



VALIDATION REPORT

10 MW RENEWABLE ENERGY PROJECT FOR GRID AT TARAILA, HIMACHAL PRADESH

REPORT No. 2006-9073

REVISION No. 02

DET NORSKE VERITAS



VALIDATION REPORT

Date of first issue: 2006-09-15	Project No.: Project Nr.
Approved by: Einar Ternes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: AT Hydro (P) Ltd. and Cimaron Power Limited	Client ref.: Mr. M.Ramesh Reddy

DET NORSKE VERITAS

DNV Certification AS

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
<http://www.dnv.com>
Org. No: NO 945 748 931 MVA

Summary:

DNV Certification AS (DNV) has performed a validation of the “10 MW Renewable Energy Project for Grid at Taraila, Himachal Pradesh” in India 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. This validation report summarizes the findings of the validation.

The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the project, as described in the project design document of 13 March 2007, meets all relevant UNFCCC requirements for the CDM is eligible as category I.D small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-I.D. Hence, DNV requests the registration of the “10 MW Renewable Energy Project for Grid at Taraila, Himachal Pradesh ” project as a CDM project activity.

Report No.: 2006-9073		Subject Group: Environment	
Report title: 10 MW Renewable Energy Project for Grid at Taraila, Himachal Pradesh			
Work carried out by: Anjana Sharma, KV Raman, Amit Thusu, Praveen Nagaraje Urs, Michael Lehmann			
Work verified by: Chandrashekara Kumaraswamy			
Date of this revision: 2007-06-08	Rev. No.: 02	Number of pages: 8	

Indexing terms	
Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism	Service Area Validation
	Market Sector
	Energy Industry
<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	

© 2002 Det Norske Veritas AS

All rights reserved. This publication or parts thereof may not be reproduced or transmitted in any form or by any means, including photocopying or recording, without the prior written consent of Det Norske Veritas AS.



<i>Table of Content</i>	<i>Page</i>
1 INTRODUCTION.....	1
1.1 Validation Objective	1
1.2 Scope	1
1.3 Description of Proposed CDM Project	1
2 METHODOLOGY.....	2
2.1 Review of Documents	4
2.2 Follow-up Interviews	4
2.3 Resolution of Clarification and Corrective Action Requests	4
2.4 Internal Quality Control	4
3 VALIDATION FINDINGS	5
3.1 Participation Requirements	5
3.2 Project Design	5
3.3 Baseline Determination	6
3.4 Additionality	6
3.5 Monitoring Plan	8
3.6 Calculation of GHG Emissions	8
3.7 Environmental Impacts	9
3.8 Comments by Local Stakeholders	9
4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS	9
5 VALIDATION OPINION	14
REFERENCES	15
Appendix A Validation Protocol	
Appendix B Certificates of Competence	

***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
MNES	Ministry of Non-Conventional Energy Sources.
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
HPSEB	Himachal Pradesh State Electricity Board
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

AT Hydro (P) Ltd. and Cimaron Power Ltd. have commissioned DNV Certification AS (DNV) to perform a validation of the “10 MW Renewable Energy Project for Grid at Taraila, Himachal Pradesh” in India (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for small-scale CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Praveen Nagaraje Urs	DNV Certification India	Team Leader, GHG auditor
Anjana Sharma	DNV Certification, India	GHG Auditor.
KV Raman	DNV Certification, India	CDM Validator
Amit Thusu	DNV Certification, India	GHG Auditor
Michael Lehmann	DNV Certification, Norway	Sector Expert
Chandrashekara Kumaraswamy	DNV Certification India	Technical verifier

1.1 Validation 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).

1.2 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-I.D, version 10, dated 23 December 2006. The validation team has, based on the recommendations in the Validation and Verification Manual /4/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

1.3 Description of Proposed CDM Project

The project activity is a bundle of two individual hydroelectric power projects of capacity of 5 MW each, on the Baira Khad located in Chamba district in the state of Himachal Pradesh, India. The two projects forming part of the bundled CDM project activity are:

- 5 MW Upper Taraila small hydroelectric power project



- 5 MW Taraila II small hydroelectric power project.

Each of the hydroelectric power projects comprises a conveyance channel, control structure, flushing conduit, desilting tank, power channel, fore bay, penstock, power house and tail race channel. The power station of both projects comprises two identical power generation units of 2500 KW each. Low voltage power generated will be stepped up to higher voltage within the project boundary. The electricity generated will be supplied to Indian northern regional grid through Himachal Pradesh state electricity board. The northern regional grid is predominantly based on power generated from fossil fuels. It is expected that the project activity will displace a proportion of fossil fuel based electricity in the northern grid leading to lower carbon intensity in the grid.

The net export of electricity to the grid is expected to be 50.51 GWh per year. Given that the project activity is implemented as stated, it is expected to reduce 36 031 t CO₂e per year.

2 METHODOLOGY

The validation consists of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /4/. The protocol shows in transparent manner 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 three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the “10 MW Renewable Energy Project for Grid at Taraila, Himachal Pradesh” is enclosed in Appendix A to this report.

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

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

The term Clarification may be used where additional information is needed to fully clarify an issue.



Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
<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), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

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

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

Figure 1 Validation protocol tables



2.1 Review of Documents

The PDD (version 01, version 02 and version 03 dated 13 March 2007) /1/ submitted by AT Hydro (P) Ltd. and Cimaron Power Ltd. and additional background documents related to the project design and baseline, were reviewed as a part of the validation.

2.2 Follow-up Interviews

On 10 September 2006, DNV performed interviews with project stakeholders to confirm the selected information and to resolve issues identified in the document review. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
AT Hydro (P) Ltd and Cimaron Power Ltd	<ul style="list-style-type: none">➤ Further clarifications that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, barriers due to prevailing practice or other barriers.➤ Clarifications on establishment of baseline, monitoring plan and emission reduction calculations.➤ Resources, training needs and procedures for operation and maintenance.➤ Benefits from CDM registration

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The corrective action requests and requests for clarification raised by DNV, presented to the project participants in DNV's draft validation report of 15 September 2006 (rev. 01) were resolved during communications between the AT Hydro (P) Ltd. and Cimaron Power Ltd. and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

Since modifications to the project design were necessary to resolve DNV's concerns, the client decided to revise the PDD and resubmitted the PDD on 13 March 2007. After reviewing the revised PDD, DNV issued this final validation report and opinion.

2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.



3 VALIDATION FINDINGS

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

The final validation findings relate to the project design as documented and described in the revised project design documentation of March 2007.

3.1 Participation Requirements

The project has been proposed as a unilateral project. AT Hydro (P) Ltd. and Cimaron Power Ltd. are the project participants from the host country, India. India has ratified the Kyoto protocol and established a DNA, the National Clean Development Mechanism Authority, MoEF as per participation requirements under the Kyoto Protocol. The DNA of India has approved the project on 14 June 2006.

The project is expected to contribute to sustainable development through the reductions of GHG emissions into the atmosphere, increased generation of employment and betterment of the socio-economic conditions of the local populace in its vicinity. The DNA approval letter of India has confirmed that the project assists in achieving sustainable development /2/.

3.2 Project Design

The project activity is a bundle of two small scale hydro power projects - Upper Taraila and Taraila II, each of 5 MW capacity. While the Upper Taraila project is located in the Upper Taraila village (in Chamba district), the Taraila II project activity is located in village Dumas (also in Chamba district). Both power plants consist of conveyance channel, control structure, flushing conduit, desilting tank, power channel, forebay, penstock, power house and tail race channel. The power station in each project comprises of two identical power-generation units of 2500 KW each. The generated electricity will be exported to Himachal Pradesh State Electricity Board (HPSEB). The HPSEB forms a part of northern regional electricity grid.

The gross head available for the project is around 170 meters and comprises two generating units of 2.5 MW each for both the projects, coupled to horizontal Francis type hydro turbines. The generated electricity is dispatched to the HPSEB grid through the 33/3.3 kV substation located at Upper Taraila and Dumas villages. Both projects have an average plant load factor of 63%.

The technology applied is deemed current good practice and is not expected to be replaced within the crediting period.

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 India.

The starting date of the project activity is 1 February 2006 and operational lifetime of the project activity is 30 years. A fixed crediting period of 10 years has been selected with the start date of the crediting period being 1 October 2007.



3.3 Baseline Determination

The project activity has used the approved baseline methodology AMS I.D, version 10, as per Appendix B of the simplified modalities and procedures for small scale CDM project activities. The choice of methodology is justified since the project activity is generating 10 MW of electricity for the grid based on renewable fuel sources.

In the absence of project activity, same amount of electricity would have been generated by the power plants connected to the northern regional grid. Currently, as per the statistics available from Central Electricity Authority (CEA), northern regional grid is energy deficient and also fossil fuel dominated. Thermal power forms 59% of the total installed capacity of northern regional grid in comparison to 35% of hydropower. In such a situation, the implementation of project activity will help to reduce the emissions resulting from the fossil fuel based power plants connected to northern regional grid. Hence, the selection of northern regional grid as baseline scenario is justified.

The emission reductions occurring due to electricity generation through renewable sources in the project scenario will be calculated as the net electricity available for sale multiplied by the relevant emission factor of the selected grid. As the project activity is feeding the generated power to the Himachal Pradesh State Electricity Board, which is a part of the northern regional grid; the baseline for this project activity is the function of the generation mix of northern regional grid. The selection of the northern regional grid as the grid system boundary for the project activity is in line with the recent EB guidance for large countries such as India

The baseline emission factor for the northern regional grid is established based on approved methodology AMS-I.D using the “weighted average emissions (in kg CO₂ e/kWh) of the current generation mix” approach. The Central Electricity Authority (CEA) has, in December 2006, published the “Baseline Carbon dioxide Emission Database”, Version 1.1, and is available at <http://www.cea.nic.in/planning/c%20and%20e/Govtment%20of%20India%20website.htm>.

CEA has the mandate for publishing such data on an annual basis, which the project promoters desire to apply for arriving at emission reductions achieved by the project activity. The emission factor published by the CEA for the year 2004-05 is 713.32 tCO₂/GWh based on weighted average approach and 754.64 tCO₂/GWh based on the combined margin approach. As required by the methodology, the project proponent, following a conservative approach, has considered the weighted average emission factor for determining the emission reductions. The project proponent has opted for the *ex-post* determination of the emission reductions based on the actual emission factors for each year.

3.4 Additionality

The additionality of the project activity has been discussed on the basis of the following barriers:

- Barrier analysis: Both the power plants face the following barriers and the revenue from the sale of CDM credits will help the project developer to overcome these barriers:
 - 1) Investment barrier:
 - Additional investment for local area development: Both power plants are located in underdeveloped and hilly area. The project developers have had to invest an additional amount of INR 5.17 million (app 1% of the total project



cost) on the development of local area. DNV was able to verify this from the implementation agreements signed by the project developers with the Government of Himachal Pradesh. The development work to be done will be mutually agreed with the Government of Himachal Pradesh.

- Additional investment on the power evacuation system: The project developers have had to invest an additional amount of INR 20 million for construction of a transmission line to the proposed pooling point of 132 KV at Kurthala village near Nakror. The existing 33 KV HPSEB substation at Nakror is incapable of taking load from small hydro power plants being established in the Tissa area. The total investment required for this proposed substation is INR 400 million, which will be shared by 20 other SHPs by independent power producers in the region.
- 2) Barrier due to prevailing practice: It is argued that the northern region is dominated by medium or large scale thermal power plants or large scale hydro power projects due to the lower risks involved and the assured returns on investments made in large facilities (due to economies of scale). This has been demonstrated through the following indicators:
- That the total share of small hydro power plants in the northern region is only 525 MW out of the total installed capacity of 33 757 MW, (of all power plants) which represents only 1.55% for small hydro power plants for the northern region. Furthermore, the contribution of small hydro power plants from the state of Himachal Pradesh is only 0.33%.
 - In the state of Himachal Pradesh, against an estimated hydro power potential of 20 400 MW, the potential for small hydro power projects (less than 25 MW capacity) account for 750 MW. However, currently the total installed capacity of small hydro power projects is only 112 MW. Approximately 80% of this installed small hydro projects is done by the state owned HPSEB.
 - Other barriers: The proposed project activity also faces barriers due to the hydrological risks, geological risks and the possibility of flash floods. While latest reliable gauge data is not available for the Baira Nala, the various factors that determine the water availability have been simulated based on data available for the nearby catchments posing a high risk to the accuracy at which the power generating potential has been estimated. In addition to this, the projects are located in the landslide zone, which poses a risk to operations and construction

Hence, for the reasons indicated above, the establishment of small scale hydropower plants is deemed not a common practice in the region.

- National and sectoral policies: The national and sectoral policies and future plans favour either the large scale fossil fuel fired power plants or the large scale hydroelectric plants. The national government has opened up the exploration of coal, oil and natural gas to the private sector which encourages the development of fossil fuel based power plants. Further, though there is a potential for hydro power development in the state of Himachal Pradesh, the focus is mainly on large scale hydropower plants. It has been



verified that the capacity additions planned for the state of Himachal Pradesh during 10th plan of Planning Commission of India, mainly consist of large scale hydropower plants*.

The registration of the project as a CDM activity will thus present additional revenue for the project and thereby significantly alleviate the financial hurdles to the project and also enable the creation of a financial buffer to overcome the other barriers.

In conclusion, it has been verified that the project is not financially attractive and faces different barriers and thus is not the most likely baseline scenario. Hence, the emissions reductions occurring from the project are deemed additional to those that would occur in the absence of the project activity.

3.5 Monitoring Plan

The approved small scale monitoring methodology AMS-I.D, “Renewable electricity generation for a grid”, has been adopted for the proposed project activity. The choice of methodology is justified as the project activity is the generation of electricity using hydro potential and supplying the same to the northern regional (NR) grid.

The monitoring will involve metering the electricity generated and sold to the grid. The generated electricity will be recorded by using either main meter or the check meter, in the presence of representative of HPSEB. The document containing details like equipment data, calibration status, previous reading, current reading, export, import, net billable units, date and timing of recording etc, signed by the representatives of project proponent and HPSEB, will form the basis for verifying the net energy supplied to the grid.

The CO₂ emission reductions due to the project are directly linked to the electricity generated and supplied by the project to the northern regional grid. The project monitoring and maintenance responsibilities are also clearly specified. The monitoring methodology will give opportunity for real measurements of achieved emission reductions.

Details of the data to be collected, the frequency of data recording, its certainty and format are clearly described. The authority and responsibility for project management, monitoring, measurement, review and reporting has been clearly established in the PDD. Similarly, the procedures for calibration and maintenance, performance reviews, internal auditing, corrective actions, etc. have been defined in the monitoring plan.

The renewable energy technology is not transferred from any other location, leakage has not been considered in this case.

Since the project is a small hydro power project based on indigenous technologies, it shouldn't require extensive initial training but the same has not been addressed in the PDD.

3.6 Calculation of GHG Emissions

The project activity will displace a part of fossil fuel based electricity in northern regional grid (NR) of India and will help in reduction of GHG emissions from the burning of fossil fuels in the plants linked to the regional grid. While the project emissions are zero, the GHG emission reduction resulting from the project activity are equal to the baseline emissions and have been

* Power Scenario-Himachal Pradesh:

<http://www.cea.nic.in/planning/POWER%20SCENARIO%20AT%20A%20GLANCE/report.pdf>



estimated to be 36 031 tCO₂e per year, based on a baseline emission factor of 713.32 tCO₂e/GWh. The grid emission factor will be updated annually ex-post for the year in which actual project generation and associated emissions reductions occur. The baseline emission factor has been derived from the “CO₂ Baseline Database” published by the CEA*.

3.7 Environmental Impacts

The proposed project is a run-off-river hydropower plant and the environmental impacts of the project are not considered significant. As per the requirement of Ministry of Environment and Forests, Government of India, an EIA is not required for small hydroelectric projects so the proposed project does not need to conduct Environmental Impact Assessment. Consent of establishment under the provisions of the Water Act 1974 and Air Act 1981 has been issued by the State Environmental Protection and Pollution Control Board for both the projects i.e. Upper Taraila and Taraila stage-II, with letters dated 7 April 2006.

3.8 Comments by Local Stakeholders

The project developer consulted the local stakeholders from the communities in the vicinity to the project site. The local ‘gram sabhas’ have provided the “no objection certificate” to both the projects.

Moreover, the project developer had made public the commencement of the project activity in the local newspaper and invited comments on the project activity. No negative comments were received. Following clearances/approvals/consents issued by the central and state government bodies have been verified:

- Techno-economic clearance from Himachal Pradesh State Electricity Board
- Consent of establishment from Himachal Pradesh Environment Protection and Pollution Control Board for both the projects.
- Clearance from Irrigation and Public Health Department, Government of Himachal Pradesh.
- Clearance from Forest Department, Government of Himachal Pradesh.
- Clearance from Revenue Department.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD version 01, submitted by AT Hydro (P) Ltd and Cimaron Power Ltd. was made publicly available on DNV’s climate change website <http://www.dnv.com/certification/climatechange/Projects/ProjectDetails.asp?ProjectId=458>

and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 31 January 2006 to 01 March 2006.

One comment was received on 01 March 2006. The comment received (in unedited form) is given in the below text box.

Comment by: [Rajaram velayudhan, individual](#)

* CO₂ Baseline Database, <http://www.cea.nic.in/planning/c%20and%20e/Govtment%20of%20India%20website.htm>



Inserted On: 2006-03-01

Subject: Debatable additionality

Comment: Dear Sir,

The project is BAU as per consideration

By considering the generation of the project activity envisages that this project should be considered as CDM project if certain issues mentioned below are not applicable

Investment Barrier:

These kinds of run of river projects are to be welcome on red carpet in a country like India where as once these projects are considered as CDM projects the vision should be on a holistic way not constricted only towards the capital cost.

The projects may avail benefits as listed below:

1. 100% accelerated depreciation for tax purposes in the first year of the installation of projects/systems
2. Hundred per cent deduction from profits and gains for first five years and thereafter 30 per cent of the profits and gains.
3. Exemption from MAT
4. An equity component of only 30% of the total project cost
5. For survey , investigation and DPR preparation the grant was in the region of 0.3 millions
6. Interest subsidy of 2 %
7. Interest rate of 12%, with repayment duration of 12 years having a moratorium of max 3 years.
8. No excise duty on manufacture of most of the finished products.
9. Low import tariffs for capital equipment and most of the materials and components.
10. Soft loans to manufacturers and users for commercial and near commercial technologies.
11. Five year tax holiday for power generation project
12. Zero fuel cost
13. No water cess etc for utilization of power for the first ten years

So the factor of investment Barrier on the SHP should be addressed by considering the above factors too.

The detailed investment analysis should be used whether there are significant non-quantifiable barriers that prevent the happening of projects or similar activities.

Rather a descriptive investment analysis approach should have been adopted to see whether the projects are financially viable on their own. The reason is that the relevant barriers that are identified are all quantifiable. Hence it should be easy to see using an investment analysis whether these are significant.

warm regards

Rajaram Velayudhan

**Reply by the client:****The project is BAU as per consideration**

The project is not a BAU for the following reasons:

In Himachal Pradesh against a total hydro potential of 20400 MW, the potential for small hydro projects with a capacity of less than 25 MW is 750 MW. However, the installed capacity of small hydro projects is only 112 MW, which accounts for 0.55% of total hydro potential in Himachal Pradesh. Even in this installed capacity of 112 MW, about 90 MW of projects were constructed by State power generator (HPSEB) over several years. The actual capacity of power plants established by private promoters is only 22.2MW only.

Considering the above statistics and the various barriers explained in the PDD this project activity is not a BAU.

By considering the generation of the project activity envisages that this project should be considered as CDM project if certain issues mentioned below are not applicable

Investment Barrier:

These kinds of run of river projects are to be welcome on red carpet in a country like India where as once these projects are considered as CDM projects the vision should be on a holistic way not constricted only towards the capital cost.

Reply:

The project proponent has relied on barrier analysis for the purpose of demonstration of additionality. The barriers considered for the project are very significant. These barriers are investment barrier (lack of infrastructure, lack of facilities for evacuation of power, construction risks etc.,) and prevailing practice. As per UNFCCC simplified modalities the project proponents may establish additionality as per Attachment A to Appendix B which lists various barriers, out of which at least one barrier shall be identified due to which project would not have occurred any way. The project proponents have demonstrated the prevalence of significant barriers as described in the PDD. Another significant factor, which has an impact on the viability of the project, is power generation by the project activity. As there is no recorded data on water flow in the stream measured by government or any other agency, simulated data has been adopted for estimating water flow and the power generation from the project activity. Therefore estimating plant load factor with reasonable certainty may not be possible for small projects in Himachal Pradesh. An analysis of operation of existing small hydro projects of capacities of 3 MW – 25 MW in Himachal Pradesh indicate varying capacity utilization factors. However the average plant load factors for five years worked out to 36 %. (Source: Himachal Pradesh State Electricity Board) With these varying figures it is difficult to estimate the power generation with accuracy from the project activity. However, as required in the stakeholder comment, an IRR analysis has been prepared based on reasonable assumptions together with sensitivity analysis. Further while working out the IRR all the benefits available for the project activity have also been considered. The result of IRR analysis is furnished below:

Scenario IRR (%)

	Without CDM benefit	With CDM benefit
Normal	14.10	17.50
10 % Increase in Project Cost	8.58	12.58
10 % Decrease in PLF	12.234	16.65
Considering central subsidy	18.19	23.17



A further analysis is made with respect to probability of occurrence of these scenarios. Therefore the weighting is given for each scenario depending on the chances of its occurrence and arrived at the weighted average IRR.. Based on this analysis the IRR is working out to 13.46% with out income from CDM and the same improves to 17.48% considering CDM revenue. Further the weighted average cost of capital is estimated as 16.92%. Therefore CDM revenue is required for the project proponent to reach the bench mark cost of capital.

b) The projects may avail benefits as listed below:

1. 100% accelerated depreciation for tax purposes in the first year of the installation of projects/systems

Reply: As per Sec.32 of the Income Tax Act, 1961 and the schedule of depreciation given under the said section on Renewable energy equipment front, only wind energy and biomass equipment is given accelerated depreciation at 80% and Hydro power equipment is subject to normal depreciation only and accelerated depreciation is not available.

2. Hundred per cent deduction from profits and gains for first five years and thereafter 30 per cent of the profits and gains.

Reply: In fact all the power generating and distribution companies are eligible for 10 years tax holiday from the initial assessment year of 100% of profits (as per sec.80 I A of the income tax). As indicated by the stake holder this is not applicable to the proponent. Enclosed the relevant extract from I.T. Act for verification

3. Exemption from MAT

Reply: As per Sec. 115JB of the Income Tax Act no exemption is available for the Power generation companies from the payment of MAT.

4. An equity component of only 30% of the total project cost

Reply: Our projection for the said projects is based on the funding structure approved by State Bank of India (SBI).

5. For survey, investigation and DPR preparation the grant was in the region of 0.3 millions

Reply: Due to complex procedures the incentive could not be availed by the company. The incentive has to be claimed within 6 months from the date of financial closure through a nodal agency and there is no possibility for claim after 6 months.

6. Interest subsidy of 2 %

Reply: There is no Interest subsidy scheme from MNES. However, MNES was considered sanction of capital subsidy by its Administrative approval issued in the year 2004. There is no information from MNES about the continuation of the scheme. Hence, the same is not considered for the purpose of working out IRR as there is uncertainty on the availability of capital subsidy. However, while preparing sensitivity analysis an assumption has been made that if subsidy is available what will be its effect on IRR.

7. Interest rate of 12%, with repayment duration of 12 years having a moratorium of max 3 years.

Reply: Interest rate is considered as per the norms of SBI and the same is 11%.. The repayment period is 36 quarters with a moratorium of one year from the date of commercial operation.

8. No excise duty on manufacture of most of the finished products.

Reply: There is no such exemption available on plant and machinery purchased by the project proponent.

9. Low import tariffs for capital equipment and most of the materials and components.



Reply: The project proponent has been advised that no such exemption available for the equipment purchased by the project proponent.

10. Soft loans to manufacturers and users for commercial and near commercial technologies.

Reply: The cost of equipment will be decided by tendering process and the cost quoted by the suppliers are after considering all the benefits. Hence no credit will be availed in the project cost.

11. Five year tax holiday for power generation project

Reply : Please refer reply to query no.2.

12. Zero fuel cost

Reply: Considered the same in financial calculations.

13. No water cess etc for utilization of power

Reply: There is no water cess for the first 15 years of operation of the plant and hence not considered the same in financial calculations.

So the factor of investment Barrier on the SHP should be addressed by considering the above factors too. The detailed investment analysis should be used whether there are significant non-quantifiable barriers that prevent the happening of projects or similar activities. Rather a descriptive investment analysis approach should have been adopted to see whether the projects are financially viable on their own. The reason is that the relevant barriers that are identified are all quantifiable. Hence it should be easy to see using an investment analysis whether these are significant.

Reply: The IRR analysis as indicated above has suitably addressed the above concern.

How DNV has considered the comment received in its validation:

As per the requirement of stakeholder comment, the project proponent has carried out the detailed IRR analysis of the project activity by taking into consideration the benefits and incentives available for the hydropower projects in India. It has been demonstrated that the project IRR in the absence of CDM works out to 14.10% which will improve to 17.50% with CDM against the WACC benchmark of 16.92%. A sensitivity analysis has also been carried out for variations in parameters such as:

Variations in Parameter	IRR without CDM	IRR with CDM
10% increase in project cost	8.58%	12.58%
10% decrease in PLF	12.34%	16.65%
Considering Central subsidy (82.50 million)	18.19%	23.17%

The sensitivity analysis on the IRR also shows that the project is not financially attractive in the absence of CDM revenue except one case i.e. with the support of capital subsidy announced by MNES in year 2004. The capital subsidy has been considered under sensitivity analysis as there is no official confirmation from MNES regarding the continuity of the subsidy scheme announced in year 2004.

And as detailed in section 3.4, it has been verified that the project is not financially attractive and faces different barriers and thus is not the most likely baseline scenario. It is also confirmed that the response provided by the PP represent correct information. Hence, the emissions reductions occurring from the project are deemed additional to those that would occur in the absence of the project activity.



5 VALIDATION OPINION

Det Norske Veritas AS (DNV) has performed a validation of the “10 MW Renewable Energy Project for a Grid at Taraila, Himachal Pradesh” in India. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country 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 activity is being proposed as a unilateral project by AT Hydro (P) Ltd. and Cimaron Power Ltd. India has provided approval of voluntary participation and meets all requirements to participate in the CDM. The project will contribute to India’s sustainable development by providing benefits such as employment generation during construction and operation of the project, ensuring environmental wellbeing and aid in bridging the gap between demand and supply of power.

Having an installed capacity of less than 15 MW, the project is eligible as type I small-scale CDM project activity.

The project correctly applies the simplified baseline and monitoring methodology AMS-I.D.

By generating renewable energy which will displace fossil fuel based grid electricity, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 36 031 tCO₂e per year over the selected 10 year crediting period. The emission reduction forecast has been checked and is deemed likely that the state amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been identified.

In summary, it is DNV’s opinion that the project, as described in the project design document of 13 March 2007, meets all relevant UNFCCC requirements for the CDM, is eligible as category I.D small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-I.D. Hence, DNV requests the registration of the “10 MW Renewable Energy Project for a Grid at Taraila, Himachal Pradesh” as a CDM project activity.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ Project design Document, Final version dated 13 March 2007 and the previous versions
- /2/ DNA of India, Letter of Approval, dated 14 June 2006, for both projects i.e. Upper Taraila and Taraila Stage-II.
- /3/ Financial Analysis sheet.

Background documents related to the design and/or methodologies employed in the design or other reference documents:

- /4/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /5/ Appendix B of the simplified modalities and procedures for small-scale CDM project activities: Approved Baseline methodology AMS ID, version 10, 23 December 2006.

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

- /4/ Ramesh Reddy – Director - *AT Hydro (P) Ltd. and Cimaron Power Ltd.*
- /5/ Mohan Reddy – Zenithenergy

- oOo -

APPENDIX A

VALIDATION PROTOCOL FOR SMALL-SCALE CDM PROJECT ACTIVITIES

Table 1 Mandatory Requirements for Small Scale Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference/Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12.2	OK	Table 2, Section E.4.1
2. 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, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	CAR-1 OK	Approval from DNA of India has been verified.
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must be additional to any that would occur in 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. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2, Section B.2.1
7. 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	Decision 17/CP.7, CDM Modalities and Procedures Appendix B,	OK	The project is being proposed as a unilateral project.

Requirement	Reference	Conclusion	Cross Reference/Comment
result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	§ 2		
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	National Clean Development Mechanism Authority, Ministry of Environment and Forests, is the DNA in India for CDM.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	OK	India ratified the protocol on 26 th August 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	The project has been proposed as a unilateral project.
11. 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	The project has been proposed as a unilateral project.
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	Table 2, Section F
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G

Requirement	Reference	Conclusion	Cross Reference/Comment
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD has been published on DNV Certification's Climate Change website. Parties, stakeholders and NGOs are through the UNFCCC CDM website invited to provide comments on the validation requirement during a period of 30 days from 31 January 2006 to 1 March 2006. One comment has been received.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. Project Description The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	The project qualifies as a renewable energy project with a maximum output capacity as 10MW, which is less then 15 MW (Type I small-scale CDM project activity). The project involves in the installation of two hydropower generation units with an installed capacity of 5 MW each. Hence the project qualifies as a small-scale CDM project.		OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR	The project is not a de-bundled component of a larger project activity as there is no other registered small-scale CDM project likely to come up within 1 km of this hydro electric project.		OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/	DR	Yes, the project falls under Type-I- Renewable Energy Projects and category I-D- Grid connected renewable electricity generation.		OK
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The project is located at Upper Taraila Nallah in Chamba district, in the state of Himachal Pradesh, India.		OK

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

Page A-4

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR	The project boundary encompasses the diversion structure, power canal, penstocks, powerhouse, and power evacuation system and tailrace canal.		OK
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR	Yes, the project design reflects current good practices through the use of synchronous generator and horizontal shaft Francis turbine.		OK
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR	No technology transfer is envisaged in the project activity		OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Though not specifically addressed in the PDD, the project will require minimal additional training and maintenance efforts, as this involves setting up of a small hydro project using indigenous technology.		OK
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project adopts a clean technology that uses renewable source for power generation and provides employment opportunities in the region apart from ensuring environmental well being.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	The project is unlikely to create any adverse environmental or social effects, as this is a run of river small scale hydro electric project.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	The proposed project is likely to create employment opportunities and contribute to local development, apart from environmental and technological well being. DNA of India has confirmed the contribution of project activity to the sustainable development of	CAR-4	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			India.		
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	As per the MoEF, an EIA is not required for projects costing less than INR 1000 Million, as is the case with the proposed project activity. The consent for establishment, as per requirements of the Air Act and Water Act and other legal permits shall be forwarded for verification.	CL4	OK
B. Project Baseline The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/	DR	Yes. The project applies one of the simplified baseline methodologies proposed for the small-scale project activity category I.D, i.e. the baseline is the annual kWh generated by the project multiplied by an emission coefficient calculated as the weighted average emissions (in KgCO ₂ e/kWh) of the current generation mix.		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	Yes, the selected baseline methodology AMS-ID is applicable to the proposed project activity since it involves generation of power from hydro sources and the installed capacity does not exceed 15 MW		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?		DR	<p>The additionality of the project activity has been demonstrated through the barriers of investment, institutional and prevailing practice</p> <p>Investment barriers: It has been indicated that since the project is located in an underdeveloped and hilly area, lack of infrastructure by way of roads, transportation problems, power evacuation facilities etc, the promoters are required to develop these facilities before implementing the project and therefore been forced to invest more on the project activity.</p> <p>Prevailing practice: The prevailing trend is to invest in fossil fuel based thermal power generating stations, which need lower investment / MW, or in large Hydro Power Projects which have superior PLF. Both ensure adequate return to the investors and hence attractive. As a result, out of the estimated hydro potential of 20, 400 Mw, the share of small hydro projects below 25 Mw is less than 1000 Mw and projects under operation are only to an extent of 70 Mw</p> <p>The location of the project falls in high seismic zone and is prone to landslides and flash floods</p> <p>Institutional barriers: it is argued that potential risk exists for the project due to change in hydro projects</p>	CL-2	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<p>policies.</p> <p>It is been argued that the project has other risk like:</p> <ul style="list-style-type: none"> • Paying 12% royalty charges to the govt. of Himachal Pradesh. • Difficulty in acquisition of forest land and • Poor incentives availability from the govt <p>However, It remains to be more clearly demonstrated that the project would not have occurred anyway. In the view of the validation team, the following shall be addressed clearly</p> <ul style="list-style-type: none"> • Data with respect to the additional investment costs due to infrastructure development • Comparative costs of installation of a fossil fuel based plant vis-s-vis a small scale hydro power plant. 		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/	DR	<p>As the project activity is in the state of Himachal Pradesh, the baseline scenario has been appropriately considered to be the northern region electricity grid.</p> <p>The project developer has used the grid emission factor published by the official website of Central Electricity Authority. The same has been verified for the northern regional grid..</p>	CL-3	OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR	Yes, the national policies favour the development of renewable energy sources		OK
B.2.4. Is the baseline selection compatible with	/1/	DR	Baseline calculation is based on the electricity	CL-3	OK

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

Page A-8

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
the available data?			supplied by the project activity to the grid and the northern regional grid emission factor. Electricity supplied to the grid will be metered. The value for grid emission factor has been taken from the official website of Central Electricity Authority (CEA). The same has been verified.		
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR	It is likely that the regional grids will remain dependent on fossil fuel energy for the next 10 years of the crediting period		OK
C. Duration of the Project / Crediting Period It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	/1/	DR	The starting date of the project is 01 February 2006 with an expected operating lifetime of 30 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	The project selects a fixed crediting period of 10 years starting from 01 October 2007.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D. Monitoring Plan The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	/1/	DR	Yes, the methodology adopted - "Metering the Electricity Generated", is in accordance with Category I.D of Appendix B of Simplified M&P for small scale CDM project activities.		OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes. The project activity is generation of electricity (2 X 5 MW) of 10 MW using the run of the river hydro potential and exporting it to the grid. Emission reduction is equal to the product of the power exported by the project activity and the emission factor of the grid. Hence, metering of the electricity generated and emission factor of the grid need to be monitored. Thus, the choice of methodology is appropriate.		OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	Yes, the application of the monitoring methodology is simple and transparent.		OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	Yes.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	There will not be any project emissions, since the activity is run-of-the-river hydroelectric project.		OK
D.3. Monitoring of Leakage If applicable, it is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	There is no leakage from the project activity.		OK
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	Yes, the baseline emissions are dependent on the net export of electricity to the northern regional grid and grid emission factor. Following parameters will be monitored: <ul style="list-style-type: none"> Gross Electricity generation from the project activity i.e. Upper Taraila and Taraila II 		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<p>hydroelectric projects: Energy meters will be installed in both the plants to measure the gross electricity generation. The data will be recorded daily and will be verified and approved by General Manager.</p> <ul style="list-style-type: none"> Auxiliary power consumption: Energy meters will be installed in both the plants to monitor the total auxiliary power consumption. The reading will be taken on daily basis. Net electricity supply to the grid: The energy meters, namely main meter and check meter of 0.5 class accuracy, will be installed at HPSEB substation to measure the export of electricity to the grid. The energy meter will be calibrated using the standard meter. The standard meter will be calibrated once in a year at the approved laboratory of Government of India or Government of Himachal Pradesh. <ul style="list-style-type: none"> The grid emission factor will be taken from the official website of Central Electricity Authority (CEA). <p>The monitored data will be kept for whole of the crediting period plus two years.</p>		
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes, the baseline indicators have been chosen in line with the small-scale methodologies approved by the CDM EB.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	The baseline indicators are all based on available data from CEA and actual records of plant		OK

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

Page A-12

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			operations		
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes, the baseline indicators give an opportunity for real measurement of baseline emissions.		OK
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/	DR	A GHG Audit team / committee appointed with mutual agreement between the two project participants oversee the management and monitoring of the project.		OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR	Authority is vested with the appointed Audit team/ Committee		OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR	No procedures for training of monitoring personnel are described, but the project requires only limited monitoring, which is part of normal operations.		OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	No GHG emission relevant emergency situations are expected to occur.		OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Procedure for calibration of energy meter shall be forwarded.	CAR-2	
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Procedure for maintenance of monitoring equipment shall be forwarded.	CAR-2	
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Yes, procedures for monitoring and reporting of the data by the GHG Committee have been delineated.		OK
D.5.8. Are procedures identified for day-to-day	/1/	DR	The records to be kept have been identified.		OK

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

Page A-13

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
records handling (including what records to keep, storage area of records and how to process performance documentation)					
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Yes, the GHG committee will deal with this aspect.		OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR	Yes. Annual audits are planned.		OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR	Yes. As in D.5.9		OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR	Yes. As in D.5.9		OK
E. Calculation of GHG emission					
It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Project GHG Emissions					
The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR	Emissions related to the setting up of the SHP are not significant in comparison to the emissions generated during the construction activities of fossil fuelled power plants. No indirect emissions are likely as this is an energy		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			generation project based on renewable resources		
E.2. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	According to the simplified baseline and monitoring methodology for category I.D small-scale projects, leakage shall be considered, only if the project represents transfer of energy technology equipment from or to another activity. Since this is not the case in this project, no leakage must be considered.		OK
E.3. Baseline GHG Emissions The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	/1/	DR	The baseline emission boundaries are defined in accordance with the methodology specified under Appendix B of simplified modalities and procedures for small-scale CDM project activities, TYPE I.D.		OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	All emission sources have been captured in the PDD.		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	Yes, as recommended by appendix B of the Simplified M&P		OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	The baseline emissions have been calculated on the basis of electricity supplied by the project activity to the grid and northern regional grid factor. Electricity supplied will be metered and the grid emission factor has been taken from the official website of Central Electricity Authority (CEA) of India. The same has been verified.	CL-3	OK
E.3.6. Have conservative assumptions been used?	/1/	DR	Yes. Wherever applicable, assumptions made are conservative.		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	No uncertainties are likely to occur		OK
E.4. Emission Reductions Validation of ex-ante estimated emission reductions.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/	DR	The project replaces fossil fuel-based electricity generation. While the project emissions are zero. The project is likely to result in emission reductions of 36 031 tonnes of CO ₂ every year.		OK
F. Environmental Impacts It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/	DR	Environmental impact assessment is not required as per MoEF of India for projects whose total investment is less than 22.22US\$, such as the project activity.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	DR	The following clearances have been obtained: <ul style="list-style-type: none"> • Consents from the PCB for establishing the project – To be presented for verification. • NOC from HIMURJA – To be presented for verification. 	CL-4	OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	As the project size is small, no adverse environmental impacts are expected to occur.		OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	Yes, the project has only beneficial environmental impacts.		OK
G. Comments by Local Stakeholder Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	Stakeholders have been identified and the process of inviting their comments undertaken. Identified stakeholders are HIMURJA, HPSEB, the village panchayat and ERCHP.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Government of Himachal Pradesh, before issuing the techno-economic clearance, published the project scheme in the local newspaper on 25 th February 2005. Public was called to comment on the project within a period of 60 days. No comment was received and Government issued the clearance to the project activity. <ul style="list-style-type: none"> - Newspaper advertisement is to be provided for verification - Clearance from HIMURJA, HPSEB, ERCHP and village panchayat to be provided for verification 	CL-4	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
G.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	Not specifically required for this type of a project activity.		OK
G.1.4. Is a summary of the comments received provided?	/1/	DR	It is stated that no comments were received and government of Himachal Pradesh has issued the clearance to the project activity. Clearance to be provided for verification	GL-4	OK
G.1.5. Has due account been taken of any comments received?	/1/	DR	As in G.1.2	GL-4	OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1: Approval from the DNA of India shall be forwarded	A.3.3	Copy of the approval letter from DNA is attached for reference	Letter of Approval from DNA has been verified and accepted. The CAR is closed
CAR 2: Section D of the PDD lacks a discussion on the calibration and maintenance of the monitoring equipment	D.5.5, 5.6	The monitoring methodology and monitoring plan has been incorporated in the section D and Annex 5 of the revised PDD, where there is a discussion on calibration and maintenance of the monitoring equipment.	Calibration and maintenance of the monitoring equipment discussed in the revised PDD is acceptable. The CAR is closed.
CL 1: The consent for establishment, as per requirements of the Air Act and Water Act and other legal permits shall be forwarded for verification	A.3.4, F.1.2	There is no separate Air act and Water Act in Himachal Pradesh. Himachal Pradesh State Environment Protection & Pollution Control board has given their consent for the establishment of the project. The relevant document will be made available for verification. All other approvals received from various Government agencies are furnished for verification.	Following documents related to Upper Taraila and Taraila II small hydro projects have been verified: <ul style="list-style-type: none"> • Consent of Establishment. • Approval from Forest department. • Agreement with irrigation department. • MoU between Government of Himachal Pradesh and Project proponents of Upper Taraila and Taraila II projects. • Techno-economic clearance from Himachal Pradesh State Electricity Board. The CL is closed

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>CL 2:</p> <p>It remains to be more clearly demonstrated that the project would not have occurred anyway. In the view of the validation team, the following shall be addressed clearly</p> <ul style="list-style-type: none"> • Data with respect to the additional investment costs due to infrastructure development • Comparative costs of installation of a fossil fuel based plant vis-à-vis a small scale hydro power plant. 	B.2.1	<p>The project is located in a remote area where there are no infrastructure facilities. The nearest town is Tisa located at a distance of 25 Kms. All the minimum facilities such as banks, schools, medical facilities etc are located only in Tisa. There are also no approach roads for the power house or the weir site. The project proponent is laying the approach roads and also installing a rope way for movement of materials. A sum of Rs. 5.16 million is being spent on local area development which includes provision of minimum civic amenities. The site also lacks transmission system for evacuation of power. The project proponent is investing over Rs.20 million for laying the transmission system by joining hands with a group of other similar promoters of hydro projects. Necessary changes are incorporated in the PDD.</p> <p>The cost of establishing a fossil fuel based power plant (coal or gas) may be about Rs.35 to Rs.40 millions per MW. Some of the costs estimated for setting up these plants based on published data are furnished for verification.</p>	<p>Implementation agreement with Government of Himachal Pradesh has been verified for the expected additional investment on the infrastructural development. Approx 1% of the project cost will be spent on infrastructural development as per the agreement. The work details will be mutually agreed by the project developers and Government of Himachal Pradesh.</p> <p>The CL is closed.</p>
<p>CL 3:</p> <p>The details of calculation of grid emission factor shall be made available</p>	B.2.2, 2.4; E.3.5	<p>The grid emission factor has been adopted from "CO2 Baseline Database" published by CEA & is available in the CEA website.</p>	<p>The weighted average emission factor for northern grid, 713.32 t CO₂/ GWh has been taken from official website of Central Electricity Authority (CEA) and</p>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		http://www.cea.nic.in/planning/c%20and%20e/Govtment%20of%20India%20website.htm	is acceptable. The CL is closed.
<p>CL 4: The following is not clear:</p> <ul style="list-style-type: none"> • When was the public hearing held? • What were the communications processes adopted for intimation/consultation of the stakeholders meeting? • Are there recorded minutes of the meeting? <p>Clearances obtained from ERCHP, HIMURJA and the village panchayat shall be forwarded for verification.</p>	G.1.2	<p>Govt. of Himachal Pradesh (GoHP) follows a stringent public consultation process for new projects in the state of Himachal Pradesh. Before issuing Techno-economic clearance, GoHP announces the proposed project scheme in the local press and invites for any objections/comments from the public. Period of public announcement will be of 60 days. The Secretary, Power, GoHP issued a notification on 25th, Feb, 2005 in news papers and called for comments from the Public for the proposed projects. No comments were there for the project. Accordingly GoHP has issued the TEC.</p> <p>The following will be made available for verification</p> <ul style="list-style-type: none"> • News Paper Advt. from ERCHP/HIMURJA • Clearance letter from HIMURJA • Clearance letter from ERCHP • NOC from Village Panchayat. 	<p>Following documents related to Upper Taraila and Taraila II small Hydroelectric projects have been verified:</p> <ul style="list-style-type: none"> • Newspaper Notification by HIMURJA dt 25th Feb 2005. • NOC provided by the local villages. • Implementation agreement with Government of Himachal Pradesh and other clearances as required by the implementation agreement. <p>The CL is closed.</p>

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4 & 5		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Raman Venkata Kakaraparthi

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	Yes	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	Sectoral scope 5		
<i>Technical Reviewer for (group of) methodologies:</i>			
ACM002, AMS-IA-D, AM0019, AM0026, AM0029, AM0045	Yes		

Høvik, 22 December 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Anjana Sharma

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	--	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Amit Thusu

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	--	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Emmi Letho

Michael Lehmann



CERTIFICATE OF COMPETENCE

Einar Telnes

Director, International Climate Change Services

Michael Lehmann

Technical Director

Praveen Nagaraje Urs

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

GHG Auditor:

Yes

CDM Validator:

--

JI Validator:

--

CDM Verifier:

--

JI Verifier:

--

Industry Sector Expert for Sectoral Scope(s):

--

Høvik, 6 November 2006

Einar Telnes

Director, International Climate Change Services

Michael Lehmann

Technical Director