fuel that would be used in absence of the project activity in place of the saved non renewable biomass, NCV of biomass and emission factor of kerosene.
Project emissions	CO ₂	Not applicable.
Leakage	CO ₂	<p>Emission due to the transportation of stove making materials and possible usage of non renewable biomass for space heating during winter has been considered as 5% of the total emission reduction. This has been fixed ex ante and the conservativeness of the same has been demonstrated (c.f section 4.7). The emission due to transportation and fuel wood usage for space heating in project is 4.06% of the total emission reduction by the project activity /15/. Moreover, the project activity area exhibits tropical climate and the temperature during winter is not beyond 12°C, thus emission due to the diverted non renewable biomass for space heating in the project region is not likely. The emission due to transportation and space heating has been accepted by DNV based on the conservativeness.</p> <p>Leakage relating to the non-renewable woody biomass shall be assessed ex post every year based on the surveys of users and areas from where woody biomass is sourced, using 90/30 precision for selection of samples, as per the methodology.</p> <p>The project stoves are new</p>



		implementations and are not transferred from other activity. Thus, leakage due to transfer of equipments is not applicable.
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In line with the CDM VVM, version 1.2, paragraph 80, DNV considers that the selected sources and gas are justified for the project activity. No other source of gas resulting to more than 1% of the over all average emission reduction by the project activity is envisaged.

4.5 Additionality

The project proponent has used “Tool for the demonstration and assessment of additionality” version 5.2 /25/ to demonstrate the additionality of the project activity/24/.

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

As per the CDM EB 49 “Guidelines on the demonstration and assessment of prior consideration of the CDM”, version 3 /23/, for the new project activity, written notification to the Host Party DNA and the UNFCCC secretariat is not necessary if the PDD has been published for global stakeholder consultation before the project activity start date. The PDD of the project activity has been published for global stakeholder consultation on 12 January 2010 and the start date of the project activity is 1 October 2010. The preparatory activity, such as identification of potential local partners, information material design and printing, field units establishment, identification and training of fuel efficient stove builders (promoters) and identification fabricators for stove parts, was started from October 2010. Since no supply agreement has been signed and the project activity does not required construction (one day for construction of each built on site stove), the date for the launch of the preparatory activity has been accepted as the start date of the project activity.

4.5.2 Identification of alternatives to the project activity

Baseline alternatives have been identified as per the methodology and the selection of the plausible baseline scenario has been demonstrated, as detailed in section 4.4 of the validation report, in line with methodology and the used “Tool for the demonstration and assessment of additionality” version 5.2/25/. The identified baseline scenario, as per the methodology, is that in absence of the project activity, fossil fuels would have been used for meeting similar thermal energy needs.

4.5.3 Investment analysis

In view of the fact that the project activity does not generate any revenue for the project proponent, a simple cost analysis has been performed to demonstrate the financial additionality of the project activity in line with “Tool for the demonstration and assessment of additionality” version 5.2/25/.

4.5.3.1 Investment analysis (simple cost analysis): Input parameters:

The input parameters of the project activity energy efficient stoves has been verified from the Promotion and dissemination of ICS in Chitwan district as sustainable carbon reduction project proposed budget for June 2007 to May 2009 /9/ and from the quotation from the private manufacturers /10//11/. Improved cooking stove project in Chitwan district was funded by TOCC in the mid hill region of Nepal.



Built on site (2 pot hole) cooking stove: The total cost of NRs 528.92 per 2 pot hole built on site improved cooking stoves has been verified from the Promotion and dissemination of ICS in Chitwan district as sustainable carbon reduction project proposed budget for June 2007 to May 2009 /9/. The two main input parameters for the pot hole built-on-site are:

- Non local material, such as iron rod, chimney pipe and pottery liner with grate: The cost of non local material of NRs 96 per pot hole stove has been verified from the Promotion and dissemination of ICS in Chitwan district project budget for June 2007 to May 2009 /9/. The purchase bills /11/ for the non local material has also been provided and verified. Due to the inflation of about 13% in Nepal, the present cost of non local material, such as iron rods, are higher than the actual cost at the time of ICS project implementation in Chitwan district. Based on the conservativeness, actual cost as per the approved budget of June 2007 to May 2009 for ICS project in Chitwan district /9/ has been considered for simple cost analysis. This cost shall be contributed by the project proponent and shall be provided free of cost to the users.
- Cost of skilled and unskilled labour: The cost of skilled and unskilled labour has sourced from the budget of ICS project of Chitwan district /9/. This cost shall be contributed by the users and shall be directly paid to the labour. The project proponent has no contribution to the same and thus has not been considered for calculation of revenue shortfall for the project activity.

Prefab Metal Portable Stove (rocket stove): The cost of prefab metal stoves of NPR1086.15 (USD 15) per stoves has been verified from the quotations provided by the suppliers /10/. The lowest price provided by the supplier has been considered for the simple cost analysis on the conservative basis. Of the total cost of NPR 1086.85 (USD 15) per stove, the project proponent shall contribute for NPR 567.38 (USD 8) as direct subsidy and NPR 519.47 (USD 7) shall be paid by the user during the purchasing the stove.

The indirect cost of the project activity includes the cost incurred in marketing, awareness, training of local labour. Indirect cost of NPR 1086 has been considered as per the budget of ICS project of Chitwan /9/. This expenditure shall be contributed by the project proponent. However, on the basis of conservativeness, the indirect cost has not been considered in the simple cost analysis.

Thus, DNV confirms that the validation of the input parameters has been conducted as per paragraph 110 and 111 of the VVM, version 1.2.

4.5.3.2 Calculation and conclusion

Simple cost analysis has been performed on the basis of the above described input parameters. The cost contributed by the project proponent in each fixed model stove is NPR 96 and NPR 579.28 for prefab metal stoves. The total revenue shortfall for the project proponent in the project activity is NPR 8.831 million, without considering the indirect cost of the project activity /15/. The calculation excel sheet for simple cost analysis has been verified by DNV.

4.5.4 Barrier analysis

It has been verified from the Baseline survey conducted by APTEC Consultancy (P) Ltd. October 2009 /2/ that no similar project on improved cooking stove has been undertaken in the Terai region of Nepal and same has been verified during the site visit. To implement the project activity, the project proponent has conducted information transfer on ICS, awareness,



publicity and marketing campaigns. Furthermore, to develop local labour skill, the project proponent shall impart training to the local promoters. It has been verified from the Budget of ICS project /9/ in Chitwan district that the indirect cost, which includes the training, awareness campaign and marketing, is NPR 1086 per stove. The CDM revenue shall be used by the project proponent to meet the indirect cost also. Moreover, the material required for the stove preparation, such as iron rod, ceramic and chimney are not available in the rural Terai region of Nepal where the project activity is implemented and thus, shall be required to be transferred from the urban area.

The lack of awareness, non availability of raw material and lack of trained man power leads to the risk of technological failure in the project implementation.

4.5.5 Common practice analysis

The Baseline survey conducted by APTEC Consultancy (P) Ltd. October 2009 /2/ confirms that no similar project activity has been implemented in the six districts in which the project activity is located. There are three other Improved Cooking Stove (ICS) in Nepal are:

- Biomass Energy Support Programme (BESP): This is a national program supported by the Alternative Energy Promotion Centre (AEPC), Government of Nepal, and funded by Danish and Norwegian government /27/. The program (BESP) is located in the 50 districts of mid hill and high hill region of Nepal and does not cover the Terai region of Nepal.
- Chitawan ICS Carbon Project: The Chitawan ICS program is located in only 3 Village Development Council (VDC) of Chitawan district. This program is supported by the The Offset Carbon Company (TOCC) /12/.
- Promotion and Dissemination of Improved Cookstove Technology in Kapilbastu, Rupandehi and Nawalparasi districts by Livelihood and Forestry Programme (LFP) /12/.

The comparison analysis between the project activity and the other three ICS projects in Nepal are as follows:

- As afore mentioned, all the three other improved cooking stove projects in Nepal are funded by national programs and by donations by other countries. The project proponent solely funds the proposed project activity.
- All the three programs are located in the mid hill or high hill region of Nepal.
- The stoves installed under the three programs are fixed mud stove and high altitude metallic stove which are not suitable for Terai region where the project activity is located. The adobe stove (fixed mud stove) used in these three programs has been improved to have better insulation and heat retaining device in the combustion chamber and decreased mass of the stove and reduced chimney height to make it suitable for the project activity region.
- No provision of direct subsidy, except for high metallic stoves, has been provided in any of the three improved cooking stove programs. The provision of direct subsidy of 35% of fixed stove and 40% of the rocket stove has been provided for the project activity.



Thus, it can be concluded that the project activity is not a common practice in the geographical region where the project activity is located. DNV also concludes that the project activity encounter investment barrier and technological barrier and the emissions reductions occurring from the project are deemed additional to those that would occur in the absence of the project activity.

4.6 Monitoring

The selected monitoring plan of the project activity is inline with the applied methodology, AMS-IIG version 2, according to Appendix B of the “*Simplified modalities and procedures for small-scale CDM project activities*” - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities.

The improved cooking stoves shall be installed only after dismantling the existing conventional cooking stoves. For every improved cooking stoves installed, a 10 digit unique ID number shall be provided and recorded. To meet the requirement of the methodology, existing stoves (recorded with type and respective number) that are dismantled or scrapped shall be entered in the spreadsheet on monthly basis along with the newly installed or sold stove and photographs shall also be taken so as to ensure that the old stoves are dismantled or scraped.

The number of cooking stoves that are expected to be dismantled or scraped and installed under project activity is 22920 by end of third year. The number of operating improved cooking stoves, efficiency of the stoves and operating time of the stoves shall be monitored by the annual survey of the representative sampling survey as per the methodology, AMS-IIG, version 2. As per paragraph 14, AMS-IIG, version 2, a representative sample of 68 improved cooking stoves shall be conducted to maintain the confidence interval of 90% and 10% margin of error. The sample survey shall be conducted annually. The standard statistical formula, developed by Cochran for large populations, has been used to determine the sample size with the stipulated confidence level and error margin. The sample size has also been verified from Survey Random Sample Calculator /26/. Each household shall be provided by one improved cooking stove under project activity.

Similarly, as per paragraph 8 of AMS-IIG, version 2, a sample survey in 8 household shall be conducted annually, maintaining the 90/30 precision for selection of samples /26/, for estimating the fuel wood consumption by non-user of project activity households. Details procedure of the sample survey has been outlined in the PDD, annex 3F /1/.

The monitoring plan is in accordance with the monitoring methodology and will give opportunity for real measurements of achieved emission reductions. DNV confirm that the project participant has the capacity to implement the monitoring plan.

4.6.1 Parameters determined ex-ante

The parameters determined ex ante are:

- Quantity of woody biomass used in the absence of project activity per household of 2.7 tonnes/year per baseline cooking stoves has been sourced from “Survey to Gather Baseline Information Required for Development of CDM Project on Improved Cooking Stoves in the Mid Terai”, October 2009 /2/. The sample size of baseline survey is 477 with the total number of households in six districts as 188 291, which



- gives the precision level higher than 90/10. A precision level of 90/10 is stipulated by the methodology (The conservativeness of the value is discussed in section 4.7).
- Efficiency of the baseline cooking stove has been considered to be 10% as per paragraph 6 of methodology AMS-IIG, version 2 /22/.
 - Efficiency of the system being deployed as part of the project activity of 28.72% has been considered. This value is the lowest efficiency of the project activity stoves and has been verified from the efficiency test reports /3//4/. In line with the methodology, efficiency of cooking stoves deployed under project activity shall be monitored ex post. The efficiency of 28.72% shall be compared with the ex post monitored value of efficiency and the conservative value shall be considered for the calculation of emission reduction during the verification period.
 - Fraction of non-renewable woody biomass saved by the project of 0.807 has been considered. The calculation has been outlined in PDD, annex 3B. The data sources /2//13//14//30//31/ used for the calculating the fraction has been verified by DNV and is found to be adequately used (The detailed calculation and the conservativeness of the value is discussed in section 4.7).
 - Net calorific value of non-renewable woody biomass that is substituted of 0.015 TJ/tonne has been sourced from IPCC 2006 default value.
 - Emission factor (of fossil fuel) for the substitution of non-renewable biomass by similar consumers of 71.5 t CO₂/TJ has been considered for kerosene (as discussed in section 4.4) and sourced from 2006 IPCC default value.
 - Leakage discount factor of 5% has been considered for transportation for the ex ante calculation. It has been demonstrated, based on the data from baseline survey, IPCC 2006 default value and estimation, that the leakage due to transportation is 4.06% of the emission reduction by the project activity.

All other data shall be monitored ex post. DNV has verified the value used against the sources and concluded that the data used are appropriate and conservative. This has been further described in section 4.6 of the report.

4.6.2 Parameters monitored ex-post

The parameters that are to be monitored *ex post* include:

- Number of cooking installed by the project activity. The data shall be compiled and reported on monthly basis. The data shall be maintained based on the number of baseline cooking stoves dismantled and improved cooking stoves installed. Each improved cooking stoves installed under project activity shall have a unique 10 digit identification number.
- Types, with respective numbers, of stoves dismantled or displaced by the project activity shall be recorded by the promoter in their database during installation/sale of stoves. 68 sampled households will be sampled during the survey by third party consultant to maintain 90/10 precision (size of sample as described in section 4.6)
- Annual check of efficiency of installed improved cooking stoves. Water boiling test shall be carried out every year for 68 sampled households (size of sample as described in 4.6) using the standard testing protocol developed by University of California,



- Berkeley and The shell Foundation and shall be carried out by national experts in stove testing as the independent third party.
- Percent of user households who are continuously using the stoves shall be monitored by sample survey per year by a third party. The improved cooking stoves used for 3 months or less than 3 months per year shall be discarded for the calculation of emission reduction.
 - Operation time of the fuel-efficient stoves shall be monitored per year by the sample survey. Since, the operation of built on site stoves starts only after a week of installation, emission reduction from the same shall only be included in the following month of installation of particular stove by the project activity.
 - Quantity of woody biomass used by non-user households shall be monitored annually by the sample survey of 90/30 precision. A third party shall conduct the sample survey.

The project activity, also applying for registration as Gold Standard project activity, also provides for monitoring social and environmental aspects of the project. As a part of Gold Standard, Carbon Monoxide (CO) and fine particulate matter (PM 2.5) emission from burning the fuel wood in fuel efficient stoves shall be monitored every six months by the project team for 68 installed improved cooking stoves (size of sample as described in 4.6). Training reports shall be generated each year to monitor the number of local population trained and the number of technical training targeted in the project activity region by the project proponent.

In view of the above mentioned monitoring procedure for each of *ex-post* monitored parameters, inline with paragraph 123 and 124 of VVM, version 1.2 /21/, DNV concludes that monitoring plan is feasible for the project activity design and project proponent shall be able to implement the monitoring plan.

4.6.3 Management system and quality assurance

The sample survey, as required by the methodology AMS-IIG, version 2, shall be conducted by the third party and the efficiency test of the project cooking stoves shall also be performed by the third party for all the 68 samples. The sample of 68 for survey has been determined by the standard statistical procedure, as described in section 4.6 of the validation report.

The project activity cooking stoves shall only be implemented after dismantling the existing conventional cooking stoves and shall be entered in the database. The project activity team shall identify local partner organisations (LPOs) in project implementation with more involvement in social mobilization. The procedure for stove distribution and dismantling of stoves has been adequately described in the PDD /1/. The CRT/N team, which is the project activity central team, shall conduct random spot check of 5% of stoves in the database. Altogether, 50% of the efficient stove installed/sold shall be spot-checked by the project and partner staff (LPO) including promoter to ensure the quality and if required necessary corrective measures are taken during the visit. The procedure for the monitoring of data for the project activity has been described in figure IV of PDD /1/.

All data will be archived in paper/ electronic form until two years after the crediting period.

4.7 Estimation of GHG emissions

The calculations and formulae as addressed in the approved baseline and monitoring methodology AMS-IIG, version 2, have been applied. All aspects related to the direct and indirect GHG emissions as relevant to the project activity have been addressed and are



presented in a transparent manner, in line with the approved methodology. No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been found.

Emission reduction: This has been calculated as per equation (1) of the applied methodology AMS-IIG, version 2. The calculation is based on the biomass saved by the project activity, fraction of non renewable biomass used, net calorific value of the non renewable biomass (woody biomass) and emission factor of the fossil fuel that would have replaced woody biomass in absence of the project activity. Following values has been considered for the emission reduction calculation:

- Biomass saving: Quantity of woody biomass used in the absence of project activity per household has been considered to be 2.7 tonnes/year per baseline cooking stoves and has been verified from “Survey to Gather Baseline Information Required for Development of CDM Project on Improved Cooking Stoves in the Mid Terai”, October 2009 /2/. It has also been verified from the baseline survey conducted by CRT/N along with Winrock International in Chitawan district in July 2009, that the average annual consumption of fuel wood is 3.87 tonnes/year per family using traditional cooking stoves. Thus, 2.7tonnes/year per baseline stove has been considered for conservativeness. As per equation (2) of the methodology, the biomass used in the baseline has been factored with the efficiency of baseline cooking stove and the project activity cooking stoves. Efficiency of the baseline cooking stove has been considered to be 10% as per paragraph 6 of methodology AMS-IIG, version 2 /22/. It has been also been verified from article on ‘Stoves used for cooking, water heating and space heating in Nepal used in Nepal’, Boiling Point Issue 38 (1997) that the efficiency of the conventional cooking stoves is 8.9%. The efficiency of the project activity stoves has been considered 28.72%, which is the lowest efficiency of the stoves. It has been verified from the efficiency test reports /3//4/ that the efficiency of the Built-on-site stoves ranges from 30.65-33.43% and 28.72-30.43% for the portable rocket stove. Thus, efficiency of 28.72% has been considered on conservative basis. The efficiency of 28.72% shall be compared with the ex-post monitored value of efficiency and the conservative value shall be considered for the calculation of emission reduction during the verification period.
- As afore mentioned in section 4.6.1, fraction of non-renewable woody biomass saved by the project is 0.807. This has been calculated based on the amount of non-renewable biomass used in absence of the project activity and the total amount of biomass used, including non-renewable and renewable biomass and also taking in to consideration the amount of non renewable woody biomass saved by the two CDM registered biogas projects in the project activity region /30//31/. Demonstrably renewable biomass has been calculated based on the total woody biomass forest area, as verified from Forest Cover Change Analysis of the Terai District (1990/91 - 2000/01), Department of Forest, May 2005 /13/, and total annual increment of the woody biomass is 1.2 m³/ha/year and density of fuel woody for Terai is 0.87 tonnes/m³ as verified from Forest Resources of Nepal /14/. Non-renewable biomass has been calculated as the difference of total harvest of the woody biomass from the forest and the annual increment of the woody biomass in the forest. The fraction of non-renewable woody biomass has been demonstrated as per paragraph 7 and calculated as per equation 4 of applied methodology AMS-IIG, version 2. The data



sources used for the calculation has been verified by DNV. It has been verified from the Energy Synopsis Report 2006 by Water and Energy Commission Secretariat of the government of Nepal that the average fraction of non-renewable biomass for the Terai region is established at 0.83. It has also been verified from a biogas project (under Voluntary Emission Reduction scheme) by World Wild Fund (WWF) that fraction of non-renewable biomass has been considered as 0.87. This concludes that the calculated fraction of non-renewable woody biomass of 0.807 is on the conservative side.

- As described in section 4.4 of the report that kerosene is the second alternative after wood that is used for cooking purpose and would have used to substitute the non-renewable biomass in absence of the project activity. The net calorific value of biomass and emission factor of kerosene has been sourced from 2006 IPCC default value.

Based on the above described parameters, the emission reduction, without considering leakage, has been calculated as 1.52 tCO₂/appliance/year. All the data sources has been verified by DNV and found to be correctly applied. As described in section 4.6, sample survey shall be conducted to monitor the requisite parameters to determine the biomass saved by the project activity as per the methodology AMS-IIG, version 2.

Leakage: The project activity shall dismantle/scrap the existing cooking stove prior to the implementation of the project activity stoves. The project stoves are new implementations and are not transferred from other activity. Thus, leakage due to the transfer of equipments is not involved in the project activity.

The non-renewable biomass saved in the project activity being diverted to non-project activity household is not likely since all households in Terai region collect fuel wood from the government forest and it is not likely that the minimal percentage (12.16%) of household using biogas shall shift to non-renewable fuel wood after the implementation of project activity. This shall be monitored ex post by the sample survey method as per paragraph 8 of AMS-IIG, version 2.

Furthermore, the project activity area exhibits tropical climate and the temperature during winter is not beyond 12°C, thus emission due to the diverted non renewable biomass for space heating in the project region is not likely. Nonetheless, emission due to the same have been quantified in the PDD. The calculation and the data sources used in the PDD have been verified by DNV. It has been demonstrated that the emission due to transportation and diversion of fuel wood for space heating in project is 4.06 % of the total emission reduction by the project activity /15/. In view of the conservativeness, a discount factor of 5% has been fixed ex ante and same shall be deducted from the emission reduction of the project activity every year to account for the emission due to transportation and space heating.

The estimated amount of GHG emission reductions from the project is calculated to be 198 994 tCO₂e during the selected fixed 10-year crediting period, resulting in estimated average annual emission reductions of 19 899 tCO₂e.

The baseline and project emissions estimate can be replicated using data and parameter values provided in the PDD and supporting files submitted for registration. The data sources mentioned have been verified by DNV.

In summary, the GHG calculations are complete and transparently documented by the



spreadsheet /15/ and data accuracy has been verified.

4.8 Environmental impacts

The project activity aims to reduce the non-renewable biomass consumption by replacing the conventional cooking system by the energy efficient cooking systems. No adverse environmental impact is envisaged from the project activity. As per the Environment Protection Regulation (EPR 1997 Schedule 1 and Schedule 2) the Improved Cooking Stove project is not enlisted in the project category requiring Environmental Impact Assessment (EIA), thus no EIA has been conducted for the project activity.

4.9 Comments by local stakeholders

The local stakeholder consultation has been conducted in two levels viz: local level, in the project activity district, and central level meeting. Participants from government organizations, non-government organizations, private sectors, local residents, health sector, forest users groups and other organisations affected by the project including media persons participated has been invited and participated in the stakeholder meeting. The stakeholder consultation at local level was conducted on 2 August 2009. The minutes of meeting /16/ and list of participants with individual signature /17/ has been provided to DNV for verification. It has been verified from the minutes of meeting and list of participants that local population from all six districts has attended the stakeholder consultation meeting. The minutes of meeting conducted at central level in Nepal for the project activity on 8 September 2009 /18/, has been provided. No negative comments have been received. DNV also interacted with the local population during the site visit. DNV considers the local stakeholder consultation carried out adequately.

4.10 Comments by Parties, stakeholders and NGOs

The PDD, version 01 dated December 2009, was made publicly available on the CDM website and Parties, stakeholders and NGOs were through the CDM website (<http://cdm.unfccc.int/Projects/Validation/DB/AG8P0F81C38EQ1G1AZN5BJNTY9SWO0/vjew.html>) invited to provide comments during a 30 days period from 12 January 2010 to 10 February 2010.

No comments were received.

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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	CAR-1 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	CAR-1 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	No involvement of ODA has been identified during the validation.
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

Requirement	Reference	Conclusion
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 that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	CL-5 CL-6 CL-7 OK
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	CL-8 CL-9 CL-10 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	OK
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	CL-12 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	PDD has been webhosted in UNFCCC website for

Requirement	Reference	Conclusion
		GSC from 12 January 2010 to 10 February 2010. No comments were received
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	CL-4 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 the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

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/I	<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/I	<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)	/1/				
A.2.1 How was the design of the project assessed?	/1/	DR/I	<i>What type is the project?</i> <input checked="" type="checkbox"/> Project in existing facility or utilizing existing equipment(s) or replacement of the existing equipment. <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 checked="" type="checkbox"/> individual small scale project activity with emission reductions exceeding 15 000 tCO ₂ e per year <input type="checkbox"/> Greenfield project		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p><i>How was the design of the project assessed?</i></p> <p><input checked="" type="checkbox"/> Physical site inspection</p> <p><input checked="" 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/	DR	The project activity is a thermal energy efficiency improvement project at household level by installing efficient cooking stove. It has been verified during the site visit that the project activity is in the demonstration phase and the implementation is yet to begin.		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/I	The physical site visit of the project activity has been conducted in the Parsauni in Bara district where the pilot demonstration has been performed. Since, the demonstration has been conducted in this area only, the physical visit to the Parsauni is deemed justified.		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/I	The project activity is spread over six districts, namely: Bara, Parsa, Rautahat, Sarlahi, Mahottari and Dhanusa of central development region in Nepal. The project activity involves the replacement of conventional cooking stove with energy efficient cooking stove (Improved Cooking Stove). Two types of improved cooking stove	CL4	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			(ICS) would be used in the project activity, namely built-on-site and prefabricated model, also called as rocket stove. The PDD needs to be revised to address the design variation of 1, 2 or 3 pot stoves. The dimensions of the improved cooking stove to be included in the PDD.		
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/I	The project activity is the complete replacement of conventional cooking with the energy efficient cooking stove. Thus, the project activity does not involve any alteration of the existing units.		OK
A.2.6 Does the project design engineering reflect current good practices?	/1/	DR/I	The project activity involves the replacement of conventional cooking stove with energy efficient cooking stove (Improved Cooking Stove). Two types of improved cooking stoves (ICS) would be installed in the project activity, namely built-on-site and prefabricated model, also called as rocket stove.		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/I	No transfer of technology from Annex I party is envisaged in the project activity. It is envisaged that the project activity shall result to reduction in fuel consumption and reduce indoor air pollution.		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/I	Yes, the project activity qualifies as the small scale project activity. The demonstration of the project activity's applicability to SSC needs to be provided considering the highest	CAR-4	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			efficiency of each type of stoves.		
A.2.9 Is the small scale project activity a debundled component of a larger project activity?	/1/	DR/I	No, the project activity is not a debundled component of a larger project activity. There is no similar CDM project activity within 1 km with the same project proponent.		OK
A.3 Participation requirements (VVM para 51-54, 125-127)	/1/				
A.3.1 Do all participating Parties fulfil the participation requirements as follows:	/1/	DR			
			Nepal (host) United Kingdom		
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			NA <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
A.3.2 Do the letters of approval meet the following requirements?	/1/	DR	LoA from both the participating countries are yet to be provided.	CAR-I	OK
			Nepal (host) United Kingdom	/1/	
a) LoA confirms that Party has ratified the Kyoto Protocol			<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No		
b) LoA confirms that participation is voluntary			<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No		
c) The LoA confirms that the project contributes to the sustainable development of the host country?			<input type="checkbox"/> Yes <input type="checkbox"/> No NA		
d) The LoA refers to the precise project activity title in the PDD			<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No		
e) The LoA is unconditional with respect to (a) to (d) above			<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No		
f) The LoA is issued by the respective Party's DNA			<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No		

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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 type="checkbox"/> DNA <input type="checkbox"/> PP	<input type="checkbox"/> DNA <input type="checkbox"/> PP		
A.3.3 Have all private/public project participants been authorized by an involved Party?	/1/	DR	LoA from both the participating countries are yet to be provided.	CC-1	OK
A.4 Technical description of the project activity (VVM para 58-64)	/1/				
A.4.1 Is the project's location clearly defined?	/1/	DR/I	The project activity is located in six districts, namely: Bara, Parsa, Rautahat, Sarlahi, Mahottari and Dhanusa of central development region of Nepal. The geo-coordinates of the project activity location have been provided in Annex 3E of the PDD.		OK
A.5 Public funding of the project activity	/1/				
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	The validation does not reveal involvement of public funding. The project proponent is requested provide the declaration confirming the same.	CC-2	OK
B Application of a baseline and monitoring methodology	/1/				
B.1 Methodology applied (VVM para 65-76)	/1/				
B.1.1 Does the project apply an approved methodology and the correct version thereof?	/1/	DR/I	The project activity correctly applied AMS-II G, version 2.		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2 Applicability of methodology (and tools) (VVM para 65-76)					
B.2.1 How was it validated that project complies with the following applicability criteria: Thermal efficiency improvement of non-renewable biomass (paragraph 1 of AMS-IIG, version 2)?	/1/	DR/I	The project activity involves the replacement of conventional cooking stove with the energy efficient cooking stoves. It has been verified from the baseline survey conducted by APTEC Consultancy (P) Ltd. in all the six districts of the project activity that non renewable biomass has been used for cooking purpose. According to the survey result 50.7 % of the users collected firewood from community forests and while some 68.8 % of users collected firewood from government forests and 13 % and 24.9 % percent of users used private forests/lands and other sources respectively. Firewood collection contributes for an average of 53.9% of the forest degradation.		OK
B.2.2 How was it validated that project complies with the following applicability criteria: paragraph 1 of AMS-IIG, version 2?	/1/	DR/I	The project activity is the first CDM project for AMS-II.G for thermal efficiency improvement in the cooking stove. The project activity involves the replacement of the conventional stove with the improved stove and thus will not account for any other source of saving of non-renewable biomass. The project proponent needs to develop the unique identification of the improved cooking stove installation under the project activity and document the same in the PDD to differentiate from the other similar	CL3	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>installations which are outside the boundary of the project activity.</p> <p>Disposal or handling of the conventional cooking stove in the baseline of the project activity needs to be addressed adequately.</p> <p>The PDD to be revised to address all the applicability criteria in section B.2 of the PDD in tabular form preferably.</p> <p>Woody biomass being non renewable biomass needs to be demonstrated with at least two of the indicators as per the methodology (para 7). Description given in the PDD only addresses “carbon stocks are depleting” issue.</p> <p>The PP needs to clarify if there is any other CDM registered projects for saving the non renewable woody biomass in the six districts of the project. If there are some, then the PP is requested to demonstrate that reduction in consumption of non renewable biomass do not significantly alter the share of non-renewable biomass calculations done for the project activity.</p>		
B.2.3 How was it validated that project complies with the following applicability criteria: non-renewable biomass has been used since 31 December 1989 (Paragraph 3 of AMS-IIG, version 2)?	/1/	DR/I	It has been verified from the baseline survey conducted by APTEC Consultancy (P) Ltd. in all the six districts of the project activity that non renewable biomass has been used for cooking purpose since 1989. Time required and distance travelled for the collection of fuel wood and cost of fuel wood has been		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2.4 Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/	DR/I	<p>assessed for 1989, 2000 and 2009.</p> <p>The project activity meets the applicability criteria of the methodology, AMS-IIG, version 2. The baseline of the project activity is that in absence of the project activity, fossil fuels would have been used for meeting similar thermal energy needs.</p> <p>It has been verified from the National Report on Population Census 2001; by Central Bureau of Statistics that kerosene is the second alternative after wood that is used for cooking purpose.</p> <p>The proponent is requested to provide more recent data source to demonstrate that kerosene is the second alternative after wood for cooking purpose in the central development region of Nepal, where the project being implemented.</p> <p>The percentage of population using kerosene needs to be consistent in the PDD.</p> <p>It has been stated in the PDD the 96% of the population uses fuel wood and 15% uses biogas. It has been verified from the Biogas Support Programme report 2008 that the house hold with biogas plant, in the six districts where the project activity is located, varies from 5.4% to 0.79% of the total household with animals and with potential biogas house hold. The percentage of population using wood, biogas and other kind</p>	CL-4	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			of fuel is to be clarified and supported and consistent in the PDD. The date & month of baseline survey to be consistent with the baseline survey report and the PDD.		
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/I	The project boundary includes households where the fuel efficient cooking devices shall be installed in maximum of 120 Village Development Committees in 6 districts, namely, Bara, Parsa, Rautahat, Sarlahi, Mahottari and Dhanusa, where non-renewable biomass is used for cooking firewood.		
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/I	GHG sources identified for the project activity are in line with the methodology and as below: Emission reduction due to the non renewable biomass saving in the project activity and fossil fuel that would have been used in absence of the project activity. Leakage due to use or diversion of non-renewable woody biomass saved under the project activity by non-project households who previously used renewable energy sources.		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	/1/	DR	All the emissions as per the methodology have been considered.		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
with more than 1% of the estimated emission reductions of the project?					
B.4 Baseline scenario determination (VVM para 81-88, 105-107)					
B.4.1 Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/	DR/I	<p>The baseline of the project activity is that in absence of the project activity, fossil fuels would have been used for meeting similar thermal energy needs. This is as per the methodology. Assessments of alternative baseline scenarios are not required as per the methodology.</p> <p>It has been verified from the National Report on Population Census 2001; by Central Bureau of Statistics that kerosene is the second alternative after wood that is used for cooking purpose.</p> <p>The proponent is requested to provide more recent data source to demonstrate that kerosene is the second alternative after wood for cooking purpose.</p>	CL 4	OK
B.4.2 How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/	DR	<p>Assessments of alternative baseline scenarios are not essential as per the methodology. However, since the project activity uses additionality tool, version 5.2, the alternatives considered for determining the baseline are:</p> <p>The proposed project activity undertaken without using carbon finance: It has been addressed that the cost of improved stoves</p>	CL 4 CL 5	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>has an indirect cost of US \$ 15 and direct cost of US \$7. The users of the stoves belong to the low per capita income group and thus shall not be able to afford the improved stove with the complete cost. The indirect cost of US \$15 shall be contributed by the project proponent.</p> <p>The total cost of the stoves and elements of the cost of stoves need to be supported with evidences and justified.</p> <p>Energy delivered at household level through liquid fossil fuels such as LPG, kerosene: It has been verified from the National Report on Population Census 2001; by Central Bureau of Statistics that kerosene is the second alternative after wood that is used for cooking purpose.</p> <p>The proponent is requested to provide more recent data source to demonstrate that kerosene is the second alternative after wood for cooking purpose.</p> <p>Energy delivered at household level through electricity and other renewable energy technologies: It has been verified from the baseline survey conducted by APTEC Consultancy (P) Ltd. in all the six districts of the project activity that non renewable biomass has been used for cooking purpose since 1989 and there is no trend to shift from wood to electricity for cooking. The other</p>		

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>renewable alternatives like solar and bio fuel stove technology are not deemed to be viable due to the high upfront cost and unavailability of the bio fuel. It has also been verified during the site visit that the energy efficient cooking stoves are installed only for the replacement of the conventional stoves.</p> <p>Energy delivered at household level through biogas: It has been verified from the Biogas Support Programme report 2008 that the house hold with biogas plant, in the six districts where the project activity is located, varies from 5.4% to 0.79% of the total household with animals and with potential biogas house hold. Further, the energy efficient cooking stoves are installed only for the replacement of the conventional stoves.</p> <p>Continuation of the current situation: business as usual: Since this scenario is in compliance with the national regulation and does not encounter any barriers, thus has been selected as the baseline scenario.</p>		
B.4.3 What is the baseline scenario?	/1/	DR	The baseline of the project activity is that in absence of the project activity, fossil fuels would have been used for meeting similar thermal energy needs.		
B.4.4 Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR	The baseline scenario has been determined as per the methodology. However CL 4 needs to be addressed.	CL 4	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.4.5 Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Baseline scenario has been determined as per the methodology. However CL 4 needs to be addressed.	CL 4	OK
B.4.6 Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Baseline scenario has been determined as per the methodology. However CL 4 needs to be addressed.	CL 4	OK
B.4.7 Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Baseline scenario has been determined as per the methodology. However CL 4 needs to be addressed.	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 CDM project activity 	/1/	DR	The baseline of the project activity is that in absence of the project activity, fossil fuels would have been used for meeting similar thermal energy needs. This is as per the methodology. Assessments of alternative baseline scenarios are not required as per the methodology. It has been verified from the National Report on Population Census 2001; by Central Bureau of Statistics that kerosene is the second alternative after wood that is used for cooking purpose. CL 4 needs to be addressed.	CL 4	OK
B.5 Additionality determination (VVM para 94-121)					
B.5.1 What approach/tool does the project use to assess additionality? Is this in line with the methodology?	/1/	DR/I	The project activity uses Additionality tool, version 5 for demonstrating the additionality of the project. The proponent needs to use Additionality	CL 5	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			tool version 5.2 which is recently available.		
B.5.2 Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR/I	The regulatory requirements has been considered in eliminating the alternatives. The additionality of the project activity has been assessed with the barrier analysis and common practice analysis. Since current practice scenario is in compliance with the national regulation and does not encounter any barriers, thus has been selected as the baseline scenario. The proponent needs to address the issues in CL 4 and CL 5.		
B.5.3 Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR/I	<p>The additionality of the project activity has been assessed with the barrier analysis and common practice analysis.</p> <p>Barrier analysis: It has been addressed that the cost of improved stoves has an indirect cost of US \$ 15 and direct cost of US \$6 for built on site stove and US \$ 10 for prefab metal portable stove. The users of the stoves belong to the low per capita income group and thus shall not be able to afford the improved stove with the complete cost. The indirect cost of US \$15 shall be contributed by the project proponent.</p> <p>The total cost of the stoves and elements of the cost of stoves need to be supported with evidences and justified.</p> <p>The simple cost analysis provided in the PDD under barrier analysis needs to be shifted to</p>	CL-5	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>investment analysis.</p> <p>The PDD and the supporting excel sheet calculation of the simple cost analysis needs to include and demonstrate to what extent the income from CDM revenue alleviates the income gap.</p> <p>The investment barrier needs to be demonstrated with the evidence for the non availability of the funds from any sources for the project in line with the definition of the investment barrier.</p> <p>Technological barrier: It has been stated that improved cooking stoves models were recently tested in the pilot project in Chitawan district and are not available locally in the project area. Significant adaptive research efforts have been made to improve these versions of stoves to make it suitable technically and socially for the project area. This technological barrier needs to be substantiated with supporting evidences from research efforts etc. and how the CM revenue helps in alleviating this barrier.</p> <p>Common practice analysis: Common practice discussion in the PDD to be further clarified by defining the region for the analysis and its justification.</p> <p>The proponent needs to demonstrate how the project activity is different from the improved cooking stove program under</p>	<p>CL-6</p> <p>CL-7</p>	<p>OK</p> <p>OK</p>

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			national program and similar other programs if any in the host country with sufficient supporting evidences.		
B.5.4 What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/1/	DR/I	The additionality of the project activity has been assessed with the barrier analysis and common practice analysis. However CL 5, CL 6 and CL 7 is to be addressed.		
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/	DR	As per the CDM EB 49 “Guidelines on the demonstration and assessment of prior consideration of the CDM”, for the new project activity, written notification to the Host Party DNA and the UNFCCC secretariat is not necessary if the PDD has been published for global stakeholder consultation before the project activity start date. The PDD of the project activity has been published for global stakeholder consultation on 12 January 2010 and expected start date of the project activity is 1 December 2010 (Note that this date was changed to 1 October 2010 as part of addressing CAR 3).		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	As per the CDM EB 49 “Guidelines on the demonstration and assessment of prior consideration of the CDM”, for the new project activity, written notification to the Host Party DNA and the UNFCCC secretariat is not necessary if the PDD has been published for global stakeholder		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			consultation before the project activity start date. The PDD has been webhosted on 12 January 2010 and expected start date of the project activity is 1 December 2010 (Note that this date was changed to 1 October 2010 as part of addressing CAR 3)..		
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 PDD has been webhosted on 12 January 2010 and expected start date of the project activity is 1 December 2010 (Note that this date was changed to 1 October 2010 as part of addressing CAR 3)..		OK
B.5.8 When did the construction of the project activity start?	/1/	DR	Expected start date of the project activity is 1 December 2010.		OK
B.5.9 When was the project commissioned?	/1/	DR/I	The project activity involves the replacement of conventional cooking stove with improved stove. Expected start date of the project activity is 1 December 2010 (Note that this date was changed to 1 October 2010 as part of addressing CAR 3)..		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	Refer to B.5.5, B.5.6		OK
Investment analysis (VVM para 108-114)					
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	Investment analysis has not been performed. However, the simple cost analysis that has been performed in the webhosted PDD needs to be a part of investment analysis as per the	CL5	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			Additionality tool.		
Barrier analysis (VVM para 115-118)					
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/I	<p>The investment analysis has not been performed. It has been addressed that the cost of improved stoves has an indirect cost of US \$ 15 and direct cost of US \$6 for built on site stove and US \$ 10 for prefab metal portable stove. The users of the stoves belong to the low per capita income group and thus shall not be able to afford the improved stove with the complete cost. The indirect cost of US \$15 shall be contributed by the project proponent.</p> <p>The total cost of the stoves and elements of the cost of stoves need to be supported with evidences and justified.</p> <p>The simple cost analysis provided in the PDD under barrier analysis needs to be shifted to investment analysis as per the requirement of additionality tool.</p> <p>The PDD and the supporting excel sheet calculation of the simple cost analysis needs to include and demonstrate to what extent the income from CDM revenue alleviates the income gap.</p> <p>The investment barrier needs to be demonstrated with the evidence for the non availability of the fund for the project in line with the definition of the investment barrier.</p>	CL-5	OK

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

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.13 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/I	Refer to B.5.12	CL-5	OK
B.5.14 How does CDM alleviate the investment barriers?	/1/	DR/I	The PDD and the supporting excel sheet calculation of the simple cost analysis needs to include and demonstrate to what extent the income from CDM revenue alleviates the income gap. Refer to CL 5.	CL-5	OK
B.5.15 Is the project activity prevented by the investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	The additionality of the project activity has been assessed with the barrier analysis and common practice analysis. Since current practice scenario is in compliance with the national regulation and does not encounter any barriers, thus has been selected as the baseline scenario. The proponent needs to address the issues in CL 4 and CL 5.		
B.5.16 How were the <u>technological barriers</u> assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/	DR/I	It has been stated that improved cooking stoves models were recently tested in the pilot project in Chitawan district and are not available locally in the project area. Significant adaptive research efforts have been made to improve these versions of stoves to make it suitable technically and socially for the project area. This technological barrier needs to be substantiated with supporting evidences for research efforts etc. and how the CM revenue helps in alleviating this barrier.	CL-6	OK
B.5.17 How does CDM alleviate the technological barriers?	/1/	DR/I	The proponent needs to demonstrate the	CL-6	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			technological barrier with supporting evidences for research efforts etc. and how the CM revenue helps in alleviating this barrier.		
B.5.18 Is the project activity prevented by the technological barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR/I	Since current practice scenario is in compliance with the national regulation and does not encounter any barriers, thus has been selected as the baseline scenario. However the proponent needs to address CL 6.	CL-6	OK
B.5.19 How were the <u>barriers due to prevailing practise</u> assessed to be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/1/	DR	Barrier due to prevailing has not been discussed in the PDD.		OK
Common practice analysis (VVM para 119-121)					
B.5.20 What is the geographical scope of the common practice analysis? Is this justified?	/1/	DR/I	Common practice discussion in the PDD to be further clarified by defining the region for the analysis and its justification. The proponent needs to demonstrate how the project activity is different from the improved cooking stove program under national program with sufficient supporting evidences.	CL-7	OK
B.5.21 What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has this been justified?	/1/	DR/I	The common practice has been conducted for cooking stoves. The proponent needs to address CL 7.	CL-7	
B.5.22 What is the data source(s) used for the common practice analysis?	/1/	DR/I	The proponent needs to address CL 7.	CL-7	
B.5.23 How many similar non-CDM-projects exist in the region within the scope?	/1/	DR/I	The proponent needs to address CL 7.	CL-7	

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.24 How were possible essential distinctions between the project activity and similar activities assessed?	/1/	DR/I	The proponent needs to address CL 7.	CL 7	
B.5.25 What is the conclusion of the common practice analysis?	/1/	DR/I	The proponent needs to address CL 7.	CL 7	
Conclusion					
B.5.26 What is the conclusion with regard to the additionality of the project activity?	/1/	DR	The conclusion on the project's additionality is subjected to the satisfactory resolve of CL 5, CL 6 and CL 7.	CL 5 CL 6 CL 7	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 "Quantity of woody biomass used in the absence of project activity per household" verified?	/1/	DR/I	The quantity of wood consumed for cooking by the house hold has been determined to be 2.7 ton/year. It has been verified from the baseline survey conducted by APTEC Consultancy (P) Ltd. in all the six districts of the project activity that non renewable biomass has been used for cooking purpose since 1989.		OK
B.6.2 How was the "Efficiency of the system being replaced" verified?	/1/	DR/I	Efficiency of the conventional cooking stove has been considered as 10% as per the default value of the methodology AMS-IIG, version 2. It has also been verified from "Stoves used for cooking, water heating and space heating in Nepal" by Kayeswar Man Sulpya, an publication in HEDON website, that the efficiency of the conventional stoves in 8.9%. Thus, on the conservative basis, 10% of efficiency has been accepted.		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.6.3 How was the “Efficiency of the system being deployed as part of the project activity” verified?	/1/	DR/I	Efficiency of the improved stove has been considered to be 25%. It has been verified from the test results from Kathmandu University, that the efficiency of the stoves are 30-33% for built-on-site stoves and 29-30% for the portable rocket stove. The proponent needs to justify efficiency of 25%. It has been observed during the site visit that 1 and 3 pothole built on site improved cooking stove shall also be installed under the project activity. The efficiency evidence has not been provided for 1 and 3 pot hole build on site.	CL-8	OK
B.6.4 How was the “Fraction of non-renewable woody biomass saved by the project” verified?	/1/	DR/I	Fraction of non renewable biomass has been calculated to be 0.81. It has been verified from the Energy Synopsis report: Nepal 2006 by Water and Energy Commission Secretariat, Government of Nepal, that the fraction of non renewable biomass in Terai region is 0.83. It has also been verified from the baseline survey conducted by APTEC Consultancy (P) Ltd. in all the six districts of the project activity that the NRB ratio is 0.82. The proponent needs to provide evidences for all the data used for the calculation of NRB ratio of 0.81.	CL-8	OK
B.6.5 How was the “Net calorific value of non-renewable woody biomass that is substituted” verified?	/1/	DR/I	The NCV of the non renewable biomass has been sourced from 2006 IPCC default value.		OK
How was the “Emission factor for the substitution of non-renewable biomass by similar consumers” verified?	/1/	DR/I	Emission factor of non-renewable biomass has been sourced from 2006 IPCC default		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.6.6 How was the “Leakage Discount Factor” verified?	/1/	DR/I	value. A leakage discount factor of 5% has been considered for estimation purpose. 5% of leakage is to be justified.	CL-8	OK
Baseline emissions (VVM para 89-93)					
B.6.7 Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR/I	The baseline emission has been calculated as per the methodology, AMS-II.G, version 2. Baseline emissions have been calculated considering the non renewable biomass used in the absence of the project activity, fossil fuel that would be used in absence of the project activity, NCV of biomass and emission factor of kerosene. However, CL 4 and CL 8 need to be addressed. Detailed calculation excel sheet to be provided with the emission reduction calculations as per the formulae given in the methodology and baseline emissions, project emissions, leakage and final emission reductions in consistent with the figures provided in PDD.	CL-8 CL-4 CL-9	OK
B.6.8 Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	CL 8 needs to be addressed	CL-8	OK
B.6.9 Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	CL 8 needs to be addressed	CL-8	OK
Project 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/I	The project emission has been calculated as per the methodology, AMS-II.G, version 2. Project emission has been calculated from the	CL-4 CL-8	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			non renewable biomass used in the project activity, considering the improvement in the thermal efficiency of the stove, fossil fuel that would be used in absence of the project activity, NCV of biomass and emission factor of kerosene. It has been verified from the test results from Kathmandu University, that the efficiency of the stoves are 30-33% for built-on-site stoves and 29-30% for the portable rocket stove. The proponent needs to justify efficiency of 25%. The proponent needs to address CL 4, CL 8 and CL 9.	CL-9	
B.6.11 Have conservative assumptions been used when calculating the project emissions?	/1/	DR	The proponent needs to address CL 4, CL 8 and CL 9	CL-4 CL-8 CL-9	OK
B.6.12 Are uncertainties in the project emission estimates properly addressed?	/1/	DR	The proponent needs to address CL 4, CL 8 and CL 9	CL-4 CL-8 CL-9	OK
Leakage (VVM para 89-93)					
B.6.13 Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR/I	A leakage discount factor of 5% has been considered for estimation purpose. The choice and appropriateness of 5% of leakage considered is to be justified. Leakage needs to address the usage of non renewable biomass in the non project households, which may belong outside the project boundary but the NRB (wood) is sourced from the same location.	CL-8 CL-10	OK
B.6.14 Have conservative assumptions been used when	/1/	DR/I	CL 8 and CL 10 needs to be addressed.	CL-8	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
calculating the leakage emissions?				CL-10	
B.6.15 Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR/I	CL 8 and CL 10 needs to be addressed.	CL-8 CL-10	OK
Emission Reductions (VVM para 89-93)					
B.6.16 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/I	The emission reduction has been calculated as per the methodology. Proponent needs to address CL 8, CL 9, CL 10.	CL-8 CL-9 CL-10	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/I	The monitoring plan of the PDD needs to address the following: Dismantling or handling of the baseline stove to be included in the monitoring in the PDD. The type of stove dismantled also needs to be added in the monitoring plan of the PDD. Systematic sampling method has been followed for determining the sample size. Considering the total number of installation,	CAR-2	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>90% confidence and tolerable error percentage of 10%, sample size of 68 has been calculated. The representative sample size of 68 has been mentioned in the annex of the PDD. This needs to be included in the B.7 of the PDD. The frequency of the survey and how the 68 samples will be selected for survey needs to be clearly described and mentioned in the PDD.</p> <p>Leakage due to the usage of non renewable biomass in the non project household, which may belong outside the project boundary but the NRB (wood) is sourced from the same location.</p>		
B.7.2 Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR/I	Surveys will be conducted to check the number of installed stoves and the number of stoves in operation. Lab test will be conducted every year to determine the efficiency of the installed improved stoves under the project activity and Stove Emissions (CO and PM2.5). The monitoring plan needs to address CAR 2.	CAR-2	OK
B.7.3 In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR/I	Surveys will be conducted to check the number of installed stoves and the number of stoves in operation. Lab test will be conducted every year to determine the efficiency of the installed improved stoves under the project activity and Stove Emissions (CO and PM2.5). The monitoring plan needs to address CAR 2.	CAR-2	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.7.4 In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR/I	Refer to B.7.3. CAR 2 to be addressed	CAR-2	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/I	Refer to B.7.3. CAR 2 to be addressed	CAR-2	OK
B.7.6 Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR/I	Refer to B.7.3. CAR 2 to be addressed	CAR-2	OK
B.7.7 Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR/I	Refer to B.7.3. CAR 2 to be addressed	CAR-2	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/I	The project proponent needs to clarify CAR 2.	CAR-2	OK
B.7.9 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/1/	DR/I	Data entry of all the fuel efficient stove installed/sold is made on monthly basis by the Project Manager appointed by the project proponent.		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	It has been addressed that 50% of the installed stoves will be visit by the project activity staff and 10% of the installation shall be spot checked by the project manager. The project proponent, CRT/N central office shall cross check the database to ensure compliance with the CDM project monitoring plan. Independent third party for sample survey will be involved as part of the		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			monitoring plan and the activities of independent third party shall include the identification of the households that are randomly selected based on the sampling plan and ex-post collection of data on fuel efficient stoves disseminated, fuel efficient stove replaced biomass use in project area and outside the project area, stoves in operation and use and the efficiency of stove. The project monitoring organisation has been provided in PDD.		
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 the data required shall be kept for two years after the end of the crediting period or the last issuance of CERs.		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/I	Legislation of Nepal does not warrant the monitoring of sustainable development or environmental impacts indicators.		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/I	Legislation of Nepal does not warrant the monitoring of sustainable development or environmental impacts indicators.		OK
B.7.14 Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR/I	The sustainable development indicators are inline with the national priorities. This needs to be confirmed from the Letter of Approval from the DNA of Nepal.	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 (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/	DR/I	<p>The expected start date of the project has been identified as 1 December 2010 (Note that this date was changed to 1 October 2010 as part of addressing CAR 3)..</p> <p>The start date of the project activity has been identified as 1 December 2010, which is after the start date of the crediting period. The start date of the crediting period needs to be after the start date of the project activity.</p>	CAR-3	OK
C.1.3 Is the stated expected operational lifetime of the project activity reasonable?	/1/	DR/I	<p>The operational lifetime of the project activity has been stated to be 10 years.</p> <p>The technical life time of the project stoves has been stated to be 3 years. The proponent needs to substantiate how the replacement of the project stoves will be ensured.</p>	CL-11	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/I	<p>Fixed crediting period of 10 years has been selected.</p> <p>The start date of the crediting period needs to be suitably revised to have at least a gap of 4 weeks between the date of submission for registration and the start date of the crediting period.</p> <p>The start date of the project activity has been identified as 1 December 2010, which is after the start date of the crediting period. The start</p>	CAR-3	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			date of the crediting period needs to be after the start date of the project activity.		
D Environmental Impacts (VVM para 131-133)					
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/I	As per the Environment Protection Regulation (EPR 1997 Schedule 1 and Schedule 2) the Improved Cooking Stove project is not enlisted in the project category requiring Environmental Impact Assessment (EIA).		OK
D.1.2 Does the project comply with environmental legislation in the host country?	/1/	DR/I	EIA is not required as per the legislation. There is not specific statutory clearance required for the project activity.		OK
D.1.3 Will the project create any adverse environmental effects?	/1/	DR/I	The project activity does not have any adverse environment effect.		OK
D.1.4 Have identified environmental impacts been addressed in the project design?	/1/	DR/I	The project activity does not have any adverse environment effect.		OK
E Stakeholder Comments (VVM para 128-130)					
E.1.1 Have relevant stakeholders been consulted?	/1/	DR/I	The local population, NGOs and other government departments has been involved in the local stakeholder consultation process. The proponent is requested to include the list of organizations attended the local stakeholder consultation process in the PDD. Minutes of the local stakeholder consultation needs to be provided and the process adopted for the invitation of the media personnel,	CL-12	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			with evidences.		
E.1.2 Have appropriate media been used to invite comments by local stakeholders?	/1/	DR/I	Minutes of the local stakeholder consultation needs to be provided and the process adopted for the invitation of the media personnel, with evidences.	CL-12	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/I	Local stakeholder consultation is not required as per law of the host country.		OK
E.1.4 Is a summary of the stakeholder comments received provided?	/1/	DR/I	Minutes of the local stakeholder consultation needs to be provided and the process adopted for the invitation of the media personnel, with evidences.	CL-12	OK
E.1.5 Has due account been taken of any stakeholder comments received?	/1/	DR/I	Minutes of the local stakeholder consultation needs to be provided and the process adopted for the invitation of the media personnel, with evidences.	CL-12	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
<p>CAR 1</p> <p>LoA from both the participating countries are yet to be provided.</p>	A.3.2, A.3.3	<p>Letter of Approval from both the parties has been provided.</p>	<p>Letter of Approval from the DNA of Nepal, dated 15 June 2010 has been provided authorizing Centre for Rural Technology, Nepal as a project participant and confirming that the project assists in achieving sustainable development. The DNA of United Kingdom has also approved the project on 22 September 2010 confirming the voluntary participation of Egluro. OK. CAR 1 is closed.</p>
<p>CAR 2</p> <p>Monitoring plan needs to address the following:</p> <p>Dismantling or handling of the baseline stove to be included in the monitoring in the PDD.</p> <p>The type of stove dismantled also needs to be added in the monitoring plan of the PDD.</p> <p>Systematic sampling method has been followed for determining the sample size. Considering the total number of installation, 90% confidence and tolerable error percentage of 10%, sample size of 68 has been calculated. The representative sample size of 68 has been mentioned in the annex of the PDD. This needs to be included in the B.7 of the PDD. The frequency of the survey and</p>	B.7.1 – B.7.7, B.7.8	<p>Measures on dismantling old stoves is included in section A.2 and monitoring of dismantling of the stove is included in section B.7 of the PDD.</p> <p>A parameter has been added in the PDD to monitor the type of stove dismantled.</p> <p>The determination of the sample size of 68 has been included in section B.7 of the PDD. The frequency of the survey and selection of the sample households have also been discussed alongside.</p> <p>The monitoring plan of the PDD has described in detail about the surveys to check the number of installed stoves, the number of stoves in operation,</p>	<p>The procedure for confirming the dismantling the existing stoves has been incorporated in the PDD. The efficient ICS fixed stoves shall be installed only after dismantling the existing fixed type two hole stoves and the old portable shall be collected in exchange of the prefabricated or rocket stoves. Spot check shall be conducted to ensure the dismantling of the old stoves.</p> <p>The PDD has been revised to include the parameter for monitoring the type of baseline stove dismantled.</p> <p>The description of the survey has been included in the PDD. The survey shall</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>how the 68 samples will be selected for survey needs to be clearly described and mentioned in the PDD.</p> <p>Leakage due to the usage of non renewable biomass in the non project household, which may belong outside the project boundary but the NRB (wood) is sourced from the same location.</p>		<p>field/lab test to determine the efficiency of the installed improved stoves and Stove Emissions (CO and PM2.5). Measuring equipment and its maintenance/calibration, measuring accuracy, measuring/recording frequency have been described in section B.7 in the PDD.</p> <p>Additional monitoring parameters relating to leakage assessment has been added in section B.7 of the PDD.</p> <p>The basis for determining the number of sample size for non users is the guideline provided in the para 8 of the methodology, AMS-II.G. As per this guideline, the sample size should be able to provide 90/30 precision. Accordingly, the sample size for non users has been re-calculated to be 8. Necessary revision has been made in the PDD.</p>	<p>be conducted every year and systematic sampling approach shall be used for the selection of the household for the sampling.</p> <p>Leakage due to the usage of non renewable biomass sourced from same location, outside the project boundary has been included in the monitoring plan.</p> <p>As per the methodology, paragraph 8, the 90/30 precision for selection of samples needs to be followed for the calculation leakage. In line with 90/30 precision, a sample size of 8 has been considered by the project activity based on the statistical formula and has been accepted by DNV.</p> <p>OK. CAR 2 is closed.</p>
<p>CAR 3</p> <p>The start date of the crediting period needs to be suitably revised to have at least a gap of 4 weeks between the date of submission for registration and the start date of the crediting period.</p>	C.1.3	<p>The crediting period starts from 1 May 2011 or date of registration whichever is later.</p> <p>The start date of the project has been</p>	<p>The start date of the crediting period of the project activity has been revised in the PDD to 1 May 2011</p> <p>The start date of the project activity has been stated as 1 October 2010, which is the start date of the preparatory activity for the project activity. No supply</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
The start date of the project activity has been identified as 1 December 2010, which is after the start date of the crediting period. The start date of the crediting period needs to be after the start date of the project activity.		revised to 1 October 2010. The start date has been revised in the PDD.	agreement has been signed and since the project activity does not require installation or construction time, this has been accepted as the project start date. OK CAR 3 is closed.
<p>CAR 4</p> <p>The demonstration of the project activity's applicability to SSC needs to be provided considering the highest efficiency of each type of stoves.</p>	A.2.8	<p>The revised PDD has been provided. The weighted average of highest efficiency of each type of stoves is considered.</p> <p>Estimated build-on-site model to be disseminated in the project =80% and the maximum value of efficiency from the test =33.46%</p> <p>Estimated portable model to be disseminated=20 % and maximum value of efficiency from the test =30.43%</p> <p>Therefore weighted average efficiency= $(0.8 \times 33.46 + 0.2 \times 30.43) / 1.0$ $= 26.768 + 6.086 = 32.854\%$</p> <p>Thermal Energy Savings = $B_{y,savings} \times NCV_{biomass}$ $= B_y \times (1 - \eta_{old} / \eta_{new\ max}) \times NCV_{biomass}$ $= 2.7t (1 - .10 / .32854) \times 4167 \times 10^{-6} \text{GWh/t}$ $= 0.0078264 \text{ GWh}$</p>	<p>The PDD has been adequately revised. It has been demonstrated that the thermal energy saving of efficient stoves is 0.0078264 GWh, thus considering the SSC limit of 180 GWh thermal energy saving, the maximum number of cooking stoves that will be operated at a certain time will not exceed 22 999</p> <p>Thus, it is concluded that the project activity abides by the SSC guidance. OK. CAR 4 is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>CL 1</p> <p>The PDD needs to be revised to address the design variation of 1, 2 or 3 pot stoves. The dimensions of the improved cooking stove to be included in the PDD.</p>	A.2.4	<p>There is some demand for 1 and 3 pothole stoves but significant demand is not expected. The experiences from the national ICS programme of AEPC and Chitawan ICS Carbon Project show that users in general prefer 2 pothole stoves. Nonetheless, in order to maximize benefits of the project to the community, technical support will be extended to construct 1 and 3 pothole stoves but there will be no financial support for them, and hence they will not be taken into account in calculating emission reductions.</p> <p>For the above reason, only the design variation and dimension of the 2 pothole stove has been included in section A.2 of the PDD.</p>	<p>The emission reduction of the project activity shall only consider the 2 pot hold stoves. The design dimension of two pot hold stoves as been included in the PDD.</p> <p>OK.CL 1 is closed.</p>
<p>CL 2</p> <p>The validation does not reveal involvement of public funding. The project proponent is requested provide the declaration confirming the same.</p>	A.5.1	<p>The declaration of non-use of ODA has been provided in the PDD (Annex 2)</p>	<p>The ODA declaration has been provided.</p> <p>OK. CL 2 is closed.</p>
<p>CL 3</p> <p>The project proponent needs to develop the unique identification of the improved cooking stove installation under the project activity and document the same in the PDD.</p>	B.2.2	<p>A coding system has been developed to uniquely identify the stoves disseminated. Various parts of the code identify district, VDC,</p>	<p>The coding system for the unique identification of the stoves installed under the project activity has been developed and mentioned in the PDD.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>Disposal or handling of the conventional cooking stove in the baseline of the project activity needs to be addressed.</p> <p>The PDD to be revised to address all the applicability criteria in section B.2 of the PDD in tabular form.</p> <p>Woody biomass being non renewable biomass needs to be demonstrated with at least two of the indicators as per the methodology (para 7). Description given in the PDD only addresses “carbon stocks are depleting” issue.</p>		<p>promoter/retailer, and the user. The code number will be printed on the ER transfer slip signed by the user and the project staff. Some suitable tag will also be developed, which the user can stick/nail nearby the stove. The complete description of the coding system has been included in section A.2 of the PDD.</p> <p>Discussed in section A.2 of the PDD.</p> <p>Applicability criteria has been put in tabular form in section B.2 of the PDD. The third para of the methodology has also been added in the table</p> <p>According to AMS-II.G v02, use of non-renewable biomass is confirmed if at least two of the following indicators support the assertion: a) increase in time spent or distance travelled by users, b) survey results show that carbon stocks are depleting in the project area, c) increase in fuelwood price, d) trends in the quality of fuelwood being collected.</p> <p>The household sample survey</p>	<p>The procedure for confirming the dismantling the existing stoves has been incorporated in the PDD. The efficient ICS fixed stoves shall be installed only after dismantling the existing fixed type two hole stoves and the old portable shall be collected in exchange of the prefabricated or rocket stoves. Spot check shall be conducted to ensure the dismantling of the old stoves.</p> <p>The applicability criteria has been included in PDD section B.2 in tabular format.</p> <p>The woody biomass being non renewable biomass has been demonstrated through all the four options provided in the methodology. It has been verified from the baseline sample survey of 488 houses in the project region that time required and distance travelled for the collection of wood has increased from 1989 to 2009, the price of wood has increased and the percentage of household using lower grade of fuel wood has increased.</p> <p>The fraction of non renewable biomass has been calculated considering the data from baseline survey results, national statistics and government source of</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>The PP needs to clarify if there is any other CDM registered projects for saving the non renewable woody biomass in the six districts of the project. If there are some, then the PP is requested to demonstrate that reduction in consumption of non renewable biomass do not significantly alter the share of non-renewable biomass calculations done for the project activity.</p>		<p>conducted in May 2009 demonstrated the following: Time needed to collect firewood increased from 1.46 hour in 1989 to 4.12 hour in 2009. Distance travelled to collect firewood increased from 2.37 km in 1989 to 5.83 km in 2009. Price of firewood increased from NPR 31.98 per bundle in 1989 to NPR 143.48 per bundle in 2009. About 3.6 percent households used low grade fuelwood in 1989 while about 77.4 percent households have been found using low grade fuelwood in 2009. All these indicate that use of non renewable biomass is in increasing trend over last 20 years period. (Please refer Baseline Information Annex 3A in PDD and the Baseline Survey Final Report, October 2009). Non renewable biomass saved by the already two registered biogas CDM projects in the region has been taken into account to calculate the fraction of non-renewable woody biomass. The amount of non-renewable biomass saved by two registered biogas projects in the project appears however not</p>	<p>information.</p> <p>The project activity stoves are installed in the households where there is no other support program, such as the Biogas Sector Partnership and Biogas Support Program projects in Nepal, has taken place. Thus, the project activity shall not claim for the non renewable biomass saved under biogas projects. This has also been clarified from the</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		significant. (Please refer B.4.4 of PDD, Annex 3B, and adjustment of Fraction of NRB in excel sheet).Further the fuel efficient stoves under the project activity is only installed in the houses where biogas plant is not installed and thus double counting of non-renewable biomass saved is not applicable	interaction with the local stakeholders during the site visit by DNV. There are two CDM registered biogas support programs in the project activity region (six districts) and amount of non renewable biomass saved by both the project has been taken in to account while calculating the fraction of non renewable woody biomass. It has been demonstrated that the fraction of non renewable woody biomass saved by the project activity, including the non renewable biomass saved by the biogas projects, is 0.807 as compared to the calculated fraction of non renewable woody biomass saved by the project activity, without considering the saving by biogas projects, is 0.81. As applicable, to eliminate any kind of double counting, 0.807 has been considered for the calculation of emission reduction. OK. CL 3 is closed.
CL 4 The proponent is requested to provide more recent data source to demonstrate that kerosene is the second alternative after wood for cooking purpose.	B.2.5, B.4	National Census 2001 shows that in all six project districts, kerosene is the second alternative to fuelwood for cooking. Nepal Living Standard Survey 2003/04 shows that kerosene is the second alternative to fuelwood for	Biogas Support Programme report 2009 has been provided to further demonstrates that biogas is not the common practice in the project region. It has been verified from the Nepal Living Standard Survey 2003/04 by

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>The percentage of population using kerosene needs to be consistent in the PDD.</p> <p>It has been stated in the PDD the 96% of the population uses fuel wood and 15% uses biogas. It has been verified from the Biogas Support Programme report 2008 that the house hold with biogas plant, in the six districts where the project activity is located, varies from 5.4% to 0.79% of the total household with animals and with potential biogas house hold. The percentage of population using wood, biogas and other kind of fuel is to be clarified and supported and consistent in the PDD.</p>		<p>cooking for first four quintiles (poorer sections) of the population indicating only the richest section use other energy sources e.g. LPG more commonly. Since the target of the CDM project i.e. users of the improved stoves is mainly the poor people, kerosene can be taken as the second alternative fuel for cooking. Also the BSP 2009, publication of Biogas Support Programme, shows that biogas has not been a common practice in the six project districts. All evidences from the reports have been provided.</p> <p>The evidence of the Nepal Living Standard Survey 2003/04 has been provided.</p> <p>The consistency has been maintained in the PDD.</p> <p>Only 12.16% (not 15%) sample households were found to be using biogas in the baseline survey. The figure '15%' was mistyped in the earlier version of the PDD.</p> <p>The baseline survey conducted in May 2009 had a multiple answer question on</p>	<p>Central Bureau of statistics, National commission, December 2004, and National Census 2001 that the kerosene is the second alternative to fuel wood. Thus, inline with the methodology AMS IIG, version 2, para 5 and 6, kerosene has been accepted to be the baseline fuel by DNV.</p> <p>The percentage of the kerosene has been revised for consistency in the PDD.</p> <p>The survey data has been corrected in the PDD. The percentage of household using biogas, kerosene and firewood for cooking has been corrected in the PDD.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>The month of baseline survey to be consistent with the baseline survey report and the PDD.</p>		<p>use of fuels to capture the scenario where a household could use multiple fuels for different purposes. Accordingly, the survey showed that firewood has been used by 96.44% of the household for cooking purpose. Similarly, 12.16% and 4.61% of the households have been using biogas and kerosene respectively. Other fuels are also in use for cooking. The percentage figures do not add up to 100% indicating multiple uses of fuels by some of the sample households.</p> <p>Comparing total installation of biogas plants (BSP 2009, publication of the Biogas Support Programme) with total potential number of biogas user households it is found that 0.9% to 6.6% of the households in the project districts have installed biogas plants. If the comparison is made with total number of households in the districts (VDC Profile of Nepal, 2008), only 0.4% to 2.8% households in the district are found to have biogas plants suggesting that biogas has not been in common use as second alternative fuel in the districts.</p> <p>The baseline survey was assigned to a private consultant, Aptec Consultancy</p>	<p>The PDD has been revised to ensure the consistency and the date of the baseline survey has been mentioned correctly in the PDD.</p> <p>OK. CL 4 is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		Pvt. Ltd., and was conducted in May 2009 and the final report was submitted in October 2009. The consistency has been maintained in the PDD.	
<p>CL 5</p> <p>The proponent needs to use Additionality tool version 5.2 which is recently available.</p> <p>Barrier analysis: The total cost of the stoves and elements of the cost of stoves need to be supported with evidences and justified.</p> <p>The simple cost analysis provided in the PDD under barrier analysis needs to be shifted to investment analysis as per the requirement of additionality tool.</p> <p>The PDD and the supporting excel sheet calculation of the simple cost analysis needs to include and demonstrate to what extent the income from CDM revenue alleviates the income gap.</p> <p>The investment barrier needs to be demonstrated with the evidence for the non availability of the fund for the project in line with the definition of the investment barrier.</p>	<p>B.5.1, B.5.3, B.5.12, B.5.13, B.5.14</p>	<p>The Additionality Tool version 5.2 has been taken into consideration in the PDD.</p> <p>Supporting document on total cost and elemental cost of the stove has been provided. Supporting document on indirect cost of the stove in the Chitawan ICS Carbon Project has been provided.</p> <p>The simple cost analysis has been shifted to investment analysis.</p> <p>The use of CDM revenue in alleviating the income gap has been explained in section B.5 of the PDD.</p> <p>The investment barrier has been demonstrated as per the definition given in the additionality tool.</p> <p>Further to the evidence provided, consultation has been made with the promoters involved in the Chitawan ICS Carbon Project. It has been clarified that</p>	<p>The additionality of the project has been revised as per Additionality tool, version 5.2.</p> <p>A simple cost analysis has been provided and has been included under investment analysis in the PDD as per the additionality tool.</p> <p>The evidence for the cost of built on site 2 pot hole cooking stove has been provided to DNV. A similar project was undertaken in mid hill region in Chitwan district of Nepal was funded by TOCC. The approved budget of the ICS in Chitwan project has been provided as evidence for the cost of built on site stoves and accepted by DNV. Further to this, purchase bills for the non local material has also been provided and verified. Based on the conservativeness, actual cost as per the approved budget of June 2007 to May 2009 for ICS project in Chitwan district has been considered for simple cost analysis. Due to the inflation in Nepal, the present cost of non local material, such as iron</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>for construction of an ICS, approximately 800 gms of iron rod was required which would cost about Rs. 49 (USD 0.62 at the conversion rate given above) per stove. (Cost figure derived for 800 g iron based upon the cost quoted for 60.5 kg in the evidence provided.) The market rate iron rod per kg was Rs 69 at that time; as of now the market rate of iron rod has increased to Rs 110. Accordingly, the cost of iron rod for 1 unit of ICS would be Rs. 88 (USD 1.22 with conversion rate 1 USD = Rs. 72.41 on 15-5-2010 from same source above). Taking increasing trend in market price of iron rod into consideration, the cost of iron rod has been estimated to be USD 1.5.</p> <p>Quotation from another manufacturer has been provided.</p> <p>The cost of skilled labour/ transport has been corrected in the PDD.</p>	<p>rods, are higher than the actual cost at the time of ICS project implementation in Chitwan district.</p> <p>The cost of rocket stoves has been verified from the quotations provided by the suppliers.</p> <p>The cost of skilled and unskilled labour shall be contributed by the user.</p> <p>The indirect cost has been verified from the approved budget of June 2007 to May 2009 for ICS project in Chitwan district. To be on the conservative side, the same has not been accounted for in the simple cost analysis.</p> <p>Since the “Investment barrier at the national level” and “Investment barrier at the local household level” are getting reflected in the simple cost analysis, these barriers have been removed from the PDD.</p> <p>OK. CL 5 is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		The section has been removed in the PDD.	
<p>CL 6</p> <p>Technological barrier: It has been stated that improved cooking stoves models were recently tested in the pilot project in Chitawan district and are not available locally in the project area. Significant adaptive research efforts have been made to improve these versions of stoves to make it suitable technically and socially for the project area. This technological barrier needs to be substantiated with supporting evidences from research efforts etc. and how the CM revenue helps in alleviating this barrier.</p>	B.5.3, B.5.16, B.5.17, B.5.18	<p>The verification study on Chitawan Project done by Winrock International Nepal shows that the model of stove has been piloted in Chitawan. (supporting document in the electronic version submitted) The Baseline Survey Final Report, October 2009 provides no evidence on dissemination of similar design of cooking stove in the six project districts although some sporadic promotion of improved cooking stoves has been reported. The CDM revenue will be utilized to transfer the technology at local level through training of local promoters, local partner organisations and local manufacturers. The technology barrier has been revised in the PDD</p>	<p>It has been verified from the Baseline Survey Final Report, October 2009 demonstrate that non of the house hold in the project region uses the improved cooking stove and any suitable type of stoves have not yet been promoted in the six programme districts. Since any structured infrastructure is not available locally for these improved implementation, the local people needs to be trained. Inline with the definition of the technological barrier provided in the Additionality tool, the lack of local skill labour has been accepted as the technological barrier.</p> <p>OK. CL 6 is closed.</p>
<p>CL 7</p> <p>Common practice analysis: Common practice discussion in the PDD to be further clarified by defining the region for the analysis and its justification.</p> <p>The proponent needs to demonstrate how the project activity is different from the improved cooking stove program under national</p>	B.5.3, B.5.20 – B.5.25	<p>Discussed in sub step 4.b of the Common Practice Analysis under section B.5 of the PDD.</p> <p>The specific comments inserted in the PDD has been addressed.</p>	<p>The difference between the improved cooking stove program under national program and project activity has been included in the PDD. The related evidences have been provided.</p> <p>OK. CL 7 is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
program with sufficient supporting evidences.			
<p>CL 8</p> <p>It has been verified from the test results from Kathmandu University, that the efficiency of the stoves are 30-33% for built-on-site stoves and 29-30% for the portable rocket stove. The proponent needs to justify efficiency of 25%.</p> <p>It has been observed during the site visit that 1 and 3 pothole built on site improved cooking stove shall also be installed under the project activity. The efficiency evidence has not been provided for 1 and 3 pothole build on site.</p>	B.6.3, B.6.4, B.6.6	<p>‘Water Boiling Test’ was performed during 17-18 September, 2009 in CRT/N premises by the researchers/ professionals from the Department of Mechanical Engineering, Kathmandu University. The test results showed that the average efficiency of both the models of stove is in the range 28.72%-33.43%. Normally the efficiency of the stove will remain the same in field condition since the stoves are being regularly used. Project participants claim this value of 28.72% efficiency used for ER calculation, as conservative.</p> <p>The ex post monitored value of efficiency shall be used for ex post emission reduction calculation. This has been mentioned in the PDD.</p> <p>As observed during the site visit, there is some demand for 1 and 3 pothole improved cooking stoves. However, dissemination of 1 and 3 pothole stoves in significant number is not expected. The experiences from the national ICS programme of AEPC and Chitawan ICS Carbon Project show that users in</p>	<p>It has been verified from the evidence provided that efficiency ranges from 28.72 % to 33.43%. The annual monitoring of the efficiency of the project improved cooking stoves shall be conducted.</p> <p>The PDD has been revised to clearly mention that ex post emission reduction shall be based on the ex post monitored value of efficiency of the project activity stoves. The ex-post monitored value shall be compared with 28.72% of efficiency and the conservative value shall be considered for emission reduction calculation.</p> <p>The emission reduction of the project activity shall only consider the 2 pot</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>The proponent needs to provide evidences for all the data used for the calculation of NRB ratio of 0.81.</p> <p>A leakage discount factor of 5% has been considered for estimation purpose. 5% of leakage is to be justified.</p>		<p>general prefer 2 pothole stoves. Nonetheless, in order to maximize benefits of the project to the community, technical support will be extended to construct 1 and 3 pothole stoves but there will be no financial support for them, and hence they will not be taken into account in calculating emission reductions.</p> <p>All the references have been provided.</p> <p>As described in section B.7 of the PDD, calculation has been done to estimate leakage emission due to the transport of stove parts by tractor, and use of firewood for space heating during winter. The leakage is thus found to be 4.06 %. Therefore, a conservative value of 5% leakage has been considered.</p> <p>The actual leakage value will be taken from the annual sample survey in calculating the emission reductions.</p> <p>Consideration of 5% leakage has been justified in the PDD.</p>	<p>hold stoves. The design dimension of two pot hold stoves as been included in the PDD.</p> <p>NRB of 0.81 has been justified along with the evidence.</p> <p>The actual leakage, if any, due to the non renewable biomass (fuel wood) used be the non project household shall be monitored by annual survey.</p> <p>The PDD has been revised to include the justification of 5% of leakage. It has been demonstrated via calculation that the leakage due to the transportation of stove making material is 4.06%, however, a conservative value of 5% has been considered for the ex ante.</p> <p>OK. CL 8 is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>CL 9</p> <p>Detailed calculation excel sheet to be provided with the emission reduction calculation as per the formula given in the methodology and baseline emission, project emission, leakage and final emission reduction in consistent with the figures provided in PDD.</p>	<p>B.6.7, B.6.10, B.6.11, B.6.12</p>	<p>The detailed calculation excel sheet has already been provided in the PDD. The difference in the total emission reduction in the PDD and in the excel sheet is only due to rounding off the values during intermediate steps of the calculation.</p>	<p>Detailed excel sheet has been provided. It has been explained clarified that one stove year shall be considered on the following month of the implementation of the stove and thus, one stove year considered at the end of 12th month. OK. CL 9 is closed.</p>
<p>CL 10</p> <p>Leakage needs to address the usage of non renewable biomass in the non project household, which may belong outside the project boundary but the NRB (wood) is sourced from the same location.</p>	<p>B.6.13</p>	<p>Leakage due to use of non-renewable biomass by non user households will be monitored through annual sample survey. On top of the sample size of users, additional households from non-user community will be surveyed to identify if they have increased consumption of fuelwood. If the consumption of the fuel wood by non user households is statistically significantly different from the baseline survey data, the difference will be taken into consideration in leakage calculation. The sample size of non-users will be determined following the para 8 of the methodology, AMS-II.G satisfying the 90/30 precision requirement. Accordingly the non-user size will be 8 (Please see Annex 3F in</p>	<p>As per the methodology, paragraph 8, the 90/30 precision for selection of samples needs to be followed for the calculation leakage. In line with 90/30 precision, a sample size of 8 has been considered by the project activity based on the statistical formula and has been accepted by DNV.</p> <p>OK. CL 10 is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		the PDD).	
<p>CL 11</p> <p>The operational lifetime of the project activity has been stated to be 10 years.</p> <p>The technical life time of the project stoves has been stated to be 3 years. The proponent needs to substantiate how the replacement of the project stoves will be ensured.</p>	C.1.3	<p>Once the stove reaches 3 years lifetime it will be replaced by new stove and there will be no gap period. Each stove during installation/purchase will be provided with unique identification number. The identification number and other details on owner, date of construction/purchase, type of stove will be recorded in data management system. This will help in identifying the stove that reaches 3 years. Such stoves will be immediately replaced by the new one providing similar financial incentives as in the first time. The 3-year old mud stove will be dismantled and rocket stove will be exchanged for the new one. The three-year old rocket stoves will be scrapped/destroyed after collection.</p>	<p>It has been explained that the requisite data for identifying the operating days and as soon as 3 years is completed; the same stove shall be replaced. 3 years old mud stove shall be dismantled and rocket stoves shall be collected and scrapped.</p> <p>OK. CL 11 is closed.</p>
<p>CL 12</p> <p>The proponent is requested to include the list of organizations attended the local stakeholder consultation process in the PDD.</p> <p>Minutes of the local stakeholder consultation needs to be provided and the process adopted for the invitation of the media personnel, with evidences.</p>	E.1.1, E.1.2, E.1.4, E.1.5	<p>Participants list has been provided,</p> <p>Minutes of the LSC process (also included in the GS LSC Report), invitation to stakeholders have been provided</p>	<p>The minutes of LSC meeting process and feedback from the local stakeholders has been provided. The evidence for the invitation of the local stakeholder has also been provided.</p> <p>OK. CL 12 is closed.</p>

APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Kumaraswamy Chandrashekara holds a Bachelor's Degree in Chemical Engineering and has an overall experience of around 24 years. Prior to joining DNV, has worked for 11 years in the Chemical Process Industry covering Plant Operations, Technical Services and Process Design activities, primarily in the fertilisers and chemicals manufacturing sector. During this tenure of 11 years in the industry, responsibilities included production, process optimization, energy efficiency improvements, environmental performance, process design, energy auditing and technical auditing.

He has experience of around six years in the validation and verification of numerous CDM projects both in India and abroad. His qualification, industrial experience and experience in CDM sufficiently demonstrate his sectoral competence in the areas of chemical process industries, energy generation from renewable sources and waste handling & disposal.

Sharmistha Shome, Auditor, DNV India, holds Master Degree in Energy Systems. Her educational qualification covers the fields of sustainable development, power plant technology, renewable energy technology, performance of thermal & electrical utilities and project financing.

She has experience of around 3 years in validation and verification of CDM projects/JI and other 3rd party validation/verification services. She has completed the ISO14001 EMS Lead Auditor course.

Astakala Vidyacharan, Auditor, DNV, India. He is a chemical engineer and prior to joining DNV in 2005, has had 11 years of direct work experience in various chemical industries. His work experience covers 4 years in project implementations in pesticide and fine chemical industries, including environment management activities; 7 years in process operations of pesticide, natural products and fine chemical industries.

He has received extensive training in the CDM validation and verification process. He is an appointed validator for the CDM validation and verification program of DNV and has performed validation of several CDM projects. He is also a trained auditor for GHG accounting standards and involved audit of Corporate GHG accounting. He is a qualified ISO9001, ISO 14001 Lead auditor and OHSAS 18001 auditor who has performed several audits for various industrial sectors under these management systems.

His qualification, industrial experience and experience in CDM facilitate him to assess renewable energy based on Hydro and Biomass, Energy Efficiency sectors, in particular to sufficient degree.

Indrajit Rana holds double Bachelor Degree, in Chemical engineering and in Chemistry and is a certified energy auditor from Bureau of Energy Efficiency (BEE) of Government of India. Having an overall experience of around nine years. Prior to joining DNV having around six years experience in Chemical process industry namely Petrochemical industry covering production, day to day production planning, energy efficiency improvement, safety, and capacity expansion of existing unit. His experience also covers the fields of environmental

management and resource conservation including optimisation of steam consumption. Being shift incharge of HDPE unit he has acquired the knowledge of utility services like, nitrogen, hydrogen, plant air and water, steam, power and flare system. He is adequately experienced in handling many types of energy intensive rotating equipment like brine refrigerator (screw compressor), centrifugal and reciprocating compressor, blower, vertical monuted centrifugal pump, extruder, etc. and also experienced in handling DCS and advanced process control systems. He has knowledge in material balance and energy balance of HDPE plant. He has also experience in intrigated offsite plant (IOP) mainly waste water treatment plant, cooling tower operation and flare operation.

He has experience of 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.

Michael Lehmann holds a Master Degree in Environmental Sciences with a specialisation in environmental chemistry. He has an overall working experience of around 13 years.

Since 1999 he has worked in the climate change field and has closely followed the international response to the climate change challenge (UNFCCC, Kyoto Protocol) and the responses by national governments (EU ETS, UK ETS) and business. He has managed the validation and verification of many CDM and JI projects and thas carried out the technical review of numerous climate change project validations and verifications.

Through his extensive work with validation and verification of CDM and JI projects, he has aquired sectoral competence within energy generation from renewable energy sources, electricity distribution, waste handling and disposal and animal waste management.

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.”
