VERIFICATION REPORT

SREDEN ISKAR CASCADE HPP PORTFOLIO PROJECT IN BULGARIA

REFERENCE NUMBER: 0063

VERIFICATION PERIOD:
1 JANUARY 2008 - 31 DECEMBER 2008

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DET NORSKE VERITAS

VERIFICATION REPORT

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Summary:

Vez Svoghe OOD has commissioned Det Norske Veritas Certification AS (DNV) to perform the verification of the emission reduction reported for the "Sreden Iskar Cascade HPP Portfolio Project" in Bulgaria for the period 1 January 2008 to 31 December 2008. This report summarises the findings of this verification.

The verification was carried out in accordance with the Validation and Verification Manual (VVM) /10/. During the verification, DNV reviewed the project's monitoring report and documents related to the project's evidences of emission reduction. HPP Lakatnik and the construction site of HPP Svrazhen were visited. On-site inspections and interviews with the staff of the HPP Lakatnik were carried out during these visits.

Project implementation is delayed. Only one HPP Lakatnik is commissioned and only this HPP produced electricity. The second HPP, HPP Svrazhen, has finished its construction and technology installation and was in the permit application process at the time of the site visit.

The GHG emission reductions were correctly calculated on the basis of the validated monitoring plan and formulae given in the Project Design Document of 8 November 2006.

DNV is able to verify that the emission reductions from the Sreden Iskar Cascade HPP Portfolio Project in Bulgaria during the period from 1 January 2008 to 31 December 2008 amount to **5 024** tonnes of CO_2 equivalent.

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Work carried out by: Zuzana Andrtová, Mario Vöröš		
Work verified by: Weidong Yang		
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Abbreviations

CAR	Corrective Action Request
CEF	Carbon Emission Factor
CEZ	CEZ ELECTRO BULGARIA AD
CL	Clarification
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
DNV	Det Norske Veritas
ERU	Emission Reduction Units(s)
FAR	Forward Action Request
GHG	Greenhouse gas(es)
HPP	Hydro Power Plant
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
MP	Monitoring Plan
NEK	National Elektricheska Kompania (National Electricity Company)
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
GWP	Global Warming Potential

1 INTRODUCTION

Vez Svoghe OOD has commissioned Det Norske Veritas Certification AS (DNV) to perform the verification of the emission reductions reported for the "Sreden Iskar Cascade HPP Portfolio Project" in Bulgaria for the period 1 January 2008 to 31 December 2008. This report summarizes the findings of the first periodic verification of the project, performed on the basis of UNFCCC criteria for Joint Implementation (JI) projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

Verification is the periodic independent review and *ex post* determinations by an Independent Entity of the monitored reductions in GHG emissions that have occurred as a result of a JI project activity during a defined verification period.

1.2 Scope

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that the reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that reported emission reductions are complete and accurate.
The verification team has, based on the recommendations in the Validation and Verification Manual /10/, employed a risk-based approach, focusing on the identification of significant reporting risks and verifying the mitigation measures for these.

1.3 Description of the Project Activity

Project Parties:	Bulgaria and Netherlands
Title of project activity:	Sreden Iskar Cascade HPP Portfolio Project in Bulgaria
UNFCCC registration No:	0063
Project Entity:	Vez Svoghe OOD, Strt. St. Karadja 7, 1000 Sofia, Bulgaria, Patrick Pauletto, +359 878 507 401, patrick.pauletto@vezsvoghe.com
Location of the project activity:	Individual planed stages are placed on the river Iskar near Sofia, Bulgaria

The project involves the installation and commissioning of 9 small run-of-the-river hydro power plants on the river Iskar near the town of Sofia in Bulgaria. The total installed capacity of the project is 25.65 MW. The project is expected to generate 415.5 GWh of electricity over the entire crediting period starting from 1 January 2008 and extending to 31 December 2012

and is expected to reduce an average of 74 194 t CO_2 emissions per year by displacing electricity produced by existing and upcoming fossil fuel fired power plants connected to the electrical grid.

Construction of the first two HPPs started in July 2006. The first HPP (Lakatnik) was commissioned at 2 July 2008 and the second HPP (Svhrazen) has finished its construction and technology installation and was in the permit application process at the time of the site visit and is expected to be commissioned in 2009. Three HPPs were expected to start construction in July 2009 and the last four HPPs are expected to start construction in May 2010.

2 METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

i) Records related to measuring quantity of delivered electricity to grid;

ii) Emission factor issued by NEK (1.059 tCO_2/MWh for 2008);

iii) Calculation of the baseline emissions based on the determined and validated baseline emission factor;

iv) Records on validation and/or calibration of the used measuring equipment, etalons and calculation software.

Verification team

				Type of involvement					
Role/Qualification	***Last Name***	***First Name***	***Country***	Desk review	Site visit	Reporting	Supervision of work	Technical review	Expert input
JI verifier / Technical team leader	Vöröš	Mario	Slovak republic	✓			✓		
GHG auditor	Andrtová	Zuzana	Czech republic		✓	✓			
Technical reviewers	Yang	Weidong	USA					✓	

Duration of verification

Preparations: 26 February 2009

On-site verification: 27 February 2009

Reporting, resolution of outstanding issues and QA/QC: 5 March 2009 to 12 October 2009

2.1 Review of Documentation

The main documentation provided by project owner for verification was the monitoring report /3/ and invoices of purchased electricity, which was included to the monitoring report as well. The other part of documentation inspected during site visit was an electronic report related to operation of HPP Lakatnik. Documents, such as, calibration protocols or power purchase agreement, were verified as appropriate during initial visit /10/, which was performed in July 2008 by DNV as part of an initial verification of the project activity.

2.2 Site Visits

DNV carried out a site visit at the Sreden Iskar Cascade HPP Portfolio Project in 27 February 2009. Through the visit, DNV can confirm that HPP Lakatnik started to fully operate in July 2008, and that HPP Svrazhen has finished its construction and technology installation and was in the permit application process at the time of the site visit. Proper installation and maintenance of measurement devices has been checked at HPP Lakatnik, including the inspection of calibration seals. Both of the devices were reviewed – the electricity meter owned by the project owner and the electricity meter, which measures the purchased electricity and is owned by CES, the electricity distribution organization.

2.3 Assessment

The data presented in the monitoring report was assessed. Project documentation and production records were verified, as well as established monitoring and reporting practices and collection of measurements and the reliability of the installed monitoring equipment. Interviews with personnel of the HPP Lakatnik and project manager have been performed to inspect personnel relevant awareness. This has enabled the verification team to assess the accuracy and completeness of the reported monitoring results, and to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan and the determination of the reductions in CO_2 emissions.

Further the assessment was carried out by means of:

- Checking and recalculation of invoicing quantity of purchased electricity and calculation of the baseline emissions;
- Checking the value of emission factor used for baseline calculation;
- Verifying the implementation of the monitoring plan including procedures for quality assurance of the monitoring/measuring equipment and software.

2.4 Reporting of Findings

Findings established during the verification may as follows:

A corrective action request (CAR) is issued, where:

i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable JI requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the project for the period 1 January 2008 to 31 December 2008. The findings of the verification are documented in more detail in the verification checklist given in Appendix A.

3.1 Remaining Issues, CARs, FARs from Previous Validation or Verification

The following FAR from the previous initial verification of the project were assessed.

FAR #	***Description of the FAR***	***Observed actions taken to resolve the FAR***	***Conclusions***
FAR 2 (from initial verification)	The procedure for data handling, keeping and archiving is relatively basic and it is oriented on responsibilities only.	The details for legibility, archiving, storing and preservation against overwriting of data are missing. Procedure for data handling is required (at first for electronic data). The responsibilities are set sufficiently.	Final revised version of MP /2/ described good data handling, archiving and safeguarding against overwriting but legibility keeping is not included The FAR is still open. Regarding the short time for implementing the correction action the FAR is still open (But the risk is minor at present and it would increase in future without preventive action. It shall be closed prior to the next periodic verification.)

3.2 CARs, FARs from this Verification Period

One CAR, one FAR and two requests for clarifications was identified during the monitoring period 1 January 2008 to 31 December 2008. An assessment of the CAR, FAR and CLs raised during this monitoring period is described in the following table:

FAR, CL #	*Description of the FAR, CL*	*Observed actions taken to resolve*	*Conclusions*
FAR1	The formal appointment of internal auditor is pending and the internal audit of project was not conducted yet.	The audit will be executed during this year and the results will be included in the next monitoring report.	The FAR is still open and it will be check during the next verification.
CAR1	The project owner's monitoring procedures should be revised to reflect the fact that the emission factor determined in the "Baseline Study of Joint Implementation projects in the Bulgarian energy sector" is not a combined margin in accordance with ACM0002.	The project owner's monitoring procedures and monitoring report were revised, only the annex 4 was not changed because it is independent document issued by NEK and it cannot be revised by Vez Svoghe. Chapter D.3.4 was reworded and situation was correctly described. The emission factor from NEK study was approved from Bulgarian government and the ministry confirmed that mentioned version is still valid for JI projects in Bulgaria.	OK, The CAR is closed
CL 1	The clear identification of the monitoring period is required in the monitoring report.	The clear determination of first period is established in the version 2 of the monitoring report /3/.	OK, the CL is closed.
CL 2	It is not clear, why only OM emission factor is used in the calculation. The OM emission factor is determined in "Baseline Study of Joint Implementation projects in the Bulgarian energy sector"/8/ as combined emission factor in the monitoring report. Description is only in the mentioned document /8/.	This is the official methodology approved for baseline implementation in the Bulgarian energy sector. This information is included in the report; the part of the study related to this point was included in the revised monitoring report /3/.	OK, the CL is closed.

3.3 Project Implementation

The project is implemented with delay related to the second stage of HPP Svrazhen, which should have been commissioned in this monitoring period. The HPP Lakatnik was

commissioned in July 2008, with an installation capacity of 2.9 MW, same as planned in the PDD, but the electricity generated prior to the PPA /6/ signing was bought by CEZ ELECTRO BULGARIA AD (CEZ) based on the invoices /2/ provided by the project owner. This electricity was included in the calculation of emission reduction.

3.4 Completeness of Monitoring

Installation of measuring devices is performed according to the PDD description of HPP Lakatnik. As the electricity meter installed by the project owner measures the gross generations including self-consumption, there are discrepancies between daily meter reading and CEZ electricity meter, which is used for the measurement of the electricity delivered to grid and for the calculation of baseline emissions. An additional electricity meter is planned to be installed at the HPP. It will be installed on line between the HPP and CEZ's electricity meters to be used if CEZ's meter would be out of order and it will be more accurate for these situations than the calculation approach determined in the PPA /6/ where the baseline emissions will be calculated by multiplying electricity measured by the current meter owned by HPP Lakatnik (Vez Svoghe) applying an coefficient.

The installed meters fulfil all requirements described in PDD /1/ and it is in accordance with "Electricity metering rules" with valid certificates /4//5/ presented to DNV during the initial visit /10/ and seals on the electricity meter. The calibration protocols were provided during the initial verification to DNV and they are still valid /4//5/. Every meter has been inspected while performing the site visit. The HPP's meter has output to a SCADA system and electricity generation is automatically recorded to this system.

Delivered electricity is measured with electricity meters owned by CEZ, and the project owner does not access this metering system except for visual meter readings. The quantity of delivered electricity is read officially every month with records in a protocol and this protocol is signed by both parties (CEZ and Vez Svoghe).

The grid emission factor used to calculate the baseline emissions is the same as used in the PDD to forecast the project's emission reductions /1/.The grid emission factor was determined and issued by NEK in May 2005 /8/.

The PDD states on page 25 that "the baseline grid emission factors will be monitored using the document "Baseline Study of Joint Implementation projects in the Bulgarian energy sector" performed annually by the NEK". However, DNV was able to confirm that this baseline study was not updated and is still valid for JI projects in Bulgaria by e-mail from Ivan Terziiski from the Bulgarian Ministry of Environment and Water /7/. Hence, the emission factor of this study published on the web sites of the Ministry is the most recent baseline emission factor determined for Bulgaria /7/. DNV was also able to confirm that the necessary data to recalculate the emission factor based on more recent data is not publicly available.

3.5 Accuracy of Emission Reduction Calculations

The emissions reduction was correctly calculated during the reporting period with the validated calculation formulae and baseline emission factors given in the PDD /1/.

The emission factor was derived from the "Baseline Study of Joint Implementation projects in the Bulgarian energy sector" issued in May 2005 /8/ by NEK. The study determined an

operating margin emission factor by applying a model to forecast the emission factor based on a dispatch analysis applying actual generation and fuel consumption data from 2000-2004. The model takes into account new capacities.

At the time of writing the PDD and the determination of the project it was anticipated that NEK would on an annual basis update "Baseline Study of Joint Implementation projects in the Bulgarian energy sector". Hence, the monitoring procedures for the project /2/ foresees an annual update of the CO_2 emission factor of the Bulgarian grid determined using the "Combined Margin Method" procedure published by NEK. However, since as discussed above the "Baseline Study of Joint Implementation projects in the Bulgarian energy sector" of 2005 has not been updated, the project participants applied the CO_2 emission factor for 2008 included in the study published in 2005.

It must be noted that the approach selected by NEK in the "Baseline Study of Joint Implementation projects in the Bulgarian energy sector" is not in full compliance with the requirements of ACM0002 to which the monitoring plan in the final PDD refers to /1/. The emission factor determined for the years 2006-2012 and thus the emission factor for 2008 selected by the project participants for this monitoring period i) is based on a model and not actual generation and fuel consumption data for these years and ii) represents the operating margin only although considering likely future capacities in the dispatch analysis model applied.

Nonetheless, the use of model data instead of actual generation and fuel consumption data is in DNV's opinion acceptable as the model uses conservative assumptions and the Bulgarian Ministry of Environment and Water confirmed that the baseline study published in 2005 was not updated and is still valid for JI projects in Bulgaria.

In the context of the project activity, DNV finds it also acceptable to not consider the build margin and only future capacity additions in the dispatch analysis model applied to estimate the operating margin emission factor. Due to the small generation of the project, it reasonable to assume that the project will not have any effect on other power sector investments /12/ and thus the build margin. Moreover, in Bulgaria, like in many Eastern European countries, the number of new plants in recent years is also very low, given the decrease in electricity demand /12/.

The average load factor for this period is 27.82% (4 744 MWh / (2.9 MW * 245 days * 24 h/day). DNV was able to confirm that the load factors were varied for different months due to river water flow and machinery operation conditions. The power station invoices from May 2008 to December 2008 /2/ were checked during the on site visit.

The electricity generated and emission reductions claimed for the proposed period were as shown in the following table:

Period	Max possible Power Generated (MWh)	Net Power Supplied (MWh)	Load Factor	Emission Reductions (tCO2)
2008				
May to July 2008	6403.2	1337.264	20.88 %	1416.163
August 2008	2157.6	521.556	24.17 %	552.3278

September 2008	2088	549.695	26.33 %	582.127
October 2008	2157.6	803.506	37.24 %	850.9129
November 2008	2088	627.338	30.04 %	664.3509
December 2008	2157.6	904.343	41.91 %	957.6992
Total	**17052**	**4743.702**	**27.82 %**	**5023.58**

3.6 Quality of Evidence to Determine Emission Reductions

The calculation is based on the quantity the electricity supplied to the grid and the grid emission factor /8/. The quantity of electricity is measured and recorded into a protocol, which is signed by representatives both of parties (CEZ and Vez Svoghe) and which is the base for the invoice. Invoices are official documents for quantity calculation and they are included in Annual report for 2008 /3/.

3.7 Management System and Quality Assurance

Due to the relatively simple management system requirements for this project, all procedures related to management and operational system were described in the project owner's monitoring procedures /2/. The procedures, which were prepared only following the initial verification, are implemented now. Internal audit has not been conducted; though internal auditor has been properly trained /9/. However, the formal appointment of the internal auditor is pending (FAR1).

4 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments	Error/Discounted Uncertainty Tonnes
		Baseline Emissions	Project Emissions	Calculated Emission Reductions		
Completeness	• Source coverage/ boundary definition	OK	NA	OK	The boundary is clear described in PDD as project site and Bulgarian energy grid.	
Accuracy	• Physical Measurement and Analysis	OK	NA	OK	The measurement device is in accordance with Bulgarian national law and it is owned by CEZ. The seals are visible. Vez Svoghe plans to install its own electricity meter, which will measure delivered electricity to grid too for their control.	
	• Data calculations	OK	NA	OK	Data calculation are based on invoicing quantity of delivered electricity and emission factor, which is determined in "Baseline Study of Joint Implementation projects in the Bulgarian energy sector" The residual risk is that the updated emission factor is not applied for the future calculation.	

Risk Areas		Conclusions			Summary of findings and comments	Error/Discounted Uncertainty Tonnes
		Baseline Emissions	Project Emissions	Calculated Emission Reductions		
	• Data management & reporting	OK	NA	OK	The data management and reporting is on sufficient level; all electronic data are managed on access privileges and safeguarded by passwords. Invoices are stored according to Bulgarian legal requirements.	
Consistency	• Changes in the project	OK	NA	OK	No change was need.	

5 VERIFICATION STATEMENT

Det Norske Veritas Certification AS (DNV) has performed a verification of the emission reductions reported for the "Sreden Iskar Cascade HPP Portfolio Project" in Bulgaria for the period 1 January 2008 to 31 December 2008.

Vez Svoghe OOD is responsible for the collection of data in accordance with the validated monitoring plan and the reporting of GHG emissions reductions from the project.

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project and the compliance with the monitoring plan.

DNV conducted the verification on the basis of the monitoring plan of the final PDD /1/ and the monitoring report for 2008 dated 4 September 2009. The verification included i) checking whether the provisions of the monitoring plan in the PDD were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In DNV's opinion, the GHG emissions reduction for the project as reported in the monitoring report for 2008 dated 4 September 2009 are fairly stated.

The GHG emission reductions were correctly calculated on the basis of the validated monitoring plan and formulae given in the Project Design Document of 8 November 2006.

Det Norske Veritas Certification AS is able to verify that the emission reductions from the Sreden Iskar Cascade HPP Portfolio Project in Bulgaria during the period 1 January 2008 to 31 December 2008 amount to **5 024** tonnes of CO_2 equivalent.

Prague and Oslo, 3 November 2009

Michael Lehmann

Zuzana Andrtová

DNV Czech Republic

Michael Lehmann

Technical Director
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6 REFERENCES

Documents provided by the Project Participants that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the periodic verification conclusions, and are usually further checked through interviews with key personnel.

/1/ PDD – Sreden Iskar Cascade HPP portfolio Project Rev. 1 dated 8 November 2006, Rev. 2 dated 15 October 2007.

/2/ Sreden Iskar Cascade Hydropower Plants Monitoring Procedures – Final revised version, October 2009 (22.10.2009).

/3/ Monitoring report for 2008, dated 23 February 2009, rev.2 dated 31 March 2009 and rev3 dated 4 September 2009.

/4/ Protocols No. 1248/13.3.2008 / 13.03.2008

1249/13.3.2008 / 13.03.2008

1250/13.3.2008 / 13.03.2008 for transformers calibration

/5/ Certificato di verifica del contatore di energia electrica No. DPEE/07/07939

/6/ Agreement for purchase of electricity energy No.78 from 14.7.2008.

/7/ E-mail from Ministry of Environment and Water (Ivan Terziiski) for confirmation of emission factor dated 20 February 2009; e-mail from Ministry of Environment and Water (Stefan Dishovsky) dated 14 July 2009 and e-mail from Ministry of Environment and Water (Ivan Terziiski) dated 24 August 2009 confirmed that the valid NEK baseline study can be used for JI projects in Bulgaria.

/8/ Baseline Carbon Emission Factor of Bulgarian Electricity and Heat Power System (NEK "Study")

http://www.moew.government.bg/recent_doc/climate/Baseline%20CEF%20Summary.pdf

/9/ Certificate of training for Internal audits of the Monitoring plan of Sreden Iskar Cascade Hydro Power plants for Anton Milchev, dated 29 October 2008.

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

/10/ CDM Executive Board: Clean Development Mechanism Validation and Verification Manual, version 01.

/11/ CDM Executive Board: ACM0002 "Consolidated baseline methodology for grid connected electricity generation from renewable sources", version 6 of 19 May 2006 and version 7.

/12/ Organisation for Economic Co-operation and Development (OECD) and International Energy Agency (IEA), Practical baseline recommendations for greenhouse gas mitigation projects in the electric power sector. Information paper of 2002 (http://www.oecd.org/dataoecd/45/43/1943333.pdf)

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

/13/ Patrick Pauletto, Project Manager, Vez Svoghe OOD, Bulgaria.

/14/ Vassil Shumanov, Chief Engineer, Vez Svoghe OOD, Bulgaria .

/15/ Marco Baldini, Project Manager, MWH S.p.A, Italia.

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APPENDIX A

PERIODIC VERIFICATION CHECKLIST

Table 1: Data Management System/Controls

The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table. A score is assigned as follows:

- Full - all best-practice expectations are implemented.
- Partial - a proportion of the best practice expectations is implemented
- Limited - this should be given if little or none of the system component is in place.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
A. Defined organisational structure, responsibilities and competencies		
A.1. Position and roles *Position and role of each person in the GHG data management process is clearly defined and implemented, from raw data generation to submission of the final data. Accountability of senior management must also be demonstrated.*	F	The all involve positions are described in monitoring report and all responsibilities are included for individual positions. During the site visit DNV verified awareness of all involved persons by discussion with them (operator of hydropower plant, manager of project).
A.2. Responsibilities *Specific monitoring and reporting tasks and responsibilities are included in job descriptions or special instructions for employees.*	F	All is described in the monitoring report clearly; other documents are not need for clarification.
A.3. *Competencies needed* *Competencies needed for each aspect of the GHG determination process are analysed. Personnel competencies are assessed and training programme implemented as required.*	P	Trainings for all technical staff were checked during the Initial visit and evidences about it were sent to DNV. Certificate of training for internal audits of the monitoring plan of Sreden Iskar Cascade Hydro Power plants for Anton Milchev /9/ (29. October 2008) was documented during the 1st verification. Formally appointment will be performed (FAR1).

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
B. Conformance with monitoring plan		
B.1. Reporting procedures *Reporting procedures should reflect the monitoring plan content. Where deviations from the monitoring plan occur, the impact of this on the data is estimated and the reasons justified.*	P	The reporting procedures are clearly described in Monitoring plan. The procedures include daily reporting paper and electronic report, monthly reporting to GHG emission reduction and yearly storing of data. Daily reports in paper are scanned for electronic archiving. Only clear determination of period duration is required (~~CL1~~).
B.2. Necessary Changes *Necessary changes to the monitoring plan are identified and changes are integrated in local procedures as necessary.*	NA	No changes were required. But process for changes implementation is theoretically described in monitoring plan.
C. Application of GHG determination methods		
C.1. Methods used *There are documented description of the methods used to determine GHG emissions and justification for the chosen methods. If applicable, procedures for capturing emissions from non-routine or exceptional events are in place and implemented.*	F	Yes, the method used for determine GHG emissions are well described. The emission factor used for baseline emission calculation is determined by NEK and it was check that the document issued in 2005 is still valid. There is only one residual risk, which was determined in determination report.
C.2. Information/process flow *An information/process flow diagram, describing the entire process from raw data to reported totals is developed.*	F	It is included in monitoring plan sufficient. Due to the relatively simple process flow and calculation, the whole processes are verified by independent person yearly.
C.3. Data transfer *Where data is transferred between or within systems/spreadsheets, the method of transfer (automatic/manual) is highlighted - automatic links/updates are implemented where possible. All assumptions and the references to original data sources are documented.*	F	The project participants provided excel sheets, which are used for calculation with opened access to formulas in calculation. Whole formula tracking was checked during the initial visit. The correctness of calculation was verified with 100% recalculation of baseline emission reduction by verifier.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
C.4. Data trails *Requirements for documented data trails are defined and implemented and all documentation are physically available.*	P	All requirements to data keeping are sufficiently described in Monitoring plan except the legibility of electronic data (it is remaining open issue from initial verification, which is still open). But this risk is really low in this time and the instruction for electronic data keeping in longer time horizon is planned (FAR2).
D. Identification and maintenance of key process parameters		
D.1. Identification of key parameters *The key physical process parameters that are critical for the determination of GHG emissions (e.g. meters, sampling methods) are identified.*	F	Yes, it is clearly stated that electricity go-to-grid is measured by electricity meters owned CEZ company and Baseline Carbon Emission Factor is determined in NEK document, which is available on government website.
D.2. Calibration/maintenance *Appropriate calibration/maintenance requirements are determined.*	F	Calibration protocols were presented on Initial verification, and during the site visit of this first verification, the seals on the measurement devices were checked, seals were on site. However, as there is a possibility to calculate the baseline emissions based on the reading from the meter installed behind the transformer (determined in PPA /6/), company decided to install new electricity meter, which will be installed behind the all consumption of plant facilities.
E. GHG Calculations		
E.1. Use of estimates and default data *Where estimates or default data are used, these are validated and periodically evaluated to ensure their ongoing appropriateness and accuracy, particularly following changes to circumstances, equipment etc. The validation and periodic evaluation of this is documented.*	P	Defaulted set is only emission factor resource – NEK, which was appointed by Bulgarian Ministry of Environment and water for national emission factor for energy sector, how was described above. Validity of emission factor mentioned in PDD/1/ was checked – e-mail from Ministry of environment and water, official document by NEK is included in Monitoring report. The emission factor is still valid. Better description for calculation is required in Monitoring report (~~CL2~~).

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
E.2. Guidance on checks and reviews *Guidance is provided on when, where and how checks and reviews are to be carried out, and what evidence needs to be documented. This includes spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.*	P	The internal audit procedure is set; the internal auditor is trained; but, no internal audit was performed till today. However, the electricity meter reading is confirmed together by the power plant operator with CEZ employee every month.
E.3. Internal verification *Internal verifications include the GHG data management systems, to ensure consistent application of calculation methods.*	F	Every month, the verification of supplied electricity quantity is performed by HPP Lakatnik operator and CEZ employee. Emission factor validity for calculation was checked based on the information from Ministry of environment and water /7/.
E.4. Internal validation *Data reported from internal departments should be validated visibly (by signature or electronically) by an employee who is able to assess the accuracy and completeness of the data. Supporting information on the data limitations, problems should also be included in the data trail.*	F	The data related to electricity production is automatically reported (every second) to IS SCADA, where the input and authorities for reading and writing is defined. The delivered electricity is described every day by operator in the daily report and SCADA (not automatically) from electricity meter owned CEZ. The data review was performed by the project manager. For emission calculations, the official invoices, which are issued every month, are used.
E.5. Data protection measures *Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights).*	F	It is clearly described in Monitoring plan; all involved employees have defined access under password.
E.6. IT systems *IT systems used for GHG monitoring and reporting should be tested and documented.*	P	As explained above, IS tool used for monitoring and reporting is on high level. The legibility of the e-data was not described in process related to data archiving (FAR 2)

Table 2: GHG calculation procedures and management control testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
➢ calibration of electricity meter (owned by purchase company)	Owned company is responsible for electricity meter calibration and its correct maintenance. The device underlies to Bulgarian law related to measured devices, which are base for invoicing. This correct measurement will be controlled with additional installed electricity meter in the future, which will be owned Vez Svoghe company.	After the new meter installation, only limited residual risk will exist.
➢ reporting of quantity of the delivered electricity	The principle of control is the same as was described in the above. The monthly invoicing is based on monthly reading of delivered quantity This reading is performed by responsible persons from CEZ (purchased company) and Vez Svoghe. It guarantees independent control of correctness of theses values. The planned installation of new meter by Vez Svoghe will improve this report further, considering the possibility of the mal-function of the CEZ meter.	After the new meter installation, only limited residual risk will exist.
➢ update of baseline emission factor	The emission factor is determined by Bulgarian government and it was checked for the previous calculation of emission reductions for 2008.	Updating of emission factor shall be checked prior to every yearly calculation.

Table 3: Detailed audit testing of residual risk areas and random testing

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Updating of emission factor	➢ The validity of emission factor was checked based on the information from Bulgarian government by e-mail /7/. ➢ Simultaneously, the websites of Ministry of environment and water was visited, where the emission factor is published.	No misstatements or nonconformities were observed.

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