

MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

CONTENTS

- A. General description of the project activity
 - A.1. Brief description of the project activity
 - A.2. Project participants
 - A.3. Location of the project activity
 - A.4. Technical description of the project
 - A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity
 - A.6. Registration date of the project activity
 - A.7. Crediting period of the project activity and related information
 - A.8. Name of responsible person(s)/entity(ies)
- B. Implementation of the project activity
 - B.1. Implementation status of the project activity
 - B.2. Revision of the monitoring plan
 - B.3. Request for deviation applied to this monitoring period
 - B.4. Notification or request of approval of changes
- C. Description of the monitoring system
- D. Data and parameters monitored
 - D.1. Data and parameters use to calculate baseline emissions
 - D.2. Data and parameters use to calculate project emissions
 - D.3. Data and parameters used to calculate leakage emissions
 - D.4. Other relevant data and parameters
- E. Emission reductions calculation
 - E.1. Baseline emissions calculation
 - E.2. Project emissions calculation
 - E.3. Leakage calculation
 - E.4. Emission reductions calculation
 - E.5. Comparison of actual emission reductions with estimates in the registered CDM-PDD
 - E.6. Remarks on difference from estimated value

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT

Ver 2.0. 26/07/2012

Thanh Thuy Hydropower Project

4338

Monitoring period #1: 03/05/2011 – 29/02/2012

SECTION A. General description of the project activity

A.1. Brief description of the project activity:

1. The project activity is a large scale run-of-river hydropower plant. It offers an environmentally friendly solution to growing energy demand. Renewable electricity is exported to the Vietnamese national grid system and, in doing so; the project reduces greenhouse gas emissions. This is achieved by displacing generation by more traditional methods that lead to anthropogenic emissions of carbon dioxide and other greenhouse gasses (the baseline scenario).
2. Once fully constructed, the project activity will have a total installed capacity of 20MW (2 cascades, one of 11MW and one of 9 MW). The project activity does not utilize an accumulation or a run-of-river reservoir for water storage during times of low rain fall or water flow.
3. At present, only cascade 2 (Thanh Thuy 2 with an installed capacity of 9MW) has come into operation and its operation date was on 29/06/2011. The cascade 1 of 11MW has been delayed due to economic difficulties (macroeconomic conditions in Viet Nam).
4. The project generated a total of 22,070 MWh over the monitoring period, corresponding to a total of 12,721 tCO_{2e} emission reductions.

A.2. Project Participants

Name of Party Involved (host) indicates a host Party)	Private and/or public entity(ies) Project participants (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Socialist Republic of Viet Nam (host)	<u>Private Entity</u> : Viet Long Industry Joint Stock Company (as the project owner)	No
Switzerland	<u>Private Entity</u> : Bunge Emissions Holdings Sarl	No

Viet Long Industry Joint Stock Company: set up to develop energy projects and also trading in the energy industry, based in Hanoi, Viet Nam.

Bunge Emissions Holdings Sarl: Bunge is an integrated, global agribusiness and food company operating in the farm-to-consumer food chain. With respect to carbon emission reductions, Bunge has been active in this sector through its subsidiary Ecoinvest carbon SA for a number of years. Bunge Emissions Holdings Sarl, one of the subsidiaries that act as a buyer of CERs, VERs and ERUs and as financial partner, has been active for more than one

year with expertise in more than thirty projects in more than ten countries across three continents.

A.3. Location of the project activity:

The project location is Xin Chai, Thanh Duc and Thanh Thuy Communes, Vi Xuyen District, Ha Giang Province in the north of Viet Nam.

The co-ordinates of the site are:

Cascade 2 weir: Latitude of 22°52'32"N and longitude of 104°48'23"E

Cascade 1 weir: Latitude of 22°52'00"N and longitude of 104°48'16"E

A.4. Technical description of the project

The produced electricity is delivered to the national grid via a 110 kV transmission line. The main construction structures of the project consist of intake point with gate, forebay/pressure tank, penstock and powerhouse containing turbines, generators and transformer as shown in Figure 1. There is no reservoir associated with the construction of the project, neither accumulation nor run-of-river type.

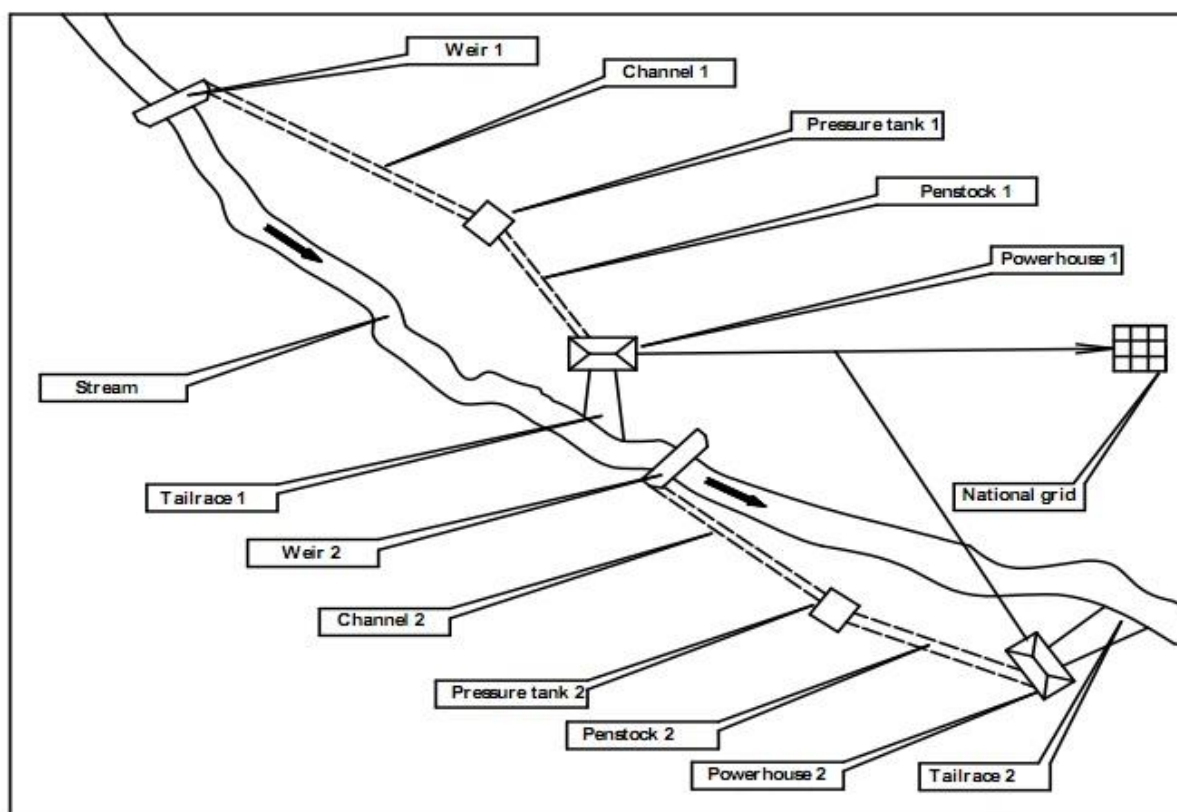


Figure 1 : Schematic representation of the proposed project activity

The technologies detailed in Table 1 along with the governors, valves, exciters and associated installation and commissioning services are imported from China and Japan. They therefore

contribute to the sustainable development aspect of the project via technology transfer.

Table 1: Key technologies utilised

Equipment of Cascade 2	Item	Specification
Turbines	Quantity	3
	Capacity	3,105 kW
	Type	HLA351C-WJ-84
	Rate flow	2.13 m ³ /s
	Max head	171.6 m
	Min head	166.98
	Rated speed	1,000 rpm
	Runaway speed	1,661 rpm
Generators	Quantity	3
	Capacity	3,000 kW
	Type	SFW3000-6/1730
	Cosα	0.8
	Rated speed	1,000 rpm
	Runaway speed	1,750 rpm
	Rated voltage	6,300 V
	Rated efficiency	96.6%

Equipment of Cascade 1	Item	Specification
Turbines	Quantity	2
	Capacity	4,179.73 kW
	Type	CJA237T-W-120/2x12
	Rate flow	1.6 m ³ /s
	Used head	307.50 m
	Rated speed	600 rpm
	Quantity	1
	Capacity	3,105.26 kW
	Type	CJA237T-W-120/2x8.5
	Rate flow	0.8 m ³ /s
	Used head	307.50 m
	Rated speed	750 rpm
Generators	Quantity	2
	Capacity	4,000 kW
	Cosα	0.8
	Rated speed	600 rpm
	Rated voltage	6,300 V
	Rated efficiency	95.7%
	Quantity	1
	Capacity	3,000 kW
	Cosα	0.8
	Rated speed	750 rpm

	Rated voltage	6,300 V
	Rated efficiency	95%

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

Reference	Version	Title
ACM0002	v11	Consolidated Methodology for Grid Connected Electricity Generation from Renewable Sources
EB35, annex 12	v1.1	Tool to calculate the emission factor for an electricity system
EB39, annex 10	v5.2	Tool for the demonstration and assessment of additionally.

A.6. Registration date of the project activity:

The project was registered on 03/05/2011.

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

The crediting period is 03/05/2011-02/05/2018 and is renewable.

A.8. Name of responsible person(s)/entity(ies):

Michel Buron (CEO), michel.buron@kyotoenergy.net
Kyoto Energy Pte. Ltd., <http://www.kyotoenergy.net>
No 80 Raffles Place, UOB Plaza 1, level 36-01
048624 Singapore, SINGAPORE

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

1. The first commercial operation date of the project activity's second cascade (Thanh Thuy 2) was on 29/06/2011. The first cascade was changed installed capacity from 8MW to 9MW. The cascade (Thanh Thuy 1) is delayed due to economic difficulties (macroeconomic conditions in Viet Nam). However this is temporary, the PP still plans the completion and the operation of the second cascade.
2. No special event (e.g.: overhaul, downtime, equipment exchange, etc.) occurred during the monitoring period.
3. No event that could impact the applicability of the methodology occurred during the monitoring period.

B.2. Revision of the monitoring plan

No revision of the monitoring plan was requested during this period.

B.3. Request for deviation applied to this monitoring period

No request for deviation was applied to this monitoring period.

B.4. Notification or request of approval of changes

A request for approval of change of the project activity has been submitted to CDM – EB regarding the increase of installed capacity, (See section B1 above) on 20/04/2012 and subsequently the changes have been approved by CDM-EB in its 68th meeting on 20/07/2012.

SECTION C. Description of the monitoring system

C.1. Electricity generation metering system

The system is composed of three energy meters (1 main and 2 backups) belonging to the grid operator EVN and used as the source of data for the calculation of emission reductions.

The location of each instrument is indicated schematically in the monitoring diagram shown in Fig. 2:

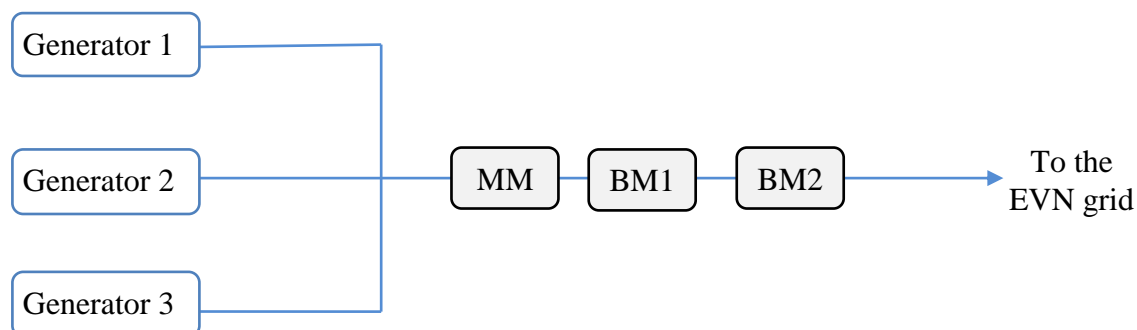


Figure 2: Meters location on the electric circuit

- MM is the main meter. It measures the electricity generation at the hydropower site while taking into account both export and import from the national grid. The MM is the source of data for the EVN receipts.
- BM1, BM2 are the backup meters. It is used to compare with the records from the main meter, and used as record source in case the main meter fails (see section C.3).

C.2. Data treatment and verification

A verification of the data recorded was performed by:

- The spot check of field instruments by staff; and
- The comparison between the main meter and backup meter.

No deviation was large enough to require any corrective action request by the electricity purchaser, EVN.

C.3. Non conformities and Emergency procedures

Non conformities are internally defined as any incidents affecting the project or its monitoring. (e.g.: calibration delay, data loss, instrument malfunction, change in project implementation, etc.). They feature various severities and some of them may lead to data reconstruction (emergency procedure), request for deviation (see section B.3) or PDD revision (see sections B2 and B4), whereas some others may not require any particular corrective measures.

In the event that the metering system suffers any failure, damage and unexpected problems, or if any errors in the main metering systems are detected during calibration, the electricity exported is determined as follows.

- Using the results of the backup system
- Should the backup system also suffer a breakdown, the electricity exported is proposed by reconstructing data by means of trend analysis (taking a conservative approach)

The only non-conformity which happened is the failure of BM2, please refer to Annex 1 for further detail. This non-conformity did not require any emergency procedure.

C.4. Maintenance and calibration of monitoring instruments

Calibration takes place at least every three years to ensure that the monitoring equipments are properly installed and functioning properly.

A manifest of monitoring equipment has been kept updated. It contains information such as:

- a) Data / Parameters
- b) Instrument tag
- c) Manufacturer ,Type and Serial number
- d) Accuracy
- e) Calibration frequency
- f) Calibration dates
- g) Events during the monitoring period

This instrument manifest is available in annex 1.

The calibrations of main and backup meters have been consistently on time during the monitoring period.

C.5. Monitoring team

The CDM monitoring team is composed of the following staff:

Table 2: CDM Monitoring Team Details

Report to:	Position	Names
Viet Long Industry Joint Stock Company	Project director	Vũ Hoài Sơn
	Site supervisor	Lê Văn Xuyên
	Operator (head of group 2)	Phạm Văn Huy
	Operator	Nguyễn Tài Tuệ
	Operator	Hà Văn Tuấn
	Operator	Trương Mạnh Hà
	Operator (head of group 2)	Phạm Văn Hưng
	Operator	Lộc Tuyên Hoàng
	Operator (head of group 2)	Vũ Thượng Hải
	Operator	Vương Đức Dũng
	Operator	Nguyễn Cao Sơn
	Operator head of group 2)	Lý Anh Tú
	Operator	Lã Cao Cường
	Operator	Hà Văn Khuê
	Operator	Nguyễn Văn Tuấn
Kyoto Energy Pte Ltd	CDM Consultant/ Project manager	David Louis Shaw

Table 3: Allocation of monitoring responsibilities

#	Tasks description (and frequency)	Operator	Supervisor	Project director	CDM consultant
Monitoring activity					
1	Recording of monitored data	✓ ¹			
Quality Assurance & Quality Control					
2	Verification of data monitored (consistency and completeness)		✓		
3	Ensuring adequate training of staff		✓		
4	Ensuring adequate maintenance		✓		
5	Ensuring calibration of monitoring instruments		✓		
6	Data archiving: ensuring adequate storage of data monitored (integrity and backup)			✓	
7	Identification of non-conformance and corrective/preventive actions and monitoring plan improvement		✓		
8	Emergency procedures		✓		

¹ This is a joint reading with representatives from the power company, as per Power Purchasing Agreement

#	Tasks description (and frequency)	Operator	Supervisor	Project director	CDM consultant
9	External audit				✓
Calculation of GHG emission reductions and reporting					
10	Processing of data and calculation of emission reductions			✓	
11	Preparation of the monitoring report			✓	

C.6. Adequate training of staff

The monitoring plan is made available to each member of staff involved in the project's monitoring. A copy is located in the control room at the site.

A training session was organised on 14/09/2011 to introduce the staff to the monitoring plan requirements. Background information was also given about the impacts of the CDM project and the importance of monitoring.

During the training, the staff signed a training attendance list. All training records are retained inclusive of training attendance, and training materials.

Records of training and awareness will be kept for at least 2 years after the crediting period.

C.7. Monitoring plan improvement

No new improvement has been incorporated in the monitoring report for this period.

C.8. Data archiving

The log files are kept for a minimum of 2 years after the end of the crediting years by using paper documents and electronic files.

The log files are stored on various media (CD-ROM and hard disks) at several locations (plant, headquarters and CDM consultant server).

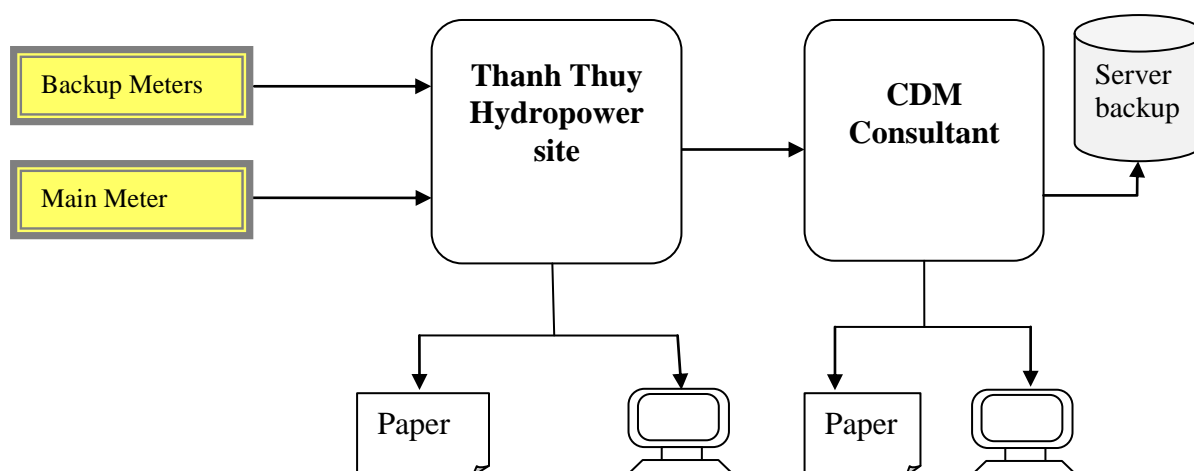


Figure 3: Monitoring data flow chart

SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	EF_{grid,CM,y}
Data unit:	tCO ₂ /MWh
Description:	CO ₂ emission factor in year y Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using “Tool to calculate the emission factor for an electricity system” (version 1.1).
Source of data used:	As per GEF report from Vietnam DNA, No.151/KTTVBĐKH, date 26/03/2010 ²
Value(s) :	0.5764
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Use for calculate emission reductions of the project
Additional comment:	

D.2. Data and parameters monitored

Data / Parameter:	EG_{facility,y}
Data unit:	MWh
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Measured /Calculated /Default:	Measured
Source of data:	MM BM1,BM2 in the event of MM failure (see section C3)
Value (s) of monitored parameter:	22,070 (Please see the table in section E.4)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Please see Annex 1
Measuring/Reading/Recording frequency:	Continuous measuring Monthly reading Monthly recording

² http://noccop.org.vn/Data/vbpq/Airvariable_ldoc_vnHe%20so%20phat%20thai.pdf

Calculation method (if applicable):	Not applicable.
QA/QC procedures applied:	<ul style="list-style-type: none"> • Measurement results shall be cross checked with records for sold/purchased electricity (e.g.: invoices/receipts) • Data are achieved up to 2 years after the end of the crediting period • Uncertainty level: low • Calibration as per manufacturer's recommendation but at least once every three years

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

The Baseline emissions are calculated as follows:

$BE_y = EG_y * EF_{grid,CM,y}$			
Where:	Description	Units	ID/value
BE_y	Baseline Emissions	tCO _{2e}	12,721
EG_y	Net quantity of electricity generated and delivered to the grid by the hydropower in year y	MWh	22,070
$EF_{grid,CM,y}$	CO ₂ emission factor in year y	tCO _{2e} /MWh	0.5764

E.2. Project emissions calculation

As per the methodology and the registered PDD, the project does not need consider project emission.

Therefore: $PE_y = 0$

E.3. Leakage calculation

As per the methodology and the registered PDD, the project does not need consider leakage.

Therefore: $LE_y = 0$

E.4. Emission reductions calculation / table

The emission reductions are calculated as follows:

$ER_y = BE_y - PE_y - LE_y$ <div style="text-align: right;">(4)</div>			
Where:	Description	Units	ID/value
ER_y	Emission reductions in year y	tCO _{2e}	12,721
BE_y	Baseline emissions in year y	tCO _{2e}	12,721
PE_y	Project emissions in year y	tCO _{2e}	0
LE_y	Leakage emission in year y	tCO _{2e}	0

Below are the detailed amounts of Emission reductions generated by the project over the monitoring period.

Table 4: Monthly emission reductions

Year	Period of Measurement	Net Electricity production by the project EG _y	Project Activity Emissions	Leakage	Baseline Emission Factor EF _y	Net Emission Reductions
		kWh	tCO _{2e}	tCO _{2e}	tCO _{2e} / MWh	tCO _{2e}
2011	03/05/2011-28/06/2011	No operation yet	No operation yet	No operation yet	No operation yet	No operation yet
	29/06/2011-30/06/2011	134,330	0	0	0.5764	77
	01/07/2011-31/07/2011	3,256,590	0	0	0.5764	1,877
	01/08/2011-31/08/2011	3,626,970	0	0	0.5764	2,091
	01/09/2011-30/09/2011	3,736,970	0	0	0.5764	2,154
	01/10/2011-31/10/2011	3,462,550	0	0	0.5764	1,996
	01/11/2011-30/11/2011	2,849,560	0	0	0.5764	1,642
	01/12/2011-31/12/2011	2,080,660	0	0	0.5764	1,199
2012	01/01/2012-31/01/2012	1,654,140	0	0	0.5764	953
	01/02/2012-29/02/2012	1,268,440	0	0	0.5764	731
Total		22,070,210	0	0		12,721

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

This section includes a comparison of actual values of the emission reductions achieved during the monitoring period with the estimations in the registered PDD.

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO ₂ e)	13,764 *	12,721

*: 19,885 CERs is the ex-ante estimation of emission reduction over a whole year in the registered PDD for cascade 2. As only 8 months are claimed in this monitoring report, the missing 4 months belong to the project's dry season. These 8 months of monitoring correspond to 69.22% of the yearly average river flow according to the project FS. The comparable value is then: $13,764 = 19,885 * 69.22\%$

E.6. Remarks on difference from estimated value in the PDD

The achieved emission reductions are lower than the ex-ante value of emission reductions in the registered PDD. Hence there is no excess of emission reductions to report.

Annex 1: Instrument Manifest

Data / Parameter	Tag	Manufacturer, Type and serial number	Accuracy (%)	Calibration frequency	Calibration dates	Event during the monitoring period
Main meter	MM	Manufacturer: Landis Type: ZMD402CT44.2407 S3 Serial: 97539302	0.2	3 years	25/04/2011	None
Backup meter 1	BM1	Manufacturer: Landis Type: ZMD402CT44.2407 S3 Serial: 97539306	0.2	3 years	25/04/2011	None
Backup meter 2	BM2	Manufacturer: Landis Type: ZMD405CR44.0007.C2 S3 Serial: 96648542	0.5	3 years	25/04/2011 15/11/2011	The serial number in the first calibration on 25/04/2011 was mistyped, the EVN reissued another one on 23/02/2012 with the correct serial number. BM2 malfunctioned in November 2011 and hence has been recalibrated by EVN