

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

Monitoring Report- Eighth VERs Verification

(VCS 2007.1)

Monitoring Period: 01/04/2010 to 30/09/2010 (Inclusive of both days)

Version: 01

Date: 09/10/2010

Jaiprakash Power Ventures Limited (JPVL)

Sector-128, Noida-201304

Uttar Pradesh

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1.0 Project Details

Vishnuprayag Hydroelectric Project (VHEP), a 4 x 100 MW Run-of-the-River Project, implemented by Jaiprakash Power Ventures Ltd. (JPVL) - a subsidiary of Jaiprakash Associates Limited (JAL a well-known business group of India), is located across river Alaknanda near Joshimath in Chamoli district of Uttarakhand state of India. . An agreement was entered into by the Company with State Government of Uttaranchal (now Uttarakhand), State government of Uttar Pradesh and Uttar Pradesh Power Corporation Limited (UPPCL) for implementation of VHEP.

Project activity generates electricity using renewable hydel energy and sells it to UPPCL. As the project activity involves generation of electricity by renewable source of energy it will reduce anthropogenic Green House Gases (GHG) emissions that would have been generated to supply power to grid using fossil fuel.

1.1 Technology Description

The project comprises of 17 m high diversion barrage across river Alaknanda, two intakes, two underground sedimentation chambers, 11.343 km long head race tunnel, and underground power station besides 1.92 km long tail race tunnel and outfall works. The water is delivered to the power house, equipped with Impulse type Pelton turbines, through a steel lined pressure shaft. To regulate the flow a surge shaft has been constructed between the head race tunnel and the pressure shaft. The project activity involves installation of four unit (4 x 100 MW), details of each is as follows:

S.No.	Unit	Name Plate Capacity	ID. No.	Supplier
1	Unit I	100 MW	G 00840/01	M/s Alstom,France
2	Unit II	100 MW	G 00840/02	M/s Alstom,France
3	Unit III	100 MW	G 00840/03	M/s Alstom,France
4	Unit IV	100 MW	G 00840/04	M/s Alstom,France

1.2 Project Implementation status

The project was successfully commissioned as per the plan and all the four turbines are running successfully till date. The commissioning dates of each turbine are mentioned below:

S.No.	Unit	Date of commissioning
1	Unit I	17 th June 2006
2	Unit II	14 th July 2006
3	Unit III	31 st August 2006
4	Unit IV	13 th October 2006

2.0 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.

PDD:

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

Date of completion: 25/05/2007

History of Issuance

Issuance	Period Covered	VCUs issued
First	03/06/2006 – 31/03/2007	728,188
Second	01/04/2007 – 30/09/2007	1,106,407
Third	01/10/2007 – 31/03/2008	278,077
Fourth	01/04/2008 – 30/09/2008	1,143,551
Fifth	01/10/2008 – 31/03/2009	361,915
Sixth	01/04/2009 – 30/09/2009	1,092,972
Seventh	01/10/2009 – 31/03/2010	370,085
Eighth	01/04/2010 – 30/09/2010	Under current Verification

3.0 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 are to be monitored in the specific project situation:

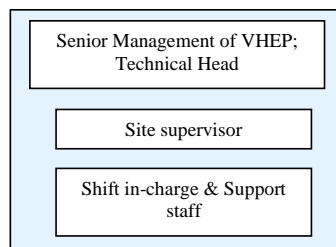
- Net electricity supplied to the state grid by project activity.
- GEF (grid emission factor) of Northern grid, the grid to which project activity supplies power.

The GEF i.e. 0.75 tCO₂/MWh has been fixed ex-ante in the PDD hence, its monitoring is not required

3.1 Monitoring Plan

A project team is constituted with participation from relevant departments. This team will be responsible for data collection and archiving. This team will meet periodically to review performance of project activity, check data etc. In case of any irregularity observed by any of the CDM team member, it shall be informed to the concerned person for necessary actions. On monthly basis, these reports are forwarded at the management level.

Team structure



Senior Management of VHEP/Technical Head: Overall responsibility of compliance with the monitoring plan.

Site Supervisor: Responsibility for completeness of data, reliability of data (calibration of meters), and monthly report generation

Shift In-charge: Responsibility of daily report generation

Data Monitoring:

Completeness-

For Electricity generation data: The project activity has installed the latest state-of-art monitoring and control equipment that measure, record, report, monitor and control various key parameters. An hourly log and daily report, of data is prepared by the shift in-charge.

Parameters monitored are the total power generated, power exported to the grid and auxiliary power consumed.

Reliability-

For electricity generation data: automatic control meters for power generation and exports are regularly maintained. The regular plant operation & maintenance procedure also includes process of regular meter testing, calibration & maintenance.

Actual power generation data is also metered using power output meter at the substation. The billing invoices for the power sold and meter readings could be used to validate the data accuracy.

Frequency-

The measurement is recorded and monitored on a continuous basis. An hourly log is prepared by the shift in-charge. At the end of the day, hourly data is aggregated in a daily report.

4.0 Quality Control (QC) and Quality Assurance (QA)

The meters, recording electricity supplied to state grid, 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 are maintained by state electricity department. Data on electricity supplied to the grid could also be cross-checked with the invoices for sale of electricity to the UPPCL

5.0 GHG Calculations

5.1 Project Activity Emissions

Project activity emissions have been calculated for the amount of electricity imported from the state grid and DG sets for running the auxiliaries.

Project emissions from electricity imported from the grid

Month	Electricity imported from the grid (MWh)	Grid Emission factor (tCO ₂ /MWh)*	Project emissions (tCO ₂)
Apr-10	26.89	0.84	22.58
May-10	25.71	0.84	21.59
Jun-10	25.21	0.84	21.17
Jul-10	40.85	0.84	34.31
Aug-10	39.03	0.84	32.78
Sept-10	36.32	0.84	30.51
Total	193.99	-	162.95

* Calculated from data published by CEA, version.5.0

Project emissions from electricity generated using DG sets

Month	Electricity supplied by DG sets (MWh)	Emission factor for power generation in the DG set (tCO ₂ /MWh)*	Project emissions (tCO ₂)
Apr-10	2.18	0.8	1.74
May-10	2.40	0.8	1.92
Jun-10	2.70	0.8	2.16
Jul-10	2.98	0.8	2.38
Aug-10	5.67	0.8	4.54
Sept-10	8.31	0.8	6.65
Total	24.24	-	19.39

*As per AMS 1-F, version.1, Table I.F.1, for diesel generators of capacity more than 200 KW

5.2 Leakages

There are no leakages associated with the project activity as per the registered PD.

5.3 Baseline Emissions

“The baseline is the MWh produced by the renewable generating unit multiplied by an emission coefficient (measured in tCO₂eq/MWh) calculated in a transparent and conservative manner as: **The weighted average emissions (in tCO₂eq/MWh) of the current generation mix.**

$$BE_y = EF_y \times EG_y$$

Where,

BE_y: Baseline emissions

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

EF_y: CO₂ baseline emission factor for the electricity displaced due to the project activity in during the year y in tons CO₂/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

$$EG_y = \text{Total Generation} - \text{Auxiliary Consumption}$$

Annual power generation details are as follows (all figures in MWh)

Month	Net Generation EG _y (Power Supplied to Grid) (MWh)
Apr-10	99,785
May-10	216,436
Jun-10	282,200
Jul-10	290,785
Aug-10	281,429
Sept-10	283,585
Total	1,454,220

Grid Emission Factor

The GEF is fixed ex-ante in the PDD as given below:

Parameter	Value
OM	0.98
BM	0.53
CM	0.75

Therefore $EF_y = 0.75 \text{ tCO}_2/\text{MWh}$

Baseline Emissions

Formula for Baseline emissions as discussed is $GEN_i * GEF$

Month	Electricity Delivered to the grid (MWh)	Grid emission factor (tCO ₂ /MWh)	Baseline emissions (tCO ₂)
Apr-10	99,785	0.75	74,839
May-10	216,436	0.75	162,327
Jun-10	282,200	0.75	211,650
Jul-10	290,785	0.75	218,089
Aug-10	281,429	0.75	211,072
Sept-10	283,585	0.75	212,689
Total	1,454,220	-	1,090,665

5.4 Emission Reductions

$$ER_y = BE_y - PE_y - L_y$$

BE_y = Baseline Emissions as calculated in Section 5.3

PE_y = Project emissions as calculated in Section 5.1

L_y = Leakages = 0

Month	Baseline emissions (tCO ₂)	Project emissions (tCO ₂) *	Leakage (tCO ₂)	Emission reductions (tCO ₂)
Apr-10	74,839	25	0	74,814
May-10	162,327	24	0	162,303
Jun-10	211,650	24	0	211,626
Jul-10	218,089	37	0	218,052
Aug-10	211,072	38	0	211,034
Sept-10	212,689	38	0	212,651
Total	1,090,665	186	0	1,090,479

*The project emission figures ,for each month, have been rounded up, as a conservative approach

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6.0 Meter Calibration Details

Meter Details	Meter Serial No.	Calibration Dates	Accuracy class (%)
Line I- Main Meter	APM 20005	31 st March 2010 & 30 th June 2010	0.2
Line I- Check Meter	APM 20007	31 st March 2010 & 30 th June 2010	0.2
Line II- Main Meter	APM 20004	31 st March 2010 & 30 th June 2010	0.2
Line II- Check Meter	APM 20006	31 st March 2010 & 30 th June 2010	0.2
DG Incomer	619139	20 th Feb 2010 & 17 th June 2010	0.5
Grid Incomer	619137	31 st Dec 2009 & 19 th June 2010	0.5
Master Meter	29993	23 rd Sept 2009	0.2

7.0 Comparison between VCUs generated v/s VCUs claimed in the registered PDD

Period	Energy delivered to grid (KWh)	Baseline emissions (tCO ₂)	Project emissions (tCO ₂)	VCUs (tCO ₂)
1 st April 2010- 30 th September 2010	1,454,220,364	1,090,665	186	1,090,479
As per registered PDD	1,019,947,500	764,961	0	764,961

The emission reduction have been estimated in the validated PDD based on the total power generation estimated for the year after deducting auxiliary and transformation losses. This on a pro rata basis for the period of verification works out to be 764,961 tCO₂. The actual emission reductions are higher because:

1. The current verification period falls in the peak season which has resulted in a higher PLF and hence, a higher generation than the average for the plant calculated on a pro rata basis for the verification period.
2. On adding the generation of the immediately preceding six months (Oct 09-Mar 10) the actual generation is less than what has been estimated for the complete year. The total energy generated for the complete year (including the previous six months) works out to be 1948 GWh as compared to an estimate of 2040 GWh net of auxiliaries and transformation losses in the PDD.

Annex- I

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POWER VENTURES LIMITED

TO WHOMSOEVER IT MAY CONCERN

This is to confirm that our 400MW ROR type Vishnuprayag Hydro-electric Project (VHEP), implemented by Jaiprakash Power Ventures Limited (JPVL), in Uttarakhand, India is claiming carbon credits only under the Voluntary Carbon Standards (VCS) Program.

We hereby declare that the Project do not form a part of any other carbon credit program from 01st April, 2010 to 30th September, 2010 (the period for which we are claiming VERs under the VCS program).

Authorised Signatory
For **JAIPRAKASH POWER VENTURES LIMITED**



(Suren Jain)
Managing Director



Date: 09.10.2010



Corp. Office : Sector-128, Noida - 201 304, Uttar Pradesh (India)
Ph. : +91 (120) 4609000, 2470800 Fax : +91(120) 4609464, 4609496
Regd. Office : JUIT Complex, Wagnaghat, P.O. Dumehar Bani, Kandighat - 173215, Distt. Solan (H.P.)
Ph. : +91 (1792) 257999, 245367 Fax : +91 (1792) 245362