Vishnuprayag Hydro-electric Project (VHEP)
Monitoring report – VERs

1. Title of the project activity

Title: Vishnuprayag Hydro-electric Project (VHEP) by Jaiprakash Power Ventures Ltd. (JPVL)

Version: Ver 01.1

Date: 13/03/2008

2. Introduction

The purpose of this monitoring report is to calculate the Greenhouse Gas emission reduction achieved by the above mentioned project activity for the period starting from 1st April 2007 to 1st September 2007. The project is verified using VCS standard. The monitoring report covers the activity from 01/04/2007 till 30/09/2007.

3. Reference

Methodology: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" Reference: Approved consolidated baseline methodology ACM0002/Version 06, Sectoral Scope: 1, 19 May 2006.

The project is a Renewable Energy project with maximum output capacity of 400 MW

Project Design Document: "**Vishnuprayag Hydro-electric Project (VHEP) by Jaiprakash Power Ventures Ltd. (JPVL)"**

Version: 1.0, Dated: 12/04/2007

4. Definitions in the report

PDD: Project Design Document

GHG: Greenhouse Gases

IPCC: Intergovernmental Panel on Climate Change

VER: Verified Emissions Reduction

VCS: Voluntary Carbon Standards

5. General description of the project

5.1. Project Activity

Vishnuprayag Hydroelectric Project (VHEP) is a 4 x 100 MW Run-of-the-River Project located across river Alaknanda near Joshimath in district Chamoli of Uttarakhand state of India which is being implemented by Jaiprakash Power Ventures Ltd. (JPVL), a subsidiary of Jaiprakash Associates Limited (JAL). The Project activity is located at a distance of about 525 km from New Delhi. JAL is a well-known business group of India and had entered into agreement with State Government of Uttarakhand State government of Uttar Pradesh and Uttar Pradesh Power Corporation Limited (UPPCL)

VHEP shall have an underground power station with an installed capacity of 400 MW and shall utilize the water from river Alaknanda. The project is located at Rishikesh - Badrinath highway.

Project activity shall generate electricity using renewable hydel energy and sell it to UPPCL. JPVL has already been entered into Power Purchase Agreement (PPA) with UPPCL for this purpose. Although the project site is located in state of Uttarakhand, which was earlier, a part of Uttar Pradesh. So the PPA shall remain in principle with UPPCL, although project activity is supplying about 12% free electricity to Uttarakhand state as royalty. As the project activity involves generation of electricity by renewable sources of energy it will reduce anthropogenic Green House Gases (GHG) emissions that would have been generated to supply power to grid using fossil fuel. Here it is important to mention that at present more than 70% of power at the northern grid of India is obtained by fossil fuels.

Emergent Ventures India Pvt Ltd (EVI) is project advisor

5.2. Technical description of the project

VHEP is a run of river scheme with no storage dam upstream and downstream. The project as envisaged comprises17m high diversion barrage across river Alaknanda, two intakes and two underground sedimentation chambers, 11.343 KM long head race tunnel, and underground power station and 1.92 KM long tail race tunnel and outfall works. The water would be delivered to the power house through a steel lined pressure shaft. A surge

shaft is constructed between the head race tunnel and the pressure shaft which would be used to regulate the flow.

The project activity utilizes Impulse type Pelton turbines. In an impulse turbine, the power is generated due to high velocity water stream striking the turbine blades, which are designed in the shape of cups. The cups move as a result of the impact in the same direction as the flow. The turbine shaft is coupled with the shaft of generator.

5.3. Contact Information

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6. Monitoring methodology and plan:

The project activity meets the applicability criteria of the 'Approved baseline methodology ACM0002'. The applicability criteria of the 'Approved monitoring methodology ACM0002' are identical to those of the 'Approved baseline methodology ACM0002'. Therefore the project activity has used the 'Approved monitoring methodology ACM0002' in conjugation with the 'Approved baseline methodology ACM0002' for the project activity.

In keeping with the Monitoring Methodology, the following parameters is to be monitored in the specific project situation:

- Net electricity supplied to the state grid by project activity.

7. Quality Control (QC) and Quality Assurance (QA)

Refer Annex-1

7.1. Calibration/Maintenance of Measuring and Analytical Instruments

Electricity meters are properly maintained with regular testing and calibration schedules developed as per the technical specification requirements to ensure accuracy. Electricity supply data to the grid could also be cross-checked with the invoices for sale of electricity to the UPPCL

7.2. Environmental Impact

There are no negative environmental impacts from the project activity.

8. GHG Calculations

8.1 Project Activity Emissions

Since, the proposed project activity is a renewable energy project which generates electricity using hydro power; no anthropogenic emissions by sources of greenhouse gases within the project boundary are identified. Hence, no formulae are applicable.

8.2 Leakages

No anthropogenic greenhouse gases by sources outside the project boundary that are significant, measurable and attributable to the project activity are identified. Hence, no leakage is considered from the project activity. In addition, project proponents confirm that the renewable energy technology is not equipment transferred from another activity. Hence, no leakage calculation is required.

8.3 Baseline Emissions

"The baseline is the MWh produced by the renewable generating unit multiplied by an emission coefficient (0.75 tCO_2equ/MWh fixed ex-ante) calculated in a transparent and conservative manner as:

$BE_y = EF_y X EG_y$

Where

BE_y: Baseline emissions due to displacement of electricity during year y in tons of CO_2

EG_y: Electricity supplied to the grid by the project activity during the year y in MWh, and

EF_y: CO_2 baseline emission factor for the electricity displaced due to the project activity during the year y in tons CO_2/MWh.

Energy supplied to Grid

The energy supplied to grid is measured using electricity meters at the supply points. The net electricity supplied is measured as

EG_y = Total Generation – Auxiliary Consumption

Monthly power generation details are as follows (all figures in KWh else if mentioned)

Month	Generation (kWH)				
	Delivered Energy	Import	Net Delivered Energy	12% Free Energy for GOUA	Net Saleable Energy
Apr-07	109,243,527		109,243,527	13,109,223	96,134,304
May-07	237,203,400		237,203,400	28,464,408	208,738,992
Jun-07	280,225,175	7,273	280,217,902	33,627,021	246,590,881
Jul-07	286,530,623		286,530,623	34,383,675	252,146,948
Aug-07	269,643,367		269,643,367	32,357,204	237,286,163
Sep-07	292,370,617		292,370,617	35,084,474	257,286,143
Total	**1,475,216,709**	**7,273**	**1,475,209,436**	**177,026,005**	**1,298,183,431**

Grid Emission Factor

GEF has been fixed ex-ante as 0.75 tCO_2/MWh

Baseline Emissions

Formula for Baseline emissions as discussed is GEN_i * GEF

Month	Net Generation (KWh)	GEF	BEy
Apr-07	109,243,527	0.75	81,933
May-07	237,203,400	0.75	177,903
Jun-07	280,217,902	0.75	210,163
Jul-07	286,530,623	0.75	214,898
Aug-07	269,643,367	0.75	202,233
Sep-07	292,370,617	0.75	219,278
Total	**1,475,209,436**		**1,106,407**

8.4 Emission Reductions

$ER_y = BE_y - PE_y - L_y$

BE_y = Baseline Emissions as calculated in Section 8.3

PE_y = Project emissions = 0

L_y = Leakages = 0

So a total Emission Reduction of **= 1,106,407 tCO_2** is achieved by Project activity from April 2007 to September 2007.

Annex-1

Monitoring details

In this project the emissions reductions depend on following factors.

1. Electricity supplied by project activity to the grid during a year.
2. The Grid Emission Factor fixed ex-ante.

As described in PDD the following data values shall be monitored to calculate the emission reductions.

Data / Parameter:	**$GEN_{i, y}$**
Data unit:	MWh
Description:	The units supplied by all WTGs to the NR grid during a particular year.
Source of data used:	Meters installed at the project site would accurately monitor electricity supplied to the grid. Invoice details of these sales could also be used for cross-checking the data.
Value applied:	Tabulated in Section 8.3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Electricity meters are properly maintained with regular testing and calibration schedules developed as per the technical specification requirements to ensure accuracy. Electricity supply data to the grid could also be cross-checked with the invoices for sale of electricity to the UPPCL.
QA / QC procedure applied	These meters are maintained by state electricity board and kept under lock. There is a provision of two transmission lines provided by UPPCL and both lines have one pair of main meter and check meter. These meters are regularly calibrated and the records maintained by state electricity department. The copies of calibration certificates have been provided. **Meter Details:** Accuracy of Meters: 0.2 CT Ratio: 1000/1A; PT Ratio: 400kV/110 v Multiplication Factor for KWh: 3636.36
Any comment:	